आई सी एम आर - राष्ट्रीय पोषण संस्थान
ICMR-NATIONAL INSTITUTE OF NUTRITION

शताब्दी वर्ष CENTENARY YEAR
1918-2018
Empowering the Nation through Nutrition

GOLDEN JUBILEE CELEBRATIONS

50th Annual International Conference of

NUTRITION SOCIETY OF INDIA

Golden Jubilee Year 2018

कार्यक्रम, कार्यवाहिया तथा सार संक्षेपण

Programme, Proceedings & Abstracts

Theme: India's Transition from Food Security to Nutrition Security

15-17 November, 2018

ICMR - NATIONAL INSTITUTE OF NUTRITION

Hyderabad–500007. Telangana. INDIA

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Welcome

It gives us immense pleasure to welcome you all to the Golden Jubilee Conference of Nutrition Society of India. It is quite befitting for the Golden Jubilee Conference to be hosted at the National Institute of Nutrition, which is has been the citadel of nutrition science in the country for for the last 100 years.

NSI conferences are known for their highest quality in scientific deliberations and have always been attracting participants from all the allied areas of nutrition science. Given the context that the country is today prioritizing nutrition, health and hygiene more than ever in the history of independent India, we as a community of nutrition scientists, researchers, practitioners and academics are poised to contribute our might to the national development through nutritional empowerment.

The theme for this year, aims to track India's transition from food security to nutrition security and we feel this is an opportune time for us to reflect on the past, learn lessons from the present and brac up for the future. We are sure there is no other place more befitting for this than NIN. You are welcome to Hyderabad, the city that immaculately blends the tradition of yore with the swiftness of modernity, the city that is the nerve centre for biomedical science research. We hope you will enjoy your stay and take home great memories and even greater science.

Wishing you the best,

Dr. B. Sesikeran
President, NSI

Dr. B. Dinesh Kumar
Organising Secretary

Dr.R.Hemalatha
Director, NIN &
Ex-Officio, NSI

MESSAGE FROM DIRECTOR, NIN

Dr. R. Hemalatha
Ex-Officio, NSI & Convenor of the conference
Director, ICMR-National Institute of Nutrition
Hyderabad

Dear Colleagues,

It is extremely heartening to write this message for the Golden Jubilee Conference of Nutrition Society of India (NSI). This I think is a great occasion – 50 years of NSI, 100 years of NIN and 100 fruitful years of Dr. Gopalan former Director of our Institute and the founder president of NSI, who also served as DG, ICMR. And all this coincides with the 150 year celebration of Mahatma Gandhi. All the four entities (NSI, NIN, Dr Gopalan and Gandhiji) have firmly believed that good food, nutrition, health and well-being are the keys to the development of the nation.

This year's theme is most apt to understand not just Inda's transition from food security to nutrition security but also the evolution of nutrition priorities of the country. The conundrum still is that India is not eating right. How, we as a community can help resolve this? From the days of severe undernutrition, India has been transitioning continually. Though undernutrition in the form of stunting and wasting has been on the decline owing to many national programmes, it somehow is not commensurate with the efforts put in. India's problems, as we all know, are not only related to undernourishment but non-communicable diseases like diabetes, hypertension and cardiovascular diseases are also on the rise. In many cases, the same cohort of individuals or communities, that were once grappling with the issues of undernutrition are today on the brink of nutrition transition. Malnutrition in its various forms is a huge threat to our development. Despite the availability of foods, we, as a nation are still, unable to attain the desired balance in the diets of our people. Deficiencies of vitamins, minerals and other micronutrients - continue to exist despite being food secure. For instance, as against the recommended intake of over 400 gm of fruit and vegetable, average Indian does not even consume half that amount in a day. Promoting dietary diversity has to go hand in hand with creating nutrition literacy.

NIN's contribution to reduction in obvious and severe forms of malnutrition by way of its research studies that have translated into national-level programmes has been enormous. Having busted the protein myth long ago, is it now time for us to take a relook at our calorie recommendations? How to promote diet diversity keeping in view the climate change and global warming issues? Is fortification a panacea for malnutrition? These and many more questions are confronting us. The food scenario, lifestyles and dietary patterns are continuously undergoing changes. We have to brace up to meet the changing scenario

NIN and NSI are almost inseparable. Having hosted 25 of 50 conferences NIN has always been like NSI's home. Welcome home and enjoy the conference.

R Hemalatha

Presidential Address

Dr. B. Sesikeran
President, Nutrition Society of India, India
Former Director, National Institute of Nutrition
Hyderabad

Dear members

It gives me great pleasure to invite you all to the Golden Jubilee National annual conference of the NSI. We have come a long way since its inception by the doyens of nutrition research in India. NSI is the official society of the nutritionists in India. It is part of the International Union of Nutritional Sciences (IUNS) which is part of the International Council of Scientific Unions (ICSU) for which the Indian office is the Indian National Science Academy (INSA). NSI is also affiliated with the Federation of Asian Nutrition Societies (FANS). The NSI is permanently located and has its origins from the National Institute of Nutrition (ICMR) the academic parent of NSI that has also just completed its 100 years of service to the Nation.

Nutrition research in India started 100 years ago during the pre independence era. A time when poverty was rampant, and there was food insecurity which did not get better until early 1960's. Green revolution brought in high yielding hybrid cereals and led to progressive decrease in food insecurity. New India took quite some time to bring down the prevalence of poverty, which was associated with food insecurity. Nutrition science in India showed that food security had not brought in nutrition security which explained the not so remarkable change over the years in nutrition indicators like under weight and stunting that still exist in unacceptable numbers. New challenges associated with food security were disproportionate energy intakes and physical activity (nutrition transition) that transformed the nutrition burden from a single burden of undernutrition to a double burden of both under and over nutrition. The common denominator for both these numerators is micronutrient malnutrition . We are also witnessing the epidemiological transition of a shift from a predominance of infection and diseases related to under nutrition to rising rates of NCDs associated with the increase in economic prosperity.

In 50 years, nutritionists in India shaped the public nutrition support programs to benefit millions of mothers and children to overcome nutrition insecurity but with limited success. The reasons were not just operational or lack of last mile deliverability but also related to the metabolic and genetic determinants and confounders associated with micro nutrient malnutrition.

New RDA's, new food composition tables and new information on epigenetics, protein quality and digestibility and better understanding of micronutrient bioavailability were all factors in helping policy makers come up with science based solutions for integrated interventions to combat nutritional challenges in India.

When we meet to celebrate 50 years of our glorious past let us travel through this transition that happened in this relatively small time period, let us critically evaluate what we did right and where we went wrong, what are the lessons for the future and consolidate the new scientific knowledge and experiences of other countries to prepare a road map for our country to be nutritionally stronger, healthier and wiser.

Good wishes

Sesikeran

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SCIENTIFIC AGENDA

PRE-CONFERENCE WORKSHOPS

Thursday 15th November, 2018

WORKSHOP-I
ABC of Enteral and Paranteral Nutrition

TIME	SUBJECT	DISCUSSANT	SESSION
8.30AM – 9.00AM	**REGISTRATION**		
9.00 AM – 9.10AM	OPENING REMARKS	**Dr. SARATH GOPALAN** Sr. Consultant Pediatric Gastroenterologist & Hepatologist, Rainbow Children's Hospital, New Delhi	
9.10AM – 9.30AM	WELCOME ADDRESS	**Dr. R. HEMALATHA** Director, National Institute of Nutrition, Hyderabad	
9.30AM – 9.50AM	WORKSHOP OBJECTIVES	**Dr. S. BHUVANESHWARI** Sr. Consultant Dietitian, Apollo Hospitals, Chennai	
10.00AM – 10.40AM	ENTERAL NUTRITION IN ADULTS	**Dr. N. RAMAKRISHNAN** Director, Critical Care Services, Apollo Hospitals, Chennai	**SESSION 1 (ABC of Enteral and Parenteral Nutrition)**
10.40AM – 11.20AM	PARENTERAL NUTRITION IN ADULTS	**Dr. N. RAMAKRISHNAN**	
11.20AM – 11.40AM	**TEA BREAK**		
11.40AM – 12.20PM	PEDIATRIC ENTERAL NUTRITION	**Dr. SARATH GOPALAN**	**SESSION 2 (Pediatric Enteral and Parenteral Nutrition)**
12.20PM – 1.00PM	PEDIATRIC PARENTERAL NUTRITION	**Dr. SARATH GOPALAN**	
1.00PM – 2.00PM	**LUNCH BREAK**		
2.00PM – 2.30PM	NUTRITION IN THE CRITICALLY ILL PATIENT	**Dr. N. RAMAKRISHNAN** + **Dr. RADHA REDDY** Chief Dietitian, General Manager, Sunshine Hospitals, Hyderabad	**SESSION 3 (Nutrition Intervention in Specific Disease Settings)**
2.30PM – 3.15PM	DISEASE – SPECIFIC NUTRITION INTERVENTION	**Dr. S. BHUVANESHWARI** + **Dr. RADHA REDDY**	
3.15 PM – 3.35 PM	BRAINSTORMING WITH WORKSHOP PARTICIPANTS		
3.35 PM – 3.45 PM	CLOSING REMARKS	**Dr. BHUVANESHWARI**	

WORKSHOP - II
Sports Nutrition

Time	Sessions	Speaker
8:00 – 9:00 am	**REGISTRATION**	
9:00 – 9:10 am	Welcome Address	**Dr.B.Dinesh Kumar**
9:10 – 9:30 am	Introduction to Workshop	**Dr. Kommi Kalpana** Scientist – D (Nutrition), MYAS-NIN Department of Sports Science, NIN, Hyderabad
9:30 – 9:45 am	Role of Sports Nutrition in Athletic Performance	**Dr. Y. Venkata Ramana** Scientist – F & Head, MYAS-NIN Department of Sports Science, NIN
9:45 – 10:15 am	Energy Requirement of Athletes: Principles and Methods	**Dr. Y. Venkata Ramana**
10:15-11:00 am	Importance of Body composition in Sports	**Ms. Keren Susan Cherian** Scientist – B (Nutrition), MYAS-NIN Department of Sports Science, NIN
11:00 – 11:20 am	**Tea Break**	
11:20 am – 12:00 Noon	Nutrition Periodisation and Recovery Nutrition for Athletes	**Dr. Priti Rishi Lal** Assistant Professor, Department of Foods and Nutrition, Lady Irwin College, Delhi University, New Delhi
12:00 Noon – 12:30 pm	Electrolyte and Fluid Balance of Athletes	**Dr. Gulshan Lal Khanna** Director (Project), Indian Institute of Sports Science and Research (IISSR), MYAS, GoI, New Delhi
12:30 – 1:15 pm	Dietary Supplements and Ergogenic Aids	**Dr. Kommi Kalpana**
1:15 – 2:00 pm	**Lunch Break**	
2:00 – 3:00 pm	Practical session: Testing protocol for determining energy expenditure using Time Allocation Pattern	**Dr. Y. Venkata Ramana** **Dr. Gulshan Lal Khanna**
3:00 – 3:50 pm	Laboratory Visit: Assessment of Body composition	**Ms. Keren Susan Cherian**
3:50 – 4:00 pm	Vote of Thanks	**Ms. Keren Susan Cherian**

GOLDEN JUBILEE CONFERENCE OF NUTRITION SOCIETY OF INDIA
(50th Annual International Conference of NSI)
***Theme*: India's Transition from Food Security to NutritionSecurity**

DAY – 1 : 15th NOVEMBER 2018	
2:00 pm – 5:00 pm	REGISTRATION
2.00 pm – 4.30 pm	Executive Committee Meeting – CONFERENCE HALL
4:00 pm – 5:00 pm	**INAUGURAL TEA (Supported by California Walnut)**
MAIN HALL	
5:00 pm – 6:30 pm	**INAUGURAL FUNCTION**
6:30 pm – 7:30 pm	42nd GOPALAN ORATION By **Prof. John H Cummings,** Emeritus Professor of Experimental Gastroenterology, University of Dundee, School of Medicine, Jacqui Wood Cancer Centre, Ninewells Hospital & Medical School, DUNDEE, United Kingdom Title: **50 years of dietary fibre**
7.30 pm – 7.40 pm	INAGURATION OF STALLS
7.40 pm – 9.00 pm	GALA DINNER
DAY – 2: 16th NOVEMBER 2018	
7:30 am – 9: 00 am	BREAKFAST
MAIN HALL	
9:00 am – 10:00 am	41st GOPALAN ORATION by Prof. C.S. Yajnik, Director, Diabetes Unit, King Edward Memorial Hospital, Pune Title: **In search of modifiable susceptibility to diabetes in Indians: Story of a hungry Indian fetus**
10:00 am – 10:30 am	HIGH TEA – GUEST HOUSE
PARALLEL SESSIONS	
10:30 am – 01:00 pm	**POSTER SESSION - I (At Poster Pavilion)** 1. Clinical Nutrition (PPCLN-01 to PPCLN-44) 2. Experimental Nutrition (PPEN-01 to PPEN-31) 3. Nutrition Education and Communication (PPNEC-01 to PPNEC-27) 4. Sports Nutrition (PPSN-01 to PPSN-09)
MAIN HALL	
10:30 am – 12:00 noon	**DEBATE on "Inclusion of millets in supplementary feeding programmes for children"** **Moderator : Dr.B.Sesikeran** Former Director, ICMR-National Institute of Nutrition, Hyderabad **Flagging the issues : Dr.Mahtab S. Bamji** INSA Emeritus Scientist, Dangoria, Charitable Trust, Hyderabad & Director Grade Scientist (Retd), ICMR-National Institute of Nutrition, Hyderabad

	For the motion: **Dr. B. DayakarRao** Principal Scientist & CEO, Nutrihub, TBI, PI(NFSM_COE); Nodal officer ITMU, ABI & ZTMC, ICAR-Indian Institute of Millets Research (IIMR), Hyderabad **&** **Dr.PrashantKottaram** SoulFull Industries, Bengaluru **Against the motion**: **Dr.BharatiKulkarni** Scientist 'F'& Head, Clinical Division ICMR-National Institute of Nutrition, Hyderabad & **Dr. K. Madhavan Nair** Scientist 'F' (Retd.) ICMR-National Institute of Nutrition Hyderabad	
12:00 noon – 1.00 pm	**INDUSTRY SESSION**	
	Scientific journey of transformation to healthier food & beverages	**Mr Sanjay Naphade** R&D Director, Nutrition PepsiCo India
	Food solutions for lifestyle diseases	**Dr Sudhakar Mhaskar** Chief Technology Officer R&D, Marico Ltd
	Health Benefits of California Walnuts	**Ms Naaznin Husein** President, Indian Dietetic Association Mumbai Chapter
	Indigenous pasteurization machine- a boon to the comprehensive lactation management center	**Ruchikachugh Sachdeva** PATH India
1:00 pm – 2.00 pm	LUNCH	
PARALLEL SESSION		
02.00 pm – 05:00 pm	**POSTER SESSION - II (At Poster Pavilion)** Community Nutrition (PPCN-01 to PPCN-143)	
MAIN HALL		
2:00 pm – 4.00 pm	**Symposium on "*Leveraging Agriculture for Nutrition"*** ***Chairperson:*** **Dr.MadhuraSwaminathan**, Professor, Indian Statistical Institute, Bengaluru, Chairperson MSSRF and Chair, LANSA Consortium Steering Group.	
	Enabling Environment for Agriculture-Nutrition Linkage	**Dr.BrindaViswanathan** Professor, Madras School of Economics
	How do policies and strategies influence the nutrition impacts of agriculture?	**Dr.Bhavani Shankar** Professor of Food, Agriculture & Health, SOAS, London & LANSA Research Lead
	Leveraging Value Chains for Better Nutrition	**Dr. Nigel Poole** Professor of International Development

		Policy, SOAS, London & LANSA Research Lead
	Nutrition Sensitive Agriculture	**Dr. R V Bhavani** Project Manager, LANSA, M S Swaminathan Research Foundation
4.00 pm – 4.30 pm	TEA	
4.30 pm – 6.00 pm	**PARALLEL SESSIONS**	
Main Hall	Young Scientists Award Session – Senior (Community & Experimental)	
Assembly Hall	Free Communications - Experimental Nutrition	
Conference Hall	Free Communications - Clinical Nutrition	
Class Room -1	Free Communications - Nutrition Health Policy Research / Sports Nutrition	
Nin-Tata Center Committee Room	Free Communications – Nutrition Education and Communication	
MAIN HALL		
6.00 pm – 6.45 pm	**30th DR. SRIKANTIA MEMORIAL AWARD LECTURE**by **Dr.Biplab K. Nandi,** Senior Food and Nutrition Officer (Retd.) FAO Regional Office for Asia and the Pacific, Bangkok, Thailand **Title: "Food and Nutrition Security as Fundamentals of Human Development: National Perspective International Agenda"**	
6.45 pm –7.45 pm	**Annual General Body Meeting**	
8.00 pm onwards	DINNER	
DAY – 3: 17thNOVEMBER 2018		
7:00 am – 9:00 am	BREAKFAST	
PARALLEL SESSIONS		
09:30 am – 12:00 noon	POSTER SESSION - III **FOOD SCIENCE & NUTRITION (PPFSN-01 to PPFSN-149)** **OTHERS (PPON-01 to PPON-06)**	
MAIN HALL		
9:00 am – 9:45 am	9th DR. RAJAMMAL MEMORIAL AWARD LECTUREby **Dr.SadhanaRamchandra Joshi,** Professor and Head, Mother and Child Health, Interactive Research School for Health Affairs (IRSHA), BharatiVidyapeeth Deemed University, Pune 411043, Maharashtra, India. **Title: Maternal Nutrition and Placental Programming: Implications for Long Term Health**	
10:00 am – 11:00 am	TEA BREAK	
PARALLEL SESSIONS - 11.00 am – 01.00 pm		
Main Hall	Young Scientists Award Session – Junior Experimental	
Assembly Hall	Young Scientists Award Session – Junior Community	
Conference Hall	Free Communication – Food Science Nutrition	
Class Room -1	Free Communication – Community Nutrition	
1:00 pm – 2.00 pm	Lunch	
2:00 pm – 3.00 pm	**POSTER SESSION - IV** **REVIEW POSTERS (PPRS-01 to PPRS-46)**	
MAIN HALL		
2.00 pm – 4.00 pm	**SYMPOSIUM - "ROLE OF CARBOHYDRATES IN HUMAN**	

	NUTRITION AND HEALTH"	
	New Thoughts and Developments in Carbohydrate Metabolism: Public Health Implications	**Prof. Jeyakumar Henry** Director, Clinical Nutrition Research Centre, A*STAR, Singapore
	Human Body Composition: New insights on predicting health and well-being in Asians	**Dr. Bi Xinyan** Research Fellow, Clinical Nutrition Research Centre, A*STAR, Singapore
	Chronobiology of Carbohydrate Intake: New thoughts and practical implications	**Dr.SumantoHaldar** Senior Research Fellow, Clinical Nutrition Research Centre, A*STAR, Singapore
	Glycemic Perspective of Cereals and Millets: How healthy are they?	**Dr. S. Shobana** Senior Scientist - Foods Research, Department of Foods, Nutrition, Dietetics Research, Madras Diabetes Research Foundation (MDRF), Chennai
4.00 pm – 4.30 pm	High Tea	
4.30 pm	**CONCLUDING CEREMONY & AWARD PRESENTATIONS**	

GOPALAN ORATION

THE AWARD

The Gopalan Oration Award was instituted in the year 1974 by the Nutrition Society of India in honour of its Founder-President, Dr. C. Gopalan, who has been the guiding force behind the Society since its inception. In his capacity as the Founder-President and as a permanent Executive Committee Member, Dr. Gopalan has nurtured the Society and has built it up to its present stature. The Society, as it is today, bears testimony to his genius as an architect and father of nutrition sciences in India.

Dr. Gopalan, presently President, Nutrition Foundation of India, is a scientist of international eminence and has spearheaded the cause of nutrition science for over four decades. His contribution towards the betterment of nutrition of population has benefited not only India but other developing countries as well. It has helped to strengthen and inspire movements for the eradication of under-nutrition among the underprivileged in many Third World countries.

Dr. Gopalan had a brilliant academic career at the Madras Medical College and obtained a Doctoral degree in Medicine. During his illustrious career, Dr. Gopalan has held several prestigious positions with distinction that has brought fame not only to him but to his country as well. He was the first Asian to be elected the President of the International Union of Nutrition Sciences and the first Chairman of the Regional Advisory Committee on Medical Research for South-East Asia of WHO. He was on several World Health Organisation Expert Panels for many years and was the Chairman of the Technical Session of the World Health Assembly. He was elected Fellow of the Royal Society of London. He was also the first Nuffield Foundation Fellow from India in Medical Research Council of United Kingdom and a Rockefeller Foundation Fellow.

The National Institute of Nutrition (NIN), Hyderabad, India, was nurtured by Dr. Gopalan with rare dedication as its Director from 1960 to 1974. Dr. Gopalan was also responsible for forging a fraternity of Asian nutrition scientists and initiating the first Asian Congress of Nutrition and promoting the subsequent ones, which led to the formation of the Federation of Asian Nutrition Societies. He is an able administrator and a visionary. During his tenure, as the Director of NIN and later as the Director-General of ICMR, the country as a whole focussed its attention on nutritional and medical problems of public health importance. Under his leadership a wealth of information was generated to tackle problems such as Protein Energy Malnutrition, Vitamin A deficiency, Phrynoderma, Lathyrism, Fluorosis and Pellagra. The foundation of the National Nutrition Monitoring Bureau was laid by him. Dr. Gopalan has also created the Nutrition Foundation of India, which has a wide interdisciplinary research network in the country and has brought out valuable reports which are of great value to nutrition scientists, administrators and policy makers. Some of the renowned national and international honours bestowed on him for his outstanding contributions include Dr. B.C. Roy National Award (1974), Dhanvanthri Award (1978), WHO Health for All Medal (1988), Sir C.V. Raman Gold Medal of the Indian National Science Academy (1988), International Union of Nutrition Sciences Award (1989), R.D. Birla Award (1990) and Fellow of the International Union of Nutrition Sciences (1993).

The Gopalan Oration Award is given every year to an expert who has made significant contributions in the field of nutrition and allied sciences.

The Nutrition Society of India is proud to announce that the 42nd Gopalan Oration will be delivered by Prof. John H Cummings, Emeritus Professor of Experimental Gastroenterology, University of Dundee, School of Medicine, Jacqui Wood Cancer Centre, James Arrott Drive, Ninewells Hospital & Medical School, DUNDEE, United Kingdom on “50 years of dietary fibre”.

And the 41st Gopalan Oration (postponed from the previous year) will be delivered by Prof.C.S.Yajnik, Director, Diabetes Unit, King Edward Memorial Hospital, Pune on “In Search of Modifiable Susceptibility to Diabetes In Indians: Story of a Hungry Indian Fetus”.

RECIPIENTS OF GOPALAN ORATION AWARD

1977 *Dr. D. B. Jelliffe*
World Trends in Infants Feeding.

1978 *Dr. J. Cravioto*
Intersensory Integration as a Function of Nutrition and Stimulation.

1979 *Dr. M. Behar*
National Nutrition Policy & Trace Elements and Metabolism.

1980 *Dr. M. S. Swaminathan*
Green Power and Freedom from Hunger.

1981 *Dr. V. M. Dandekar*
Measurement of Undernutrition.

1982 *Dr. S. Varadarajan*
Technology for Better Nutrition.

1983 *Dr. H. K. Jain*
Evolutionary March of Indian Agriculture.

1984 *Dr. S. G. Srikantia*
Nutrition Adaptation in Man.

1985 *Dr. K. T. Achaya*
Invisible Fats Revised.

1986 *Dr. V. Kurien*
Oils and Fats Beyond Nutrition.

1987 *Dr. R. K. Chandra*
Nutrition Immunity and Clinical Outcome.

1988 *Dr. Anand S. Prasad*
Human Zinc Deficiency.

1989 *Dr. J.V.G.A. Durnin*
Is Satisfactory Energy Balance Possible on Low Energy Intake ?

1990 *Dr. J. C. Waterlow*
A New Look at Protein-Energy Malnutrition - Controversies and Challenges.

1991 *Dr. Vernon R. Young*
Amino Acids Kinetics in Humans

1992 *Dr. M. C. Latham*
Alleviating malnutrition in the developing countries of the World.

1993 *Dr. Nevin S. Scrimshaw*
Complementarities among foods and nutrients.

1994 *Dr. W.P.T. James*
Assessing Energy Need : Recent Advances.

1995 *Dr. Florentino S Solon*
Food Fortification Programme Development in the Philippines.

1996 *Dr. John D Potter*
Plant Foods and Cancer Risk - Science and Tradition.

1997 *Dr. B. N. Tandon*
Nutrition Intervention in 2000 AD

1998 *Dr. Artemis P. Simopoulos*
Genetic variation and nutrition.

1999 *Dr. R.S. Paroda*
Household Food and Nutritional Security Through Advances in Agriculture.

2000 *Dr. Gurudev S Khush*
Strategies to Meet the Global Food and Nutrient Needs in the New Millennium.

2001 *Dr. B. S. Narasinga Rao*
Newer Perspectives in Energy Nutrition and Malnutrition and their Relevance to India.

2003 *Dr. Chen Chunming (At IX Asian Congress of Nutrition)*
Nutrition and Economic Development.

Dr. Prakash S Shetty
Non-Communicable Diseases in Developing Societies : Causes, Costs and Consequences.

2004 *Prof. Mark L Wahlqvist*
The New Nutrition Science : Solutions for Development.

2005 *Dr. Shanti Ghosh*
For Better Health and Nutrition, Prioritize the Young Child.

2006 *Dr. M.K. Bhan*
Preparing to Face the Challenge.

2007 *Dr. Ricardo Uauy*
Leadership more than new knowledge is required to improve nutrition in India.

2008 *Dr. John M Pettifor*
Vitamin D and Calcium Nutrition in Children in Developing Countries.

2009 *Prof. K. Srinath Reddy*
Public Health Nutrition in India : Moving from Science to Policy and Action.

2010 *Prof. David Barker*
Nutrition in the Womb.

2011 *Prof. Barry M Popkin*
The Global Dynamics of Diet, Activity and Body Composition: Rapid Shifts in the stages of the Nutrition Transition

2012 *Dr. Reynaldo Martorell*
The First 1000 Days and Human Development: Implications for India

2013 *Dr. Robert E Black*
Foetal Growth Restriction: Nutritional Determinants, Consequences in Childhood and Interventions

2014 *Dr. Michael S Kramer*
International Standards for Birth Weight – Does One Size Fit All?"

2015 Dr. Prema Ramachandran
India's Nutrition Challenges

2016 Dr Anura V Kurpad
The health-nutrition-agriculture connect for protein in India

2017 Prof.C.S.Yajnik
"In Search of Modifiable Susceptibility to Diabetes In Indians: Story of a Hungry Indian Fetus".

42nd GOPALAN ORATION

50 years of Dietary Fibre

Professor John H Cummings
Emeritus Professor of Experimental Gastroenterology, Dundee, UK

THE RECIPIENT

John Cummings is Emeritus Professor of Experimental Gastroenterology in the University of Dundeeand was Honorary Consultant in Gastroenterology and Nutrition at Ninewells Hospital until 2007. He graduated in medicine in 1964 and after undertaking specialist clinical training in gastroenterology, joined the staff of the Medical Research Council in London. He worked for the MRC for 28 years, firstly, at the Gastroenterology Unit, then at the Dunn Clinical Nutrition Centre in Cambridge where he gathered together a unique group working on diet, the gut microflora and large bowel function. He has published over 300 papers and articles on this subject and is known for his pioneering work on the importance of colonic bacteria to health and the role of carbohydrates especially resistant starch and dietary fibre as substrates for fermentation and the metabolism of short chain fatty acids. Following the closure of the Dunn in 1998, he moved to Dundee. Professor Cummings has served on many national, European and international bodies concerned with diet and health, including the UK Government's COMA committee, Scientific Advisory Committee on Nutrition, Dietary Reference Values Panel, Panel on Novel Foods and DH/FSA Nutrient Profiling Advisory Committee. He was chairman of the IUNS Diet and Cancer Committee and the EU PASSCLAIM working group on gut health. He was a member of the FAO / WHO Expert Consultation on Carbohydrates in Human Nutrition (1997) and the Scientific Update on Carbohydrates in Human Nutrition. (2006). He chaired the PASSCLAIM (EC concerted action) working group on Gut Health and Immunity and was a member of the Consensus Group, which drew up criteria for substantiation of health claims on food in 2005. He has been a member of the WHO Nutrition Guidelines Advisory Group (NUGAG) since 2009. In 1993 Professor Cummings was awarded the Caroline Walker Science Prize and the Cleave Trophy of the McCarrison Society in recognition of his work on public health aspects of diet. In June 2008 he was made an OBE in the Queen's birthday honours for his services to medicine and nutrition and awarded the British Nutrition Foundation Prize in the same year. In May 2009 the North West University in South Africa made him an honorary PhD for the work he has done with them in establishing a department of nutrition over the last 25 years. He was the Rank Prize Funds Nutrition Prize winner in 2012.

ABSTRACT

1968 was an important time in the emergence of the dietary fibre hypothesis. Two years earlier Surgeon Captain Cleave'sbook "Diabetes, Coronary Thrombosis and the Saccharine Disease" (1)had been published. Cleave had travelled the world as a naval surgeon and became convinced that in those countries where there was a higher prevalence of conditions such as obesity, coronary heart disease and diabetes that this was due the excessive consumption of sugar brought about by the refining of foods from their natural state. Also in 1966 Denis Burkitt, a surgeon, returned to England from Africa where he had worked for 20 years. During his time there he had observed that the distribution of a rapidly fatal childhood cancer could be explained by climatic conditions favouring a transmissible agent, which was eventually shown to be a virus. Burkitt went on to find a cure for the cancer, which became known as Burkitt's Lymphoma. Burkitt continued his interest in the geography of diseases when he returned to England and met Cleave in 1967, who explained his theory of Saccharine Diseases to him. In November 1968, exactly 50 years ago, Burkitt was speaking at a meeting of the British Society of Gastroenterology in London where he heard Neil Painter a surgeon talk about fibre and diverticular disease of the colon. Painter showed that lack of fibre was the cause and that the symptoms of the condition could be relieved by giving patients fibre. Burkitt had not been convinced by Cleave that sugar was the problem and now he began to realise that lack of fibre was much more important. By 1971 he was writing that "..removal of fibre maybe the causative factor"(2) for bowel cancer and other non-infective bowel diseases.

This was a significant turning point in the fibre story, but it was not the beginning. For over 200 years fibre, known by animal nutritionists as crude fibre, had been regarded as an important indicator of the digestibility of a feed. Fibre was considered to be non-digestible and to impair overall digestion particularly in ruminants. In human nutrition cereal fibre, or bran, had been shown to affect bowel habit but it was unclear what happened to it in the gut until later in the 19th century it was shown that it was not inert but was broken down, although not by human digestive enzymes. Pioneers that preceded Burkitt (3) include ARP Walker, a nutritional biochemist working in South Africa,who in 1954, when doing studies of diet and atherosclerosis, concluded that "..apart from low fat intake there is a factor or factors in the pattern of the diet….possibly related to its high fibre content which bears some responsibility for the low serum cholesterol values observed." (4). There was Neil Painter, who went against medical opinion at the time and treated successfully patients with diverticular disease with fibre (5). Hugh Trowell, a physician colleague of Burkitt's in Africa, came late the fibre story but when asked by Burkitt whether it was crude fibre that was the key came up with a broader definition which he called dietary fibre. From his own observations of the pattern of diseases in Africa compared with those in Europe and North America he concluded that dietary fibre could protect against ischaemic heart disease (6) and later he added diabetes and obesity.Burkitt knew all these people and with his interest as a surgeon being mainly the large bowel he set about finding if fibre was important in the aetiology of large bowel cancer and other bowel diseases. His 1971 paper (2)on this subject is one of the iconic papers in the fibre story paving the way for the development of the fibre hypothesis which links a lack of fibre in the diet to a group of "fibre deficient" disorders including "..varicose veins, deep vein thrombosis and haemorrhoids, diverticular disease of the colon, colonic cancer and polyps, appendicitis, constipation and the irritable bowel syndrome, diabetes, dental caries, atherosclerosis and coronary heart disease." (7)

The hypothesis was so wide ranging and included the key diseases of most "Western" countries that it invited controversy and disbelief. So in 1972 the Medical Research Council of the UK asked its Gastroenterology Unit in London if we could investigate the "Burkitt hypothesis". We started by looking at the effects on the large bowel and were able to show that fibre was the key element in the diet to affect bowel habit, that it was almost entirely degraded in the large bowel and the major change in the composition of faeces was not an increase in fibre excretion but an increase in bacterial biomass (8). We went on to show that fibre passes through the stomach and small bowel, where it may affect satiety, starch digestion, glucose and insulin responses and lipid metabolism. Fibre is then almost completely broken down in the large bowel by the resident microflora in a series of reactions known as fermentation. This process is key to the health of the colon and yields principally short chain fatty acids, the gases hydrogen, carbon dioxide and methane and stimulates the growth of the microflora (biomass) and has led to a new understanding of the importance of the large bowel to health and of its diseases (9). The major products of fermentation, the short chain fatty acids are rapidly absorbed and so contribute to the body's overall energy balance. We showed that acetate reached the peripheral circulation, did not stimulate insulin release and was an essential substrate for some tissues (10,11). Propionate was taken up by the liver and butyrate by the colonic epithelium. Butyrate especially maybe important in the prevention of large bowel cancer. Thus an entirely new process in human digestion was described, which required the colon and its bacteria and supplemented small bowel digestion and absorption.

At the present time there is great interest in the large bowel microflora and their role in the health of the mucosa, in hepatic metabolism and the brain-gut axis, all stimulated by the advent of technology that allows the sequencing of 16S ribosomal RNA (16SrRna) genes from gut contents and thus the identification of thousands of species existing in a community known as the gut microbiome. The gut microbiota play a number of important roles in human health including protecting against pathogens, development of the gut immune system, vitamin synthesis, metabolism of xenobiotics and maybe involved in complex gut-brain communication. (12) However their principal function is to complete the digestion of fibre and other carbohydrates that escape breakdown in the small bowel and it is the availability of these substrates that dominate the metabolism of the gut microbiome moderated principally by transit time.

Calculation of the substrate requirements of the gut microbiome led to the search for other carbohydrates that might reach the colon. We showed that some starch also passed into the large intestine, resistant starch (13) and a new classification of dietary carbohydratewas proposed, endorsed by WHO at its Scientific Update on Carbohydrates in Human Nutrition in Geneva in 2006 (14). Interest in dietary fibre has continued to grow and many avenues of research have been followed. WHO, through its Codex Committee, has recommended a new definition of fibre for nutritional purposes , taking into account the 1997 & 2005 FAO/WHO Reports, the US definition and a recent EC directive, the following definition was agreed(15)

“Dietary fibre means carbohydrate polymers with ten or more monomeric units, which are not hydrolysed by the endogenous enzymes in the small intestine of humans and belong to the following categories:

- Edible carbohydrate polymers naturally occurring in food as consumed,
- carbohydrate polymers, which have been obtained form food raw material by physical, enzymatic or chemical means and which have been shown to have a physiological effect of benefit to health as demonstrated by generally accepted scientific evidence to competent authorities,
- synthetic carbohydrate polymers which have been shown to have a physiological effect of benefit to health as demonstrated by generally accepted scientific evidence to competent authorities”

What is key about this definition, in practice a compromise between science, the requirements for food labeling and public health policy, is that fibre is essentially carbohydrate polymers as present naturally in food. In other words it is whole foods containing fibre that are healthy.

Since 2015 the Nutritional Guidelines Advisory Group (NUGAG) of WHO has been looking at the importance of fibre to health as part of a review of dietary carbohydrate quality. A large systematic review and meta analysis has been undertaken as part of this review (16) from which it emerges that dietary fibre is fundamentally important to a healthy diet. Significant decreases in all-cause mortality, cardiovascular related mortality, incidence of coronary heart disease, stroke, type 2 diabetes and colorectal cancer were seen with higher intakes of fibre and of whole grains. Dose response calculations allow a recommendation to be made for dietary fibre intakes that will be most beneficial to health. Similar findings for fibre from fruit and vegetables have also been reported recently (17).

Thus 50 years on from the early days of the fibre story key aspects of it have proved to be correct and fibre is on the agenda of public health nutrition in many countries of the world.

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41st GOPALAN ORATION

In search of modifiable susceptibility to diabetes in Indians: Story of a hungry Indian fetus

Prof C S Yajnik,
Diabetes Unit, King Edward Memorial Hospital and Research Centre, Pune

THE RECIPIENT

Dr Yajnik is the Director of the Diabetes Unit at the King Edward Memorial Hospital and Research Centre in Pune, India. He trained in Pune and in Oxford, UK, and investigates the high susceptibility of Indians to diabetes and related disorders. He is known for his description of the 'thin-fat' Indian (high body fat percent at low BMI) and its intrauterine programming by maternal nutritional and metabolic factors. He is the current President of SNEHA India (Society for Natal Effects on Health in Adults) and a Trustee of the International DOHaD society. He is an Honorary Visiting Fellow, MRC Lifecourse Epidemiology Unit, Southampton, UK, visiting Professor at University of Exeter UK, and of the Danish Diabetes Academy, and adjunct Professor IISER, Pune. He received Helmut Mehnert award of International Diabetes Federation (2009), David Barker medal of Intrnational DOHaD society (2011), and Outstanding Investigator Award of World India Diabetes Foundation. Dr Yajnik is advisor to many organizations including Department of Biotechnology (DBT), Indian Council of Medical Research (ICMR), National Institute of Nutrition (NIN), India, WHO (Geneva), FIGO (Federation International of Gynecology and Obstetrics) and the Wellcome Trust, London, UK.

ABSTRACT

The textbook model of type 2 diabetes includes genetic susceptibility and precipitation by obesogenic affluent lifestyle (dietary excess, physical inactivity, psychosocial stress etc). More than hundred genetic variants have been associated with type 2 diabetes but more than a decade after the description of the human genome there is little contribution of genetics to prevention or day to day management of diabetes. The diabetes prevention programmes in the world have therefore concentrated on controlling the obesogenic precipitating factors in adults. This can at best be described secondary prevention, and the lifestyle changes are difficult to sustain over long periods. There is a need to investigate modifiable susceptibility factors.

An average western type 2 diabetes patient is in his 60's and considerably obese by BMI criteria. As a medical student, I realized that Indian diabetic patients are much younger and thinner, and though not obese by BMI criteria they are centrally obese (higher waist-hip ratio). Over years, the age at diagnosis has fallen and gestational diabetes is on rise. Genetics is unlikely to account for any of the rapidly changing characteristics.

In last few decades there is a growing recognition that intrauterine environment has an influence not only on the immediate health of the fetus but also its lifelong health. Initial evidence was in diabetic pregnancies. Babies born to diabetic Pima Indian mothers had a higher risk of obesity and diabetes than those born before mother became diabetic. Pedersen and Freinkel proposed that excess fuel supply to the developing fetus promoted overgrowth and increased risk of obesity and diabetes by a 'stable alteration in gene expression' (fuel-mediated teratogenesis).

On this background, when Hales and Barker reported that people born with lower birth weight were at a higher risk of type 2 diabetes, the idea was met with some skepticism. When Barker met me in 1991, the confusing paradox of Indian phenotype of T2D became clear to me. I agreed to set up a study in young children with Dr AnandPandit to test the idea. Caroline Fall helped set up the study, and the Wellcome Trust provided funds. We soon found that lower birth weight Indian children had higher glucose and insulin concentrations. Our findings provided a possible explanation for the paradoxical situation that India shares the distinction of being the world's capital of low birth weight on one side and being one of the capital of diabetes on the other. When we studied these children a few years later, another interesting fact emerged: the worst risk for diabetes and heart disease was in children who were born small but had grown big, the mismatch in growth was detrimental. The lifecourse evolution of diabetes had started unfolding.

It was time to find out why Indian babies were so small and what was in their small size which predisposed them to future diabetes and other NCDs. This was the birth of the Pune Maternal Nutrition Study in 1993. It is a community based preconceptional birth cohort to study the association between maternal nutrition, fetal growth and future risk of diabetes and NCDs. The cooperation of the community has been phenomenal and the village field staff have been fantastic. As a result we have followed more than 95% of the eligible children upto 20 years of age. The rural mothers were short and thin but had substancial subcutaneous fat, a third were anemic and iron deficiency was common. Average calorie and protein intakes were low. Shobha Rao showed that rather than macronutrient intake, lower intake of micronutrient rich foods (GLVs, fruit and milk) predicted smaller babies. Gestational diabetes was conspicuous by absence. The babies were on average 2.7 kg and smaller compared to the English babies. Surprisingly their skinfolds were relatively well preserved. For a given birth weight the skinfolds of Indian babies were larger than those of the English babies, the cord blood concentrations of insulin and leptin were higher and adiponectin lower in the Indian babies. We had described a 'thin-fat' Indian baby and shown that the body composition of the Indians is laid down in utero and that the risk for future NCDs is evident in the cord blood.

We soon discovered that two thirds of the mother had low vit B12 status in pregnancy though folate status was good. High levels of homocysteine in the mother predicted fetal growth restriction. Follow up studies revealed that higher maternal folate concentrations were associated with higher adiposity and insulin resistance in the child, which was exaggerated if vit B12 status was low. We then found that vit B12 absorption was normal in the majority and therefore, performed a pilot RCT of supplementation of low dose vit B12 with or without folic acid to lower homocysteine concentrations. When the efficacy was confirmed, we felt ready for a pre-pregnancy supplementation trial to improve fetal growth and reduce diabesity. This is called the PRIYA trial (Pune Rural Intervention in Young Adolescents) which is the world's first attempt to improve micronutrient nutrition of adolescents to reduce risk in their offspring. The trial is on way and will provide results in a few years.

Measurements on the cord blood of the babies born in the trial will give important leads about the molecular mechanisms of intergenerational programming.

On the clinical side we have established various studies of ‘gestational’ diabetes and its effect on the risk of obesity and diabetes in the children. Indian GDM women are again younger, shorter and thinner than the western GDM women and their children have higher adiposity and glucose intolerance in childhood. However, a substantial number of babies born to GDM mothers are still small and this issue needs to be further researched. It appears that multigenerational undernutrition and recent rapid socio-economic and nutritional transition has added a component of fetalovernutrition to the story and what we observe in urban Indians is a mixture of under- and over-nutrition driven fetal programming of diabetes (Dual teratogenesis).

In summary, trained as a clinical diabetologist I diverted into maternal nutrition and child health and had a thoroughly enjoyable career. My world conspired to make it possible.

SRIKANTIA MEMORIAL LECTURE

THE AWARD

Srikantia Memorial Lecture Award was instituted in 1989 by the Nutrition Society of India to honour late Dr.S.G.Srikantia, one of the Founder-Members of the Society. As a Member, and later as its Treasurer (1974-1978) and Vice-President (1978-80), Dr.Srikantia was instrumental in building, expanding and consolidating the activities of the Society.

Dr. Srikantia was born in 1926 in an illustrious family in Mysore. After his brilliant undergraduate career in Mysore Medical College, he joined the National Institute of Nutrition - then known as the Nutrition Research Laboratories, Coonoor, in 1951. He served the Institute with rare distinction and dedication for more than three decades till his voluntary retirement in 1980. From 1974 to 1980, he was the Director of the Institute and contributed to the growth and development of the Institute.

Dr. Srikantia was an internationally renowned nutrition scientist and made outstanding contributions in clinical nutrition. He was a versatile, knowledgeable and well informed scientist not only in clinical nutrition but also in nutritional biochemistry and public health nutrition. Under his able stewardship, the National Institute of Nutrition diversified its research activities and had a coordinated approach, which added new dimension and depth to nutrition research.

A scientist with ideas, vision, initiative and drive, he could enthuse colleagues in an inimitable, gentle and persuasive manner. His elegant studies on the role of ferritin in the pathogenesis of nutritional oedema have attracted considerable attention. His pioneering research contributions on protein energy malnutrition, vitamin A deficiency, nutritional anaemias, pellagra and fluorosis have earned him academic recognition. He led the studies on the prevention and control of vitamin A deficiency in the country and was the man behind the National Vitamin A Prophylaxis Programme. Even after his voluntary retirement, he continued to be active in research and teaching, and was associated with the University of Mysore and served as Temporary Adviser, WHO. He was a member of the Editorial Board of the Indian Journal of Medical Research and was valued for his unbiased critical and mature views on a wide range of topics.

Dr.Srikantia has several publications to his credit including Chapters in books. He was frequently invited by national and international agencies to be on their expert committees.

He was a tower of support and strength to the Nutrition Foundation of India and played a leading role in the formulation and implementation of many of its research projects and in the preparation of its scientific reports.

A man of simple habits and sterling qualities; upright, sincere and devoted to scientific pursuits and loyal to the committed cause, Srikantia was a friend, philosopher and guide to many a junior colleagues. He was a diamond among men, transparent in his dealing with people, dazzling in intelligence, hard in getting the work done and sharp in seeing through people.

The Nutrition Society of India is proud to announce that the 30th Dr. Srikantia Memorial Lecture will be delivered by Dr. Biplab K. Nandi, Senior Food and Nutrition Officer (Retd.) FAO Regional Office for Asia and the Pacific, Bangkok, Thailand & President, Society for Nutrition, Education and Health Advancement (SNEHA), Kolkata on "Food and Nutrition Security as Fundamentals of Human Development: National Perspective International Agenda".

PREVIOUS RECIPIENTS

1989 *Dr.P.S.Shetty*
Energy Metabolism in Chronic Energy Deficiency.

1990 *Dr.M.Gabr*
Better Nutrition for the World Poor : A Challenge of the Future.

1991 *Dr.B.N.Tandon*
Malnutrition and Gastroenterological Disorders.

1992 *Dr.B.S.Narasinga Rao*
Current concepts in human nutrient requirements and allowances - A critique of their use in practice and a need for an alternative.

1993 *Dr.Rajammal P. Devadas*
Empowering women towards improving family nutrition.

1994 *Dr.Tara Gopaldas*
Problems and prospects in upscaling Nutrition-Research-Action Projects or Pilots to Programmes.

1995 *Dr. Vinodini Reddy*
Dietary approaches to combat vitamin A deficiency.

1996 *Dr. N. Kochupillai*
Micronutrient Deficiency and Human Health and Development.

1997 *Dr. M. V. Rao*
Population - Food - Nutrition : Challenges and Options Before India.

1998 *Dr. Shanti Ghosh*
Nutrition, Growth and Development - The first two years are crucial.

1999 *Dr. Mahtab S. Bamji*
Understanding and combating recognized and less recognized vitamin deficiencies.

2000 *Dr. S. Rajagopalan*
Perspective Planning for Human Development.

2001 *Dr. Prema Ramachandran*
Research Studies on Mother Child Dyad - Foundation for National Programmes.

2003 *Dr. M. S. Swaminathan*
Ensuring Ecological, Social and Economic Access to Balanced Diets and Safe Drinking Water.

Prof. K. N. Agarwal
Nutrition and Brain.

2004 *Dr. Kamala Krishnaswamy*
Turmeric – The Salt of the Orient is the Spice of Life.

2005 *Dr. Subadra Seshadri*
The Persistent Problem of Iron Deficiency Anaemia and its Consequences: A Life Cycle Approach is Critical for its Control.

2006 *Dr. K. Vijayaraghavan*
Community Nutrition Research in India – Contributions, Constraints and Controversies.

2007 *Dr. V. Prakash*
Nutrition Links in the Food Chain.

2008 *Dr. Ramesh V Bhat*
Status of Food Safety in India : Past, Present and Future.

2009 *Prof. H.P.S. Sachdev*
Improving Nutrition through Relevant Evidence: Transforming an Indian Dream into Reality.

2010 *Dr. B. Sivakumar*
Carotene conversion to vitamin A is not inefficient.

2011 *Dr. B. Sesikeran*
Technology for Better Nutrition

2012 *Dr. B. S. Ramakrishna*
Gut Microbiota: Roles in Nutrition and Perturbations in Disease

2013 *Dr. Sheila C Vir*
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Food and Nutrition Security as Fundamentals of Human Development: National Perspective International Agenda

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THE RECIPIENT

- Dr. Biplab K. Nandi, Ph.D; International Civil Servant (retired) is at present serving as Founder-President of a Voluntary Organization named “Society for Nutrition, Education and Health Advancement (SNEHA)”, Kolkata. SNEHA is dedicated to overall improvement in nutrition and health of the community.The primary activities are centered around imparting education through effective means of communication.
- Dr. Nandi worked for the United Nations (UN) Food and Agriculture Organization (FAO) at its Regional Office for Asia and the Pacific in Bangkok, Thailand as Senior Food and Nutrition Officer for about 18 years. After his mandatory retirement from the United Nations Service he continued to work as International Consultant until 2016. During his tenure he had to oversee the Food and Nutrition related issues, programmes and projects of 46 countries in the Asia and Pacific Region. In that capacity he worked in close collaboration with WHO, UNICEF, UNDP, EU, USAID, FAO (Rome) besides the National Governments of the countries of the Region. He was known as “Friend of Nutrition Community” in Viet Nam, the Philippines and in Indonesia.
- Prior to joining FAO, he was the Technical Adviser to the Government of India (Ministry of Food) and Divisional Head, Food and Nutrition Board, New Delhi; he was Demonstrator and a Faculty staff member (Biochemistry and Nutrition) at the All India Institute of Hygiene and Public Health, Calcutta under the Ministry of Health and Family Welfare, Government of India.
- Currently, from time to time Dr. Nandi is hired as (UN Retiree) International Consultant by WHO, FAO and such other organizations. He has a distinguished service career of about 37 years of which18 years was for the United Nations.
- He is closely associated with International Life Sciences Institute, Delhi; National Institute of Nutrition (NIN), Hyderabad; and Nutrition Society of India besides Indian Dietetic Association. As an alumnus of the NIN he enjoys an emotional and special relationship with the Institute. He is an active Member of the Rotary Club in Kolkata. He is also a distinguished Member of the Independent Ethics Committee (IEC) of the Apollo Gleneagles Hospitals Kolkata.
- Dr. Nandi, in his personal life, believes that nothing can replace the "Joy of Giving"

ABSTRACT

Introduction

Food security as a concept originated only in the mid-1970s, in the discussion of international food problems at a time of global food crisis at the World Food Conference in 1974. The continuing evolution of food security as an operational concept in public policy has reflected the wider recognition of the complexities of the technical and policy issues involved. The most recent careful redefinition of food security is that negotiated in the process of international consultation leading to the World Food Summit (WFS) in November 1996. The varying definitions of food security adopted in 1974 and 1996, along with those in official FAO and World Bank documents of the mid-1980s and its comparison of these definitions highlights the considerable reconstruction of official thinking on food security that has occurred over the years. The initial focus of attention in the understanding of food security was primarily on food supply problems - of assuring the availability and to some degree the price stability of basic foodstuffs at the international and national level. The issues of famine, hunger and food crisis were also extensively examined, following the events of the mid1970s. The outcome was a redefinition of food security, which recognized that the behaviour of potentially vulnerable and affected people was a critical aspect.

Food Security and World Food Conference----Background

As the world food situation deteriorated after 1972, in his capacity as National Security Advisor to President Nixon, it fell to Henry Kissinger, the US Secretary of State to develop a US response. He ordered the preparation of a 'National Security Study Memorandum on Food', which was completed in late 1972. Hence the proposal to have the World Food Conference met under UN auspices. The US government followed Kissinger's proposal by suggesting that an item on this matter be included on the agenda of the twenty-eighth session of the UN General Assembly.

On 1 February 1973 the very first warning of the gathering world food crisis was disseminated to the world press by FAO Director-General Addeke Boerma. In the face of a mounting world food crisis, the heads of state or governments of the Non-Aligned Countries, at their fourth conference held in Algiers, Algeria from 5 to 9 September 1973, urged that an emergency joint conference of FAO and UNCTAD should be convened at ministerial level in order to formulate a programme of international co-operation to overcome the increasing shortage of food and other commodities and maintain stable prices.

Another important impetus for a high level international discussion on food problems came from Henry Kissinger. In a statement to the UN General Assembly on 24 September 1973 he said: "The growing threat to the world's food supply deserves the urgent attention of this Assembly … No one country can cope with this problem. The United States therefore proposes: That a World Food Conference be organized under United Nations auspices in 1974 to discuss ways to maintain adequate food supplies, and to harness the efforts of all nations to meet the hunger and malnutrition resulting from natural disasters".

On 18 October 1973, it was recommended to the UN General Assembly that such a conference be held in 1974, and requested that the governing bodies of all UN agencies discuss their own contributions to such a meeting as an item of top priority. As the UN specialized agency with the mandate for food and agriculture, FAO's reaction was considered particularly important. At its biennial conference in November 1973, recognizing that the UN could best generate the political momentum to sustain the nature of such a conference, the FAO Conference welcomed such an effort under UN auspices and recommended that the proposed conference should focus on the resolution of the food problem within the larger context of overall economic development.

Official concepts of Food Security and its Evolution as an operational concept in Public Policy

The initial focus, reflecting the global concerns of 1974, was on the volume and stability of food supplies. Food security was defined in the 1974 World Food Conference as: "availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices".
In 1983, FAO expanded its concept to include securing access by vulnerable people to available supplies, implying that attention should be balanced between the demand and supply side of the food security equation: "ensuring that all people at all times have both physical and economic access to the basic food that they need".

In 1986, the highly influential World Bank report “Poverty and Hunger” focused on the temporal dynamics of food insecurity. It introduced the widely accepted distinction between chronic food insecurity, associated with problems of continuing or structural poverty and low incomes, and transitory food insecurity, which involved periods of intensified pressure caused by natural disasters, economic collapse or conflict. This concept of food security is further elaborated in terms of: “access of all people at all times to enough food for an active, healthy life”.

Changing dimension of Food Security to Nutrition Security

By the mid-1990s food security was recognized as a significant concern, spanning a spectrum from the individual to the global level. However, access now involved sufficient food, indicating continuing concern with protein-energy malnutrition. But the definition was broadened to incorporate food safety and also nutritional balance, reflecting concerns about food composition and minor nutrient requirements for an active and healthy life. Food preferences, socially or culturally determined, now became a consideration. The potentially high degree of context specificity implies that the concept had both lost its simplicity and was not itself a goal, but an intermediating set of actions that contribute to an active and healthy life.

The 1994 UNDP Human Development Report promoted the construct of human security, including a number of component aspects, of which food security was only one. This concept is closely related to the human rights perspective on development that has, in turn, influenced discussions about food security. The wider investigation into the role of public action into combating hunger and deprivation, found no separate place for food security as an organizing framework for action. Instead, it focused on a wider construct of social security which has many distinct components including, of course, health and nutrition.

The 1996 World Food Summit adopted a still more complex definition: “Food security, at the individual, household, national, regional and global level is achieved when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”

This definition is again refined in The State of Food Insecurity (SOFI) in the World 2001: Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. Household food security is the application of this concept to the family level, with individuals within households as the focus of concern. This new emphasis on consumption, the demand side and the issues of access by vulnerable people to food, is most closely identified with the seminal study by Amartya Sen. In using the concept of food security, Sen focuses on the entitlements of individuals and households.

The international community has accepted these increasingly broad statements of common goals and implied responsibilities. But its practical response has been to focus on narrower, simpler objectives around which to organize international and national public action. The declared primary objective in international development policy discourse is increasingly the reduction and elimination of poverty. Essentially, food security can be described as a phenomenon relating to individuals. It is the nutritional status of the individual household member that is the ultimate focus, and the risk of that adequate status not being achieved or becoming undermined. The latter risk describes the vulnerability of individuals in this context. As the definitions reviewed above imply, vulnerability may occur both as a chronic and transitory phenomenon. Food insecurity exists when people do not have adequate physical, social or economic access to safe and nutritious food as defined above. The broader concept of food security therefore emerges as nutrition security.

Household measurements: the focus on chronic hunger and poverty

Sub-nutrition, often assumed in official literature to be synonymous with the more emotive term hunger, is the result of food intake that is continuously insufficient to meet dietary energy requirements. Measurement is typically indirect and based on food balance sheets and national income distribution and consumer expenditure data. Linking hunger and sub-nutrition with inadequate food intake allows the measurement of food insecurity in terms of the availability and apparent consumption of staple foods or energy intake. This type of measurement corresponds to the earlier narrower definitions of chronic food insecurity. Where international cross-sectional and national time series comparisons are undertaken, as in SOFI 2001, national estimates are based on average per capita availability of staple foods, or apparent consumption. The estimates may also be weighted by evidence of food expenditure by income categories for countries where consumer expenditure surveys are not available.

Because poverty lines, such as those calculated by the World Bank, also reflect assumptions about dietary energy intake, there is inevitably a high degree of correlation in these cases with estimates of poverty and extreme poverty. The international comparison of country estimates of chronic food insecurity therefore, reflect cross-sectional patterns and trends in food production, supplemented by what is recorded about trade in basic foodstuffs (effectively cereals) as incorporated into national food balance sheets. The definition of sub-nutrition includes poor absorption and/or poor biological use of nutrients consumed. People may become more vulnerable, and so the economy more fragile and sensitive to ever-smaller shocks. This is also a reason for reassessing the importance of transitory, acute food insecurity.

Food and Nutrition Security: a multi-dimensional Phenomenon

Food and Nutrition security is a multi-dimensional phenomenon. National and international political action seems to require the identification of simple deficits that can be the basis for setting of targets, thus necessitating the adoption of single, simplistic indicators for policy analysis. Something like the "State of global food insecurity" analysis has to be undertaken. Since food insecurity is about risks and uncertainty, the formal analysis should include both chronic sub-nutrition and transitory, acute insecurity that reflects economic and food system volatility. Such formal exploration is usefully complemented by multi-criteria analysis (MCA) of food security. This should lead to qualitative, if not quantitative, comparisons. Where the focus of investigation is on sub-nutrition, then the linkages between sub-nutrition and inadequate food intake need to be carefully explored. Some elements that need to be considered in this regard are:

- sources of dietary energy supply – taking into account, for example, of different foods, trends in the acquisition of food from subsistence to marketing;
- climatic variability as a source of volatility and short-term nutritional stress;
- health status, especially changes in the incidence of communicable diseases, most obviously HIV/AIDS;
- spatial distribution within countries of poverty and forms of food insecurity, drawing on evidence from vulnerability assessment and mapping supported by the Food Insecurity and Vulnerability Information Mapping Systems (FIVIMS), the FAO and the World Food Programme (WFP) interagency initiative.

It is sometimes suggested that there should be more practical use of Amartya Sen's entitlement theory. If this were to involve the re-labelling of indicators of food needs as entitlements, it would be less useful than, for example, reflecting entitlement failure in a formal MCA.

Entitlement as a construct introduces an ethical and human rights dimension into the discussion of food security. There has been a tendency to give food security a too narrow definition, little more than a proxy for chronic poverty. The opposite tendency is international committees negotiating an all-encompassing definition, which ensures that the concept is morally unimpeachable and politically acceptable, but unrealistically broad. As the philosopher, Onora O'Neill, noted: "It can be mockery to tell someone they have the right to food when there is nobody with the duty to provide them with food. That is the risk with the rights rhetoric. What I like about choosing the counterpart, the active obligation of duties rather than the rights, you can't go on and on without addressing the question who has to do what, for whom, when".

Food and Nutrition security basically stands on its four pillars: namely, Availability of Safe and Nutritious food; Physical, Social and Economic Access to food; Sustainability of both Availability of and Access to food; and Biological Utilization of food.

Food and Nutrition Security-Indian Scenario

1. ***Agriculture and Food production***

Indian agriculture comprises mainly of marginal and small farmers; sustainability of agricultural development depends largely on them. The gradual decline in size of farm holdings has made a majority of small and marginal farms unviable. In India a large part of the farms are rain-fed, spread over 200 million hectares and constitute 62 percent of the country's total geographical area. Rain-fed agriculture supports 40 percent of the country's population, and has a large share of the cropped area under rice (42 percent), pulses (77 percent), oilseeds (66 percent) and coarse cereals (85 percent). It hosts 78 percent of cattle, 64 percent of sheep and 75 percent of goats. Increased focus on water conservation and its sustainable utilization in rain-fed areas is key to the development of these areas. Land degradation constitutes a major threat to India's food and environmental security. The deteriorating quality of groundwater is another threat. However, there are initiatives to prevent and

control animal diseases, develop feed and fodder resources, increase fish production and improve the welfare of fisher folks. Efforts are also on to develop the poultry sector with focus on backyard poultry, development of small ruminants, genetic up-gradation of livestock, and conservation of indigenous breeds. In India the poverty figure is pegged at nearly 30 percent. States, however, vary significantly in terms of both the incidence and depth of poverty. Extreme poverty exists more among small producers, landless labourers, rural wage earners, women and population groups living in remote and resource-poor areas.
However, it is heartening to note that the new United Nations Sustainable Development Goals (SDGs) that India is following, incorporate a critical number of interconnected destinations identified with farming and nourishment. SDG 1 centers expressly around sustenance by trying to "end hunger, accomplish nourishment security and enhanced nourishment and advance supportable horticulture," however, different objectives identify with challenges in the sustenance framework.

2. Vulnerability and resilience

Overall, India has moved out of the short-term relief-response dominated dependency trap in which many developing countries still find them. The country has vast experience in managing droughts, so at the macro-scale the Government has progressively improved resilience of the national food system. India is a founding member of the Global Agricultural Monitoring and Information System (AMIS), a FAO-G-20 initiative. It has a well-developed and resourced National Disaster Management Authority and several other resilience building programmes such as the National Innovations on Climate Resilient Agriculture (NICRA), crop insurance schemes, and the National Action Plan for Climate Change (NAPCC) with eight National Missions under it. India has long been an essential and effective partner in Desert Locust information and control systems nationally and globally. However, the same is not true about other trans-boundary threats, particularly of animal (including zoonotic) diseases like the highly pathogenic Avian Influenza, Peste de Petits Ruminants, Newcastle disease, and Foot and Mouth Disease. Veterinary services do not sufficiently reach a majority of small ruminant holding communities, nearly all in rain-fed areas, where over 70 percent of livestock keepers are women. Similarly, up to 20 percent of its districts, nearly all in rain fed areas, are affected by socio-political unrests of various intensities. As a result, millions of people across India continue to be affected by disasters and crises.

3. Hunger, food insecurity and malnutrition

While India has made significant progress in reducing the absolute number of hungry, the country still accounts for a quarter of the world's hungry. Some 39 percent of Indian children under the age of five are stunted, 15 percent wasted and 29 percent are underweight. A 2015 study by the Global Alliance for Improved Nutrition (GAIN) shows rising incidence of malnutrition-related diseases among women. It also reports an alarming 74 percent of Indian children under five-years and 52 percent of married women being anaemic.

Deficiencies in nutrition inflict long-term damage to both individuals and society. Compared with their better-fed peers, nutrition-deficient individuals are more likely to have infectious diseases such as pneumonia and tuberculosis, which lead to a higher mortality rate. In addition, nutrition-deficient individuals are less productive at work. Low productivity not only gives them low pay that traps them in a vicious circle of under-nutrition, but also brings inefficiency to the society, especially in India where labour is a major input factor for economic production. On the other hand, over-nutrition also has severe consequences. Obesity causes several non-communicable diseases such as cardiovascular diseases, diabetes, some forms of cancer and chronic respiratory diseases. On the Global Hunger Index India is on place 67 among the 80 nations having the worst hunger situation. Research has conclusively shown that malnutrition during pregnancy causes the child to have increased risk of future diseases, physical retardation, and reduced cognitive abilities. Nutritional trends of various demographic groups suggest that many factors, including region, religion and caste affect the nutritional status of Indians. Living in rural areas also contributes to nutritional status. In general, those who are poor are at risk for under-nutrition, in India while those who have high socio-economic status are relatively more likely to be over-nourished. Anaemia is negatively correlated with wealth. When it comes to child malnutrition, children in low-income families are more malnourished than those in high-income families. There is a serious problem when inadequate protein is consumed because 56% of poor Indian household consume cereal to consume protein. It is observed that the type of protein that cereal contains does not parallel to the proteins that animal product contain. This phenomenon is most prevalent in the rural areas of India where more malnutrition exists on an absolute level. Whether children are of the appropriate weight and height is highly dependent on the socio-economic status of the population. Children of families with lower socio-economic standing are faced with sub-optimal growth. Child nutrition is also different from family to family depending on the mother's characteristic,

household ethnicity and place of residence. It is expected that with improvements in socio-economic welfare, child nutrition will also improve. Under-nutrition is more prevalent in rural areas, again mainly due to low socio-economic status. Anaemia for both men and women is only slightly higher in rural than that in urban areas. In urban areas, overweight status and obesity are over three times as high as rural areas.

Government of India recognizes the need for a comprehensive social protection system to reduce poverty and vulnerability and runs a number of programmes to that end. For example, the Mid-Day Meal Scheme provides hot cooked meal to around 100 million school going children; the Nirmal Bharat Abhiyan accelerates sanitation coverage in rural areas; the National Rural Drinking Water Programme provides safe drinking water; and the Indira Gandhi Matritva Sahyog Yojana which offers maternity benefits. The Integrated Child Development Services (ICDS) programme started in 1975. ICDS has been instrumental in improving the health of mothers and children under age 6 by providing health and nutrition education, health services, supplementary food, and pre-school education. The ICDS program is one of the largest in the world. It reaches more than 34 million children ages 0–6 years and 7 million pregnant and lactating mothers. Other programmes impacting under-nutrition include the National Rural Health Mission, and the Public Distribution System (PDS). The challenge however, for these programmes and schemes is how to increase efficiency, impact, and coverage. Various studies suggest that one of the basic reasons for India's malnutrition is poor sanitation. Because of poor sanitation situation, more children in India are exposed to bacteria. The bacteria sicken them, and make it hard for children to consume food therefore missing out on nutrients and result in malnutrition. About 620 million people in India don't have a toilet in their house and they use public toilet or just outside. In addition, the air quality in India is extremely bad and it leads to more poor sanitation. In 2012, UNICEF made a report that malnutrition is based entirely on lack of the food; but now, sanitation has been included. Currently, the Government of India is working to solve malnutrition problems not only by making more foods but also addressing the issues related to hygiene and sanitation. India has the highest number of children stunted because of malnutrition (48.2 million), according to Save the Children's 'Stolen Childhoods' report 31 million of children are part of India's workforce, the highest in the world. These two factors along with the lack of education and early marriage/parenthood pushed India to 116th place among 172 countries assessed for threats to childhood

Food and Nutrition Security-Global Scenario

The flagship report entitled "The State of Food Security and Nutrition in the World 2017" was launched on the 15th September 2017 at FAO headquarters jointly by five UN Agencies namely, *FAO, IFAD, WFP, UNICEF and WHO*, which marked an expanded partnership than the previous years. The 2017 report suggests that the number of chronically undernourished people in the world is estimated to have increased to 815 million, up from 777 million in 2015 although still down from about 900 million in 2000. After a prolonged decline, this recent increase could signal a reversal of trends. The food security situation has worsened in particular in parts of sub-Saharan Africa, South-Eastern Asia and Western Asia, and deteriorations have been observed most notably in situations of conflict combined with droughts or floods. The apparent halt to declining hunger numbers is not yet reflected in the prevalence of child stunting, which continues to fall, though the pace of improvement is slower in some regions. Globally, the prevalence of stunting fell from 29.5 percent to 22.9 percent between 2005 and 2016, although 155 million children under five years of age across the world still suffer from stunted growth. Wasting affected one in twelve (52 million) of all children under five years of age in 2016, more than half of whom (27.6 million) live in Southern Asia. Multiple forms of malnutrition coexist, with countries experiencing simultaneously high rates of child under nutrition, anaemia among women, and adult obesity. Rising rates of overweight and obesity add to these concerns. Childhood overweight and obesity are increasing in most regions and in all regions for adults. In 2016, 41 million children under five years of age were overweight. Exacerbated by climate-related shocks, conflicts (even at local level) seriously affect food security and are a cause of much of the recent increase in food insecurity. Conflict is a key driver of situations of severe food crisis while hunger and under nutrition is significantly worse where conflicts are prolonged and institutional capacities are weak. Addressing food insecurity and malnutrition in conflict-affected situations cannot be "business as usual". It requires a conflict-sensitive approach. This report sends a clear warning signal that the ambition of a world without hunger and malnutrition by 2030 will be challenging – achieving it will require renewed efforts through new ways of working.

International Development Agenda

Alive to the issues of food security and nutrition since 1974, when the World Food Conference was held in Rome, the United Nations and its specialised agencies namely, FAO and WHO in particular have been taking a number of actions in this direction at the International arena with a view to translating those actions at the national level.

Some such important initiatives have been convening two major Interministerial International Conferences on Nutrition by UN (FAO and WHO) namely:

1. International Conference on Nutrition in Rome: December 1992 (ICN)
2. International Conference on Nutrition in Rome: November 2014 (ICN2)
3. Additionally, the World Food Summits in 1996 and 2002; and the World Summit on Food Security in 2009 as well as in relevant international targets and action plans, including the WHO 2025 Global Nutrition Targets and the WHO Global Action Plan for the Prevention and Control of Non communicable Diseases 2013-2020.

The ICN2 in 2014 noted with profound concern that, notwithstanding significant achievements in many countries, recent decades have seen modest and uneven progress in reducing malnutrition and estimated figures show that: a) the prevalence of undernourishment has moderately declined, but absolute numbers remain unacceptably high with an estimated 805 million people suffering chronically from hunger in 2012-2014; b) chronic malnutrition as measured by stunting has declined, but in 2013 still affected 161 million children under five years of age, while acute malnutrition (wasting) affected 51 million children under five years of age; c) under nutrition was the main underlying cause of death in children under five, causing 45% of all child deaths in the world in 2013; d) over two billion people suffer from micronutrient deficiencies, in particular vitamin A, iodine, iron and zinc, among others; e) overweight and obesity among both children and adults have been increasing rapidly in all regions, with 42 million children under five years of age affected by overweight in 2013 and over 500 million adults affected by obesity in 2010; f) dietary risk factors, together with inadequate physical activity, account for almost 10% of the global burden of disease and disability. A common vision for global action is to end all forms of malnutrition.

To address the aforesaid multiple challenges of malnutrition in all its forms and identify opportunities for tackling them in the next decades the Ministers and Representatives of the Members of the FAO and the WHO, assembled at the Second International Conference on Nutrition in Rome from 19 to 21 November 2014, jointly organized by FAO and WHO. They reaffirmed the commitments made at the first International Conference on Nutrition in 1992, and the World Food Summits in 1996 and 2002 and the World Summit on Food Security in 2009, as well as in relevant international targets and action plans, including the WHO 2025 Global Nutrition Targets and the WHO Global Action Plan for the Prevention and Control of Non communicable Diseases 2013-2020. They also reaffirmed the right of everyone to have access to safe, sufficient, and nutritious food, consistent with the right to adequate food and the fundamental right of everyone to be free from hunger consistent with the International Covenant on Economic, Social and Cultural Rights and other relevant United Nations instruments. They acknowledged that malnutrition, in all its forms, including under nutrition, micronutrient deficiencies, overweight and obesity, not only affects people's health and wellbeing by impacting negatively on human physical and cognitive development, compromising the immune system, increasing susceptibility to communicable and non-communicable diseases, restricting the attainment of human potential and reducing productivity, but also poses a high burden in the form of negative social and economic consequences to individuals, families, communities and States. The Ministers called on FAO and WHO, in collaboration with other United Nations agencies, funds and programmes, as well as other international organizations, to support national governments, upon request, in developing, strengthening and implementing their policies, programmes and plans to address the multiple challenges of malnutrition.

The ICN2 recommended to the United Nations General Assembly to endorse the Rome Declaration on Nutrition, as well as the Framework for Action which provides a set of voluntary policy options and strategies for use by the governments, as appropriate, and to consider declaring a Decade of Action on Nutrition from 2016 to 2025 within existing structures and available resources.

United Nations (UN) Decade of Action on Nutrition 2016-2025

A common vision for global action to eradicate hunger and end all forms of malnutrition was defined by the ten commitments of the Rome Declaration on Nutrition and the accompanying 60 recommended policy options and strategies in its Framework for Action which were adopted at the Second International Conference on Nutrition (ICN2) in November 2014. The implementation of the ten commitments through the use of the ICN2 Framework for Action would contribute to ensuring accountability and monitoring progress in achieving the World Health Assembly six global nutrition targets 2025 and the nutrition-related voluntary global non communicable diseases targets.

Following the recommendations in the Rome Declaration, the United Nations (UN) Decade of Action on Nutrition (2016–2025) was declared by the UN General Assembly in April 2016. The UN Decade of Action on Nutrition offers a unique opportunity to all countries and stakeholders to unite around a common framework and to increase the visibility, coordination, efficiency and effectiveness of nutrition action at all levels across the world. The ten commitments made globally through the Rome Declaration on Nutrition are: (1) Eradicate hunger and prevent all forms of malnutrition; (2) Increase investments for effective interventions and actions to improve people's diets and nutrition; (3) Enhance sustainable food systems; (4) Raise the profile of nutrition with national strategies and align national resources accordingly; (5) Strengthen human and institutional capacities to improve nutrition; (6) Strengthen and facilitate contributions and action by all stakeholders; (7) Ensure healthy diets throughout the life course; (8) Create enabling environment for making informed choices; (9) Implement these ten commitments through the Framework for Action; and (10) Integrate the Declaration's vision and commitments into the post2015 development agenda process.

Food Security and Sustainable Development

On 1 January 2016, the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development were adopted by world leaders of which Goals 2 (zero hunger), 6 (clean water and sanitation) and 17 (partnership) are closely related to food security and nutrition. This was a follow-up of the September 2015 post Millennium Development historic UN Summit. The 8 Millennium Development Goals that are associated with food security and nutrition are: to eradicate extreme poverty and hunger; to achieve universal primary education; to promote gender equality and empower women; to reduce child mortality; to improve maternal health; to combat HIV/AIDS, malaria, and other diseases; to ensure environmental sustainability; and to develop a global partnership for development.

WASH (Water, Sanitation and Hygiene) and Nutrition Programme—UNICEF

Achieving nutritional impact on children and pregnant women implies implementing comprehensive and holistic WASH programmes in the communities and addressing many barriers related to the access and uptake of safe water, sanitation and hygiene services and behaviours. Following are some of the important considerations in this regard:

Water: improving accessibility and quality of drinking water, construction and rehabilitation of improved water resources, building the capacity of water committees to operate, maintain and financially manage water sources, promoting point-of-use water treatment and safe storage, designing community Water Safety Plans, etc.

Sanitation: generating demand for improved sanitation through community-led approaches and sanitation marketing, construction and rehabilitation of improved latrines for the community members, etc.

Hygiene: promotion and demonstration of safe hygiene practices – i.e. hand washing with soap, food hygiene, menstrual hygiene management, safe stool disposal, solid waste management, etc.

Concluding Remarks

The elimination of malnutrition in all its forms is an imperative for health, ethical, political, social and economic reasons, paying particular attention to the special needs of children, women, the elderly, persons with disabilities and other vulnerable groups. To address the issues of Food and Nutrition Security in all its totality a more serious and concerted effort would be needed at all fronts—both nationally and internationally. Following are some of the suggested actions: a) nutrition policies should promote a safe, diversified, balanced and healthy diet at all stages of life. In particular, special attention should be given to the first 1,000 days (i.e., 1000 Days Window of Opportunity), from the start of pregnancy to two years of age, pregnant and lactating women, women of reproductive age, and adolescent girls, by promoting and supporting adequate care and feeding practices, including exclusive breast feeding during the first six months, and continued breast feeding until two years of age and beyond with appropriate complementary feeding. Healthy diets should be fostered in preschools, schools, public institutions, at the work place and at home, as well as healthy eating by families; b) coordinated action among different actors, across all relevant sectors at international, regional, national and community levels, needs to be supported through cross-cutting and coherent policies, programmes and initiatives, including social

protection, to address the multiple burdens of malnutrition and to promote sustainable food systems; c) excessive volatility of prices of food and agricultural commodities can negatively impact food security and nutrition, and therefore, needs to be better monitored and addressed for the challenges it poses. d) improvements in diet and nutrition require relevant legislative frameworks for food safety and quality, including for the proper use of agrochemicals, by promoting participation in the activities of the Codex Alimentarius Commission for the development of international standards for food safety and quality, as well as for improving information for consumers, while avoiding inappropriate marketing and publicity of foods and non-alcoholic beverages to children.

As regards India the following actions are particularly considered important: improving the food distribution system; proper monitoring of the nutrition programmes; strengthening inter sectoral coordination; implementing measures to improve agricultural productivity and food storage; ensuring food availability and accessibility to below poverty line (BPL) candidates; improving purchasing power through employment generating schemes; diversifying crop production, establishing food grain banks and promoting household gardening; consolidating community awareness through IEC activities and social marketing with due attention to food safety and quality; and monitoring and timely evaluation of nutrition programmes besides ensuring community participation and inter sectoral coordination.

It is indeed gratifying to note that with a view to addressing the issues of food and nutrition security various actions both at the national and international levels are underway within the mandate of UN Decade of Action on Nutrition 2016-2025. Concerns however, can never be undermined, and that includes very recent unfortunate incident of starvation death of three girl children aged 2, 4 and 8 years in Delhi on 24 July 2018.

RAJAMMAL P DEVADAS MEMORIAL LECTURE

THE AWARD

The Rajammal P Devadas Memorial Lecture Award was instituted by the Nutrition Society of India, in association with Avinashilingam Education Trust and Avinashilingam University for Women in the year 2009. Dr. Rajammal P Devadas (lovingly called 'amma' by her colleagues and students) had made significant contributions for the cause of Nutrition Science, Home Science and Women's development in the country. She was the President of the Nutrition Society of India during 1987 to 1991.

Born in Kallikulam in Tirunelvelli District of Tamil Nadu, Dr.Devadas had her early education in Chennai and graduated from Women's Christian College. She received her Ph.D. degree from Ohio State University, USA, with copious honours in 1950, and her Post Doctoral D.Sc. degree from the University of Madras in 1978. As a leading nutritionist of international reputation, Dr. Devadas, in her various capacities as Principal, Vice Chancellor and Chancellor, had a stupendous academic record throughout. Dr. Devadas held several celebrated positions such as Chief Home Economist and Joint Director (Home Science), Directorate of Extension, Ministry of Food and Agriculture, Government of India (1955-1961) and Assistant Director General (Nutrition) ICAR (1975-76). She also served with immense merit as the Regional Vice President - International Federation for Women in Agriculture (IFWA), Regional Coordinator for Research-World Alliance for Breast Feeding and the First Vice President of the World Food Conference convened by the FAO in 1970 in The Hague, Holland, besides holding many other memorable advisory positions in National and International Organizations.

Dr. Devadas's major scientific contributions in the area of Home Science and Community Nutrition has resulted in various implementable programmes. To name a few, nutrition consultation in the colossal State-wide Nutritious Noon Meal Programme of the Government of Tamil Nadu, organization of training programmes for thousands of workers involved in nutrition intervention programmes, direction of a project in five states to commence Nutrition/Health Education and Environmental Sanitation in primary schools in which 10,000 teachers from five districts of Tamil Nadu were skilled in nutrition. In the academic year 1991-1992, she integrated NSS into the undergraduate curriculum of the Avinashilingam University giving it credits and an academic status. She toiled hard to educate the community on the significance of nutrition by developing educational materials and conducting research and community outreach programmes. She was the chief editor of the Indian Journal of Nutrition and Dietetics, Research Highlights and the Tamil Science monthly Vignana Chudar. She has left behind to her credit over 500 research papers and 57 books. She represented India in more than 50 International Nutrition/Home Science Conferences in about 40 countries.

She received many awards from various national and international organizations for her commendable and priceless service in different fields including the Tagore Literacy award (1991), Padma Shri from Government of India (1992) and Dr. B.C.Guha memorial award (1993). She was awarded the Honorary Degree of Humane Letters from Oregon State University (1993) and Ohio State University (1994), Honorary D.Sc. from Chandrasekar Azad University of Agriculture and Technology, Kanpur (1994), Honorary Degree of D.Sc. from University of Ulster, Northern Ireland (1996), G.D. Birla award (1998), the Malcolm S. Adiseshiah award (2000) and the prestigious International Union of Nutrition Sciences (IUNS) award in 2001 at Vienna, Austria.

The phenomenal growth of the Avinashilingam Institutions to the present heights is only due to the consistent and unstinted efforts of Dr. Devadas. Sri Avinashilingam Home Science College for Women was established in 1957, the Home Science College acquired the Deemed University status in 1988 with Dr.Rajammal P. Devadas as its first Vice Chancellor.

Dr. Rajammal P. Devadas Memorial Lecture Award is given every year to an outstanding women nutrition scientist of Indian origin working in India who has made noteworthy contributions in the field of applied nutritional sciences.

The Nutrition Society of India is proud to announce that the 9th Dr. Rajammal P. Devadas Memorial Lecture will be delivered by Dr. Sadhana Ramchandra Joshi, Professor and Head, Mother and Child Health, Interactive Research School for Health Affairs (IRSHA), Bharati Vidyapeeth Deemed University, Pune, Maharashtra, India on "Maternal Nutrition and Placental Programming: Implications for Long Term Health"

PREVIOUS RECIPIENTS

2010 *Dr.Mahtab S Bamji*
Striving for village-level nutrition security - Challenges and opportunities

2011 *Dr. Rita S Raghuvanshi*
Reorganizing Nutrition for a Better Tomorrow

2012 *Prof. (Mrs.) Vijayakhader*
Impact of Economic Empowerment of Women on Health Security – Lessons from Studies in Andhra Pradesh; Karnataka, Kerala, Tamil Nadu and Kenya.

2013 *Prof. Jamuna Prakash*
Exploring Food Based Approaches for Translational Nutrition : From Research to Practice

2014 *Prof. G. Subbulakshmi*
Farm Foods and Pharm Foods

2015 *Prof. Satyavati Rana*
Nutrition and Disease – An Interaction

2016 *Dr R. Hemalatha*
Mother and Child Nutrition- Life Cycle Approach

2017 *Dr.Asna Urooj*
Translational nutrition research for sustainable dietary management of diabetes mellitus

Maternal Nutrition and Placental Programming: Implications for Long Term Health

Dr Sadhana Joshi
Professor and Head,
Department of Mother and Child Health,
Interactive Research School for Health Affairs,
Bharati Vidyapeeth (Deemed to be University), Pune
Email: srjoshi62@gmail.com

THE RECIPIENT

Dr. Sadhana Joshi completed her PhD in Nutritional Biochemistry from Agharkar Research Institute, Pune, India. She joined Interactive Research School for Health Affairs (IRSHA), Bharati Vidyapeeth University, Pune as a Senior Scientist in 2004. Currently, she is a Director Grade Scientist and heads the Division of Mother and Child Health at IRSHA. She has been working in the area of Mother and Child health for over 25 years.

Her interests are in maternal nutrition and early life events which are now recognized to play a vital role in the development of non-communicable diseases in later life. Her work has resulted in several novel findings which are published in over 120 International journals and 5 book chapters. The group has received a large number of grants from DBT, ICMR and DST. She is the Principal Investigator on an ICMR, Centre for Advanced Research which will examine the association of maternal long chain polyunsaturated fatty acids (LCPUFA) and micronutrients with clinical outcome in preeclampsia.

She is a recipient of the 'Research Excellence Award for Developing Country Scientist' at the 7th World Congress on Developmental Origins of Health and Disease, Portland, USA. She has also received the "Best Researcher Award" at the 15th Foundation day Ceremony at Bharati Vidyapeeth University, Pune. Her group has received a large number of awards at various International and National conferences. She is a Task Force member at DBT and an Editorial board member of "Journal of Nutrition & Intermediary Metabolism", ELSEVIER

She has been nominated as an Expert on the Committee on Wellness Counselling formed by the State Project Director, Rashtriya Uchchatar Shiksha Abhiyan (RUSA), Maharashtra in 2017. She is a board member for the Preterm Birth International Collaborative PREBIC Australasian Branch (2017-2018). She was invited to participate in the 2016 Grand Challenges Meeting sponsored by Bill & Melinda Gates Foundation at London.

She was also invited to deliver Key note addresses and talks at Asia Pacific Workshop on Polyunsaturated fatty acids, Singapore; Indian Science Congress, Bhuwaneshwar and Mumbai; Gestosis "A disturbed Pregnancy" Conference, Bangalore; World Congress-BCGIP, Delhi; Annual Congress of Society of Fetal Medicine, Delhi; Nutrition Society of India, Hyderabad and Indian Dietetic Association, Pune.

A total of 14 students have obtained their PhD degree under her guidance and 6 others are currently doing their PhD. She is an invited member of the Fellow of the Society of Applied Biotechnologists, Member of the Board of The India Chapter of Gestosis, The Indian Society of Preeclampsia, Life member of the International Society for Developmental Origins of Health and Disease, Life member of Nutrition Society of India, India and Life member of Society for the natal effects on health in adults, India.

ABSTRACT

Maternal nutrition and Pregnancy Outcome

Pregnancy is a period of increased nutritional demands and is considered the most vulnerable period in the human life cycle. Maternal nutritional status has an important influence on the health of the pregnant woman and the growing fetus [1]. Maternal nutrients and hormones play a critical role at every stage of embryonic and fetal development. In particular, the diet of the mother during the first trimester is vital for the development and differentiation of various organs. Nutrient deficiencies may lead to suboptimal fetal nutrition, congenital malformations and pregnancy complications [2].

The placenta

Maternal nutritional status in pregnancy influences the placental development and thereby fetal growth. The placenta is a highly specialized temporary organ of pregnancy which forms the interface between maternal and fetal nutrition, which transfers maternal nutrients to the fetus. A variety of factors affect this transfer which include placental blood supply, placental size and morphology and nutrient transporters. Impaired placental development may have a profound effect on the nutrient transport. Alterations in placental growth and development in response to maternal diet affects the supply of nutrients to the fetus resulting in an adverse pregnancy outcome thereby predisposing the offspring to adult diseases [3].

Maternal Nutrition and Developmental Origins of Health and Diseases (DOHaD)

Studies have well-established the association between maternal nutrition, placental development and risk for non-communicable diseases (NCDs) (coronary heart disease and type II diabetes mellitus) in the offspring at adult age. It is suggested that alterations in fetal nutrition may result in developmental adaptations that permanently change the structure, physiology and metabolism of the offspring; thereby predisposing the infant to cardiovascular, metabolic and endocrine diseases in adult life [4, 5]. Nutrition during the first 1,000 days of life (from pregnancy till two years of the child growth) can influence health outcomes during adulthood and this phenomenon is referred to as Developmental Origins of Health and Diseases (DOHaD) [6]. There is growing interest in the field of DOHaD; however the mechanisms that lead to adverse programmed changes in growth, development and metabolism are unclear. These programmed changes are likely to be a result of stable changes in the gene expression patterns which are influenced by epigenetic modifications, as a result of a number of external and internal environmental factors. Epigenetic mechanisms may therefore, provide a possible explanation regarding the role of nutritional influences in early life on long-term changes in later life [7].

Epigenetics

Epigenetics is defined as a study of heritable functional modifications to genes without the underlying change in the nucleotide sequence. Epigenetic information is transferred from the parent cell to daughter cells and across generations. Epigenetic mechanisms involve modifications of chromatin and proteins associated with it. There are three basic epigenetic mechanisms that regulate gene expression: DNA methylation, histone modifications and RNA regulation [8]. It has been suggested that *in utero* exposure to nutritional, environmental or lifestyle factors can induce alterations in gene expression through epigenetic modifications [9].

Nutrition and Epigenetics

Evidence suggests that maternal nutritional exposure *in utero* can result in epigenetic modifications in the offspring [10]. Nutrients can reverse or change the epigenetic patterns by inhibiting enzymes that catalyze DNA methylation and histone modifications or by altering the availability of substrates, thereby modifying the expression of critical genes associated with physiological and pathological processes, including embryonic development. Number of animal studies has demonstrated that maternal malnutrition during pregnancy can alter the DNA methylation patterns of specific genes in the offspring leading to permanent phenotypic changes such as coat color and body weight [11]. Reports indicate that individuals who were exposed to famine *in utero* during the Dutch Hunger had different methylation patterns in genes involved in growth and metabolic disease compared with controls [12].

Nutritional Regulation of DNA Methylation through One-Carbon Cycle

The one-carbon metabolism is used to describe a set of reactions that involve the continuous transfer of a single carbon unit from folate, the key methyl donor, to various methyl acceptors and recycling of the by-product homocysteine. The one-carbon metabolism is regulated by its substrates (methionine, cysteine), cofactors (folate, vitamin B12, and vitamin B6), and intermediates (S-adenosyl methionine (SAM), S-adenosyl homocysteine (SAH), and homocysteine). Micronutrients (folate and vitamin B_{12}) involved in the one carbon cycle are known to play an important role in DNA methylation processes since they influence the supply of methyl groups and thereby the biochemical pathways of methylation process. Studies have shown that alterations in the one carbon cycle during pregnancy and periconceptional period influences gene expression through altered DNA methylation patterns. Epigenetic events therefore constitute an important mechanism through which dietary components can selectively activate or inactivate gene expression [13].

In addition to the above mentioned nutrients, long chain polyunsaturated fatty acids (LCPUFA) are also crucial for the growth and development of placenta and fetus. They are important for the structural and metabolic functions and are intracellular mediators of gene expression. In addition to these functions they play an important role in maintaining the fluidity, permeability and conformation of cell membranes and thus determine important membrane function.

In the one-carbon cycle, methyl groups from SAM are transferred to major acceptors like phospholipids, DNA, histones, and neurotransmitters. The enzyme phosphatidylethanolamine N–methyltransferase (PEMT) utilizes three SAM molecules for interconversion of phosphatidylethanolamine (PE) to phosphatidylcholine (PC). PC synthesized by the PEMT enzyme is critical for the delivery of important LCPUFA such as DHA from the liver to the plasma and distribution to peripheral tissues.

LCPUFA, have been suggested to modify the epigenome [14]. A review highlights the role of the phospholipids as major methyl acceptors from the one-carbon cycle [15]. In an altered one-carbon scenario if the phospholipid conversion by PEMT is low, as indicated by low DHA levels [16], then the methyl groups will be directed to the DNMTs for DNA methylation leading to altered methylation of various genes [15].

Epigenetic Regulation in the Placenta and Adverse Pregnancy Complications

The placenta is considered as the key programming agent of adult health and disease. It is known that the placenta displays unique epigenetic profile [17], and a number of studies are examining the role of epigenetic regulation in placental development both at genome-wide and gene-specific levels.

Evidence suggests that epigenetics is linked to adverse pregnancy outcomes including early pregnancy loss, intrauterine growth restriction (IUGR), preeclampsia and preterm birth. A number of studies have shown important links between alterations to appropriate epigenetic regulation in the placenta and diseases of gestation and early life. DNA methylation patterns are established during embryogenesis. Genome-wide demethylation occurs after fertilization and before embryo implantation, resulting into a state of hypomethylation. *De novo* global remethylation then occurs following embryo implantation in response to organ development. This further leads to development of gene-specific methylation patterns, which determine tissue-specific transcription. Epigenetic regulation, thus, evolves before implantation and then across gestation.

At every stage of placental development there is a sequence of *de novo* methylation and chromatin remodeling that dictates the placental structure and function through a finely tuned pattern involving the switching ‘on’ and ‘off’ of gene expression [14-16]. There are critical spatio-temporal windows during which these ‘programs’ must be completed; failure to complete these ‘programs’ in time may be irrevocable and have long-term consequences. It is therefore, necessary to understand the methylation patterns of various vital genes involved in placental development. Alterations in the methylation pattern of these genes may lead to abnormal placentation, thereby affecting birth outcome.

Studies at IRSHA

Studies carried out in our department in humans and animals have demonstrated a link between micronutrients (folate, vitamin B_{12}) and LCPUFA in the one carbon cycle [17-19]. We have shown altered maternal one carbon cycle (micronutrients like folate, vitamin B_{12} and homocysteine) in pregnancy complications like

preeclampsia. Perturbations in the levels of folate, vitamin B_{12} and DHA can result in altered homocysteine levels. High levels of homocysteine are associated with reduced methylation potential, as it leads to an increase in cellular levels of Sadenosylhomocysteine (SAH) which inhibits the SAM dependant methyl transferases.

We have also reported lower maternal and placental LCPUFA in women with preeclampsia. It may be possible that sub-optimal maternal micronutrient status leads to altered gene specific methylation of key genes involved in placental development. Vasculogenesis and angiogenesis are considered to be central processes in the development of the placenta and are mainly controlled by vascular endothelial growth factor (VEGF). Altered levels of VEGF and its receptors can disrupt angiogenesis which affect placental development. Our studies have demonstrated altered global and gene specific methylation pattern of VEGF and its receptor in pregnancy complications like preeclampsia suggesting the role of epigenetics in normal placental development and in the adversity of pregnancy complications [20, 21].

Conclusion and Future Prospects

Sub optimal nutrition during pregnancy may alter epigenetic signatures resulting in abnormal placental development causing poor pregnancy outcome and higher risk of NCD in later life. Recent data from World Health Organization indicate that approximately 800 women in developing countries die as a result of complications during pregnancy and childbirth every day, [26]. It is known that children born to mothers with an adverse pregnancy outcome are at increased risk of diseases in later life. An appropriate epigenetic regulation of various genes is crucial for placental development and any alterations may affect birth outcome and disease susceptibility in later life. In view of this, it is necessary to undertake studies for identification of epigenetic biomarkers which may be useful in the prediction of adverse pregnancy outcomes. As nutritional epigenetic experts say, "Your genes load the gun but your environment pulls the trigger". Thus it is important to have good maternal nutrition for the best start in life.

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B. K. ANAND MEMORIAL AWARD

THE AWARD

This was instituted by the Nutrition Society of India, in association with B. K. Anand Benevolent Trust, New Delhi, in the year 2014 in memory of Prof. Bal Kishan Anand, an internationally renowned physiologist.

Dr. Anand was born on September 18, 1917 in Lahore (now in Pakistan). All through his formative years, he was rated as an excellent student and won many scholarships, medals and prizes. He graduated in Medicine from King Edward Medical College, Lahore in 1940 and went on to do M.D. in three subjects - Medicine, Pathology and Physiology. Prof. Anand joined the Lady Hardinge Medical College as a Professor of Physiology at a tender age of 32 in 1949. As the first Rockefeller Foundation Fellow, he went to Yale University in 1950 and discovered the existence of a neural substrate which is responsible for regulating food intake that is now known as the Feeding Centre. In 1952, he returned to India and joined the Lady Hardings Medical College as Professor and Head, Department of Physiology. Under his leadership it became the first Medical College in the country to introduce human and mammalian experiments in Physiology in 1953. By 1955, Lady Hardings Medical College was recognized to start an M.D. course in Basic Medical Sciences and he also got the credit of establishing the first Neurophysiology Research Unit in Lady Hardings Medical College in the same year.

Dr. B K Anand joined the All India Institute of Medical Sciences (AIIMS) in 1956 as its first Professor in the Department of Physiology. He demonstrated his dynamic leadership by helping to structure the MBBS course to three phases of three semesters, each followed by a year of internship that included three months of rural posting. This pattern was quickly followed throughout the country. Dr. Anand was a member of the core team which laid down the policies and curriculum for postgraduate training in AIIMS that was soon accepted by the Medical Council of India for all Medical Colleges in India. In 1969, he went on to become the Dean of AIIMS.

Dr Anand's tryst with science continued till the end of his long and distinguished scientific career by raising further questions related to the Neurobiology of feeding and satiety. The Neurophysiology Research Unit started by him at AIIMS continues to flourish even today. Besides understanding the neural basis of feeding and satiety, Dr. Anand and his team undertook studies to understand the role of limbic system in emotional and aggressive behaviour, the role of hypothalamus in reproduction as well as in cardiovascular, respiratory and gastrointestinal activities.

In 1955, Dr. B K Anand was instrumental in establishing the Association of Physiologist and Pharmacologists of India affiliated to the International Union of Physiological Sciences. In 1957, he also started the publication of Indian Journal of Physiology and Pharmacology that is now one of the best medical journals published in India. In 1974, he worked for the World Health Organization in New Delhi. Working in Health Manpower Development Division in South East Asia, he rendered advice for policy matters relating to education, nursing and paramedical manpower in the member countries. In 1977, he joined the Family Planning Foundation as its Biomedical Doctor and he held this position till his retirement in 1982 after successfully steering research in India in Biomedical Sciences especially in the development of contraceptives. In 1982, after retiring from the Family Planning Foundation, he took up yet another challenge of establishing a Postgraduate Medical Institute in Srinagar at the behest of the late Shri Sheikh Abdullah. During the period 1982-1985, he served as the Director of Sher-i-Kashmir Institute of Medical Science, Srinagar. Throughout his career, he guided many students, practitioners, researchers and faculty. He authored numerous research publications.

Dr. Anand won numerous national and international awards and accolades. Most significant among them are the Shanti Swarup Bhatnagar Prize for Science and Technology in Medical Sciences in 1963 and Padma Shri in Medicine in 1969 from Government of India.

The Nutrition Society of India is proud to announce the 5th Dr. B.K. Anand Memorial Award is given to Dr William Selvamurthy, President, Amity Science, Technology and Innovation Foundation, Director General for Amity Directorate of Science and Innovation and Chair Professor for Life Sciences.

THE RECIPIENT

Dr. W. Selvamurthy is presently working with Amity University as President, Amity Science, Technology and Innovation Foundation, Director General for Amity Directorate of Science and Innovation and Chair Professor for Life Sciences. He is also designated as the Chancellor, Amity University, Chhattisgarh.

Dr.Selvamurthy did his Masters (M.Sc.) in Human Physiology from Christian Medical College, Vellore (1972) and Doctorate (Ph.D) (Faculty of Medical Science) from Delhi University (1982) and Doctorate of Science (D.Sc.) from Bangalore (2006). He was also awarded D.Sc. (h.c) from five universities in recognition of his outstanding research and development contributions in Life Sciences.

Dr.Selvamurthy has served Defence Research and Development Organization (DRDO), Government of India for 40 years in which, all the health related life science research technologies were developed and inducted in the Armed Forces for keeping the health and efficiency of soldiers even in extreme operational environments. This biomedical research immensely benefited the Armed Force personnel and gave a lot of spin off benefits to the society at large. His R&D contributions include development of life support technologies for soldiers, NBC Defence Technology, Nano Technology Application for Defence, Application of yoga for the Armed Forces, Military psychology and others. He was the leader of the first Indo-Soviet scientific expedition to the Arctic Circle for polar physiology research. He superannuated from DRDO on 28 February, 2013 as Chief Controller, Research & Development (Life Sciences & International Cooperation).

Dr.Selvamurthy was closely associated with Department of Science and Technology (DST) for the promotion of health related research. He was Chairman of PAC in DST in the field of Health Sciences for International Co-operation with many countries for more than a decade. He was also the Area Co-ordinator for Biomedical technology under ILTP programme with Russia.

He is the member of the Scientific Advisory Committee to Cabinet (SAC-C), particularly in the field of Life Science, including health research. He is the Chairman of Programme Management Board in the Society for Bio-medical Technology. He is a member of the High Powered Committee appointed by ICMR to review its 12th plan proposal. He is also an expert member in the Department of Biotechnology, ICMR and CSIR.

In recognition of his significant contribution to Biomedical research and development, he has been awarded a number of prestigious research awards, including CSIR “National Award for S&T Innovations” presented by Hon’ble Prime Minister of India (2012), Academician MirsaidMirrakhimov award for “Contribution to High Altitude Medicine” from Kyrgyz Republic (2012), “Technology Leadership Award” by DRDO (2010) presented by Defence Minister, LifetimeAchievement Award from Hon’ble President of India in the field of Clinical and Preventive Cardiology (2006), ICMR Shakuntala Amir Chand Award (1986) and more.

PREVIOUS RECIPIENT

2014 *Dr. Prema Ramachandran*

2015 *Dr. Dr. K. Satyanarayana*

2016 *Dr Mario Vaz*

2017 Dr.B.Sivakumar

DEBATE
on
"Inclusion of millets in supplementary feeding programmes for children"

Debate on "Inclusion of millets in supplementary feeding programmes for children"
Against the motion

Dr Bharati Kulkarni
Scientist F (Senior Grade Deputy Director)
Clinical Division, National Institute of Nutrition,
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For tackling the present widespread prevalence of hunger and undernutrition, the GOI provides food grains to the poor, at a subsidised price, under the Public Distribution System (PDS). India also runs several children's targeted programs including Mid-day Meal Scheme and the Integrated Child Development Scheme which work in close association with the PDS. While the PDS and the targeted programs, have so far been focusing on rice and wheat as the major sources of calories, the focus is now gradually shifting towards millets as a rich source of nutrients to mitigate the problems of undernutrition in India.

Millets have traditionally been consumed in various parts of India, particularly among the indigenous communities residing in the dry rainfed areas. Millets, including Sorghum, Pearl millet, Foxtail millet, Little millet, etc, contain high amounts of essential nutrients such as calcium and iron which is believed to be helpful in combating hidden hunger in India. However, there are several issues that cannot be overlooked while considering millets as a part of children's nutritional programs.

Along with the nutrients, millets are also high in fibre and contain certain anti-nutrients like phytate, oxalate, non-starch polysaccharide glucans and protease inhibitor, which are known to reduce the bioavailability of several essential nutrients particularly iron, zinc and calcium. Few human studies have suggested that absorption of iron tends to be lower from millets than from rice or even wheat. Thus, the advantage of having a higher micronutrient content may to some extent be nullified by lower bioavailability.

The average shelf-life of millets is limited making them unsuitable for long-term storage. As noted in an approach paper to the Tenth Plan, a research report (June 2000) found that half of FCI's grain stocks are at least two years' old, 30 per cent between two and four years old, and some grains as old as 16 years and stocks that are more than three years old needs immediate disposal. With the present storage conditions, millets cannot be included in a national level programme under the PDS.

Moreover, different millets demand different storage operations, which may be operationally difficult. Millets are also prone to aflatoxin contamination and thus require special quality checks. Children exposed to aflatoxin, may have severe health risks including stunting and other long term consequences. Unless sufficient quality control is available, and India's food stock storage system is revamped, millets are likely to pose more health risks than benefits. According to a report of the Planning Commission, the storage godowns are small-scale, low quality structures and sometimes, grains are also stored in the open (known as covered and plinth storage-CAP),which also leads to heavy storage losses.

Another point which cannot be overlooked while considering children's diet, is the taste and acceptability. A child, if hungry, does not necessarily mean, would consume nutritious food with an unacceptable taste. A variety of millets are traditionally being consumed in several pockets in India,but their tastes may not be acceptable to children elsewhere,who are not familiar to these varieties with them. Moreover, undernourished children often experience lack of appetite; introduction of a new taste would require prior sensory evaluation to understand their acceptability.

In summary, although millets are rich in nutrients, their low bioavailability may render these nutrients unavailable to children. Even if processing could increase the bio-availability of the nutrients to some extent, millets are difficult to store and are prone to aflatoxin contamination that has potential serious consequences for vulnerable children. Considering these issues, although millets are rich in nutrients, introducing them in children's national program does not seem to be feasible at this point of time.

SYMPOSIA

LANSA SYMPOSIUM
on
"LEVERAGING AGRICULTURE FOR NUTRITION"

(Dedicated to the memory of Dr. Prakash Sarvotham Shetty, CEO LANSA (2012-18), and first Srikantia memorial lecture awardee)

Enabling Environment for Agriculture-Nutrition Linkage

Brinda Viswanathan
Madras School of Economics, Chennai

Studies based on secondary data, in the decade of 1990s, largely indicated disconnect between agriculture and nutrition for India. This is could be because these analyses captured more of nutrition-poverty linkage given that agriculture in India is a low productivity sector. However, by changing the modelling framework focusing on rural population or farm households the results from LANSA studies seem to support a positive relation between farming and nutrition while also emphasizing the role of enabling factors like women's agency and WASH. The results are arrived at using varied unit of analysis like districts, or households or adult women; differing aspects of agriculture like land productivity or per capita foodgrain production or production diversity; child or adult undernutrition rates; and intake or outcome measure of undernutrition. The district-level analysis has a distinct advantage of capturing the macro effect within a specific agro-climatic region and effectiveness of public service delivery. Household/Individual level data provides better insights into women's agency, care and intra-household related aspects and access to better amenities relating to WASH.

How do policies and strategies influence the nutrition impacts of agriculture?

Bhavani Shankar
SOAS University of London

Agricultural strategies and policies are rarely shaped by anticipated poverty and nutritional impacts. And yet, agri-food policies such as farm and food subsidies and investment choices about which crops or livestock, regions, institutions and infrastructure to invest in, have consequences for the incomes and nutrition of the poor. This presentation will focus on *choices* exercised by governments in the region in the agriculture sphere, and the (intended or unintended) impacts these have on nutrition outcomes. After examining the conceptual pathways through which agri-food policies and strategies influence nutrition, we will briefly discuss the global evidence base on this front, followed by presentation of fresh evidence originating from the LANSA project. The broad focus will be on South Asia in general, but special attention will be trained on India, where substantial changes to the agri-food policy sphere are underway. The presentation will end with reflections on policy priorities and how policy can be designed to be more nutrition sensitive in the future.

Leveraging value chains for better nutrition?

Nigel Poole
SOAS University of London

Considering the contribution of the private agribusiness sector to food and nutrition, it is logical -- and consistent with the SDGs -- to look to businesses to support the pro-nutrition agenda. Hence, there are initiatives such as the Global Alliance for Improved Nutrition (GAIN) and the Scaling Up Nutrition (SUN) movement.

Nevertheless, better nutrition is not often an objective of agrifood firms either in value chains initiated by development projects, which tend to be focused on primary production and productivity, or by private sector businesses. This presentation reports on the value chain research within the LANSA programme which examined three types of intervention and initiative in comparative and contrasting situations Bangladesh, India, Pakistan and Afghanistan using a case study approach and a common conceptual framework. We test the proposition that '… there are very few successful examples where governments have harnessed the market power of private sector actors to achieve positive gains in nutrition'. We suggest what might be conditions in the food environment that are conducive to improvements in the nutrition performance of agrifood value chains.

Nutrition Sensitive Agriculture

R V Bhavani
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Abstract: Nutrition sensitive agriculture envisages mainstreaming the nutrition dimension in agriculture to address the problem of malnutrition, a key Sustainable Development Goal. Leveraging agriculture for nutrition has potential in a context where a large section of the population is malnourished and agriculture is the main occupation of a majority, as seen in South Asia. There is evidence of agriculture interventions with nutrition focus leading to improved diet quality. A Farming System for Nutrition (FSN) Study under LANSA in India in two different agro-ecological regions with high levels of malnutrition (Wardha district in Maharashtra and Koraput district in Odisha), examined feasibility of a farming systems approach to address the problem of undernutrition. Baseline survey in 2014 revealed, cereal dominated diets with consumption of all other food groups being less than the recommended levels. The FSN design under the study focused on increasing availability and access to nutrient dense crops (e.g. millets and pulses), promotion of nutrition gardens of fruits and vegetables, and access to animal source foods, accompanied by nutrition literacy. Endline survey at the end of three years showed evidence of improved diet diversity and better nutrition awareness.

SYMPOSIUM
on
"ROLE OF CARBOHYDRATES IN HUMAN NUTRITION AND HEALTH"

Role of carbohydrates in human nutrition and health

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Deputy Executive Director,Singapore Institute for Clinical Sciences, A*STAR,
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It's hard to believe that the science of nutrition had its roots in Asia. Firstly, with McCarrison'sclassical study on goitre in India in 1902 and Eijkman's study on BeriBeri in Indonesia in the 1890s. As NIN celebratesits Centenary, it's an honour to reflect and look forward to the future of nutritional science in Asia into and beyond the next Century.Food has now become the new medicine. The discovery of vitamin by Eijkman in 19th century, is viewed as the origins of the science of nutrition. During the intervening decades, nutrition has been transformed from therapeutics science to a preventive science.

The concept of "Food the new medicine" is the merger of two scientific values -namely food and health. Functional foods may be defined as "Food Similar in appearance to conventional food, consumed as part of the usual diet, with demonstrated physiological benefits, and / or to reduce the risk of chronic disease beyond basic nutritional functions". Today we are at a new frontier in nutritional science.We are in the midst of a global food revolution – A revolution driven by consumer demands for "healthy foods". Nutrition and health have taken centre stage in our lives – no time in human history has food manufacturing been driven by nutrition as we are witnessing today. In response, food manufacturers have evolved several strategies to develop foods with specific health benefits over and above its nutritional content- these foods are sometimes called "functional foods". The strategies used by industry to develop healthy foods include (i) innovative food processing technologies (ii) isolation of novel food ingredients from plants (iii) development of new food ingredients.

The numerous advances in nutrition have enabled us to understand the role food can play in public health. Asia is in the midst of a pandemic in Type 2 diabetes and metabolic syndrome. Of the 450 million Type 2 diabetics diagnosed worldwide, approximately 50% live in this region. The high prevalence of Type 2 diabetes in Asians has been partly ascribed to the high carbohydrate (CHO) and high Glycaemic content of their diets. Glycaemic index (GI) is a measure of the glucose response to carbohydrates. High GI foods are those that increase blood glucose rapidly and low GI foods are those that produce a modest increase in blood glucose. The regular consumption of high GI foods has been implicated in the aetiology of obesity and Type 2 diabetes. Recent evidence also suggests that Asians are susceptible to Type 2 diabetes due to their phenotype. An increasing body of evidence has emerged on how food and food ingredients may be used to manage and treat Type2 diabetes and chronic diseases. Rice is the principal staple and energy source for nearly one half of the world's population. In Asia, rice is a major contributor to the energy, protein, vitamin and mineral intake in this community. The role rice plays in human nutrition cannot be therefore underestimated. In Asia, carbohydrates can contribute up to 70% of calories. Food Chemists have typically categorized dietary carbohydrates into simple sugars and complex carbohydrates on the basis of their degree of polymerization. However, the effect of carbohydrate on health may be better categorized according to their physiological effects, notably their ability to raise blood glucose. Paradoxically, most carbohydrates-rich foods we consume notably bread, rice and potato are high GI foods. Diet based interventions have been promoted as a complimentary strategy to manage, prevent and treat diabetes. One of the earliest food based ingredient used to reduce glycaemia was beta-glucan. Since then a series of natural ingredients have been identified and used to reduce the glycaemic impact of carbohydrates. This

presentation will highlight the important role that several food ingredients can play in reducing and impacting onglycaemic excursion of carbohydrate rich foods.

It will also showcase how the inclusion of soya protein, soy milk, essence of chicken and other source of proteins can dramatically reduce glycaemic response of foods. Ironically, in our quest to identify and isolate novel ingredients from Mother Nature, we have ignored or neglected a vast reservoir of food resources – the tropical plants. Given the fertile environment that surrounds us with a variety of fauna and flora, moving forward, the challenge is to identify and research on range of plant-based foods and ingredients that will reduce blood glucose, blood pressure, enhanced cognition and improve brain development.Scientists, clinicians, plant breeders, food manufacturers and consumers would gain great benefit by developing food-based strategies in order to reduce the risk of developing type 2 diabetes and obesity.

Human body composition: New insights on predicting health and well-being in Asians

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Substantial evidence indicates that fat patterning and percent body fat (PBF) differ between Asian and Western populations. Asians have a greater PBF at a lower body mass index (BMI) than do Westerners [1]. To date, few studies have been conducted to measure body composition and its impact on metabolic biomarkers in Asian populations. Therefore, we conducted a cross-sectional study of 601 participants (21-100 y)living in Singapore to investigate the body composition and its associations with metabolic disorders in this population.

Having more body fat is often linked to a higher prevalence of chronic diseases, including cardiovascular diseases (CVDs), hypertension, type 2 diabetes (T2D), dyslipidemia and several cancers [2,3]. Since most fundamental body composition studies have been conducted in USA and Europe and most assumptions are based on data obtained from Westerners, it is important to determine whether these methods are valid in tracking body composition changes in Asians. It is therefore of interest to compare several measuring methods, including DEXA, BOD POD, bioelectrical impedance analysis and skinfold, to access PBF in Asians. Although skinfold provides a good estimate of PBF, it underestimates PBF by more than 12%. It is probably because the prediction equation used is not suitable for our participants. In order to develop a simple and accurate equation suitable for clinical and field settings, we used only two skinfold measurements, i.e. bicep and triceps, as well as waist circumference (WC), height, and age to predict PBF. Our new equations resulted in good predictability with modest discrepancies in body fat of 1.8% ± 2.7% in males ($p < 0.001$) and 0.7% ± 3.1% in females ($P = 0.125$) compared with the Asian-specific Davidson equations (-7.4% ± 3.2% ($P < 0.001$) and -7.4% ± 2.7% ($P<0.001$), respectively).

Compared to total body fat, regional body fat distribution, especially in the abdominal region is a stronger correlate of metabolic syndrome (MetS), CVDs, insulin resistance, and morbidity. However, the results are controversial. We conducted a cross-sectional study of 428 participants and found that android fat percentage (AFP) was strongly correlated with more metabolic risk factors than gynoid fat percentage (GFP) in men. In women, AFP and GFP showed significant opposite effects on triglyceride (TG), high-density lipoprotein cholesterol (HDL-C), and WC. On multivariate regression, AFP was an independent determinant of MetS in men after adjustment for confounding factors. For women, both AFP and HOMA-IR were predictors for MetS. The gender difference of the associations between android fat, insulin resistance, and MetS is probably due to different effects of sex hormones on adipose tissue or by genetic factors between genders. Knowing the gender differences in developing MetS may help design gender specific preventative strategies that will benefit overall population health. However, the use of DEXA is limited because of the high costs, restricted availability, and radiation exposure. To address this issue, an alternative method, ultrasound measurement have been developed.

Ultrasound was used to determine preperitoneal fat thickness (PFT) and subcutaneous fat thickness (SFT). Our results show that both PFT and SFT had significant positive correlations ($p < 0.05$) with fasting insulin concentration, HOMA-IR, TG, and blood pressure, and negatively correlated to serum HDL-C in all participants. Separating men and women, PFT was an independent determinant of insulin resistance and low HDL-C only in men, not in women. On receiver-operating characteristic curve (ROC) analysis, PFT ≥ 1.2 cm was the optimal cut-off value to identify insulin resistance and low HDL-C in men. On the other hand, SFT was the determinant of insulin resistance, elevated TG, and low HDL-C only in women, not in men. A SFT of 1.1 cm was the optimal cut-off value to define insulin resistance, elevated TG, and low HDL-C in women. These results suggested that ultrasound measurements of PFT and SFT could provide simple and useful indices of insulin resistance and lipid disorders for healthy Singaporean men and women. They might have the diagnostic values for predicting cardiovascular risks in this population. The results presented highlight the need to continue research on human body composition within the Asian phenotype.

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Chronobiology of Carbohydrate Intake: New thoughts and practical implications

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Asia is the epicenter of global type 2 diabetes prevalence, with India contributing to a great extent to this statistics. Furthermore, with the high prevalence of pre-diabetes and that of undiagnosed type 2 diabetes in this region, there is an urgent need to intervene. Since it is well recognised that type 2 diabetes is predominantly a lifestyle disease, to date, the efforts to halt the progress of diabetes incidence have mainly focused on modifying dietary composition, reduce caloric intake as well as maintain healthy levels of physical activity. Furthermore, Asian diets being rich in carbohydrates, as well as high in their glycaemic index (GI), a large body of research have investigated how the GI as well as the glycaemic load (GL) of the diet can be modulated to improve glycaemic control and the subsequent risk of developing type 2 diabetes and/or cardiovascular diseases. However, given that there is a diurnal variation in carbohydrate metabolism, principally driven by circadian rhythmsmore research is needed to investigate how chronometabolism interact with the carbohydrate quantity and/or quality within our diet to modulate glycaemic control. The circadian rhythm is mainly driven by the day-night (light-dark), fasting-feeding, sleep-awake cycles which in turn regulates clock genes that modulate various physiological processes and functions, including those involved in glucose homoestasis.These include modulations of various endocrine and metabolic functions including insulin secretion, insulin sensitivity, other hormone secretion etc., Furthermore, previous studies have found that increased intake of macronutrients/calories in the morning seem to be associated with better dietary habits, greater metabolic benefits and improved weight control than the same consumed during the evening. Recent studies have also demonstrated that the timing of the meal intake and its nutrient profile interact with each other to play a vital role to modulate metabolic homeostasis, although more rigorously controlled clinical trials within the normal dietary context are still lacking in humans.

Surprisingly, very few studies have thoroughly explored how the glyceamic index (GI)/glycaemic load (GL) of the meals interact with the timing of the meal intake to influence glucose response not only during the postprandial period immediately after the meal consumption, but also whether there are any carry over effects on the subsequent standard meals. We have recently completed a controlled trial where we fed a high GI or low GI meal either for breakfast or for dinner in a 2 x 2 crossover design and followed them until 3 hours after their subsequent standard meals. In this study, 34 Chinese participants completed the trial and we observed significant differences between breakfast and dinner consumption in glycaemic and insulinaemic responses to both high and low GI meals. We found that irrespective of the GI of the meal, there were significantly greater (approx. 56% for both, $p<0.0001$) postprandial iAUCs of serum glucose during the dinner as compared with breakfast. In fact, the timing of the meal seemed to have a greater effect than the differences in GI with regards to the glycaemic response not only in the period immediately after the test meal but also on the glycaemic responses of the subsequent standard meals. To our surprise, we found that a low GI meal taken at dinner had a greateriAUC of serum glucose than a high GI meal taken at breakfast. Given that people of Indian ethnic origin have a greater predisposition to develop diabetes and prediabetes resulting from their distinctive metabolic phenotype, as well as their cultural habit of eating late dinners, often containing large amounts of carbohydrates, we believe that it isimperative to give due consideration to the amounts and quality of carbohydrates eaten at dinner in order to alleviate the incidence of type 2 diabetes in the future. There is also emerging evidence that minor components of diet including polyphenols (such as green tea catechins and red wine resveratrol), caffeine etc can modulate circadian rhythms. We have recently shown the beneficial effects of mixed spices (rich in various polyphenols) on glucose homeostasis. Therefore, the utility of commonly consumed polyphenols in Asian food systems may be additionally explored as potential dietary components to alleviate the effects of circadian desynchrony caused by carbohydrate consumption late during the day. The important role that chrononutrition may play in glucose homoestasis highlights the need for further research in this area.

Glycemic Perspectives of Cereals and Millets: How healthy are they?

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Madras Diabetes Research Foundation, Dr. Mohan's Diabetes Specialties Centre, WHO Collaborating Centre for Non-Communicable diseases, and International Diabetes Federation (IDF) Centre of Education, Gopalapuram, Chennai, India.

Indian diets are predominantly cereal staple based, out of which rice and wheat are the major cereal staples. Rice is being predominantly consumed in the southern, eastern and north eastern regions of India, whereas wheat is consumed in western and northern parts of India. During ancient times, sorghum and millets were the main staples. Bio-geographical evidences indicate that peninsular India was supposed to be housing several diverse crop cultivars including sorghum, and millets.

Currently India is facing an escalation in the prevalence diet related chronic diseases such as diabetes and cardiovascular diseases. The recent ICMR INDIAB study on the prevalence of diabetes in India reported prevalence of diabetes almost 7.3% in several states of Indiaand higher prevalence of pre-diabetes in many states including both rural and urban areas. Asian Indians are more vulnerable to diabetes (Asian Indian Phenotypes), been characterized by insulin resistance and dyslipidemia. Although genetic susceptibility is likely to play a role in chronic disease etiology, the role of environmental triggers such as faulty diet and physical inactivity playa key role. There is a huge shift in the nature of diets currently being consumed compared to those which was consumed during ancient times in terms of quality of grains and seeds and hence the quality of carbohydrates, fats and dietary fibre.As a result, energy dense, fatty and fibre depleted foods are common today.

Traditionally, rice was hand pounded for consumption, however with time, due to modernization of rice milling technology, polished white rice became popular owing to its appealing color, better yield, longer shelf lifeand sensory properties. Our earlier studies on the dietary profile of ruraland urbanadult population in south India had shown that carbohydrate provided (64-78 %E)followed by fat (13.2-24%E) and protein (9.6-12%E). The study has also indicated that refined cereals especially provides the bulk of the total calorie intake (45.8%). The mean intake of white rice was almost 253 g/dayin this population.

Refined cereals are known to contain lower dietary fibre and higher available carbohydrates (these are glycemic carbohydrates which raise the blood sugar levels more quickly and are available for the metabolism) and are known to increase the glycemic load (GL) of diets too. Generally, high GL diets would in turn lead to hyperinsulinemia, insulin resistance and type 2 diabetes. With increased quintiles of refined grain intake, our study has shown increased metabolic abnormalities such asinsulin resistance (IR), body weight, waist circumference, blood pressure, triglycerides, and fasting blood glucose were seen along with lower levels of HDL cholesterol in urban adults. Our study has also indicated that high carbohydrates and higher GL diets are strongly associated with increased risk of type 2 diabetes.

Polishing is known to decrease protein, fat, dietary fibre, polyphenols, oryzanol and mineral contents of rice with a concomitant increase in the available carbohydrate content. Thus white rice is devoid of all the bran and germ nutrients and contains mainly the starchy endosperm which may elicit higher post meal glycemic and insulin responses.Recent studies indicated that, many of the commonly consumed Indian rice varieties including ponni, surti kolam and sonamasuri belonged to high GI category. Glycemic Index, an 'in vivo' assessment is the sole parameter to determine quality of carbohydrates in the food which plays a major influence on glucose homeostasis and metabolic regulations.

Brown rice (unpolished rice, a whole grain) elicits a lower glycemic response when compared to minimally polished rice and fully polished white rice.Our group has recently shown that Bapatla (BPT-5204, a Indian rice variety) BR elicited the lowest GR (GI=57.6) compared to under milled rice (UMR, GI=73) and WR (GI=79.6) (prepared from the same rice variety). The differences in the degree of milling, distinct cooking characteristics attributed to the intactness of the bran content and the rate of hydration and gelatinization could be the possible reasons for higher GI of UMR and WR.One of our studies have shown lower day long blood glucose responses for brown rice based diets as compared to white rice based diets using Continuous Glucose Monitoring System in overweight and obese subjects further validate the GI of brown and WR.We have also reported a lower GI (GI= 61.3) for a novel high fibre white rice variety (as compared to normal white rice, GI= 79.2).

Nutritionally, millets are undoubtedly superior to white rice (WR) and refined wheat. A market survey conducted by us in Chennai indicated that many of the brands sell highly polished millets. Like WR, polished millets too are fibre depleted, starchy with higher level of glycemic carbohydrates. Consumption of these kind of polished millets like other refined grains may increase the glycemic load of the diets, may elicit higher glycemic responses and may increase one's risk for type 2 diabetes. Studies at MDRF has shown higher GI values for finger millet (FM) based preparations such as upma prepared from polished finger millet, flakes and medium GI values for upma prepared from vermicelli and ready to eat extruded snack. Both FM based extruded snack and vermicelli contained added soluble fibre. FM gruel, plain cooked unpolished foxtail and little millet showed high GI, whereas sorghum idli, roti and bajra roti showed medium GI. The GI of millet preparations widely vary and more studies on the glycemic aspects using validated protocols are required for making dietary recommendations.

The day long glycemic response of the FM based diets in comparison to WR based diets as assessed by continuous Glucose Monitoring System (CGMS™) iPro 2™ in 14 healthy volunteers showed no difference between the two diets. More such intervention studies and long term feeding trials are required to understand the glycemic properties of millet diets. The big changes in the years to come in Indian diets need to reduce the total percent calories from carbohydrates to a maximum of 55% predominantly derived from lower GI wholegrains such as brown rice to replace not only white rice but also the unpolished minor millets with higher GI (little millet and foxtail millet) and higher protein and good quality fats (MUFA) to recommend a healthier diet for prevention of chronic diseases.

INDUSTRIAL SESSION

Mr. Sanjay Naphade
R&D Director, Nutrition
PepsiCo India

When we exercise or do any other physical activity, working muscles generate heat. The body temperature increases and the body sweats to cool itself, losing necessary fluids in the process. If the body is not replenished, it further leads to heat illness, fatigue and cramps.

Gatorade is a scientifically formulated Sports Drink with fluids, electrolytes and carbohydrates to help rehydrate, replenish and refuel during exercise.
It helps to replace lost electrolytes, fluids and energy that is lost in sweat during exercise.

Gatorade is a 6% carbohydrate solution which is favorable for improved fluid replacement and absorption (Baker 2014). At a rate of replacement of 1 liter per hour it also provides the recommended carbohydrate content to meet the energy replacement guidelines put forth by the American College of Sports Medicine (ACSM). The current ACSM recommendation, which is based on seminal research studies published in 2007 and 2009 (Sawka 2007, Rodrigues 2009), for exercise lasting more than one hour, is 30-60 grams of carbohydrate per hour.

Electrolytes in Gatorade specifically sodium, aid hydration by:

1) **Stimulating thirst (improved drinking response) and enhances its palatability** (Baker 2013, Nose 1988, Wemple 1997, Shireffs 2007). These factors result in greater voluntary fluid consumption, which improves hydration during and after exercise.

2**) Promoting fluid retention,** including whole-body (decreased urine output) and extracellular (plasma volume) hydration (Baker 2014). The presence of sodium in a fluid replacement beverage helps stimulate more complete rehydration after an athlete incurs exercise-induced hypohydration. This includes both better plasma volume restoration and whole-body fluid balance compared to ingestion of plain water. Because sodium is the primary extracellular osmolyte, ingestion of sodium protects the extracellular fluid space, including plasma volume and decreases urine output (Baker 2013, Nose 1988, Shireffs 2007 & 2011, Gonzalez 1992, Maughan 2004 & 1994, Wemple 1997).

Potassium (K) is the primary intracellular cation; however, there is insufficient evidence that beverage K+ improves body water balance (Leiper 2001, Murray 2001). Potassium may play an important role in hydration. Potassium is thought to play a preferential role in helping to hydrate the intracellular fluid space (Nielsen 1986). K+ is often included in small amounts in sports drinks to help replace sweat K+ losses (Sawka 2007).

Carbohydrate content and percentage also impacts fluid absorption and gastric emptying (Baker 2014). **Gatorade provides carbohydrate energy to working muscles, thus providing the fuel needed to play longer and stronger**. The presence of a small amount of carbohydrate in a fluid replacement beverage promotes fluid absorption because co-transport of glucose and sodium facilitate the passive absorption of water across the intestinal mucosa (Crane 1983, Schedl 1963)

When we exercise or do any other physical activity, working muscles generate heat. The body temperature increases and the body sweats to cool itself, losing necessary fluids in the process. If the body is not replenished, it further leads to heat illness, fatigue and cramps.

Health Benefits of California Walnuts

Ms Naaznin Husein
President
Indian Dietetic Association Mumbai Chapter

California walnuts - an excellent source of Alpha-Linolenic Acid (ALA) – the plant-based form of Omega-3 – are loaded with the goodness of fibre, antioxidants, phosphorous and magnesium. The recommended daily portion according to the USDA National Nutrient Database is a handful/28 gms for both men and women. The only tree nut that contains a significant amount of heart-healthy omega-3, walnuts may help in reducing the risk of various health conditions like heart stroke, diabetes, cancer, inflammation etc. Walnuts also promote cellular and protective cellular and cognitive health and are rich in bioactive compounds such as polyunsaturated fatty acids, polyphenols, and dietary fiber. Therefore, the consumption of walnuts can contribute to a healthy diet and lifestyle.

Indigenous pasteurization machine - A boon to the comprehensive lactation management center

Praveen Kandasamy[1], ***Ruchikachugh Sachdeva***[1], Prabhakar Kanade[1], Jayashree mondkar[2], Vikrant lele[3]
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Background

India has the highest number of vulnerable babies having one-fourth of the world's preterm (3.5 M) and 40% of the low birth weight babies (7.5M). Pasteurized Donor Human milk (DHM) made available through milk banks is found to be lifesavingand next best alternative to breast milk recommended by WHO. To Pasteurize DHM shaker water bath which has inadequate process control and requires manual handling. The imported automated pasteurizers are very expensive, require more water &energy, and have service issues, limiting its usage in resource strapped settings. The Government Technical Advisory Group committee on April 2016 highlighted the need for development of indigenous automated pasteurizer.

Method

PATH an international nonprofit organization worked on "Make in India" indigenous pasteurizer with private manufacturer, KVC processes as part of the India Innovation Hub. Mentoring was provided by PATH, national and international human milk bank and quality experts. The machine was successfully validated for its performance at Sion Hospital, Mumbai the first milk bank in Asia. The user feedback and time temperature cycles were closely monitored.

Results

The Automated pasteurizer confirms to the specifications laid down by National Guidelines on Comprehensive Lactation Management Centers which emphasize high standards of safety and quality of the DHM. The features include automated process control, CE certified parts, low cost and better conservation of water and energy. The process takes 30 minutes to complete heating cycle at 62.5^0C and cooling cycle within 10 minutes to 25^0C from 62.5^0C and 30 minutes to 4^0C. The preparation takes 30 minutes.

Conclusion

The indigenous automated pasteurizer is cost efficient, process optimized and scalable will be a boon not only in low resource country but also around the world. Strengthened breastfeeding and (DHM) through human milk banks (HMBs) can help 5 million vulnerable babies in India.

YOUNG SCIENTISTS AWARDS SESSION - I

SENIOR AWARD IN EXPERIMENTAL NUTRITION & COMMUNITY NUTRITION

Friday, 16th November 2018, 4:30 PM – 6:00 PM.

SENIOR AWARD IN EXPERIMENTAL NUTRITION

Code	Name and Address	Title
SAEN-01	K. Devi Avinashilingam Institute for Home Science and Higher Education for Women, Pondicherry University	Nutritional quality and structural characteristics of antioxidative whey protein hydrolysate.
SAEN-02	Kotamballi N Chidambara Murthy, Central Research Laboratory, Ramaiah Medical College and Hospital, Bengaluru.	Evidence based cancer prevention bioactive molecule from citrus- valuable information for bench to bed translation.
SAEN-03	Dhanya Radhakrishnan, St.Theresa's college,	A study on the role of diet counselling in the prevention of progression of the cardiovascular vascular patients to minimal invasive techniques,
SAEN-04	Jeyakumar S.M., ICMR-National Institute Of Nutrition, Hyderabad.	Deciphering The Role Of Vitamin A And Its Metabolic Pathway In Adipose Tissue Sexual Dimorphism And Its Association With Insulin Resistance Using Diabetogenic Diet-Fed Wistar Rat Model

SENIOR AWARD IN COMMUNITY NUTRITION

Code	Name and Address	Title
SACN-01	Little Flower Augustine, ICMR-National Institute of Nutrition, Hyderabad.	Determinants of vitamin d deficiency and validity of ultra violet index- based estimates of optimal sun exposure among college-going girls from hyderabad,
SACN-02	Nancy Sahni, Postgraduate Institute of Medical Education & Research, Chandigarh,	Impact of dietary and life style modifications on snoring and mild sleep apnoea patients *nancy sahni,*
SACN-03	Premagowri Balakrishnan, Dr.NGP ASC, Coimbatore.	Nutritional Status Of Newly Detected Female Type 2 Diabetes
SACN-04	Swapan Banerjee , Seacom Skills University,	A study on relationship between hypothyroidism & obesity among middle-aged working women with dietary intervention in kolkata.

YOUNG SCIENTIST AWARDS

SENIOR AWARD – EXPERIMENTAL NUTRITION

SAEN-01 **NUTRITIONAL QUALITY AND STRUCTURAL CHARACTERISTICS OF ANTIOXIDATIVE WHEY PROTEIN HYDROLYSATE.** ***K. Devi*[1],** Sundaramoorthy Haripriya[2].1= Avinashilingam Institute for Home Science and Higher Education for Women, 2=Pondicherry University, Email:- devi.karuthapandian@gmail.com.

Background & Objectives: Enzymatic hydrolysis of proteins is a bioactive approach in enhancing antioxidant activity of whey proteins, but requires antioxidative hydrolytic conditions specific to enzymes and also lack of focus on nutritional aspect and structural changes in hydrolysed whey proteins. Hence the present study was formulated to prepare antioxidative whey protein hydrolysate by adopting antioixdative hydrolytic conditions for Alacalase enzyme and compare nutritional quality as well as structural changes of native whey protein isolate (WPI) and antioxidative whey protein hydrolysate by Alcalase (WPHA).**Materials & Methods:** WPI was hydrolysed at antioxidative hydrolytic conditions such as substrate concentration (8 %w/w), pH of 8, temperature (60°C), E/s ratio (0.9%w/w), time (60 min). Ferric Reducing Antioxidant Power (FRAP) Assay was employed to assess antioxidant activity of WPHA and WPI. Biochemical, nutritional and structural characteristics of WPHA was comparatively analysed with WPI.**Result:** WPHA was observed with FRAP values of 555.7µM FeSo4.7H2O higher than WPI. Amino acid profile of WPI and WPHA were not significantly differed (P>0.05) with the increase in methionine and tryptophan in WPHA. Gel filtration fractionation and SDS Page showed the release of low molecular weight peptides (<3 KDa). Nutrition quality parameters such as Amino Acid score, Essential Amino Acid Index, Protein Efficiency Ratio and Biological value and Digestible Indispensable Amino Acid Score (DIAAS) proved the good quality of proteins in WPI and WPHA (P>0.05).Structural Analysis revealed the deformation of spherical shaped particles of WPI in WPHA from Field Emission Scanning Electron Microscope, β Sheet secondary structural changes in WPHA by Raman and Fourier Transform Infra Red Spectra, particle size reduction from 689.5 nm in WPI to 228.2 nm in WPHA.**Conclusion :** Antioxidative hydrolytic conditions enhanced antioxidant activity and preserved good quality proteins in WPHA to use as a nutritional antioxidative in the field of natural antioxidants.**Keywords:** whey proteins, Antioxidant, DIAAS, Nutritional quality, structure of whey proteins

SAEN-02 **EVIDENCE BASED CANCER PREVENTION BIOACTIVE MOLECULE FROM CITRUS-VALUABLE INFORMATION FOR BENCH TO BED TRANSLATION.** ***Kotamballi N Chidambara Murthy,***Central Research Laboratory, Ramaiah Medical College and Hospital, MSRIT Post, MSR Nagara, Bengaluru, India, Email:- kncmurthy@gmail.com.

Background & Objectives: Use of natural plant based ingredients for treatment, prevention and managements of human disease is an ancient concept originated from India and other South Asian countries (Patwardhan et al., 2005). There are good amount of evidence at all level to prove the health benefit of plant based diet rich in fruits and vegetables (Liu, 2013). Early research on benefits from diet has led to explore the benefit of each of the plant/ plant based ingredients. Towards this, our research is focused to understand the benefit of most commonly used citrus fruits and explore its benefits in cancer. Citrus fruit is one of the most widely consumed fruit across the globe and there are more than 200 verities of fruits cultivated and used in the form of juice, fresh fruit, and concentrate or food formulations. Citrus is globally one of the highly consumed fruit with an annual production of over 87 million metric tons [Orange of 49.3 million metric tons 30.0 million metric tons of tangerine and 7.5 million metric tons of Lime/Lemons] (Source of data USDA website https://apps.fas.usda.gov/ psdonline/circulars/citrus.pdf accessed on 23rd July 2018). Citrus fruits have shown wide range of health benefits, including source of Vitamin C, antioxidants like carotenoids, polyphenols, flavonoids, terpenoids, source of functional ingredients like pigments, volatile oil, polymethoxy flavones etc.,(Abeysinghe et al., 2007).Our research is focused on understating complete phytochemicals profile of citrus fruits in both edible and non-edible part and explores its health benefits especially in less explored or understood area. Towards this, we have isolated more than 30 compounds from different citrus fruits, seed and peel. In the current paper, results of cancer prevention activity of one of the major triterpenoid, obacunone that has shown potent cancer cell inhibition activity through multiple pathways as studied by in vitro model.**Materials & Methods:** Both Obacunone and OG were isolated

form powdered Marsh White grapefruit seeds as per published method (Jayaprakasha et al., 2007) samples were subjected for HPCL to confirm the purity and chemical structure were confirmed using 13CNMR as mentioned in our previous publication (Chidambara Murthy et al., 2011).**Proliferation inhibition screening:** To understand the effect of both Obacunone and OG on proliferation of three different cancer cells namely SW480, Panc-28 and LNCaP cells and normal cells like NIH3T3 (Mouse embryonic fibroblast) cells, RWPE-1 (human prostate epithelial) were subjected to both MTT assay and cell count assay using different concentrations of obacunone and OG as explained in our previous publication (Chidambara Murthy et al., 2011a).**Confirmation of Apoptosis induction:** DNA fragmentation assay, Annexin-V staining assay and quantification enzymes such as caspaspe-3, 8 and cytochrome-c was done using ELISA kits and protocols as mentioned in our previous publications (Chidambara Murthy et al., 2012).Western blotting to understand the expression of protein and mechanism: Expression of different proteins after treatment of 50 and 100μM obacunone and its glucoside for different intervals (12, 24, 48 h) was studied using western blotting protocols (Chidambara Murthy et al., 2011). The protein expression studied were markers associated with apoptosis (Bax, Bcl2, Caspase-3, cleaved products of Capsae-3, Caspase-8), inflammation (IL-6, Cox-2 and NF□B), cell signaling (Akt, pAKt), hormone (AR) and antigen (PSA). To normalize the expression and protein binding to antibodies, in each experiment β-actin was used as control. **Statistical methods:** The above experiments were performed as three biological replicates with minimum of three replicates for each concentration and time point. Results were expressed as standard error ± mean using the values from all the replicates and ANOVA was performed for activity studies and data was analyzed by Tukey's post-test analysis using Graph Pad Prism software version-5.00.288 **Result :** The IC50 values for obacunone and OG were 97.02 ± 4.1 and 109.7 ± 2.49 μM, respectively after 24 h in SW480 cells. Panc-28 cells have shown relatively less activity with 42% of inhibition after 72 h of treatment with 100 μM of obacunone. In LNCaP cells, inhibition of 37 and 30% was observed after 24 h of treatment with 100 μM of obacunone and OG, respectively. Up to 80% inhibition was observed after 48 h or treatment with both the compounds.SW-480 and LNCaP cells have shown genomic DNA fragmentation into 200 bp fractions after treating with both obacunone and OG. In case of Panc-28 cells, cell treated with compounds were stained with Annexin-V, suggesting the involvement of programmed cell death. Induction of 5 to 6 fold higher caspase-3 activity was observed with obcunone (100μM) treatment in SW480 cells. Panc-28 cells showed increase in the content of caspace-3 by two fold was with treatment of OG for 48h. Similarly, 30-40% increase in the activity was observed with treatment of compounds to LNCaP cells.Western blot results suggest that both compounds could increase the expression of Bax and decrease the expression of Bcl2. SW480 cells showed that treatment of obacunone and OG resulted in depletion in the expression of Bcl2/ Bax by 0.8 and 0.85-fold after 48 h. In Panc-28 cells, ratio of Bcl2/Bax depleted by 9 & 10 fold with treatment of 50 μM obacunone for 24 and 48 h, respectively.Major proteins involved in inflammation NFkB, IL-6 and Cox-2 were inhibited with treatment of compounds as observed in case of Panc-28 cells. Treatment of 100 μM compounds has shown decrease in the expression of Akt and its phosphorylated product in LNCaP cells. Treatment has also induced decreased expression of AR and PSA, key clinical markers of prostate cancer.**Conclusion:** Results of the study suggest that both obacunone and it glucoside can inhibit all the three organ specific cancer cells in both dose and time dependent manner. Interestingly, there was no toxicity observed in case of both NIH3T3 and RWPE-1 normal cells used for comparison. This provides information that these compounds are highly suitable to protect the normal cells during treatment, which is a major clinical challenge. Results of the DNA fragmentation assay suggests that the compounds are inducing apoptosis to inhibit proliferation and results were comparable with that of camptothecin, a natural chemotherapeutic agent used as positive control.Upon confirming the induction of apoptosis, it was our interest to understand extent of cell death and modulation in apoptosis associated protein expression modulation. It was observed that both compounds are capable of altering many pathways at 50 and 100 μM concentration, which is very effective.Unlike synthetic molecules which have specific binding site and known to execute single pharmacological activity, natural molecules are capable of producing more than one pharmacological effect. This may be due to capability of binding to multiple sites or its effect on universally expressed proteins/ genes. One of the best examples for such activity is curcumin which is known to possess several pharmacological activates mediated through multiple pathways (Patil et al., 2009). On similar line results from our study indicate that obacunone, a triterpenoid known for bitter taste is capable of inhibiting cancer cells through multiple pathways. These results suggest that obacunone and its glucoside are good cytotoxic compounds selectively on cancer cells (Chidambara Murthy 2015). Potency of compound warrants its benefit in cancer, which need further studies to take it to human applications. Based on the results further studies in preclinical and clinical models are under progress.**Keywords:** Apoptosis, Bioactive compounds, Cancer Cell lines, Citrus, Obacunone, Triterpenoids

SAEN-03 **A STUDY ON THE ROLE OF DIET COUNSELLING IN THE PREVENTION OF PROGRESSION OF THE CARDIOVASCULAR VASCULAR PATIENTS TO MINIMAL INVASIVE TECHNIQUES,** ***Dhanya Radhakrishnan*[1],** Dr.Anooja Thomas[2],1=St.Theresa's college, 2=C.M.S College Kottayam, Email:- dhanya2804@gmail.com.

Background & Objectives: The objectives of this study are to find out the role of diet counseling in preventing the progression of the cardiovascular patients to minimal invasive techniques (percutaneous transluminal coronary angioplasty (PTCA) and coronary artery bypass grafting).**Materials & Methods:** The study was conducted in Visakhapatnam district Andhrapradesh. A sample size of 400 cardiovascular patients, selected for the study were screened for their biochemical parameters and the subjects were grouped into sub samples of 3 each with 50 subjects namely primordial group (on diet and medicine), secondary group (advised PTCA), and post PTCA (advised CABG). A detailed diet counseling, with a structured cardiac diet was advised to these groups to be followed for 6 months and the results were consolidated with reference to biochemical parameters. Statistical analyses were done and comparative results were interpreted. **Result:** The results depicted the effectiveness of diet counselling to the patients advised to undergo PTCA. The results were validated through the improvements in the biochemical parameters before and after diet counselling. Data analysis was conducted using SPSS version 16. Quantitative variables are expressed in mean±SD. For testing the effect of intervention paired t test was applied. For comparing the three groups, one way ANOVA was done with Games Howell post–hoc test. From the table it was seen that there is significance difference among the three groups in each of the outcome variables. The difference is more in PTCA compared to the other two groups and least difference is observed in primordial group. To know which of the groups differ significantly, Post-hoc Games-Howell paired comparison was done. The result showed no statistically significant difference in plasma LDL between Primordial and Post PCTA groups ($p = 0.648$), but the PTCA group differs ($p<0.05$). For all other outcome variables the three groups shows very high significance. ($p<0.001$).The pre and post counseling biochemical values, statistically proved to be significant with a mean difference significant at 5% level of significance. **Conclusion:** The results concluded that even though diet counseling doesn't play a major role in curing the cardiovascular diseases completely, but still it can be used as a preventive measure in the progression of the disease from the primordial stage to PTCA and CABG. Thus the study proved to recognize diet counseling as preventive measure for the progression of the disease to severe stages which require interventional therapies.**Keywords:** coronary artery disease, PTCA, CABG, Diet counseling.

SAEN-04 **DECIPHERING THE ROLE OF VITAMIN A AND ITS METABOLIC PATHWAY IN ADIPOSE TISSUE SEXUAL DIMORPHISM AND ITS ASSOCIATION WITH INSULIN RESISTANCE USING DIABETOGENIC DIET-FED WISTAR RAT MODEL,** ***Jeyakumar S.M.,*** Raja Gopal Reddy M, Chakaravarthy G, Swathi Dr, Vajreswari A, National Institute Of Nutrition, Email:- smjkumar@gmail.com.

Background & Objectives: Background: Gender-specific adipose tissue deposition is implicated in disease development and progression. On the other hand, the fat-soluble vitamin, retinol (vitamin A) and its metabolites are shown to regulate the adipose development. However, no studies have envisaged, whether there are any gender or depot-specific modulation of vitamin A or its metabolic pathway and its role in insulin resistance. Therefore, the present study was aimed at addressing this missing link, in the experimental model.**Materials & Methods: Methods:** 5 weeks old 16 male and 16 female rats of Wistar were taken and divided into two groups consisting 8 rats from each gender, fed either control or diabetogenic diet for 24 weeks and terminated, after performing glucose and insulin tolerance tests. **Result:** It was observed that body weight, adiposity and plasma retinol of female rats were lower than that of male counterparts. On the other hand, diabetogenic diet feeding although increased the adiposity (both visceral and subcutaneous adipose depots) in male, female rats resisted these changes except for gonadal fat, which increased significantly. Further, it had no effect either on plasma or adipose tissue retinol levels, and the expression of its metabolic pathway genes. However, the lipid droplet-associated proteins such as lipocalin-2 and perilipins were influenced by both sex and diet. Feeding of diabetogenic diet without affecting plasma glucose levels markedly elevated the plasma insulin with concomitant reduction of free fatty acid levels. Further, the area under curve for glucose of insulin tolerance test showed a significant elevation in diabetogenic diet-fed rats of both sexes. **Conclusion:** Vitamin A status or its metabolic pathway in visceral and subcutaneous adipose depots did not exhibit any sexual-dimorphism. However, the lipid-droplet associated proteins displayed both gender and depot-specific changes. Interestingly, both male and

female rats were susceptible to diabetogenic diet-induced insulin resistance as evidenced by hyperinsulinemia, independent of sexual-dimorphic adipose deposition.
Keywords: VITAMIN A, OBESITY, PROTEOMICS, LIPIDS.

SENOIR AWARD – COMMUNITY NUTRITION

SACN-01 **DETERMINANTS OF VITAMIN D DEFICIENCY AND VALIDITY OF ULTRA VIOLET INDEX- BASED ESTIMATES OF OPTIMAL SUN EXPOSURE AMONG COLLEGE-GOING GIRLS FROM HYDERABAD,** ***Little Flower Augustine****,* K. Madhavan Nair, N. Balakrishna, Seshacharyulu,Bharati Kulkarni, National Institute of Nutrition, Hyderabad. Email:- Lf1707@gmail.com

Background & Objectives: High prevalence of vitamin D deficiency in India is a public health enigma necessitating action. Without quantification of the duration of sun exposure, the 'ample sun exposure' guideline will not be effective to educate population. Therefore the study aimed to assess the determinants of vitamin D deficiency among college-going girls from Hyderabad (17 degree latitude) and validate the ultra violet Index (UVI) based estimates of adequate sun exposure in this group.**Materials & Methods:** A cross-sectional study was conducted among girls (18-25 years, N=392) from four colleges during post-monsoon season. Biomarkers (25 hydroxy D3, intact parathyroid hormone) and determinants of vitamin D deficiency were studied. Sun exposure was assessed using questionnaire and standard erythemal dose (SED) from polysulfone badges (University of Manchester, UK). Estimates for adequate sun exposure (1000 IU vitamin D) was obtained for each individual from UVI after converting to vitamin D effective UV, applying Holick's rule for 10 % body surface area (BSA) exposure in Indian skin-types (reference period 1 month). The determinants were tested using generalized estimated equations and the validity was tested using mixed models adjusting for clustering and confounders.**Result:** The mean age was 18.9±1.91 years. About 61 % had vitamin D <12 ng/mL. Intact PTH concentrations were negatively associated with vitamin D. Low BSA exposed (OR, 1.382, 95 % CI, 1.033-1.852, p=0.003), not belonging to backward community (OR, 2.854, 1.281-6.359, P=0.010) and higher standard of living index were the determinants of vitamin D. Only 10% had SED corresponding to adequate vitamin D status. The participants with >39 minutes exposure (average adequate sun exposure) had higher vitamin D3 concentration (Geometric mean, 10.2, 95 % CI, 9.6-10.9 ng/mL, P=0.047) compared to <39 minutes group (8.8, 95 % CI, 7.8-10.2 ng/mL, P=0.047).
Conclusion: The UVI-based estimate of sun exposure appear to have validity at 17 degree latitude among young girls in Hyderabad.**Keywords:** vitamin D, sun exposure, determinants, college-going girls, Hyderabad.

SACN-02 **IMPACT OF DIETARY AND LIFE STYLE MODIFICATIONS ON SNORING AND MILD SLEEP APNOEA PATIENTS** ***Nancy Sahni,*** Sandeep Bansal, Sunita Malhotra, Reddy GVN, Postgraduate Institute of Medical Education & Research, Chandigarh, Email:- nsahni74@yahoo.com

Background & Objectives: Obstructive breathing during sleep is called snoring which leads to sleep deprivation and might be an alarm of upcoming obstructive sleep apnoea (OSA). One of the reasons for snoring and OSA is obesity which causes deposition of adipose in and around the throat. This study highlights the effect of weight reduction through life style management and customised dietary counselling on severity of snoring measured subjectively and effect on quality of life.**Materials & Methods:** It's a prospective trial in which thirty six patients with 'snoring/mild sleep apnoea' on polysomnography, were enrolled from January 2017 to December 2017. Tailor made diet charts were given according to the current nutritional status & life style of patients. Physical activities were encouraged and monitored. Severity of snoring and quality of life before and after intervention was measured by Epworth Sleepiness Scale (ESS) questionnaire & Thornton Snoring Scale (TSS) and statistically analysed. **Result:** Significant reduction in weight and BMI (p≤0.01) was recorded as a result of decreased calorie intake to 2358 (669) kcal and 1904 (417) kcal/day at 3 & 6 months respectively from an initial of 3054 (1003) kcal/day. 56% (n=20) of patients achieved the target of 10,000 steps/ day/ 5 times a week while 33.3% (n=12) patients achieved 8000 steps target. Subjective TSS and ESS showed highly significant improvement (p≤0.001).
Conclusion: Obesity induced snoring and mild sleep apnoea is a major physical and psychological deterrent and may take the shape of obstructive sleep apnoea which might become life threatening. Life style changes in the form of dietary modifications, imparting right knowledge about good food and implementation of the same

monitored in a way that can manifest into a permanent behavioural change can go a long way in improving the quality of life of the patient as well as the bed partner.**Keywords:** Dietary; Lifestyle; Modifications; Impact; Snoring.

SACN-03 **NUTRITIONAL STATUS OF NEWLY DETECTED FEMALE TYPE 2 DIABETES**
***Premagowri Balakrishnan*[1],**Dr. Jemima Beryl Mohankumar[2], 1= Dr.NGP ASC,Coimbatore,2=PSG CAS Coimbatore Email:- msgpremagowri@gmail.com.

Background & Objectives: Type 2 diabetes is genetically transferred among family members however the hereditary pre-disposition alone not the only factors but several factors such as diet, obesity, ethnic background, ageing and stress also shown to influence the development of diabetes. The investigation was designed to study the relationship of anthropometric indices and vitamin D status with type 2 diabetes.**Materials & Methods:** Around 214 newly detected female type 2 diabetics, who visited the Diabetes specialties centres in Coimbatore were the subjects. The data collection carried out through structured questionnaire which included the information on age, sex, marital status, family history of diabetes, symptoms onset on diabetes, known medical illness, physical activity, anthropometric measurements and clinical parameters Dietary pattern and dietary intake of the subjects assessed by 24hour diet recall method. The data collected were analyzed by using appropriate statistical tools like percentage, mean, standard deviation, test of significance (paired t-test) and correlation between variables. **Result:** Among the selected subjects 48% of the females were overweight, whereas only 45% of females stood with normal BMI. Grade-Iobesity were 4%, grade-II obesity 3% females. The correlation between anthropometric indices and blood sugar levels were analysed. It was clear that fasting and postprandial blood sugar levels were positively and significantly correlated with total body weight, BMI and WHR. The vitamin D status shows that 38% of selected female subjects had severe deficiency and 14% were deficient, only 12% had sufficient Vitamin D status. It was found that higher intake of carbohydrates and fat contribute to increased energy intake. There was protein and fibre inadequacy. **Conclusion:** It was concluded that elevated anthropometric indices (body weight, BMI and WHR), poor vitamin D status and faulty diet are strongly associated with an increased risk of developing diabetes. Nutrition education has a great role in the treatment of T2DM.**Keywords:** anthropometric measurements, obesity, diabetes, vitamin D, diet recall.

SACN-04 **A STUDY ON RELATIONSHIP BETWEEN HYPOTHYROIDISM & OBESITY AMONG MIDDLE-AGED WORKING WOMEN WITH DIETARY INTERVENTION IN KOLKATA.**
Swapan Banerjee, Seacom Skills University,
Email:- sbanerjee90@gmail.com.

Background & Objectives: Background – Obesity is the root cause of so many diseases including hypothyroidism, the most common endocrine disorders among females in urban areas. Objective - To find out the relationship between obesity & hypothyroidism among working women leading sedentary lifestyles. Further to assess the recovery from hypothyroid to the euthyroid state through dietary interventions but not levothyroxine therapy. **Materials & Methods:** Methods – Total 120 obese women had a history of hypothyroidism with other comorbidities within the age group 30-40 years located in Kolkata were enrolled for this study from July 2017 to December 2017 with Levothyroxine therapy for first three months & next three months without this as per physician. A qualitative study by purposive sampling method was used applying BMI as the main parameter along with questionnaires. Thyroid hormones tests, blood tests & other reports were incorporated as secondary data. All subjects who visited in diet clinic & diet camps were under observation with weight loss diet for the first three months & next three months with a tentative hypothyroid diet plan. SPSS-version -16 was used as a statistical tool for data analysis & findings. **Result:** Results – The study revealed that there was no such deficiency of nutrients, only elevated TSH & normal or low T4 among the subjects. The correlation coefficient for BMI & hypothyroid type was r = .524 & r = .425 ,(p=.000) ,p < 0.001 (p< .001 or P=0.000 means p<0.0005) and BMI with TSH r = .554 & .437 (p=. 000). Just because of diet, progress on conversion from obese-1 to normal (9 participants) & from moderate hypothyroid state to borderline (14 participants). Relation with comorbidities with other variables also positively correlated p = .001 (BMI), .005 (TSH),.010 (Hypothyroid).**Conclusion :** Conclusions – There was a significantly positive correlation between hypothyroidism & obesity including comorbidities. Further, the study revealed, hypothyroid diet plan worked remarkably in absence of levothyroxine. A satisfactory & significant progress on hypothyroidism was noticed due to dietary interventions.**Keywords:** Hypothyroidism, Obesity ,BMI, Comorbidities, Dietary interventions.

YOUNG SCIENTISTS AWARDS SESSION - II

JUNIOR AWARD IN EXPERIMENTAL NUTRITION

Saturday, 17th November 2018, 11:00 AM – 1:00 PM

Code	Name and Address	Title
JAEN-02	Deepika.M, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore.	Effect Of Chlorella Vulgaris In Improving The Vitamin B12 Status Among Vegetarian Obese And Overweight Young Adult Women
JAEN-03	Ayesha Ashraf Kherani, College of Home Science, Nirmala Niketan, affiliated to University of Mumbai.	Effect Of Vitamin D And Probiotic Supplementation In Patients With Rheumatoid Arthritis.
JAEN-04	R.PRAGATHEESWARI, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore,	Red onion seed var.co5 (allium cepa)-“as a hepatoprotective functional food.
JAEN-06	Tasneem Ravat, Nutrition and Dietetics, College of Home Science, Nirmala Niketan, University of Mumbai,	Physicochemical and functional characterization of gamma depolymerized locust bean gum and assessment of its efficacy as a source of dietary fibre in home based enteral feed.
JAEN-07	D Kodandaram Reddy, Jawaharlal Nehru Technological University, Jntu Ananthapur, A.P	Production of low calorie deep fried potato chips with reduced oil uptake: a comparative study on effect of infrared radiation assisted pre-drying on potato with conventional tray drying,
JAEN-08	Ms. Vaishali Kasture, Interactive Research School for Health Affairs (IRSHA), Bharati Vidyapeeth,	Omega-3 fatty acids differentially influences embryotoxicity in subtypes of preeclampsia,
JAEN-09	Anindita A.Nandi, Interactive Research School for Health Affairs (IRSHA), Bharati Vidyapeeth.	Vitamin d deficiency influences fatty acid metabolism,
JAEN-10	Alomib Austina Ribanar, Department of Food Science and Nutrition, College of Community Science University of Agriculture Science,	Formulation Of High Protein And High Energy Sorghum Flakes Based Snack Bar,
JAEN-11	Saba Naqvi, Division of Nutrition, St. John’s Research Institute, Bengaluru	Estimation Of Protein Requirements In Indian Pregnant Women Using A Whole-Body Potassium Counter,
JAEN-12	Pragya Pandey, Kiran Grover, Tarsem singh dhillon, Amarjeet kaur,	Development and evaluation of anthocyanins rich dairy products by incorporating black carrot concentrate,
JAEN-13	Pushpa Dhami, Kiran Bains,Harpreet Kaur,	Development Of Traditional Ready-To-Use Mix For Calamity Evacuees And Evaluation Of Its Sensory, Nutritional And Storage Parameters,

JUNIOR AWARD IN COMMUNITY NUTRITION

Saturday, 17th November 2018, 11:00 AM – 1:00 PM

Code	Name and Address	Title
JACN-02	AT.Agilandeswari, Avinashilingam Institute for Homescience and Higher Education for women University,	Information and communication technologies – an effective tool for nutrition education among young adult women (17-23 years) on polycystic ovarian syndrome,
JACN-03	Syed Mahfuz Al Hasan, Kagawa University, Kagawa, Japan.	Trends Far Away From An Acceptable Macronutrient Distribution Range In Diet In Bangladesh: A Joinpoint Regression Analysis Of Fao's Food Balance Sheet Data From 1961 To 2013
JACN-06	Neha Pathak, Punjab Agricultural University,	Impact of ready-to-eat extruded snacks on the nutritional and anthropometric profile of malnourished preschool children,
JACN-07	Poonam Jethwani, College of Home Science, Punjab Agricultural University,	Impact of antioxidant rich bar incorporating chiaseeds and mango fruit on the lipid profile of hyperlipidemic subjects,
JACN-08	Dr Nida Fatima Hazari, Professor Jayashankar Telangana State Agricultural University.	Is e - learning ideal for rural women
JACN-09	Ankeeta Menona Jacob, K.S.Hegde Medical Academy, Mangalore.	A community based comparative study of nutritional status of children aged 5-15 years with and without disability,
JACN-10	Aparna Kohli, Lady Irwin College, University of Delhi,	A diet-pattern measurement tool for cardiovascular disease prevention-construction, validation and association with risk markers,
JACN-12	Archana Konapur, ICMR-National Institute of Nutrition, Hyderabad.	Validation of diet diversity score that can predict micronutrient adequacy of 6-10 y old rural children,
JACN-13	Chitrarpita Saha, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat	Improving food and nutrition security by positive deviance approach-a case control study using public-private partnership in rural households of vadodara, western india,.
JACN-14	S G D Nagalakshmi Reddi[1], ICMR-National Institute Of Nutrition, Hyderabad.	Development and validation of household food safety index (hfsi) and identification of key food safety issues among rural and urban households,

JUNIOR AWARD – EXPERIMENTAL NUTRITION

JAEN-02 **EFFECT OF CHLORELLA VULGARIS IN IMPROVING THE VITAMIN B12 STATUS AMONG VEGETARIAN OBESE AND OVERWEIGHT YOUNG ADULT WOMEN**

Deepika.M,Balasasirekha R,Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Tamil Nadu, Email:-deepikadeepu54321@gmail.com.

Background & Objectives: Vegetarians are deficient in vitamin B12 and the complication increases with the obesity and overweight. Chlorella vulgaris a single cellular algae was found to contain the active vitamin B12. The objective of the study is to supplement Chlorella vulgaris as a source of vitamin B12 to vegetarian obese and overweight young adult women and evaluate the effect of supplementation of Chlorella vulgaris in improving the vitamin B12 status.**Materials & Methods:** The study was conducted in Saibaba colony, Coimbatore. Study participants were vegetarian young adult women either obese or overweight and were divided into experimental group and placebo group with 20 participants in each group. The experimental group was supplemented with 200 ml of Chlorella vulgaris juice prepared with 3 g of Chlorella vulgaris and placebo group with 200 ml curd for a period of 50 days. The anthropometric measurements like height, weight, BMI, WHR and WtHR and biochemical parameters namely vitamin B12 and heamoglobin were assessed at baseline and after 50 days. The data collected were consolidated, tabulated and analysed stastically to assess the effect in supplementing Chlorella vulgaris. **Result:** The results revealed that anthropometric measurements of the experimental group showed a mean difference after supplementation but there was no difference in the placebo group. The vitamin B12 increased from 227.50 pg/ml to 338.60 pg/ml and haemoglobin increased from 11.61g/dl to 12.24 g/dl in the experimental group and was statistically significant at 1% level and that of the placebo group was not significant. **Conclusion:** It was concluded that the active vitamin B12 in Chlorella vulgaris is useful in improving the vitamin B12 status of the vegetarian obese and overweight young adult women. This will be an effective way for preventing vitamin B12 deficiency especially among the child bearing age group and prevents high circulating homocysteine in the blood due to elevated methylmalonic acid.**Keywords:** Chlorella vulgaris, vitamin B12, vegetarians, obesity, overweight, young adult women.

JAEN-03 **EFFECT OF VITAMIN D AND PROBIOTIC SUPPLEMENTATION IN PATIENTS WITH RHEUMATOID ARTHRITIS.**

***Ayesha Ashraf Kherani*[1]**, Dr. Veena Yardi[1], Dr. Zubair Sorathia[2], 1=College of Home Science, Nirmala Niketan, affiliated to University of Mumbai. 2=Medicare Hospital, Marol, Andheri.
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Background & Objectives: The present study aimed at investigating the effectiveness of vitamin D and probiotic supplementation (Lactobacillus acidophilus La5 and Bifidobacterium BB-12) in improving disease activity score (DAS-28 CRP) and Visual Analogue Scale (VAS) score in patients with Rheumatoid Arthritis (RA).Separately, work has been done to study Vitamin D supplementation in RA patients as well as probiotic supplementation in RA patients. Limited data links vitamin D to probiotics. Studies have indicated that a key factor in shaping the human gut microbiome is the human Vitamin D receptor (VDR). Five probiotic Lactobacilli strains obtained from Korean kimchi were shown to upregulate VDR signalling and its target genes. Cathelicidin activates autophagic responses, and inflammation was shown to be suppressed by these probiotic strains. Thus, it was hypothesized that these Lactobacilli probiotic strains could serve as therapeutic targets for inflammatory conditions, in combination with vitamin D as they play a role in modulating the VDR-autophagy pathways and inhibit infection and inflammation.Also, since probiotics have a safer side effect profile than most of the drugs used for treatment, it may serve as a novel adjuvant therapy in combination with DMARDs/ NSAIDs and vitamin D in decreasing disease activity in patients with RA. Hence, it is essential to explore the role of vitamin D and probiotic supplementation in patients with rheumatoid arthritis.**Materials & Methods:** In this clinical trial, patients who were newly diagnosed with Rheumatoid Arthritis or were suffering from a disease flare-up, aged 18-60 years, were selected using purposive sampling technique. Patients who fulfilled European League against Rheumatism/ American College of Rheumatology (EULAR/ACR) (2010) criteria were recruited into the study to receive either Disease Modifying Anti Rheumatic Drugs (DMARDs) and Vitamin D supplement (control group), or DMARDs with vitamin D and a probiotic capsule containing 109 colony forming units (CFU) of L. acidophilus La5 and B. BB-12

(intervention group) for a duration of 3 months. DAS-28 CRP was calculated and VAS score was evaluated and high-sensitivity C- reactive protein (hsCRP) and erythrocyte sedimentation rate (ESR) were measured. Fifteen patients were recruited in each group and analyzed.**Result :** Results suggested that hsCRP values, tender joints count (TJC), DAS-28 CRP values and VAS score were reduced significantly in both the control ($p<0.05$) as well as the intervention ($p<0.05$) group. ESR values were found to be significantly lower only after probiotic supplementation ($p<0.05$). At the end of the study, a significant difference was observed between the two groups for DAS-28 CRP ($p=0.007$; $p<0.05$), in favor of the probiotic group. No adverse effects were reported for the intervention.**Conclusion :** It may be concluded that vitamin D and probiotic supplementation may be an adjunct therapy for RA patients, may help in improving inflammatory status, and in lowering disease activity in patients with RA.**Keywords:** Rheumatoid Arthritis, disease activity score (DAS-28 CRP), Visual Analogue Scale (VAS) score, Vitamin D, Probiotic.

JAEN-04 **RED ONION SEED VAR.CO5 (ALLIUM CEPA)-"AS A HEPATOPROTECTIVE FUNCTIONAL FOOD".** ***R.PRAGATHEESWARI*[1]**, DR.PA.RAAJESWARI[1], 1= Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Email:- pragathirajamani@gmail.com.

Background & Objectives: Hepatic cells are endowed with remarkable potential of self-repair, inspite of that Hepato Cellular Carcinoma(HCC) is the second common cause for deaths from cancer globally. Onion is an extensively used dietary compound with immense therapeutic benefits even though, the properties of onion seed remains unexplored. The present study is aimed to explore the hidden miracles of Red Onion Seed var.CO5(ROS) as a functional food with special reference to hepatoprotective potentials. **Materials & Methods:** The Red Onion Seed var.CO5(ROS) was collected from Tamil Nadu Agricultural University and extracts were prepared using aqueous, cooked aqueous and methanol mediums. Phytochemical identification was done to analyze the ROS Qualitatively. Quantitative analysis evaluated the antioxidant potential of the two best extracts through DPPH, FRAP and H2O2 scavenging activities. Paper Chromatography(PC), Thin layer Chromatography(TLC) and Gas Chromatography –Mass Spectroscopy(GC-MS) were carried-out to determine the thrust compound. Anti-inflammatory Activity was assessed by anti-proteinase activity. Percentage inhibition of Lipid Peroxidation(LP) was assessed with goat liver homogenate. Hepatoprotective activity of ROS extract on HepG2 cell line was assessed by MTT-assay. **Result:** Qualitative analysis showed the presence of alkaloids, terpenoids, saponins, flavonoids, quinine, phytosterol and tannin. Quantitative analysis of phytochemicals revealed Cooked Aqueous Extract(CAE) with maximum DPPH scavenging activity-96µg/ml, H2O2 scavenging activity-153µg/ml. Aqueous extract(AE) showed maximum FRAP reducing power-86µg/ml. PC and TLC indicated alkaloids, flavonoids and terpenoids ,where GC-MS showed 37 therapeutically beneficial compounds. Anti-inflammatory activity of CAE showed 82% anti-proteinase action. Percentage inhibition of LP on goat liver homogenate by CAE showed maximum inhibition of 51.1% for 2 ml. The extract showed a dose dependent increase in apoptosis with maximum 68.1% for 30µl of CAE on HepG2 cell lines. The percentage of cell viability decreases with increase in concentration of extract. **Conclusion:** Proved the efficacy of ROS as a potent functional food against LP and HCC(HepG2 cell lines). **Keywords:** Functional Food, Chromatography, Lipid Peroxidation, Apoptosis, Hepatoprotective Activity.

JAEN-06 **PHYSICOCHEMICAL AND FUNCTIONAL CHARACTERIZATION OF GAMMA DEPOLYMERIZED LOCUST BEAN GUM AND ASSESSMENT OF ITS EFFICACY AS A SOURCE OF DIETARY FIBRE IN HOME BASED ENTERAL FEED.** ***Tasneem Ravat*,**Nutrition and Dietetics, College of Home Science, Nirmala Niketan, University of Mumbai,Email:-tnavagharwala@gmail.com.

Background & Objectives: Locust bean gum (LBG), a soluble dietary fibre, was irradiated to study its effect on physicochemical properties and it was incorporated in home based enteral feed (HBEF) to evaluate its viscosity and nutritional quality.**Materials & Methods:** LBG was exposed to gamma radiation processing using 60Co gamma irradiator to a dose of 5, 10, 25, 50 kGy. Aqueous dispersion of control and irradiated LBG was tested for viscosity, swelling, solubility, bile acid and glucose dialysis retardation index. Gel permeation chromatography was used to determine the molecular weight. Gelling property was tested using texture analyzer. The tolerance of L. plantarum MTCC 2621 in the presence of non irradiated and irradiated LBG to simulated gastric and small intestinal transit was determined. 3 varieties of home based enteral feeds were developed i.e., without LBG, containing 0 kGy LBG, containing 25 kGy LBG and its viscosity and nutritional parameters were analyzed.**Result :** Characteristics like lowering of viscosity, increase in solubility, and decrease in swelling index were better

achieved with the use of irradiated LBG ($p < 0.05$). Molecular weight was found to decrease significantly with increase in irradiation dose ($p < 0.05$). Decrease in glucose and bile acid dialysis retardation index due to irradiation were in agreement with rate of depolymerization. Findings showed comparable results in non irradiated and irradiated LBG with respect to maintaining growth of L. plantarum under simulated gastrointestinal transit conditions to free cell suspension ($p < 0.05$). Addition of irradiated LBG into HBEF showed promising results in terms of viscosity and increase in total dietary fibre as against HBEF containing unprocessed LBG ($p < 0.05$). **Conclusion :** Radiation processed LBG could be used as an alternative to unprocessed, highly viscous LBG for use in enteral formula as a source of dietary fibre.**Keywords:** Enteral formula, dietary fibre, locust bean gum, gamma irradiation, viscosity, L. plantarum

JAEN-07 **PRODUCTION OF LOW CALORIE DEEP FRIED POTATO CHIPS WITH REDUCED OIL UPTAKE: A COMPARATIVE STUDY ON EFFECT OF INFRARED RADIATION ASSISTED PRE-DRYING ON POTATO WITH CONVENTIONAL TRAY DRYING,** ***D Kodandaram Reddy,***Jawaharlal Nehru Technological University, Jntu Ananthapur, A.P.Email:- dekore20@gmail.com.

Background & Objectives: The most important energy source in the human diet is carbohydrates, and can be found in abundance in potatoes. Among the many processed varieties, deep fried potato chips are highly appreciated by the consumers. But high oil content in fried products is one of the major issues making them unsuitable for daily consumption. The average fat absorption of potato chips is usually 20-30%.More the number of pores greater the oil absorption , so by using an alternative and rapid heat source during the pre-drying, we can reduce the thermal expansion so as to reduce the number of pores, consequently reduction in the oil uptake. Infrared radiation can be one of the options to this pre-drying of potato slices followed by deep frying to study the reduction of oil uptake. The surface morphology can be studied using scanning electron microscopy (SEM). **Materials & Methods:** Potatoes used in this study were collected from the local market of hyderabad, of good quality with uniform size. Cleaning ,peeling and slicing were done at laboratory, half portion of slices of uniform diameter and thickness were blanched using hot water and then dried using Tray drier ,and the other half were directly dried with infrared heater set up(Simultaneous blanching and drying) .Then simultaneous deep frying(160 degree Celsius to 180 Degree Celsius) was applied to both the groups for few seconds using table top fryer and the oil content was measured using Soxhlet extraction method. The surface morphology of slices also studied using Scanning Electron Microscopy before and after frying.**Result :** The fat content of potato chips treated with Tray drying were compared with Infrared pre-drying, which resulted in reduction of the fat content from 20.62 g fat per 100 g to 16.79 g fat per 100 g of fried product. The study of SEM images showed that, the surface of infrared treated slices was smoother and less broken than the pre-treated tray dried slices. **Conclusion :** In the present study the process time for pre-drying period is much lesser in infrared radiation than that of tray drying almost 50%, the thermal expansion of solid surface area is also less which leads to the overall reduction in the porosity, as a result the oil absorption has reduced around 18.6%. The same effect is observed even in the morphological study of the surface of potato slices by Scanning Electron Microscopy.**Keywords:** Oil uptake, deep frying , Infrared Radiation, Scanning Electron Microscopy,Potato Chips.

JAEN-08 **OMEGA-3 FATTY ACIDS DIFFERENTIALLY INFLUENCES EMBRYOTOXICITY IN SUBTYPES OF PREECLAMPSIA,** ***Ms. Vaishali Kasture,***Ms.Surabhi Dalvi, Mr. Mayur Swamy,Dr. Anvita Kale,Dr. Sadhana Joshi, Interactive Research School for Health Affairs (IRSHA), Bharati Vidyapeeth (Deemed to be University),Email:- vaishuk1990@gmail.com

Background & Objectives: Early (EOP) and late onset (LOP) preeclampsia are two subtypes of preeclampsia, and considered two distinct disease entities. Our earlier studies have demonstrated altered levels of polyunsaturated fatty acids, increased oxidative stress and lower vitamin E levels in women with preeclampsia. The current study examines effect maternal omega-3 fatty acids and vitamin E supplementation in subtypes of preeclampsia. **Materials & Methods:** Pregnant Wistar rats were assigned to control and four treatment groups: early onset preeclampsia (EOP); late onset preeclampsia (LOP); early onset preeclampsia + omega-3 fatty acid supplementation +vitamin E (EOP + O + E) and late onset preeclampsia + omega-3 fatty acid supplementation +vitamin E (LOP + O + E). L-Nitroarginine methylester (L-NAME; 50 mg/kg body weight/day) was used to induce preeclampsia. Blood Pressure, feed intake and dam weights were recorded during pregnancy and dams were dissected at d14 and d20 of gestation. Data was analysed using SPSS/PC+ package (Version 20.0, Chicago, IL). **Result:** Animals from both EOP as well as LOP groups demonstrated higher ($p<0.01$ for both) systolic and

diastolic BP; lower weight gain (p<0.01), lower conceptuses size, lower conceptuses weight (p<0.01 for both) and fetal weight (p<0.05) as compared to control. EOP and LOP groups showed higher percentage of fetal resorptions and embryotoxicity (deformities and hematomas).**Conclusion:** Supplementation reduced the diastolic BP, the percentage of resorptions and embryotoxicity only in the LOP group, suggesting a need for differential supplementation regime for the two subtypes of preeclampsia. **Keywords:** Early onset preeclampsia; Late onset preeclampsia; Omega-3 fatty acids; Vitamin E; Nitric oxide.

JAEN-09 **VITAMIN D DEFICIENCY INFLUENCES FATTY ACID METABOLISM** ***Anindita A.Nandi,***Nisha S. Wadhwani,Sadhana R. Joshi,Mother and Child Health, Interactive Research School for Health Affairs (IRSHA), Bharati Vidyapeeth (Deemed to be University),Pune,Email:- aninditanandi5feb@gmail.com.

Background & Objectives: Reports indicate that maternal vitamin D deficiency may be associated with increased inflammation. Long chain polyunsaturated fatty acids (LCPUFA); omega-3 and omega-6 fatty acids are known to have anti-inflammatory and pro-inflammatory properties respectively. The present study examines the effects of vitamin D deficiency on fatty acid composition and metabolism in a rat model. **Materials & Methods:** Female Wistar rats were randomly divided into two groups (n=8/group) as follows; control and vitamin D deficient (VDD). Diets (control: 1000 IU D3/kg diet; VDD: 0 IU D3/kg diet) were given from weaning and continued throughout pregnancy. Pregnant female rats were dissected on gestational day 20 to collect blood, liver and placenta. **Result:** The VDD diet reduced maternal serum 25-hydroxyviatmin D3 levels (p<0.001) as compared to control. Maternal vitamin D deficiency resulted in lower total weight gain and placental weight (p<0.05 for both) during pregnancy. Animals from VDD group demonstrated higher arachidonic acid (AA) levels in both the liver and plasma (p<0.05 for both) as compared to control. Liver and plasma monounsaturated fatty acid levels (MUFA) were lower (p<0.001) while plasma total saturated fatty acids (SFA) (p=0.05) were higher in the VDD group. Animals from the VDD group demonstrated lower âˆ†9-desaturase activity index (p<0.01) both in the liver and plasma. The plasma âˆ†5-desaturase activity index (p<0.05) was higher although no change was observed in the âˆ†6-desaturase activity index. However, the mRNA levels of liver âˆ†6-desaturase was lower (p<0.05) in the VDD group. The serum levels of 6-keto prostaglandin F1Î± (6-keto PGF1Î±) was similar in both the groups whereas the serum level of thromboxane B2 (TXB2) and the ratio of TXB2/6-keto PGF1Î± were higher in the VDD group as compared to control.**Conclusion :** Our findings indicate that maternal vitamin D deficiency influences fatty acid metabolism and the inflammatory eicosanoids production which may lead to adverse pregnancy outcome.**Keywords:** Arachidonic acid (AA), fatty acid desaturases (FADSs), eicosanoids, long chain polyunsaturated fatty acids (LCPUFAs), pregnancy, vitamin D deficiency.

JAEN-10 **FORMULATION OF HIGH PROTEIN AND HIGH ENERGY SORGHUM FLAKES BASED SNACK BAR,** ***Alomib Austina Ribanar*[1]***,*** Hemalatha S[2], 1=Department of Food Science and Nutrition, College of Community Science University of Agriculture Science, Dharwad, 2=FPT, Bakery Training Unit, University of Agriculture Science,Dharwad, Email:a.austina.r@gmail.com

Background & Objectives: The present study was carried out to develop sorghum flakes-based snack bar to provide high protein and high energy, to add variety to the food pattern of the school-going children and also to utilize the underutilized sorghum grains. **Materials & Methods:** The formulated snack bar was analyzed for the physical characteristics such as colour, water activity and hardness and the sensory analysis was determined. The best-selected one was analysed for proximate composition, dietary fibre, mineral composition, in-vitro protein and carbohydrate digestibility and microbial plate count. Also, the consumer preference test by FACT (Food Action rating Test) scale method was carried by 135 children belonging to the age group of 6 to 14 years.**Result :** Trials were carried out by varying different varieties of sorghum flakes viz., white sorghum flakes (M35-1) as formulation I and red sorghum flakes (AKJ-1) as formulation II. The formulated sorghum-based snack bar was 10 cm long, 3 cm wide, 3.5 cm thick and weighed 50 g per one serving. Water activity and hardness were significantly lower than formulation I. According to the sensory evaluation formulation II was found to be highly acceptable with 95% acceptability index. The protein and energy contents were 17.5 g and 450 kcal per 100 g. Protein-energy ratio was 15.67 with 74.70% protein digestibility. Consumer acceptability test by FACT found that majority of the children (82.96%) opined to eat this every opportunity and only 1.48 per cent like this and would eat now and then.**Conclusion :** In conclusion, the protein and energy content of the AKJ-1 (red sorghum) sorghum flakes-based snack bar met the one-third of the RDA requirement. Therefore, the addition of red sorghum flakes to snack bar is feasible, based upon sensory results, which may facilitate marketing of this

functional food with was qualities equivalent to conventional products.**Keywords:** Energy, Protein, Snack bars and Sorghum flakes.

JAEN-11 **ESTIMATION OF PROTEIN REQUIREMENTS IN INDIAN PREGNANT WOMEN USING A WHOLE-BODY POTASSIUM COUNTER,** ***Saba Naqvi,***Division of Nutrition, St. John's Research Institute, Bengaluru,Email:- saba.n@sjri.res.in

Background & Objectives: The 2007 WHO/FAO/UNU recommendation for the Estimated Average Requirement (EAR) of additional protein during pregnancy for a gestational weight gain (GWG) of 12 kg is 6.7 and 21.7 g.d-1 in the 2nd and 3rd trimester respectively. This EAR is based on measurements of potassium accretion in high-income country (HIC) pregnant women. It is not known if well-nourished pregnant women from low to middle income countries (LMIC) have comparable requirements. This study therefore aimed to estimate total body potassium (TBK) accretion during pregnancy in Indian pregnant women, using a whole-body potassium counter (WBKC), to measure their protein EAR.**Materials & Methods:** Well-nourished pregnant women (20-40 years, n = 38, middle socioeconomic stratum) were recruited in the first trimester of pregnancy. Anthropometric, dietary and physical activity measurements, and measurements of TBK using a WBKC, were performed at each trimester and at birth. **Result :** The mid-trimester weight gain was 2.7 kg and 8.0 kg in the 2nd and 3rd trimesters, for an average 37 week GWG of 10.7 kg and mean birth weight of 3.0 kg. TBK accretion was 2.7 and 5.7 g.d-1, for an EAR for 8.2 and 18.9 g.d-1 in the 2nd and 3rd trimesters, respectively. The EAR calculated for a GWG of 12 kg, was 9.1 and 21.2 g.d-1 in the 2nd and 3rd trimesters, respectively. **Conclusion:** The additional protein requirements of well-nourished Indian pregnant women for a GWG of 12 kg in the 2nd and 3rd trimester were similar to the 2007 WHO/FAO/UNU requirements. It was about 10% lower for the observed GWG, which was associated with a good birth weight. **Keywords:** Pregnancy, Protein Requirements, Total Body Potassium, Gestational Weight Gain, Whole-Body Potassium Counter.

JAEN-12 **DEVELOPMENT AND EVALUATION OF ANTHOCYANINS RICH DAIRY PRODUCTS BY INCORPORATING BLACK CARROT CONCENTRATE,** ***Pragya Pandey,***Kiran Grover, Tarsem singh dhillon, Amarjeet kaur, email:- pragya1pandey@gmail.com

Background & Objectives: Anthocyanins are potent polyphenols, which have exhibited a great antioxidant activity in in-vivo and in-vitro studies. Although dairy products comprise a great nutritional value but are deficient in polyphenols. Black carrot are extraordinary and cheapest source of anthocyanins in India and black carrot concentrate (BCC) has almost 10 times higher anthocyanins than fresh black carrots. Therefore an attempt was made to develop anthocyanin rich dairy products viz. ice cream, yogurt and buttermilk by incorporating black carrot concentrate. **Materials & Methods:** Ice cream, yogurt and buttermilk was delveloped by adding BCC at the level of 2.5, 5, 7.5 and 10 percent. The sensory analysis was done by trained panelists using 9 point hedonic scale. Best acceptable products were analyzed for minerals like magnesium, iron and zinc, bioactive compounds and antioxidant activity. The developed products were analyses for their storage stability. **Result :** Dairy products with 7.5 percent black carrot concentrate were found found to be best acceptable. Mg and Fe content increased significantly after incorporation of BCC. Bioactive compounds and antioxidant activity was significantly improved in black carrot concentrate added dairy products. The total phenols increased by 35.87, 28.11 and 26.39 times and flavonoids increased by 34.62, 16.01 and 14.52 times and antioxidant activity was increased by 2.97, 1.57 and 1.63 times in experimental ice cream, yogurt and buttermilk respectively. Ice cream had shelf life of more than 60 days, yogurt was highest acceptable upto 5 days and buttermilk showed storage stability upto 10 days. **Conclusion:** Black carrot concentrate can be incorporated upto 7.5 percent level into dairy products. Black carrot has potential use as ingredient in different food products. It helps to improve food quality by providing nutritionally active components and making diet rich in bioactive ingredients, which are beneficial for human health. **Keywords:** black carrot concentrate, anthocyanins, ice cream, yogurt, buttermilk.

JAEN-13 **DEVELOPMENT OF TRADITIONAL READY-TO-USE MIX FOR CALAMITY EVACUEES AND EVALUATION OF ITS SENSORY, NUTRITIONAL AND STORAGE PARAMETERS,** ***Pushpa Dhami,*** Kiran Bains,Harpreet Kaur,Email:- dhami01@yahoo.com.

Background & Objectives: Assam, a north eastern state in India is vulnerable to multiple disasters including earthquake, floods and landslides. Food assistance is an important factor aftermath of disaster which helps the

stranded evacuees to recover fast and reduce the stress due to shock. Traditional food which is well known to the local population helps in its wider acceptance and its ready-to-use form with increased shelf life and time saving quality paves way the necessity of utensils and other kitchen preparations to prepare food in refugee shelters. **Materials & Methods:** Ready-to-use traditional food sandah guri mix was developed using cooked rice flour, roasted wheat flour and bengal gram flour in different formulations with 40% skimmed milk powder, 30% jaggery powder and some dry fruits. The sensory analysis was done by semi-trained panelists and students from the identified disaster prone state Assam. It was analyzed for its sensory and nutritional parameters including proximate composition, essential amino acid lysine, NDP cal %, in vitro protein digestibility, minerals like calcium, iron and zinc. The shelf life was also assessed for two months in different packaging materials namely high density poly propylene (HDPE) and aluminium laminate pouches. **Result:** The ready-to-use mix was widely accepted by the sensory panelists and showcased high protein (16.23 %), fibre (0.82 %), ash (1.06%), NDP cal % (10.5 %), in vitro protein digestibility (87.1 %), lysine (444.7 mg), calcium (206.2 mg) and iron (3.14 mg). The product was acceptable for 60 days in HDPE and laminate pouches at ambient temperature with no compromise in its overall quality, however, laminate pouches offered the best option for packaging. **Conclusion:** This ready-to-use sandah guri mix was found to be nutrient dense with adequate balance of protein quality and quantity thus capable of meeting the increased nutrient needs of calamity victims. The cultural familiarity of the product to the stranded population helps in its easy acceptance. This mix can also be put in the food baskets of defense personnel, astronauts, school children and included in the feeding programs running by the respective state. **Keywords:** sandah guri, ready-to-use, protein, disaster, evacuees.

JUNIOR AWARD – COMMUNITY NUTRITION

JACN-02 **INFORMATION AND COMMUNICATION TECHNOLOGIES – AN EFFECTIVE TOOL FOR NUTRITION EDUCATION AMONG YOUNG ADULT WOMEN (17-23 YEARS) ON POLYCYSTIC OVARIAN SYNDROME,** ***AT.Agilandeswari*[1],** Dr.A.Thirumani Devi[1], 1=Avinashilingam Institute for Homescience and Higher Education for women University, Email:atagilandeswari@gmail.com.

Background & Objectives: Polycystic ovarian syndrome, is an endocrinal dysfunction common among the young women belonging to reproductive age group .On an average PCOS affects 5-10 % of the women in reproductive age group worldwide and prevalence in India is also rapidly rising. It contributes to hormonal imbalance leading to irregular menstruation, hirsutism , hyperandrogenism, obesity, and diabetes .Many untreated endocrinal disorders may leads to infertility and other reproductive disorders. **Materials & Methods:** A comparative study was conducted to find out the best method to impart nutrition education and to assess the knowledge, attitude and practise of the selected subjects before and after nutrition education intervention on PCOS date relatable to socio economic, dietary pattern, physical activity and medical information were collected and used for further in depth study.The prevalence was also noted among the subjects with normal BMI, Waist hip ratio and Body fat .The present study concluded that PCOS is not only associated with obesity but also with other factors. **Result:** The statistical analysis revealed that the impact of ICT enabled education module related to PCOS on nutritional knowledge has improved and found to be one percent significant. Hence it is relevent that there is drastic improvement in nutritional knowledge on PCOS among the selectedsubjects. The standard deviation and the mean difference is found to be increased hence it is proven that the physical activity is increased and has behavioural change after giving nutrition education .**Conclusion:** Nutrition education through ICT enabled tools lectures and physical activity intervention had improved the nutritional knowledge on PCOS and bought behavioural change among the young women population. The findings from this study provide a Mobile phone based primary intervention strategy to increase awareness and promote healthy lifestyles pattern among the younger generation. Thus the study supports in preventing the problem of PCOS and promoting their healthstatus. **Keywords:** Poly cystic ovarian syndrome(PCOS), Information communication technology(ICT), Nutrition Education, Physical intervention and Behavioural change.

JACN-03 TRENDS FAR AWAY FROM AN ACCEPTABLE MACRONUTRIENT DISTRIBUTION RANGE IN DIET IN BANGLADESH: A JOINPOINT REGRESSION ANALYSIS OF FAO'S FOOD BALANCE SHEET DATA FROM 1961 TO 2013 ***Syed Mahfuz Al Hasan*[1]**, Joyosree Roy Chowdhury[2],Md. Shimul Islam[3],Abdur Rahman[3],Kanae Kanda[1],Tomohiro Hirao[1],1=Kagawa University, Kagawa, Japan.2=University of Mysore,Mysore,India.3=Jessore University of Science and Technology, Jessore, Bangladesh. Email:- mahfuz@med.kagawa-u.ac.jp.

Background & Objectives: The changes in dietary history have quickened over the last three centuries. Understanding the trends and dynamics of the changes is very crucial for predicting the future changes so that adequate protective measures can be taken in advance. The aim of this study was to analyze the temporal trends and significant changes in available energy and macronutrient distribution in the Bangladeshi diet from 1961 to 2013. The study also identified the years in which acceptable macronutrient distribution ranges (AMDRs) in the available diet will be achieved. **Materials & Methods:** Due to the lack of long-term national dietary intake dataset, this study used dataset derived from the FAO's food balance sheets. We used joinpoint regression analysis for the temporal trends. The annual percentage change (APC) was computed for each segment of the trends. Moreover, we calculated the tentative time required to attain the AMDRs. **Result:** Energy availability increased by 13.7% in diet from 1961 to 2013. The carbohydrate energy availability in the Bangladeshi diet decreased by only 5.7% during the 53 years, while available energy from fat increased by 59.4%. The carbohydrate energy showed nearly unchanged downward trends from 1961 to 1980 and thereafter significantly decreased at a very slow rate (APC= -0.2). The available protein energy showed a W-shaped temporal pattern. Whereas energy from fat was virtually unchanged for the period of 1961-1980 and unlike carbohydrate then increased significantly at a marked rate until 1998 (APC= 2.4). At a reducing rate, as many as 27 years will be required to achieve only the upper limit of the AMDR for carbohydrate. In case of protein and fat, it is estimated to require about 3 and 10 years, respectively more to achieve only the lower limits of the AMDRs for protein and fat. **Conclusion:** This study presented the temporal trends of available energy and macronutrients distribution in the Bangladeshi diet from 1961 to 2013. Bangladesh is far away from attaining the AMDRs in an available diet which might be a good reason for the growing burden of diet-related chronic diseases along with hidden hunger and undernutrition. **Keywords:** Acceptable macronutrient distribution ranges, Food balance sheet, Joinpoint regression analysis.

JACN-06 IMPACT OF READY-TO-EAT EXTRUDED SNACKS ON THE NUTRITIONAL AND ANTHROPOMETRIC PROFILE OF MALNOURISHED PRESCHOOL CHILDREN, ***Neha Pathak,*** Dr.Anita Kochhar,Punjab Agricultural University, Email:- neha-fn@pau.edu

Background & Objectives: The objective of the present study is to evaluate the supplementary effect of nutrient-dense, easily digestible and affordable ready to eat extruded snacks developed using locally available ingredients on the nutritional and anthropometric profile of malnourished preschool children. **Materials & Methods:** Extruded snacks were formulated using wheat flour, germinated green gram flour mixed in the ration of 3:1 with incorporation of 6 percent amla powder and 2 percent black carrot leaves powder. On the basis of preliminary survey and anthropometric measurement sixty moderately malnourished preschool children were selected and equally categorised into two groups namely control and experimental group. To see the impact of extruded snacks the preschool children of 2-5 years in the experimental group were supplemented with 100g of extruded snacks for the period of three months. **Result:** Results revealed that the nutritional status of experimental group improved after the three months supplementation of extruded snacks. Non-significant changes were recorded in anthropometric parameters i.e. height, head and chest circumference after supplementation of extruded snacks while significant increase was observed in the weight (16.89%), BMI (14.87%) and MUAC (3.0%) of the experimental group. A significant increase in all the biochemical parameters with highest increase in haemoglobin (12.40%) followed by albumin (11.66 %) were recorded in experimental group while the control group did not reveal any significant changes in their blood profile except for total protein (4.37%).After supplementation of extruded snacks in the experimental group a significant increase was observed in the intake of all the macro, micro nutrients and the entire food group except for the intake of other vegetables, fruits. The anthropometric profile of the pre-children in experimental group after supplementation showed highest increase for weight (16.89 %) followed by BMI (14.87%). **Conclusion:** Supplementation of 100g of the developed extruded snacks formulated using wheat flour and germinated green gram flour in the ratio of 3:1, incorporated with amla powder at 6 per cent and black carrot leaves powder at 2 per cent improved the nutritional status of the preschool children fulfilling approximately one third of their recommended protein and energy requirement. Developed extruded snacks were nutritious, inexpensive, had longer shelf life and can be provided in the ICDS, anganwadi centres

and supplementary feeding programmes run by the government and non-government agencies to combat malnutrition. **Keywords:** Supplementation, Extrusion, Malnourished children, nutritional status.

JACN-07 **IMPACT OF ANTIOXIDANT RICH BAR INCORPORATING CHIASEEDS AND MANGO FRUIT ON THE LIPID PROFILE OF HYPERLIPIDEMIC SUBJECTS,** ***Poonam Jethwani,*** Anita Kochhar,College of Home Science, Punjab Agricultural University,Ludhiana.Email:-poonam.jthi@gmail.com.

Background & Objectives: India is on the threshold of an epidemic of cardiovascular disease and unhealthy diet and lifestyle is the major cause which is needed to be improved. So keeping this in view the present study was conducted to assess the Impact of antioxidant rich bars incorporating chiaseeds and mango fruit on nutritional status and lipid profile of hyperlipidemic subjects in Ludhiana and Jaipur city. **Materials & Methods:** Six types of bars were developed using puffed wheat, flaxseeds, chiaseeds, whole mango, apple, guava fruit and honey in different combinations. All the bars were evaluated for organoleptical attributes, bioactive and antioxidant content. The highly acceptable bar in terms of sensory and nutritional value were supplemented to the 30 hyperlipidemic subjects (15 males and 15 females) of Ludhiana city and 30 hyperlipidemic subjects (15 males and 15 females) of Jaipur city so as to determine the difference in impact of supplementation in both the cities. The control group of 30 subjects in both the cities respectively were not given any supplementation and the improvement in lipid profile and health status between experimental and control group of respective cities was evaluated. The subjects were selected on the basis of their anthropometric parameters and lipid profile content. **Result:** The bar (55g) formulated using puffed wheat (20g), peanuts (10g), chiaseeds (5g), whole mango fruit (10g) and honey (10g) found to be highly acceptable. The bioactive and antioxidant content of bar was found to be rich in β-carotene (325.24µg/55g), polyunsaturated fatty acids (39.38%), Flavanoids (56.68%), DPPH activity (80.09% inhibition), FRAP (480.40 µmolFe2+/g), ABTS (45.49 mmolTE/55g) and RPA (222.92 mgTE/55g) content. Therefore the selected mango chiaseeds bar was supplemented to the experimental group of both Ludhiana and Jaipur city. It was revealed that supplementation of bar increased intake of fibre , riboflavin, niacin, vitamin C, β-carotene, calcium, iron and zinc content significantly (p□0.01, 0.05) with the average percent change of 16.61%, 18.90%, 12.32%, 11.32%, 14.39%, 7.37%, 11.06%, 22.14% respectively in the experimental group of both the cities. Significant decrease in weight, systolic and diastolic blood pressure, total cholesterol, LDL, VLDL and triglycerides was observed with the average percent change of 1.31%, 1.62%, 2.61%, 2.97%, 3.27%, 2.51%, and 2.12% in the experimental group of both the cities. **Conclusion:** Hence the supplementation of 55g of the mango chiaseeds bar formulated using puffed wheat (20g), peanuts (10g), chiaseeds (5g), whole mango fruit (10g) and honey (10g) for three months improved the nutritional status and lipid profile of hyperlipidemic subjects in both Ludhiana and Jaipur city and it can be a healthy substitute for mid morning or evening snack to maintain the health and nutritional status of hyperlipidemic subjects. **Keywords:** Antioxidant rich bars, hyperlipidemic, anthropometric, nutritional status, lipid profile, supplementary feeding.

JACN-08 **IS E - LEARNING IDEAL FOR RURAL WOMEN** ***Dr Nida Fatima Hazari,*** Dr V Vijayalakshmi, Professor Jayashankar Telangana State Agricultural University,Email:-nidamaaz@gmail.com.

Background & Objectives: The global appeal of e-learning made localization of information not only possible but highly relevant and is the platform of choice for rural women who socially, politically and geographically find it difficult to learn by other means.The primary objective is to develop and standardize a knowledge, attitude and practice questionnaire on basic nutrition, health and hygiene for rural women to assess if e – learning is ideal. **Materials & Methods:** Following quasi-experimental study design, 100 rural women of reproductive age group (15-49 years) constituted the experimental group and were selected from three different villages of Rangareddy district in Telangana region through purposive random sampling. The e – learning nutrition education intervention used was a 2D animated film focussing on nutritional needs of children (0-6 years), pregnant, lactating women and also nutritional deficiency diseases seen in these groups with strategies to prevent and control them.A knowledge, attitude and practice questionnaire was specifically designed and standardized using appropriate tests.The e - learning intervention was screened every week for a period of 6 months. Nutrition knowledge, attitude and practice scores for the experimental group were assessed using the developed questionnaire at baseline and 6-month after intervention.The pre and post scores were calculated using relevant statistical procedures. **Result:** The questionnaire standardized was clear and appropriated for easy understanding. Results indicated that there were significant increments in the post intervention scores of knowledge (10.58 vs.17.70) attitude (52.87 vs.70.64) and practice (24.59 vs.30.7). **Conclusion:** This study produced favorable outcome on improving knowledge, attitude and practice of rural women and thus it can be concluded that e – learning nutrition

modules are suitable and ideal for rural women. **Keywords:** Knowledge, Attitude, Practice, e - learning, Multimedia, 2D Animation.

JACN-09 **A COMMUNITY BASED COMPARATIVE STUDY OF NUTRITIONAL STATUS OF CHILDREN AGED 5-15 YEARS WITH AND WITHOUT DISABILITY,**

Ankeeta Menona Jacob[1], Sreekantaiah Pruthvish[2], B.S. Nandakumar[3], Mohan Raju[3],Radhika K[3],1= K.S.Hegde Medical Academy,Nitte(Deemed to be University), Mangalore,Karnataka,.2=State Neonatal and child health Consultant for UNICEF, Karnataka,3 = M S Ramaiah Medical College and Hospitals,MSR Nagar,Bangalore Email:- neelankeet@gmail.com.

Background & Objectives: Individuals with one form of Disability are often expected to have poorer nutrition and nutritional consideration than their non-disabled peers. This study was conducted to assess the effect of nutritional status of the individuals with disability on the social interaction and its difference compared to their non-disabled peers. **Objectives: 1.**To assess and compare nutritional status of disabled & non-disabled children.**2.**To assess the association between the nutritional status and social interaction among the disabled and non-disabled peers. **Materials & Methods:** Study Settings: Rural Field Practise area of a medical college. **Study Design:** Cross –Sectional Study. **Study Population:** Children aged 5-15 years with various (Locomotor disability/mental/visual and communication disabilities) who are permanent residents of study areas included and non-disabled peers who were permanent residents selected from the school going children of same age, siblings or neighbours. **Data Collection:** A pre-tested semi-structured questionnaire was used to collect data on anthropometric measurements, dietary intake using 24-hour recall method, and social interaction. **Statistical Methods:** Descriptive statistics were expressed in terms of mean, standard deviation, median and Inter-Quartile range and proportions. Independent T test, Chi square, Mann-Whitney U and Spearman's correlation co-efficient was used to correlate between parameters of nutritional status and social interaction domains in study population. **Result:** Undernutrition in children with disabilities was higher 87(60.0%) when compared to their non-disabled peers 85(53.1%) as per Indian Academy of paediatrics (IAP) classification. Overweight and obesity was higher among children with disability 15(10.3%) when compared to children without disability 10(6.9%) as per WHO BMI Centiles classification. However, grades of malnutrition did not significantly differ in both the groups. The grades of malnutrition were positively and significantly correlated with the social interaction domains especially among disabled children aged 5-10 years. **Conclusion:** Special attention towards improvement of nutritional status children with disabilities aged 5-10 years is needed as it affects their social interaction. **Keywords:** undernutrition, children, social interaction, disability.

JACN-10 **A DIET-PATTERN MEASUREMENT TOOL FOR CARDIOVASCULAR DISEASE PREVENTION-CONSTRUCTION, VALIDATION AND ASSOCIATION WITH RISK MARKERS,*Aparna Kohli[1]***, Anupa Siddhu[1],R. M. Pandey[2],K. Srinath Reddy[3],1=Lady Irwin College, University of Delhi, 2= All India Institute of Medical Sciences, Delhi. 3=Public Health Foundation of India (PHFI), Delhi-NCR, Email: kohli.aparna3@gmail.com

Background & Objectives: Existing definitions of diet-patterns derived statistically and based on inductive-logic, are limited to a qualitative picture that results in subjectivity in actual practice. Recent concept of diet-quality-indices may be considered a step towards objectivity in diet-pattern study. Existing diet-indices have gaps, applicability is limited to specific populations and none yet has examined impact on health outcome change. **Materials & Methods:** We developed a quantitative measurement tool iPACE DQI (Prudent Approach to Cardiovascular Epidemic, for Indians – Diet Quality Index) for diet-pattern assessment with respect to coronary heart disease (CHD) risk. A 100-point scale (higher numeric value considered healthier) with eight main components, broadly based on prudent diet, and assessment focus on quality, quantity and intake-pattern. Construct-validity was evaluated based on association with conventional nutrients. Relationship of score with CVD-risk markers high-sensitivity C-reactive-protein (hs-CRP), body-mass-index (BMI) and body-fat-percent was examined at single point in time in proof-of-concept 12-weeks pre-post intervention among free-living Indians (25-44 years, n=55). Predictive ability of diet-pattern score change on hs-CRP change over a period of time was also evaluated. **Result:** Associations of iPACE DQI score with mean daily intake of key nutrients were robust and in expected direction [protein ($r=0.5$, $p<0.001$), total fat ($r= -0.4$, $p=0.002$), vitamin C ($r=0.5$, $p<0.001$), total-dietary-fiber ($r=0.5$, $p<0.001$), crude-fiber ($r=0.6$, $p<0.001$), total carbohydrate ($r=0.3$, $p=0.017$)]. Trends of hs-CRP, BMI and body-fat percent across increasing diet-pattern score showed highest degree of abnormality in lowest tertile (<35). Logistic regression model (exercise-adjusted) indicated higher likelihood for hs-CRP reduction (odds ratio: 4.6 times, 95% CI 0.4 to 47.6) among those with increase in iPACE DQI score as compared with no increase over

12 weeks. **Conclusion:** iPACE DQI is a 0-100 point quantitative measurement that assesses diet-pattern with respect to CHD-risk. It provides researchers /health practitioners with a handy tool for tracking diet-pattern change and concomitant CHD-risk reduction. **Keywords:** diet pattern, diet quality index, CHD, hs-CRP.

JACN-12 **VALIDATION OF DIET DIVERSITY SCORE THAT CAN PREDICT MICRONUTRIENT ADEQUACY OF 6-10 Y OLD RURAL CHILDREN,*Archana Konapur,*** K. Madhavan Nair,N. Balakrishna, R. Harikumar, Bharati Kulkarni, G.M.Subba Rao, National Institute of Nutrition (ICMR), Hyderabad. Email:- konapurarchana@gmail.com.

Background & Objectives: Considering that low diet diversity is the major reason for micronutrient malnutrition among children (6-10 y), there is a need for a rapid assessment tool that can predict micronutrient adequacy of children. A context specific diet diversity score (DDS) was developed for this purpose. This study aimed to validate DDS developed against nutrient intake. **Materials & Methods:** The study was conducted in two villages of Ghatkesar sub-district, Medchal District Telangana. Demographic details, height, weight and biomarkers of micronutrient status of 76 children were measured using pretested questionnaire, standardized tools and methods. A 24 hour diet recall was obtained on 3 non-consecutive days using weighment method. Estimated average requirements were used to calculate probability of adequacy (PA) and Mean PA (MPA). DDS was validated with MPA using Spearman's correlation. To test the median difference of nutrient intake between children consuming adequate/inadequate micronutrients Mann- Whitney U test was done. Sensitivity/specificity of DDS was determined using area under the receiver-operating-characteristic (ROC) curve. **Result :** DDS was significantly correlated ($p<0.001$) with MPA ($r=0.48$) and PA for vitamin A ($r=0.41$), vitamin C ($r=0.46$),thiamine ($r=0.42$),riboflavin ($r=0.41$),niacin ($r=0.49$),folate ($r=0.52$),vitamin B12 ($r=0.26$),calcium ($r=0.47$),zinc ($r=0.35$) and iron ($r=0.45$). A trend ($p=0.07$) was observed between DDS and height-for-age (HAZ). HAZ was significantly ($p<0.05$) correlated with nutrients intake, hemoglobin and ferritin status. Out of the 13 food group, >60% of requirement was met by consumption of ≥10 food groups with area under the curve of 0.76. Children consuming ≥10 food groups had a significantly higher intake of certain nutrients compared to children with DDS <10. However, there was no association between DDS and biomarkers of micronutrients status. **Conclusion:** DDS developed was validated against nutrient intake. DDS can be a useful predictor of micronutrient adequacy and a DDS of ≥10 should suffice to identify children with a micronutrient adequate diet (MPA >60%) with optimal sensitivity and specificity. K**eywords:** micronutrient adequacy, diet diversity score, validation, 6-10 y old rural children.

JACN-13 **IMPROVING FOOD AND NUTRITION SECURITY BY POSITIVE DEVIANCE APPROACH-A CASE CONTROL STUDY USING PUBLIC-PRIVATE PARTNERSHIP IN RURAL HOUSEHOLDS OF VADODARA, WESTERN INDIA, *Chitrarpita Saha,*** Vanisha S Nambiar, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat.Email:- schitrarpita@gmail.com.

Background & Objectives: The study aimed at improving Food and Nutrition Security (FNS) in rural households with mother-child (<5y) pairs using public private partnership (PPP) and positive deviance approach (PDA). **Materials & Methods:** A case-control community trail aided by a local industry, wherein all households (HHs) with mother-child (<5y) pairs registered in ICDS, were enrolled (n=160) from 4 clusters, randomly divided into experimental and control group. Indicators of FNS (FAO 2006) were used for data collection and key pointers leading to food insecurity were recorded. Following 1year intervention trial using the PPP model and PDA where four attributes were assessed Household Dietary Diversity (HDD), Infant and Young Child Nutrition (IYCN) Practices, Hygiene and Sanitation (H&S) Practices and weight for age of children. Data were analyzed using SPSS23 software. **Result :** Gross food insecurity, 100% below poverty line (<$1.90/d/person), poor utilisation with stunted (60%), wasted (36%) and underweight (59%) children and underweight mothers (54%); low Household dietary diversity scores (HDDS) (43%), poor IYCN practices (48%) and poor H&S score (32%) resulted in only 13 mothers with PDBs available for PDA promotion. PPP led to 2 new Anganwadis (AW) and improvement in existing AW, promotion and distribution of drumstick seeds and samplings, smokeless chulha, installation of solar bulbs and solar street lights and new drinking water pipelines along with a significant positive shift in wasting and under-nutrition status of children of the experimental group using PDA. **Conclusion:** Poor utilisation is the biggest challenge in rural communities. Innovative options such as PDA along with PPP on a continuous basis may lead to enhanced FNS along with social security nets. **Keywords:** food and nutrition security, household dietary diversity, Infant and Young Child Nutrition, positive deviance approach, public-private partnership

JACN-14 **DEVELOPMENT AND VALIDATION OF HOUSEHOLD FOOD SAFETY INDEX (HFSI) AND IDENTIFICATION OF KEY FOOD SAFETY ISSUES AMONG RURAL AND URBAN HOUSEHOLDS,** ***S G D Nagalakshmi Reddi*[1],** Subbarao M Gavaravarapu[1], M Vishnuvardhana Rao[2], Sudershan Rao Vemula[1], 1=National Institute Of Nutrition,ICMR,Hyderabad.2= National Institute Of Medical Statistics, ICMR, New Delhi. Email:-Gaganareddy42@Gmail.Com.

Background & Objectives: Food safety is an essential pillar along with food and nutrition security to ensure well-being of households. In India, majority of foods are prepared at household level. Cooked food stored (>2 hours) and uncooked foods are susceptible to microbiological contamination due to unsafe food handling practices. This study aimed to develop and validate a Household Food Safety index (HFSI) that can predict household food safety status and the same for addressing critical food safety issues. **Materials & Methods:** In this cross-sectional study, for development of HFSI, primary food prepares (N=400) were selected @200 each from rural (RangaReddy district) and urban (Hyderabad) homes of Telengana. An 87-item pre-tested questionnaire covering knowledge (43), practices (36) and enabling assets (8) was administered on subjects. Weightages were assigned for responses and maximum possible score was 205. Simultaneously, at consumption point @400 each of stored cooked-food, drinking water samples and hand rinses were collected from participants for microbial analysis. Each of the 87 variables were associated with high-risk foodborne pathogen (Salmonella spp.) risk value (1.55 logCFU/g) in order to identify the key risk variables that would form the HFSI. The HFSI was then administered on 200 rural and urban(@100each) subjects for assessing the food safety status. **Result :** The mean score was 124.9 out of 205. Eleven out of 87 parameters were significantly associated ($p<0.05$) with pathogen risk in foods. The optimal cut-off value for validated 11-item HFSI score estimated 9 and it was found to have a sensitivity (77%), specificity (74%) and AUC-0.808 which are acceptable. Rural households showed significantly lesser HFSI score than the urban. Practice of separating raw and cooked foods in urban, reheating of stored cooked foods in rural and hand washing are mostly predicting the food safety risk. **Conclusion:** HFSI is simple tool to rapidly assess food safety status of homes. Identified key practices can be addressed through food safety education. **Keywords:** Index, Food safety, Households.

FREE COMMUNICATIONS SESSION

ORAL PRESENTATIONS

16th November 2018 **4.30 PM – 6.30 PM**

NUTRITION EDUCATION AND COMMUNICATION

Code No.	Name and Address	Title of Presentation
OPNEC-01	***Komal Chauhan***, Department of Foods And Nutrition, Faculty of Family And Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat, India. Email:- komal.chauhan-fn@msubaroda.ac.in	Impact Of Nutrition Health Education (Nhe) On Elderly Subjects Of Urban Vadodara With Mild Cognitive Difficulties.
OPNEC-02	***Pallabika Gogoi***, Avinashilingam Institute For Home Science And Higher Education For Women, Coimbatore, Tamil Nadu Email:- pallabika.gogoi.pg@gmail.com	Development And Evaluation Of A Database "Asstranutriment" On Traditional Therapeutic Foods Of Assam
OPNEC-03	***Paromita Banerjee***, National Institute of Nutrition,Hyderabad Email:- paromitabanerjee0806@gmail.com	Identifying The Opportunities And Barriers Of Promoting Health And Lifestyle Of Corporate Employees Through A Corporate Wellness Programme- A Formative Research
OPNEC-04	***Suvodatta Sinha*** National Institute of Nutrition, Hyderabad Email:- nutridatta@gmail.com	Making Home Kitchen Safe: Assessing The Impact Of Communication Intervention On Food Safety Scores Of The Households
OPNEC-05	***Godbharle Swapnil Rajendra***, Interdisciplinary School of Health Sciences, Savitribai Phule Pune University Email:- swapnilg660@gmail.com	Development And Pilot Testing Of Water, Sanitation And Hygiene (Wash) Education Material On Diarrhoea Prevention Among Children Under 5 Years
OPNEC-06	***Vijayata Sengar***, Department of Foods And Nutrition, Faculty of Family And Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat. Email:- v_sengar@yahoo.com	Training School Going Adolescents For Self Assessment Of Dietary Quality And Assessing The Efficacy Of Healthy Eating Index For Adolescents As A Self-Assessment Tool

OPNEC-01 IMPACT OF NUTRITION HEALTH EDUCATION (NHE) ON ELDERLY SUBJECTS OF URBAN VADODARA WITH MILD COGNITIVE DIFFICULTIES. ***Komal Chauhan***, Department Of Foods And Nutrition, Faculty Of Family And Community Sciences, The Maharaja Sayajirao University Of Baroda, Vadodara, Gujarat, India. Email:- komal.chauhan-fn@msubaroda.ac.in

Background & Objectives: Mild Cognitive Impairment (MCI) affects memory, causing changes in daily function, dependent with decrease in the quality of life. Nutrition Health Education is a process that helps to adopt healthy practices and life-style. **Materials & Methods:** Elderly subjects of 65-75 years from urban Vadodara were assessed for nutritional status, life style pattern, dietary and morbidity profile and cognitive functions using mini mental state examination (MMSE) and cognitive impairment test (CIT). Hundred and ten subjects found with MCI. On stratified random sampling experiment group received NHE for 3 months and post data was collected on cognition functions and KAP. Data analysed on MS Excel 2007, for t test and coefficient correlation. **Result:** Prevalence of MCI was 31.4% the with mean age 68.8±2.54 years. The anthropometric measurements showed that 12.9% females were overweight whereas 2.5% males, 68.5% were at risk of central obesity against 37.5 % males. Time spent on exercises and yoga was less whereas on sleep, sitting idle and spending leisure time was more. Diets of 74.5% subjects were vegetarian, only 22.7% and 29.1% of subjects frequently consume vitamin B12 and omega-3 rich foods. Low intake of energy, protein, iron, calcium, vitamin B12 and β carotene was noted. Minor oral problems ranked first, 72.7% had lack of appetite, 82.5% males had low mood as compared to 62.8% females. Key features of NHE tools were role of nutritional, physiological, social and general aspects on MCI. The intervention data showed improvement ($p \leq 0.001$) in MCI level of experimental group, 47.3% and 72.7% subjects were shifted to normal category as per MMSE and CIT scores with most impact on knowledge on physiological aspects. Highly significant improvement ($p \leq 0.001$) was found on practice scores also.
Conclusion : Thus an educational tool at early stage can lead to knowledge gain, positive attitude and change in good practices. **Keywords:** cognition, elderly, education, knowledge

OPNEC-02 DEVELOPMENT AND EVALUATION OF A DATABASE "ASSTRANUTRIMENT" ON TRADITIONAL THERAPEUTIC FOODS OF ASSAM ***Pallabika Gogoi***[1], Dr. V.Premala Priyadharshini[2], Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Tamil Nadu. Email:- pallabika.gogoi.pg@gmail.com

Background & Objectives: Assam, a state with a blend of culture, heritage, faith and belief of numerous ethnic tribes with a distinct food culture has once been a cradle of therapeutic cuisines. Urbanization and westernization has resulted in a drastic shift of eating habits of people of Assam leading to spare usage of recipes that have potential therapeutic values .Reintroducing the forgotten therapeutic recipes into the tribal communities of Assam is the need of the day. **Objective (Primary)**:Develop and evaluate the performance of a database "ASSTRANUTRIMENT" on traditional therapeutic tribal foods of Assam. **Materials & Methods**: A total of 50 tribal women (purposive sampling) above the age group of 60 years from Sadiya in Assam were interviewed to collect the original traditional therapeutic recipes of Assam. A total of 120 traditional therapeutic tribal recipes were collected ,documented and classified for 13 different disease conditions namely Gastrointestinal diseases(43), Degenerative diseases(15), Infectious diseases(21), Respiratory diseases(14), Liver disease(8), Renal disorder(3), Cardiovascular Disease(3), Reproductive problems(5), Nutritional deficiency(20), Sleeping disorder(2), Vision problem(2), Blood toxicity(2) and Others (1). The classified recipes were standardized and tested for it's acceptability by a semi trained panel of 10 members using a 9 point hedonic scale. The database "Asstranutriment" was developed using the programming language Core PHP for designing the frontend of the database and MySQL was used for formatting the backend. Database Asstranutriment was developed with five in built modules. **Result** : Module 1 : Asstra Vignette: displays brief introduction about culture, heritage and food habits of Assam. Module 2: Asstra Thera Exotica: displays the recipes categorized under 13 therapeutic conditions. (ingredients, method of preparation, preparation time ,portion size and weight per portion , The bio active components of the major ingredients that is believed to give the therapeutic properties is also given along with the recipes for the users to get scientific authentication .Module 3: Asstra Reckon: It projects the

nutrient content of all the 120 recipes standardized and also enables the viewer to view the nutrient content of any individual ingredients he/she wishes to view(IFCT,2017,NIN).Module 4: Asstra Fact Bank: It educates the users on the causes ,symptoms and the dietary management of some of the common communicable and non communicable diseases.Module 5 : Asstra Glossy Trove: It projects the pictorial description, scientific name, local name and the regional name (Tamil name) for all the major ingredients of the recipes. **Conclusion :** The database was rated to be very good for attributes like – authentication, user friendly, usability, reliability, readability and novelty and creativity and was well received and appreciated by the doctors and dietitians for it's authentication of information given in the database.

OPNEC-03 IDENTIFYING THE OPPORTUNITIES AND BARRIERS OF PROMOTING HEALTH AND LIFESTYLE OF CORPORATE EMPLOYEES THROUGH A CORPORATE WELLNESS PROGRAMME- A FORMATIVE RESEARCH. ***Paromita Banerjee***, Subbarao GM, Bhanuprakash Reddy G.National Institute of Nutrition. Email:- paromitabanerjee0806@gmail.com

Background & Objectives: The 'Digital India' and 'Make in India' initiatives of Indian Government have accelerated the growth of Information Technology-Business Process Outsourcing sectors which employ around half-a-million Indians. The lifestyles promoted by this sector are blamed in part for exacerbating Non Communicable Diseases (NCDs) among employees, creating huge loss to national income. Herein we report from the formative research of a study that aimed to identify opportunities and barriers of developing a Corporate Wellness Programme (CWP), as per WHO 'healthy workplace model'**Materials & Methods:** The study employed two qualitative exploratory methods- Focus Group Discussions (FGDs) and non-participant observation (NPO). Two IT companies, with >5000 and <500 employees were purposively selected. Five FGDs were conducted with 38 employees to assess the factors affecting their food and physical activity practices. The facilities available, food and physical activity behaviour at workplace were assessed by NPO, using a checklist. FGDs were analysed using grounded theory approach. **Result :** The opportunities of development of a CWP were - (i) Areas for nutrition education and willingness to take part in awareness programmes (ii) Senior management recognised the need and favoured introduction of CWP (iii) willingness to utilise the existing facilities for physical activity, (iv) scope for modifying display of foods in cafeteria. The barriers were: (i) Perceived inability to manage time for physical activity, (ii) Positive bias among junior employees – not considering themselves at risk of NCDs (iii) fear of appraisals being affected if engaged in physical activity during working hours, (iv)Limited opportunity of changing the food options in cafeterias (v) Inefficiency of wellness coordinator. The checklist showed difference in facilities provided in the two companies – food environment, physical activity promotion, recreation etc. **Conclusion :** This qualitative study aided in understanding opportunities and barriers in different scales of corporate setups and the findings are being used to execute a programme in these companies **Keywords:** Corporate wellness, Employee health, occupational health, Non Communicable Diseases, Sedentary lifestyle

OPNEC-04 MAKING HOME KITCHEN SAFE: ASSESSING THE IMPACT OF COMMUNICATION INTERVENTION ON FOOD SAFETY SCORES OF THE HOUSEHOLDS. ***Suvodatta Sinha***, S. G. D. N. Lakshmi Reddi, V. Bhaskar G. M. Subba Rao, National Institute of Nutrition, Hyderabad Email:- nutridatta@gmail.com

Background & Objectives: Various standards and regulations are made by regulatory bodies to ensure food safety from production to retailing level for controlling food-borne diseases as food gets contaminated and becomes unsafe for consumption. But at consumer level in households there is no regulation or standards to reduce food-borne diseases. Foods are likely to get contaminated through inappropriate storage, cooking and cross contamination at home. There is a need to assess food safety at household level. In India a Validated Household Food Safety Index was developed with 11 variables to assess food safety at households. This study hypothesized that targeted communication using a multi-media approach would help to improve household food safety indices and the objective was to assess households' food safety scores before and after educational intervention. **Materials & Methods:** A cross-sectional study was conducted among primary food-preparers in households of Hyderabad and rural areas of Telangana. Subjects (N= 120) were selected 40 each from urban, rural and slum. Validated household food safety index

was used for data collection. Educational films, pamphlets and videos were developed as education materials in Telugu, Hindi and English with key messages which addressed identified 5 food safety key issues**. Result :** After retention period, out of 120, 110 subjects retained. Mean scores at baseline (8.59) and post-assessment (13.72) were significantly ($p<0.05$) different with 5 points increase. Eight out of nine food safety practices have shown significant ($p<0.05$) between pre and post-assessment. A significant improvement in scores was observed after intervention in residential areas and among subjects of different education levels**. Conclusion :** Educational material which address 5 messages and their respective actions were significantly effective in changing scores positively in rural and slum residents where essential enabling assets required to ensure food safety are not sufficient. Illiterates and subjects with secondary education also improved their scores positively as an effect of educational intervention. **Keywords:** Food Safety, Households, Educational Intervention.

OPNEC-05 DEVELOPMENT AND PILOT TESTING OF WATER, SANITATION AND HYGIENE (WASH) EDUCATION MATERIAL ON DIARRHOEA PREVENTION AMONG CHILDREN UNDER 5 YEARS. ***Godbharle Swapnil Rajendra***,Jori Chandrashekhar,Bibek Raj Giri, Zakir Hussain Mirzaie, Jeyakumar Angeline, Interdisciplinary School of Health Sciences, Savitribai Phule Pune University
Email:- swapnilg660@gmail.com

Background & Objectives: Nutrition-sensitive interventions combined with nutrition specific interventions improve nutrition and health behaviour. The study aimed to develop education material on WaSH interventions, and assess its content and effectiveness. **Materials & Methods:** A three-phased evaluation study that involved development of education material (two posters: one on diarrhoea and second on WaSH practices) for WaSH intervention in Phase I; evaluated and modified the content of the education material in Phase II. A questionnaire comprising of 13 questions pertaining to a) relevance, b) comprehensibility and c) layout was tested for content analysis in a sample (n=38) that comprised of 10 public-health experts, 5 housekeeping employees from university campus and 23 mothers from an anganwadi. Phase III pilot tested the intervention for its effectiveness among 40 mothers attending ANC centre in Talegaon, Pune using a questionnaire comprising of 17 questions. Descriptive analysis was performed for content analysis and McNemars test to analyse change in knowledge, attitude and practices post intervention. **Result :** In content analysis maximum score for the domains pertaining to relevance and comprehension was 5 each and layout was 3. For these the scores for respective posters 1 and 2 were 4.34±0.9 and 4.00±1.1 for relevance; and 4.89±0.3 and 4.95±0.2 for comprehension. Pre-test obtained 100% correct responses for questions pertaining to personal hygiene, followed by contaminated food (95%), open defecation (80%), contaminated drinking water (70%) and <60% for source of water as cause of diarrhoea. Maximum increase was obtained in questions pertaining to continuation of breast feeding during diarrhoea (0.078), followed by open defecation and drinking water as cause of diarrhoea ($p=0.18$ and 0.28). All other domains showed improvement in scores but none were significant. **Conclusion :** The communication material was effective in improving awareness of participants. Supplementary methods need to be adopted to improve knowledge in other domains. **Keywords:** WaSH, Education material, Diarrhoea

OPNEC-06 TRAINING SCHOOL GOING ADOLESCENTS FOR SELF ASSESSMENT OF DIETARY QUALITY AND ASSESSING THE EFFICACY OF HEALTHY EATING INDEX FOR ADOLESCENTS AS A SELF-ASSESSMENT TOOL. ***Vijayata Sengar***, Department of Foods and Nutrition, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat. Email:- v_sengar@yahoo.com

Background & Objectives: Improving dietary quality can have long term health and growth benefits for adolescents. Healthy Eating Index for Adolescents (HEIA) is a valid and reliable tool to assess dietary quality. Thus, imparting training in use of HEIA as self-assessment tool can enable adolescents to measure and evaluate their dietary quality by themselves. The major objective of the study was to train school-going adolescents for self-assessment of dietary quality and to assess the efficacy of HEIA as self-assessment tool for evaluating dietary quality. **Materials & Methods:** Data was obtained from 109 subjects from 2

schools regarding dietary intakes and knowledge, attitude and practices (KAP) of the subjects. Schools were randomly allocated to Experimental group (EG-62 subjects) and Control group (CG-47 subjects) for Nutrition Health Education program (NHE). **Result:** Prevalence of stunting and overweight was 54% and 24% respectively. Dietary quality assessment showed that all the subjects belonged to need improvement category. Training module on HEIA and its different components was developed on the basis of KAP data. Twelve sessions were conducted over 2 months for EG subjects. Mean HEIA scores, total grains, total vegetables, total fruit, total milk and variety scores significantly improved while significant reduction in total edible oil and SOFAAS scores was observed in EG subjects post training. Correlation and Bland Altman analysis showed no significant difference between the self assessed (by the subject) and researcher assessed HEIA scores indicating that HEIA can be used as self-assessment tool. Similar findings were observed after washout period of one month indicating retention of knowledge post training. **Conclusion:** Thus, training module developed for HEIA training can be used for educating adolescents to evaluate their dietary quality themselves and to modify individual components where they received fewer scores. School authorities and parents can also be involved and steps should be taken to make it a part of their learning activities.
Keywords: Nutrition health education, dietary quality evaluation, Adolescents, self assessment

16th November 2018 **4.30 PM – 6.30 PM**

NUTRITION AND HEALTH POLICY RESEARCH / SPORTS NUTRITION

Code No.	Name and Address	Title of Presentation
OPNHSP-01	Srishti Sinha, St. John's Research Institute, St. John's National Academy of Health Sciences, Bangalore, India. Email:- srishti.s@sjri.res.in	Revisiting dietary iron requirement and deficiency in Indian women: Implications for fortification and supplementation.
OPNHSP-02	Neepa Banerjee, HPAFU, Department of Physiology, University of Calcutta. Email:- bneepa.15@gmail.com	Climate change and nutrition security: Tracing the linkage.
OPNHSP-03	Madhurima Roy, Sports Authority of India, NSEC, Kolkata. Email:- madhurima.nin.icmr@gmail.com	Prevalence of abnormal eating behaviour and body shape concern among game specific female athletes: An exploratory approach.
OPNHSP-04	Zoobi Khanam	Withdraw
OPNHSP-05	Sanchit Makkar, St. John's Research Institute, St John's Medical College, Email:- sanchit.m@sjri.res.in	Economic implications of double fortified salt.
OPNHSP-06	Ishani Sanjay Ghotikar, National Institute of Nutrition. Email:ishanimayaghotikar@gmail.com	Acute mountain sickness among high altitude Indian himalayan trekkers.

OPNHSP-01 REVISITING DIETARY IRON REQUIREMENT AND DEFICIENCY IN INDIAN WOMEN: IMPLICATIONS FOR FORTIFICATION AND SUPPLEMENTATION. Srishti Sinha[1], Santu Ghosh[1], Tinku Thomas[1],Harshpal S Sachdev[2], Anura V Kurpad[1],1=St. John's Research Institute, St. John's National Academy of Health Sciences, Bangalore, India, 2= Sitaram Bhartia Institute of Science and Research, New Delhi, India. Email:- srishti.s@sjri.res.in

Background & Objectives: Anaemia in Indian women continues to be highly prevalent and is thought due to low dietary iron. However, the risk of inadequate iron intake has never been estimated which should be based on estimated average requirement (EAR) cut-point method. Therefore, there is a need for transparent determination of EAR for iron and estimation of risk of inadequate iron intake in this population. **Materials & Methods:** The EAR of iron is derived as the ratio of average physiological requirement (basal and menstrual losses) and bioavailability of iron from the diet. The distribution of iron requirements was estimated by Monte Carlo simulations from probability distribution of daily basal and menstrual iron loss which were corrected for 8% dietary iron absorption. The risk of inadequate iron intake was calculated by probability approach, using 'usual intake distribution' of dietary iron intake estimated from National Sample Survey Organization (NSSO) 68th round household survey data in combination with Indian food composition table. **Result :** The analysis determined the EAR for iron of 15mg/d, in contrast to present value of 21mg/d. Applying the new EAR on dietary intake data from NSSO for estimation of risk of inadequate iron intake showed that the dietary iron deficiency was about 25% lower than previously thought, with considerable heterogeneity between states. With the addition of 10mg/d iron in diet through fortification, the risk reduced to 18% and virtually disappeared when supplementary iron intakes through supplementation program were considered. However, the risk of exceeding the tolerable upper limit began to appear in some states to as high as 54%, when iron is supplied from both fortification and supplementation. **Conclusion:** The newly and transparently defined EAR of iron for Indian women should be used to evaluate the benefits and risk of iron fortification and supplementation policies. **Keywords:** Iron requirement, Women of reproductive age, Dietary iron deficiency, Iron fortification, Iron supplementation

OPNHSP-02 CLIMATE CHANGE AND NUTRITION SECURITY: TRACING THE LINKAGE ***Neepa Banerjee***, Sandipan Chatterjee, Ayan Chatterjee, Ayan Chatterjee, Satabdi Bhattacharjee, Surjani Chatterjee, Shankarashis Mukherjee. HPAFU, Department of Physiology, University of Calcutta. Email:- bneepa.15@gmail.com

Background & Objectives: Nutrition security, which exists when food security is combined with a sanitary environment, adequate health services, and proper care and feeding practices to ensure a healthy life for all household members, is of great importance especially in the present environmental context. On the other hand, climate change phenomenon caused inter alia due to global warming, because of increased emission of GHGs, has been responsible for about 0.6° C rise in ambient temperature during the 21st century. It is projected that 1.8 - 4.0 (average 3.0) °C increase will take place by 2100 AD depending on actions taken to limit GHG emissions and future developmental scenario. An attempt, in this context, has been made to review the impacts of climate change on nutrition security and the existing mechanisms, strategies, and policies to address them. **Materials & Methods:** Literature search and an analysis were performed to understand the mechanisms by which climate change phenomenon is impacting the nutritional security and the existing and novel potential strategies to address it. **Result:** Climate extreme, variability and change are directly impacting food security, livelihoods, household food access, maternal and child care, health, water and sanitation, and many socioeconomic factors influencing nutrition security. It has been found that although measures are being taken in order to minimize the negative impacts of climate change, still now there exists a gap between research and practice, knowing-doing or science-policy. Coherence of both adaptation and mitigation approaches is required to face the nutritional security challenge posed by climate change. In every sphere, which inter alia includes technological development, economic growth, capacity building and policy intervention, nutrition sensitive adaptations may be of use to address such challenges. **Conclusion:** Climate change has direct impacts on nutrition security resulting into under-nutrition, one of the world's most serious but least addressed public health challenge. An integrated multi sectorial approach of direct nutrition interventions coupled with nutrition sensitive policy formulation and implementation can address the threats to food and nutrition security in the present changing environment. **Keywords:** adaptation, Millennium Development Goals, mitigation, quality of life, household food access, under-nutrition.

OPNHSP-03 PREVALENCE OF ABNORMAL EATING BEHAVIOUR AND BODY SHAPE CONCERN AMONG GAME SPECIFIC FEMALE ATHLETES: AN EXPLORATORY APPROACH. ***Madhurima Roy***, Subhra Chaterjee, Swapan Dey. Sports Authority of India, NSEC, Kolkata. Email:- madhurima.nin.icmr@gmail.com

Background & Objectives: The prevalence of eating disorder has become a growing health concern among female athletes. To achieve and maintain a perfect body shape athlete often follows restrictive dieting which ultimately leads them to eating disorders. The purpose of the study was to identify the proneness of abnormal eating behaviors and to explore its relationship with perceived stress, body shape concern, emotional eating, total mood disturbance and food choice between professional female athletic populations who engage in different sports category. **Materials & Methods:** One hundred and forty healthy young female participants matched for BMI were selected by stratified random sampling. Subjects were divided into 4 categories i.e. artistic gymnast, endurance sports, anaerobic game group and healthy controls. Structured questionnaires were used for data collection during their non competitive session.A non parametric test, Kruskal Wallis followed by Mann Whitney test was applied to compare different parameters among the groups. Regression model examined the associations among disordered eating behaviors, stress, body shape concern, emotional eating, total mood disturbance and food choice. **Result:** Result revealed disordered eating behaviour was significantly prominent in control and gymnast group than other two groups. About 36% of total subject showed abnormal eating behaviours while 64% had no such abnormalities. Control group obtained the highest score in stress and emotional eating while gymnast secured the highest score in body shape concern. Mood disturbance was more prevalent in anaerobic game group. Significant correlations were observed between stress & fast food eating, depression and sweet consumption. Body mass index, body shape concern, emotional eating and total mood disturbance were identified as strongest predictor of EAT-26 scores. The result revealed that controls and gymnast group exhibit more abnormal eating behaviors than other athletic population. **Conclusion:** The nutritionist and supports staffs of the team needed to make them aware regarding importance of balance diet for healthy lifestyle and motivate them to manage competitive pressure. **Keywords:** Eating disorder, Body shape concern, Stress, Food habit, Female athletes, Game specificity

OPNHSP-04 ***Zoobi Khanam***, - Withdraw

OPNHSP-05 ECONOMIC IMPLICATIONS OF DOUBLE FORTIFIED SALT. ***Sanchit Makkar[1],*** Sumedha Minocha[1], Kishore Govinda[1] Sumathi Swaminathan[1], Anjaly Teresa John[1], Tinku Thomas[1], Venkatesh Mannar[2], Anura V Kurpad[1]. 1=St. John's Research Institute, St John's Medical College, 2=University of Toronto, Canada, Email:- sanchit.m@sjri.res.in

Background & Objectives: The primary agenda of policy making is to enhance the social and economic value of a given population. The focus of the present study is to evaluate the possible benefits of providing Double Fortified Salt (DFS) which extend beyond reducing the burden of given micronutrient deficiencies and helps in improving the quality of life by enhancing the productivity and wages of the target population and hence, contributing towards an increase in Gross Domestic Product (GDP). **Materials & Methods:** National sample survey organization (NSSO) Employment- Unemployment data was triangulated with the NSSO Consumer Expenditure data at an individual level for the year 2011-12 using a statistical matching technique, and associations between wages and anaemia were found. The status of anaemia was predicted using mathematical modelling of anaemia level response to a wide range of nutrient intakes (from expenditure data) in adult women and men. This included iron intake from heme and non-heme sources along with inhibitors and enhancers in the diet. Further, a structural model for wage determination was used and a dummy for anaemia was introduced as an independent variable, controlling for education, experience and other demographic factors that were associated with wages. **Result:** It is observed that there is a significant and negative association between anaemia levels and wages at a national level. A state level analysis suggests that this association holds for some states but not in others. Depending on the type of employment, sex and sector, on an average, the non- anaemic population earn around 2-8% higher wages than anaemic population. **Conclusion:** On an average, non-anemic population earn higher wages than anemic population with variable effects across states. Given the multisectoral nature of the problem, iron fortification could have a reasonable impact depending on the relative strength of other extraneous determinants of work output and wages. **Keywords:** Iron, Economics, Policy, Anaemia, Wages

OPNHSP-06 ACUTE MOUNTAIN SICKNESS AMONG HIGH ALTITUDE INDIAN HIMALAYAN TREKKERS. ***Ishani Sanjay Ghotikar***, Department of Work Physiology and Sports Nutrition, National Institute of Nutrition. Email:- ishanimayaghotikar@gmail.com

Background & Objectives: High altitude trekking is on the rise with limited research among Indians on physiological changes leading to Acute Mountain Sickness [AMS]. The Lake Louise Score (1991, 2018) is a self - reporting tool used to diagnose AMS. Thus, this study aims to understand the prevalence of AMS and the possible predisposing factors leading to AMS among Indian Himalayan trekkers. **Materials & Methods:** Secondary data analysis was performed on cardiorespiratory parameters (oxygen saturation, heart rate) of 5,023 trekkers in the Indian Himalayas. Independent samples t-test was employed to assess the differences in variables between trekkers "with" (AMS group) and "without" (No AMS group). Acute Mountain Sickness was diagnosed using both 1991 and 2018 Lake Louise Scores [LLS], the difference between the two questionnaires being the inclusion of the presence of a headache (of any severity) as mandatory and exclusion of sleep symptoms in the 2018 LLS. **Result:** Out of the 5,023 trekkers, AMS was observed in 319 (6.3%) trekkers (1991 LLS), while the incidence was 132 (2.6%) according to the 2018 LLS. Across AMS and No AMS groups, no significant differences were observed in age, body mass, Body Mass Index and blood pressure. However, height showed a difference (P-value<0.05), with shorter trekkers exhibiting more symptoms of AMS. Oxygen saturation upon arrival at higher altitude showed no significant difference across groups, while the evening and the following morning (>12 hours) oxygen saturation was lower among the AMS group. Average heart rate was significantly higher in subjects exhibiting symptoms of AMS. **Conclusion:** A lower height, higher heart rate, and lower oxygen saturation were observed among trekkers with AMS. Further, the lower oxygen saturation in the evening and following day among AMS group indicates a time lag between arrival at high altitude and onset of the illness.

ORAL PRESENTATIONS - EXPERIMENTAL NUTRITION

16th November 2018 **04:30 PM – 6:00 PM**

Code No.	Name and Address	Title of Presentation
OPEN-01	Kotamballi N Chidambara Murthy, Central Research Laboratory, Ramaiah Medical College and Hospital, MSRIT Post, MSR Nagara, Bengaluru-560054, India. Email:- kncmruthy@gmail.com	Evidence based cancer prevention bioactive molecule from citrus- valuable information for bench to bed translation.
OPEN-02	Ayesha Kherani, Department of Foods, Nutrition and Dietetics, College of Home Science Nirmala Niketan, University of Mumbai. Email:- ayeshakherani2595@gmail.com	Effect of vitamin D and probiotic supplementation in patients with rheumatoid arthritis.
OPEN-03	Dipayan Choudhuri,	Withdraw
OPEN-04	*Dr.Shubhra Saraswat*. Manav Rachna International Institute of Research & Studies. Email:- shubhra.fas@mriu.edu.in	Biochemical evaluation of the health enhancing effects of probiotics augmented by some non conventional foodstuffs with prebiotic activity and development of food products incorporating them.
OPEN-05	Sindhu Kashyap St. John's Research Institute, St. John's National Academy of Health Sciences, Bangalore, India Email:-sindhu.k@sjri.res.in	True ileal digestibility of legumes determined by dual isotope tracer method in Indian adults.
OPEN-06	Jijnasa Bordoloi, CSIR-North East Institute of Science and Technology(Neist),Jorhat,Assam. Email:- bordoloijijnasa9@gmail.com	Gamma-glutamyl carboxylated proteins are lower in patients with hyperlipidemia and vitamin K supplementation prevents impaired lipid metabolism via activating gla-proteins in high fat diet fed mice.
OPEN-07	Srividya Gopalakrishnan, Department Of Biochemistry, National Institute Of Nutrition. Email:- gsrividya98@gmail.com	Procyanidin-b2 an active component of cinnamon extract inhibits proteasomal activity and induces growth arrest in human prostate cancer cells.
OPEN-08	Navneet Agnihotri	Withdraw
OPEN-09	Ithayamalar S Seethalakshmi Ramaswami College, Trichy. Email:- ithayaaa@gmail.com	Impact of intervention on body composition of selected obese young adults and implication of selected gene polymorphism on its outcome**.**
OPEN-10	Dr. Koushik Das, Raja Narendra Lal Khan Women's College. Email:- koushikphysiology@yahoo.com	Isolation And Identification Of Omega 3 Fatty Acids From Sea Fish (Bholabhetki) Oil.

OPEN-01 Evidence based cancer prevention bioactive molecule from citrus- valuable information for bench to bed translation. ***Kotamballi N Chidambara Murthy***, Central Research Laboratory, Ramaiah Medical College and Hospital, MSRIT Post, MSR Nagara, Bengaluru-560054, India. Email:- kncmruthy@gmail.com

Background & Objectives: Use of natural plant based ingredients for treatment, prevention and managements of human disease is an ancient concept originated from India and other South Asian countries (Patwardhan et al., 2005). There are good amount of evidence at all level to prove the health benefit of plant based diet rich in fruits and vegetables (Liu, 2013). Early research on benefits from diet has led to explore the benefit of each of the plant/ plant based ingredients. Towards this, our research is focused to understand the benefit of most commonly used citrus fruits and explore its benefits in cancer. Citrus fruit is one of the most widely consumed fruit across the globe and there are more than 200 verities of fruits cultivated and used in the form of juice, fresh fruit, and concentrate or food formulations. Citrus is globally one of the highly consumed fruit with an annual production of over 87 million metric tons [Orange of 49.3 million metric tons 30.0 million metric tons of tangerine and 7.5 million metric tons of Lime/Lemons] (Source of data USDA website https://apps.fas.usda.gov/psdonline/circulars/citrus.pdf accessed on 23rd July 2018). Citrus fruits have shown wide range of health benefits, including source of Vitamin C, antioxidants like carotenoids, polyphenols, flavonoids, terpenoids, source of functional ingredients like pigments, volatile oil, polymethoxy flavones etc.,(Abeysinghe et al., 2007). Our research is focused on understating complete phytochemicals profile of citrus fruits in both edible and non-edible part and explores its health benefits especially in less explored or understood area. Towards this, we have isolated more than 30 compounds from different citrus fruits, seed and peel. In the current paper, results of cancer prevention activity of one of the major triterpenoid, obacunone that has shown potent cancer cell inhibition activity through multiple pathways as studied by in vitro model. **Materials & Methods:** Both Obacunone and OG were isolated form powdered Marsh White grapefruit seeds as per published method (Jayaprakasha et al., 2007) samples were subjected for HPCL to confirm the purity and chemical structure were confirmed using 13CNMR as mentioned in our previous publication (Chidambara Murthy et al., 2011). Proliferation inhibition screening: To understand the effect of both Obacunone and OG on proliferation of three different cancer cells namely SW480, Panc-28 and LNCaP cells and normal cells like NIH3T3 (Mouse embryonic fibroblast) cells, RWPE-1 (human prostate epithelial) were subjected to both MTT assay and cell count assay using different concentrations of obacunone and OG as explained in our previous publication (Chidambara Murthy et al., 2011a). Confirmation of Apoptosis induction: DNA fragmentation assay, Annexin-V staining assay and quantification enzymes such as caspaspe-3, 8 and cytochrome-c was done using ELISA kits and protocols as mentioned in our previous publications (Chidambara Murthy et al., 2012). Western blotting to understand the expression of protein and mechanism: Expression of different proteins after treatment of 50 and 100μM obacunone and its glucoside for different intervals (12, 24, 48 h) was studied using western blotting protocols (Chidambara Murthy et al., 2011). The protein expression studied were markers associated with apoptosis (Bax, Bcl2, Caspase-3, cleaved products of Capsae-3, Caspase-8), inflammation (IL-6, Cox-2 and NF□B), cell signaling (Akt, pAKt), hormone (AR) and antigen (PSA). To normalize the expression and protein binding to antibodies, in each experiment β-actin was used as control. Statistical methods: The above experiments were performed as three biological replicates with minimum of three replicates for each concentration and time point. Results were expressed as standard error ± mean using the values from all the replicates and ANOVA was performed for activity studies and data was analyzed by Tukey's post-test analysis using Graph Pad Prism software version-5.00.288. **Result:** The IC50 values for obacunone and OG were 97.02 ± 4.1 and 109.7 ± 2.49 μM, respectively after 24 h in SW480 cells. Panc-28 cells have shown relatively less activity with 42% of inhibition after 72 h of treatment with 100 μM of obacunone. In LNCaP cells, inhibition of 37 and 30% was observed after 24 h of treatment with 100 μM of obacunone and OG, respectively. Up to 80% inhibition was observed after 48 h or treatment with both the compounds. SW-480 and LNCaP cells have shown genomic DNA fragmentation into 200 bp fractions after treating with both obacunone and OG. In case of Panc-28 cells, cell treated with compounds were stained with Annexin-V, suggesting the involvement of programmed cell death. Induction of 5 to 6 fold higher caspase-3 activity was observed with obcunone (100μM) treatment in SW480 cells. Panc-28 cells showed increase in the content of caspace-3 by two fold was with treatment of OG for 48h. Similarly, 30-40% increase in the activity was observed with treatment of compounds to LNCaP cells. Western blot results suggest that both compounds

could increase the expression of Bax and decrease the expression of Bcl2. SW480 cells showed that treatment of obacunone and OG resulted in depletion in the expression of Bcl2/ Bax by 0.8 and 0.85-fold after 48 h. In Panc-28 cells, ratio of Bcl2/Bax depleted by 9 & 10 fold with treatment of 50 µM obacunone for 24 and 48 h, respectively. Major proteins involved in inflammation NFkB, IL-6 and Cox-2 were inhibited with treatment of compounds as observed in case of Panc-28 cells. Treatment of 100 µM compounds has shown decrease in the expression of Akt and its phosphorylated product in LNCaP cells. Treatment has also induced decreased expression of AR and PSA, key clinical markers of prostate cancer. **Conclusion:** Results of the study suggest that both obacunone and it glucoside can inhibit all the three organ specific cancer cells in both dose and time dependent manner. Interestingly, there was no toxicity observed in case of both NIH3T3 and RWPE-1 normal cells used for comparison. This provides information that these compounds are highly suitable to protect the normal cells during treatment, which is a major clinical challenge. Results of the DNA fragmentation assay suggests that the compounds are inducing apoptosis to inhibit proliferation and results were comparable with that of camptothecin, a natural chemotherapeutic agent used as positive control. Upon confirming the induction of apoptosis, it was our interest to understand extent of cell death and modulation in apoptosis associated protein expression modulation. It was observed that both compounds are capable of altering many pathways at 50 and 100 µM concentration, which is very effective. Unlike synthetic molecules which have specific binding site and known to execute single pharmacological activity, natural molecules are capable of producing more than one pharmacological effect. This may be due to capability of binding to multiple sites or its effect on universally expressed proteins/ genes. One of the best examples for such activity is curcumin which is known to possess several pharmacological activates mediated through multiple pathways (Patil et al., 2009). On similar line results from our study indicate that obacunone, a triterpenoid known for bitter taste is capable of inhibiting cancer cells through multiple pathways. These results suggest that obacunone and its glucoside are good cytotoxic compounds selectively on cancer cells (Chidambara Murthy 2015). Potency of compound warrants its benefit in cancer, which need further studies to take it to human applications. **Keywords:** Apoptosis, Bioactive compounds, Cancer Cell lines, Citrus, Obacunone, Triterpenoids

OPEN-02 EFFECT OF VITAMIN D AND PROBIOTIC SUPPLEMENTATION IN PATIENTS WITH RHEUMATOID ARTHRITIS. ***Ayesha Kherani***, Veena Yardi, Zubair Sorathia. Department of Foods, Nutrition and Dietetics, College of Home Science Nirmala Niketan, University of Mumbai. Email:- ayeshakherani2595@gmail.com

Background & Objectives: The present study aimed at investigating the effectiveness of vitamin D and probiotic supplementation (Lactobacillus acidophilus La5 and Bifidobacterium BB-12) in improving disease activity score (DAS-28 CRP) and Visual Analogue Scale (VAS) score in patients with Rheumatoid Arthritis (RA). Materials & Methods: In this clinical trial, patients who were newly diagnosed with Rheumatoid Arthritis or were suffering from a disease flare-up, aged 18-60 years, were selected using purposive sampling technique. Patients who fulfilled European League against Rheumatism/ American College of Rheumatology (EULAR/ACR) (2010) criteria were recruited into the study to receive either Disease Modifying Anti Rheumatic Drugs (DMARDs) and Vitamin D supplement (control group), or DMARDs with vitamin D and a probiotic capsule containing 109 colony forming units (CFU) of L. acidophilus La5 and B. BB-12 (intervention group) for a duration of 3 months. DAS-28 CRP was calculated and VAS score was evaluated and high-sensitivity C- reactive protein (hsCRP) and erythrocyte sedimentation rate (ESR) were measured. Fifteen patients were recruited in each group and analyzed. Result : Results suggested that hsCRP values, tender joints count (TJC), DAS-28 CRP values and VAS score were reduced significantly in both the control ($p<0.05$) as well as the intervention ($p<0.05$) group. ESR values were found to be significantly lower only after probiotic supplementation ($p<0.05$). At the end of the study, a significant difference was observed between the two groups for DAS-28 CRP ($p=0.007$; $p<0.05$), in favor of the probiotic group. No adverse effects were reported for the intervention. Conclusion: It may be concluded that vitamin D and probiotic supplementation may be an adjunct therapy for RA patients, may help in improving inflammatory status, and in lowering disease activity in patients with RA. **Keywords:** Rheumatoid Arthritis, disease activity score (DAS-28 CRP), Visual Analogue Scale (VAS) score, Vitamin D, Probiotic.

OPEN-03 ***Dipayan Choudhuri***, - withdraw

OPEN-04 BIOCHEMICAL EVALUATION OF THE HEALTH ENHANCING EFFECTS OF PROBIOTICS AUGMENTED BY SOME NON CONVENTIONAL FOODSTUFFS WITH PREBIOTIC ACTIVITY AND DEVELOPMENT OF FOOD PRODUCTS INCORPORATING THEM. ***Dr.Shubhra Saraswat***. Manav Rachna International Institute of Research & Studies. Email:- shubhra.fas@mriu.edu.in

Background & Objectives: The human intestinal microbiota is known to play an important role in human health; serving as an attractive target for clinical interventions. Scientists and researchers have become increasingly interested in assessing the therapeutic and nutritional ability of probiotics and prebiotics. The present study was aimed at validating the hypocholestrolemic and hypoglycaemic potential of probiotics-prebiotics (Cichorium intybus as the main prebiotic source) combine in medicinal and food forms and developing food products incorporating them. **Materials & Methods:** The study participants (Age: 25-55 yrs and BMI: 20-23 kg/m2) selected purposively (total serum cholesterol: 170-220 mg/dl and random blood sugar levels: 80-120 mg/dl) were divided into control and test group. Test group was subjected to two intervention phases: primary and secondary. In the part named, primary the subjects were divided into two test groups T1P and T2P, the former given probiotic in encapsulated form in combination with prebiotic recipe for a period of 30 days, and the latter given probiotic alone. Biochemical indices were determined on day 1, 15 and 30. After a cooling off period of 7 days, the secondary part of intervention began by renaming the test groups T1P and T2P groups as T1S and T2S respectively. Like in the primary part, T1S subjects were supplemented with the recipe made out of probiotic curd and prebiotic food stuffs, majorly chicory powder. In the same vein, subjects comprising the T2S were supplemented with probiotic curd without the corresponding prebiotic component. The secondary part also lasted for 30 days and again, biochemical indices were evaluated on day 1, 15 and 30.**Result:** The test group supplemented with prebiotic- probiotic combine resulted in decreased serum total cholestrol, LDL-Cholestrol and triglycerides and raised HDL cholesterol, both in the primary and secondary part of the intervention phase. **Conclusion**: Probiotics alone were not able to bring sizable changes in blood biochemical indices of human subjects over a time period of 60 days. However, their blending with prebiotics produced significantly diminishing effects in the corresponding blood determinations. Keywords: PROBIOTIC, PREBIOTIC, HYPERCHOLESTROLEMIC, HYPOGLYCEMIC

OPEN-05 TRUE ILEAL DIGESTIBILITY OF LEGUMES DETERMINED BY DUAL ISOTOPE TRACER METHOD IN INDIAN ADULTS. ***Sindhu Kashyap[1],*** Aneesia Varkey[1], Nirupama Shivakumar[1], Sarita Devi[1], Rajashekar Reddy[1], Tinku Thomas[1], Thomas Preston[2], Sheshshayee Sreeman[3], Anura V Kurpad[1]. 1=St. John's Research Institute, St. John's National Academy of Health Sciences, Bangalore, India.2= Scottish Universities Environmental Research Centre, East Kilbride, Scotland, United Kingdom.3= University of Agricultural Sciences, Bangalore, India.Email:- sindhu.k@sjri.res.in

Background & Objectives: High quality plant protein sources are important for protein adequacy in a balanced diet, as well as for environmental sustainability. Legumes are known to be a good source of high quality protein, but the true ileal digestibility of indispensable amino acids (IAA) of commonly consumed legumes is not known in humans. Therefore, we aimed to measure the true ileal IAA digestibility of intrinsically labelled chickpea, yellow pea, and mung bean protein using the dual isotope tracer technique and to determine the effect of dehulling on true ileal IAA digestibility of mung bean. **Materials & Methods**: The 2H intrinsically labelled legumes were obtained after watering plants with deuterium oxide (2H2O). These were administered in a plateau feeding method to healthy Indian adults to determine their true ileal IAA digestibility using the dual isotope tracer technique with [U-13C] spirulina protein as the standard protein. Similarly, the digestibility of dehulled mung bean was also measured. The Digestible Ileal Amino Acid Score (DIAAS) of the legumes was calculated. **Result**: The mean ± SD true ileal IAA digestibility of chickpea, yellow pea, and mung bean were 74.6 ± 0.8%, 71.6 ± 1.3%, and 63.2 ± 1.5% respectively. The true ileal digestibility of mung bean improved to 70.9 ± 2.1% after dehulling. The limiting IAA based on DIAAS was methionine. **Conclusion**: The mean true ileal IAA digestibility of legumes in healthy Indian adults was lower than expected. Traditional processing techniques such as dehulling improve protein

digestibility by about 8%. The low DIAAS value for legumes implies that higher quantities must be consumed in mixed diets to meet quality protein requirements. **Keywords**: intrinsic labelling, dual isotope tracer technique, legume protein, chickpea, yellow pea, mung bean, dehulling, Digestible Ileal Amino Acid Score (DIAAS)

OPEN-06 GAMMA-GLUTAMYL CARBOXYLATED PROTEINS ARE LOWER IN PATIENTS WITH HYPERLIPIDEMIA AND VITAMIN K SUPPLEMENTATION PREVENTS IMPAIRED LIPID METABOLISM VIA ACTIVATING GLA-PROTEINS IN HIGH FAT DIET FED MICE. ***JIJNASA BORDOLOI*****,** Dibyajyoti Ozah, Dr. Jatin Kalita, Dr. Prasenjit Manna. Csir-North East Institute of Science and Technology (Neist), Jorhat, Assam. Email:-bordoloijijnasa9@gmail.com

Background & Objectives: Coagulation unrelated vitamin K [VK]-dependent gamma-glutamyl carboxylated [Gla]-proteins have attracted scientific attention because of their association with various health disorders. This study examines the hypothesis that circulating Gla-protein deficiency may be associated with hyperlipidemia and VK supplementation may reduce the impaired lipid metabolism via activating VK-dependent Gla-proteins. **Materials & Methods:** Patients with hyperlipidemia [n=22] and age-matched healthy controls [n=19] attending clinic at CSIR-NEIST have been included in this study. The plasma levels of Gla-proteins, VK, triglyceride, total cholesterol, and liver function enzymes were measured in all subjects. The beneficial effects of VK supplementation were examined using high fat diet [HFD]-fed male albino mice model. Plasma biochemical assay, liver histology, immunoblotting, immunoprecipitation, quantitative PCR, ELISA, and enzyme activity bioassay were performed to understand the molecular mechanism. Data were analyzed statistically by using Sigma Stat statistical software. **Result:** Circulating Gla-proteins and VK were lower in patients with hyperlipidemia. Interestingly, Gla-proteins were significantly and positively correlated with VK and negatively with total lipid levels in hyperlipidemic patients, which suggests that VK supplementation may reduce the hypelipidemia via augmenting the Gla-proteins. Further animal studies demonstrated that VK supplementation [5 µg/kg BW,8wks] reduced the plasma lipid levels and attenuated the intrahepatic lipid accumulation by modulating the AMPK/SREBP1/PPARα pathway of lipid metabolism in HFD-fed mice. VK supplementation also enhanced the plasma levels of total Gla proteins and its protein expression in hepatic tissue of HFD-fed mice. **Conclusion:** The present study for the first time demonstrates the beneficial effect of VK supplementation in preventing hyperlipidemia via activating VK-dependent Gla-proteins. The outcome of the study will be helpful for the development of a novel adjuvant therapy to achieve better control of lipid profile and that may improve the lives of the patient population associated with hyperlipidemia. **Keywords:** Vitamin K, Gla proteins, hyperlipidmia, lipid metabolism.

OPEN-07 PROCYANIDIN-B2 AN ACTIVE COMPONENT OF CINNAMON EXTRACT INHIBITS PROTEASOMAL ACTIVITY AND INDUCES GROWTH ARREST IN HUMAN PROSTATE CANCER CELLS. ***Srividya Gopalakrishnan*****,** Dr.G.Bhanuprakash Reddy, Dr.Ayesha Ismail. Department of Biochemistry, National Institute of Nutrition. Email:-gsrividya98@gmail.com

Background & Objectives: The inhibition of the proteolytic activity of 26S proteasome, the protein-degrading machine, is now considered a novel and promising approach for cancer therapy. Interestingly, proteasome inhibitors have been demonstrated to selectively kill cancer cells and also enhance the sensitivity of tumor cells to chemotherapeutic agents. Abnormal activity of the proteolytic machine is observed in many disease conditions. Hence, either inhibition or activation of the 26S proteasome is thought to be a novel therapy for treatment of certain disorders such as cancer and neurodegenerative disorders. We tested the potential of cinnamon and its active component procyanidin-B2 (PCB2) in inhibiting the catalytic activities of the proteasome and suppressing prostate cancer cell growth. **Materials & Methods:** PC3 and LNCaP human prostate cancer cell lines were are used. Proteasome activities were measured using fluorogenic substrates specific for the different enzymatic activities of the 26S proteasome by flourimetry. Cell growth was assessed using MTT and clonogenic assays. and Cell cycle analysis was done to monitor the phase at which growth is arrested. Apoptosis was determined by the Annexin V binding assay. **Result:** The cinnamon extract and the PCB2 fraction of cinnamon inhibited the catalytic activities of the purified proteasome and the proteasome in cancer cells but not in normal cells. Further, cinnamon and

its active component decreased cell proliferation and led to apoptotic cell death of human prostate cancer cells but not normal cells. **Conclusion:** The Cinnamon and its active component, PCB2 act as proteasome inhibitors and anti-cancer agents. **Keywords:** Cinnamomum Zeylanicum; procyanidin-B2; proteasome inhibitor; cancer

OPEN-08 ***Navneet Agnihotri*** - Withdraw

OPEN-09 IMPACT OF INTERVENTION ON BODY COMPOSITION OF SELECTED OBESE YOUNG ADULTS AND IMPLICATION OF SELECTED GENE POLYMORPHISM ON ITS OUTCOME**.** ***Ithayamalar S*[1]**,** Kowsalya S.1= Seethalakshmi Ramaswami College, Trichy, 2= Avinashilingam University, Coimbatore. Email:- ithayaaa@gmail.com

Background & Objectives: The recognition that nutrients could interact and modulate molecular mechanisms underlying an organism's physiological functions has prompted a revolution in the field of nutrition. Performing population-scaled epidemiological studies in the absence of genetic knowledge may result in erroneous scientific conclusions and misinformed nutritional recommendations. The relationship between genes and diet is of enormous help in the field of nutrition. A genetic predisposition to obesity and possible impaired metabolic and appetite regulation make it difficult to lose and, more importantly, to maintain weight loss. Because of the psychological and physiologic impact of dieting, individuals should be encouraged to attain and maintain a reasonable body weight. Pathogenesis of obesity is multifactorial and involves both genetics and environmental factors. Thus, the clue for weight loss could be obtained via genetic implications that would particularly help young adult population to personalize diet and lifestyle modification. Sedentary lifestyle and excess caloric intake due to obesogenic environmental changes coupled with genetic susceptibility likely contributed to the recent escalation of obesity rates. Hence, it was of interest to develop a food mix and supplement the same as a dietary intervention along with physical activity intervention and nutrition education intervention. Peroxisome Proliferator Activator Receptor (PPAR) Gamma polymorphism were analysed using Restricted Fragment Length Polymorphism (RFLP) technique. Genotyping of the patients was performed to identify the Pro12Ala (rs1801282)polymorphism in the PPAR gamma gene The study was presented before the Institutional Human Ethical Committee of the Avinashilingam University and ethical approval was obtained (AUW/IHEC13/FHP-02). The trial was also registered in Clinical Trial Registry of India (CTRI) of ICMR and trial registration number was obtained (CTRI/2014/11/005222. **Objectives:** Evaluate the impact of interventions on body composition and anthropometry, To relate the implications of PPAR Gamma polymorphism and obesity parameters. **Materials & Methods**: The urban area of Coimbatore district was selected. Young adults in the age group of 19 – 24 years were recruited. A total of 1873 participants from different colleges were randomly selected for screening. The subjects were screened for obesity, overweight and normal category using the BMI latest Asian cut-off (WHO, 2000). Out of 1873 participants, a total of 150 subjects were chosen for further study. Based on the BMI, the subjects were divided into three groups viz obese, overweight and normal. Out of 150 subjects, 75 subjects were male and 75 subjects were females. Purposive sampling technique was used for this selection. The inclusion and exclusion criteria were strictly followed for the recruitment of subjects. The intervention study was conducted by supplementing the developed food mix to selected subjects of various groups such as obese, overweight and normal subjects. Impact of intervention was evaluated based on the changes in anthropometric, biochemical, body composition, metabolic syndrome parameters and physical activity pattern after supplementation. Peroxisome Proliferator Activator Receptor (PPAR) Gamma polymorphism were analysed using Restricted Fragment Length Polymorphism (RFLP) technique. Genotyping of the patients was performed to identify the Pro12Ala (rs1801282) polymorphism in the PPAR gamma gene. Body composition were analysed in INBODY 720 body composition analyser. As a part of dietary intervention, 50g of the prepared supplement was given to the subjects daily for a period of 4 months. In physical activity intervention, a set of twelve exercises were instructed to be performed by the subjects for 45 minutes each day. Nutrition education was given to all the subjects. The phenotype (obese, overweight and normal) Vs genotype variation based on single nucleotide polymorphism was taken as a primary criterion and other criteria such as diet, biochemical parameters physical activity parameters, body composition were compared and respective statistical tools were applied. **Result:** Prevalence of pro 12 ala: The prevalence of Pro 12 Pro was found to be 78.3 and 75 percent among male and female obese subjects. An equal per cent of male and female subjects (77.27%) exhibited pro 12 pro polymorphism among the selected overweight subjects while around 95 and 91 per cent of the normal male and female subjects were identified to possess pro 12 pro polymorphism BMI of the Subjects: The distribution of subjects based on Body Mass Index and gender revealed that prevalence of obesity was 19.91 and 23.21 per cent among the male and female subjects respectively. Prevalence of overweight among the selected subjects

were found to be higher among females (22.87%) than males (13.33%). The results of phytochemical screening of the food supplement: It showed the presence of maximum secondary metabolites (alkaloids, tannin and phenolic compounds, flavonoids and protein) in all the ingredients of the food supplement in ethanol extract than aqueous extract. The supplement exhibited 151.96±1.98 mg/100g of gallic acid equivalent of flavonoids followed by the aqueous extract of the supplement containing 12.238±0.33 mg/100g. The keeping quality of the functional food mix was found to be best within one week of preparation Mean changes in Body weight: The differences in weight for the male and female obese subjects after intervention were found to be -4.79±1.28 and -3.52±1.13 which showed the efficacy of the functional food supplementation and the exercise regimen that were followed by the subjects Mean changes in BMI: Subjects with pro 12 ala polymorphism had a higher body weight and BMI at baseline when compared with subjects with pro 12 pro genotype. Among the variants, weight reduction was more pronounced among the males when compared with the females. **Conclusion:** The present study results proved the efficacy of intervention on reduction in body weight, body fat per cent and visceral fat area. Pro 12 ala polymorphism was high among obese and overweight subjects. Long term intervention would throw more light on the efficacy. Limitation of Methodology - The polymorphism was found to be in lower percentage in the selected sample. The study was conducted only among 19-24 years old subjects. **Keywords:** Body composition, obesity, young adults, supplement

OPEN-10 ISOLATION AND IDENTIFICATION OF OMEGA 3 FATTY ACIDS FROM SEA FISH (BHOLABHETKI) OIL. ***Dr. Koushik Das,*** Shrabanti Pyne, Meghamala Mandal, Deblina Giri, Holima Khatun. Raja Narendra Lal Khan Women's College.
Email:- koushikphysiology@yahoo.com

Background & Objectives: Sea fish oil (SFO) comes from oily sea fish tissues which contains huge amount of omega-3fatty acids viz, docosahexanoic acid (DHA) and eicosapentaenoic acid (EPA), harbinger of certain eicosanoids known as to decrease body inflammation, hypertriglyceridemia, and decreasing clinical depression, anxiety, cancer and macular degeneration. Literatures postulated that SFO consumption helps in reducing breast, prostate, colon cancer and prevent inflammation and decreases mammary gland tumours growth in rodents. These SFO or O3FA inhibits the action of inflammatory cytokines such as IL-6 and IL-1β and prevent neurodegenerative and autoimmune diseases. DHA and EPA converted into resolvins (Rvs), prostaglandins E 1 and 5 (PGE1 and PGE5), prostacyclin (PGI2) which resolve inflammation by inhibiting platelet aggregation. DHA and EPA Decreased production of prostaglandin E2 (PGE2) metabolites, thromboxane A2, a potent platelet aggregator and vasoconstrictor, leukotriene B4 formation, an inducer of inflammation, and a powerful inducer of leukocyte chemotaxis and adherence. So, objectives of the study were identification of DHA and EPA from sea fish. **Materials & Methods:** We collected the sea fish (local name: Bholabhetki, scientific name: Nibea soldado.) near the Dighamohona, coastal area of Bay of Bengal, Purba Medinipur district of West Bengal State in India. After collection of fish, cleaned up and chopped to dry in sunlight for few days. After completely drying, grinded and made fine dust for oil extraction. Fine sea fish dust 10 g was dissolved in to hexane - isopropanol mixture at 3:2 ratios and kept in shaker incubator for 24 hours. After that it was centrifuged and filtered by whatman no 1 filter paper and collected 2.7 ml oil. This oil mixed with sodium hydroxide, methanol, Sulphuric acid and n-haptane and refluxed by soxlet for 1 hour. Then saturated by adding anhydrous Sodium Sulphate till dry and collect the fatty acid methyl esters (FAMEs). FAMEs (1 ug/ml. **Result:** Main 3 fatty acids or fatty acids derivatives were identified by GC MS analysis, which formula was analysis by NIST MS Search 2.0 software ie., C20H22O5 (MW:526) 51%, C20H22O5W (MW:526) 22% and C24H39NO7 (MW:453) 10%. **Conclusion:** Bholabhetki sea fish is available at the coastal area of Bay of Bengal, which contains large amount of eicosa fatty acids and carbon 24 fatty acids. **Keywords:** Key words: Oil, Docosahexaenoic acid, Dighamohona, Bay of Bengal, TLC.

ORAL PRESENTATIONS - CLINICAL NUTRITION

16th November 2018 **04:30 PM – 6:00 PM**

Code No.	Name and Address	Title of Presentation
OPCLN-01	Wagle SS, Diabetes Unit, King Edward Memorial Hospital and Research Centre, Pune, India. Email:- sonalishree@gmail.com	Food frequency consumption and its association with body size and composition among offspring of diabetic and non-diabetic mothers in India.
OPCLN-02	Suhasini Mudraganam, Truweight Wellness Pvt. Ltd. Email: suhasini@truweight.in	Impact of weight loss and remission of diabetic parameters among type 2 diabetes clients enrolled in truweight program.
OPCLN-03	Baptist A, King Edward Memorial Hospital and Research Centre, Pune, India. Email:- alma.baptist@gmail.com	Association of dietary factors with microvascular complications of type 1 diabetes among young Indian T1D patients.
OPCLN-04	Devarajj P, ICMR- National Institute Of Nutrition. Email:- jpdevraj26@gmail.com	Effect of yoga nidra on blood pressure and mental health status of hypertensive subjects-A pilot study.
OPCLN-05	Ms. Varsha, Department of Home Science, Women's Christian College. Email:- varshabanthia@gmail.com	Effect of zinc supplementation on nutritional status and cognitive function to eradicate its hidden hunger in school- going children
OPCLN-06	Juhi Nema, Department of Mother and Child Health, Interactive Research School for Health Affairs (IRSHA), Bharati Vidyapeeth (Deemed to be University), Pune, India. Email:- bvduirsha@gmail.com.	Vitamin D status in pregnancy and its association with neonatal vitamin D: A longitudinal study.
OPCLN-07	Deepali Sundrani, Mother and Child Health Department, Interactive Research School for Health Affairs, Bharati Vidyapeeth Deemed University, Pune Sata ra Road, Pune. Email:- bvduirsha@gmail.com.	Maternal long chain polyunsaturated fatty acid status in early pregnancy and placental dimensions.

OPCLN-01 FOOD FREQUENCY CONSUMPTION AND ITS ASSOCIATION WITH BODY SIZE AND COMPOSITION AMONG OFFSPRING OF DIABETIC AND NON-DIABETIC MOTHERS IN INDIA. ***Wagle SS[1]***, Kumaran K[2], Ladkat R[1], Yajnik PC[1], Baptist A[1], Yajnik CS[1].1=Diabetes Unit, King Edward Memorial Hospital and Research Centre, Pune, India. 2=MRC Lifecourse Epidemiology Unit, University of Southampton, UK. Email:- sonalishree@gmail.com

Background & Objectives: Limited studies have assessed nutrition and studied its association with overweight and adiposity among offspring of diabetic mothers (ODM). With this in view, we followed children born to diabetic and non-diabetic mothers 2-26 years after delivery to assess their food frequency consumption and its association with risk of overweight and adiposity. **Materials & Methods**: We studied 200 ODM and 177 offspring of non-diabetic mothers (ONDM) who were matched for age, gender and socioeconomic status. We measured their body size (height, weight) and composition (DXA scan) using standard techniques. Overweight (IOTF for 2-18 y and WHO for >18 y) and adiposity (Khadilkar et.al. 2015) was defined based on the international and Indian reference standards. Child's nutrition was assessed using FFQ with 85 food items (during last 6 months), monthly consumption scores were calculated, categorized and compared between ODM and ONDM. The associations of food frequency consumption categories with body size and composition (age-gender specific SD scores) were studied using trend analysis. We also did interaction analysis to test whether risk of overweight-adiposity in ODM is modified by their food frequency consumption. **Result:** ODM consumed sweets, milk and milk products and vegetables and salads more frequently and cereals less frequently than ONDM. Frequent consumption of 'healthy foods' (dry fruits, milk and milk products, vegetables and salads) was associated with lower BMI. Frequent consumption of bakery products, fats, packed and preservative containing foods increased the risk for overweight and adiposity whereas consumption of oilseeds decreased the risk for the same. Interaction analysis showed that, food frequency consumption did not have an additive effect on the risk of obesity-adiposity in ODM, nor did they reduce the influence of maternal diabetes on the offspring's risk of obesity-adiposity. **Conclusion:** Our study demonstrates increased risk of obesity-adiposity in the children born in diabetic pregnancies which was not modified by their current lifestyle. **Keywords:** offspring of diabetic mothers, overweight, adiposity, food frequency consumption

OPCLN-02 IMPACT OF WEIGHT LOSS AND REMISSION OF DIABETIC PARAMETERS AMONG TYPE 2 DIABETES CLIENTS ENROLLED IN TRUWEIGHT PROGRAM. **Suhasini Mudraganam**, Laxmi Kulkarni, Shunmukha Priya, G. Jyothsna[4].Truweight Wellness Pvt. Ltd.Email: suhasini@truweight.in

Background & Objectives: Obesity is a serious problem associated with the risk of developing diabetes. Type 2 diabetes results from the body's ineffective use of insulin and 7.8% people in India have diabetes. With healthy diet, maintaining normal body weight, and physical activity can prevent or delay as well as control Type 2 diabetes. The specific objectives of the present study were to assess the impact of weight loss on HbA1c level and to observe the correlation between macro-nutrient intake and weight loss in type 2 diabetic subjects enrolled in Truweight program. **Materials & Methods**: The present study was a nine months clinical observation of diabetic clients enrolled in the Truweight program. The study participants (N=50) comprised of 27 males and 23 females with a BMI > 25 kg/m2, between the age group of 30 - 65 years and were selected using purposive sampling technique. Initial weight, BMI, HbA1c values were collected using standard procedures. Diet plan with addition of superfoods were provided and the plan was designed to fulfill the nutritional requirements of the clients. Paired t-test, correlation coefficient, model F test and regression methods were used for statistical analysis. **Result**: In the present study, there was significant reduction in the BMI (32.59±4.72 to 29.78±4.04) and HbA1c level (8.47±1.90 to 6.44±1.02) among subjects. Dietary intake of all the macro-nutrients (carbohydrates, protein, fat and fiber)were positively correlated with weight loss. There was a significant reduction in HbA1c level as weight loss increased. **Conclusion**: The present study showed that with decrease in the BMI by 2.81 ± 1.50 kg/m2 results in the reduction of Hba1c level by about 2.02 ± 1.66 in a span of 9 months. A personalized diet counselling with super foods and physical activity played an important role in managing Type 2 diabetes. **Keywords:** Weight loss, BMI, HbA1c, Diet, Macronutrients.

OPCLN-03 ASSOCIATION OF DIETARY FACTORS WITH MICROVASCULAR COMPLICATIONS OF TYPE 1 DIABETES AMONG YOUNG INDIAN T1D PATIENTS. ***Baptist A*[1]**, Wagle SS[1], Shah S[1], Salvi S[2], Yajnik CS[1]. 1=King Edward Memorial Hospital and Research Centre, Pune, India. 2=Chest Research Foundation, Pune. Email:- alma.baptist@gmail.com

Background & Objectives: Relation of dietary factors with microvascular complications of Type 1 Diabetes (T1D) among young Indian T1D patients is less researched topic. We aim to assess the association of dietary factors (frequency of food consumption) with prevalence of microvascular complications and its risk factors. **Materials & Methods:** FFQ data (48 food items, recall of last 3 months) was collected, monthly scores calculated and categorized. Using standard techniques these patients were assessed for microvascular complications (retinopathy, nephropathy and neuropathy), their risk factors (poor glycemic control, elevated Blood pressure, dyslipidemia, overweight-obesity, elevated Waist-Hip Ratio(WHR)) and defined using age-classified international cut-offs. Association of dietary factors with prevalence of complications and its risk factors was done using logistic regression (adjusted for duration of diabetes, age at study, gender and age at diagnosis) and risk is reported as β (95%CI). **Result :** We studied 200 T1D patients attending Diabetes Unit, KEM Hospital Pune (41% male), age at diagnosis [11.2years (median), 1month (min.) - 42(max.) years] and duration of diabetes (11.9 years, 1-52 years). In our population , healthy foods (whole grains, salad, dry fruits, egg, fish etc) were consumed more frequently as compared to unhealthy foods (frozen/ready-to-eat foods, fast food). However, Indian sweets (gulabjamun, barfi etc.) and deep-fried foods (batatawada, samosa etc.) were consumed more frequently. Prevalence and risk of microvascular complications decreased with higher consumption of fiber containing food (legumes, whole grains, salads and dry fruits; β: 0.24, 0.08-0.73) and Non-veg foods (fish, chicken and eggs; β:0.18, 0.04-0.64). Prevalence of elevated BP and WHR decreased with increased frequency of fiber containing and non-veg foods consumption respectively. Prevalence of overweight and WHR increased with frequency of fast food and deep-fried food consumption. **Conclusion:** Our study shows, dietary factors are associated with microvascular complications among Indian T1D patients. Further longitudinal studies on this association are needed. **Keywords:** type 1 diabetes, microvascular complications, dietary factors.

OPCLN-04 EFFECT OF YOGA NIDRA ON BLOOD PRESSURE AND MENTAL HEALTH STATUS OF HYPERTENSIVE SUBJECTS-A PILOT STUDY. ***Devarajj P*,** Raja Sriswan Mamidi, Santosh Kumar B, Jagadish B, Sylviya F. Rao, Vijayabhaskar Desai,R Hemalatha. Icmr- National Institute Of Nutrition. Email:- jpdevraj26@gmail.com

Background & Objectives: Hypertension (HTN) exerts a substantial public health burden in India. Patients with hypertension may experience mental health disorders particularly anxiety, depression and stress. Yoga Nidra is a “systematic” method of inducing complete physical, mental and emotional relaxation. It is observed that Yoga Nidra, when used along with a standard therapy, is a safe, inexpensive and very effective method of management of hypertension. The present study was conducted to assess the effect of “Yoga Nidra” on blood pressure and mental health among hypertensive subjects. **Materials & Methods**: Both known and newly diagnosed subjects (n=74) with HTN (blood pressure ≥140/90 mmHg) aged between 35-70 years were included in this study after obtaining NIN-IEC approval, and their consent. Subjects with critical illness and any psychological ailments were excluded from this study. The Experimental group (n=32) included with those subjects who showed interest in Yoga Nidra to practice daily (45 min/day) for 3 months at NIN premises. Blood Pressure was monitored weekly by the Physician before Yoga Nidra session. Others were included in control group (n=42) and were asked to continue with their regular diet and physical activity along with medications prescribed by their Physicians. Depression Anxiety Stress Scales (DASS)-21 questionnaires was used to assess depression, anxiety, and stress of both group in baseline and end point. **Result** : After adjusting baseline data, highly significant reduction of Systolic Blood Pressure (mean 16 mm/hg) and Diastolic Blood Pressure (mean 8.6 mm/hg) observed among experimental group ($p<0.001$**). A significant reduction of Depression (mean diff: 0.54 p:0.03), Anxiety(mean diff:0.8 p:0.0001) and Stress(mean diff;1.225 p:0.0001) were observed among experimental group. **Conclusion**: In this pilot study, we observed a significant reduction of blood pressure, Hs-CRP, Sr.Cortisol and level of Stress, depression

and anxiety were significantly reduced among Yoga Nidra group as compared with control group. There were no side effects observed during this study. **Keywords:** YOGANIDRA, HYPERTENSION, DASS-21

OPCLN-05 EFFECT OF ZINC SUPPLEMENTATION ON NUTRITIONAL STATUS AND COGNITIVE FUNCTION TO ERADICATE ITS HIDDEN HUNGER IN SCHOOL-GOING CHILDREN. ***Ms. VARSHA*** [1]**,** Mrs. Gayathri.V[2]. 1= Department of Home Science, Women's Christian College.2= Assistant professor, Department of Clinical Nutrition, Sri Ramachandra University. Email:- varshabanthia@gmail.com

Background & Objectives: The Indian plant based diet is a poor source of zinc and dietary zinc inadequacy is a major cause for under nutrition, stunting wasting, poor cognitive function among Indian children. Thus, strategies must be developed to eradicate the hidden hunger of zinc. So, this study was aimed to formulate a zinc rich supplement and study its effects on the nutritional status and cognitive function of School going Children. **Materials & Methods:** A simple random sampling technique was used to allocate 50 School-going children into 25 children in the experimental and 25 in the control group. The experimental group was provided with zinc supplement for 3 months and the control group was given nutrition counseling alone. Nutritional status (Height, weight, BMI) and cognitive function assessment (working memory and processing speed) was done in both the groups before and after supplementation. **Result:** Among 50 subjects in the experimental and control group there were 25 girls and 25 boys. The children belonged to age group of 6-15 years. After 3 months of zinc supplementation there was a highly significant ($p < 0.0005$) improvement in the height, weight, BMI and cognitive function of School-going children. **Conclusion:** School-going children to whom zinc Supplementation had been given for 3 months showed a statistically significant ($p < 0.0005$) improved nutritional status and cognitive function after supplementation thereby suggesting a positive effect of zinc on the improvement of nutritional status and cognitive function of children. **Keywords:** School-going children, Zinc, Nutritional status, Cognitive function

OPCLN-06 EFFECT OF ZINC SUPPLEMENTATION ON NUTRITIONAL STATUS AND COGNITIVE FUNCTION TO ERADICATE ITS HIDDEN HUNGER IN SCHOOL-GOING CHILDREN. ***Juhi Nema***[1], Deepali Sundrani[1], Karuna Randhir[1], Nisha Kemse[1], Vandana Suryawanshi[1], Shweta Madiwale[1], Sanjay Gupte[2], Sadhana Joshi[1]. 1= Department of Mother and Child Health, Interactive Research School for Health Affairs (IRSHA), Bharati Vidyapeeth (Deemed to be University), Pune, India. 2= Gupte Hospital and Research Centre, Pune, India. Email:- bvduirsha@gmail.com.

Background & Objectives: Low vitamin D levels during pregnancy may have adverse effects both on mother and child health. Limited studies have assessed vitamin D status longitudinally across gestation and results are conflicting. This study aims to determine the prevalence of vitamin D deficiency across gestation. It also examines the levels in cord blood its association with maternal vitamin D status. **Materials & Methods:** This study is a part of a large ongoing departmental study funded by ICMR. A total of 47 pregnant women enrolled at their first antenatal visit were included in this study. Maternal vitamin D was estimated using blood samples collected at four different time points across gestation that is V1= 11-14 weeks, V2= 18-22 weeks, V3= 26-28 weeks and V4= delivery and cord blood sample were collected following delivery to evaluate vitamin D status. Serum vitamin D was estimated using enzyme linked immunosorbent assay (ELISA). **Result:** At V1, mean serum maternal 25OHD levels were 26.70±14.44ng/ml. The prevalence of vitamin D deficiency (<20 ng/mL) and insufficiency (20-30 ng/mL) were 40.4 and 17% respectively. As pregnancy progresses, mean serum maternal 25OHD levels decreases from V2= 26.80±9.83 ng/mL, V3=23.67±7.71 ng/mL to 21.78±7.27 ng/mL at the time of delivery. Vitamin D deficiency increases as pregnancy progresses. Only 8% of total women had sufficient vitamin D levels (>30 ng/mL) at the time of delivery. Mean serum maternal 25OHD levels in cord blood was 20.48±7.67 ng/mL with vitamin D deficiency and insufficiency as 45.0 and 45.0%, respectively. There was a positive correlation between maternal vitamin D levels in early pregnancy and cord blood vitamin D levels and placental weight ($p<0.05$). **Conclusion:** There is a high prevalence of vitamin D deficiency in pregnant women and neonates. Vitamin D deficiency increases across gestation. Vitamin D status during pregnancy will influence fetal growth and development. **Keywords:** Vitamin D, Pregnancy, Prospective

OPCLN-07 MATERNAL LONG CHAIN POLYUNSATURATED FATTY ACID STATUS IN EARLY PREGNANCY AND PLACENTAL DIMENSIONS. ***Deepali Sundrani***[1], Kamini Dangat[1], Hemlata Pisal[1], Anupam Poddar[1], Sakshi Selukar[1], Girija Wagh[2], Savita Mehendale[2], Sadhana Joshi[1]. 1= Mother and Child Health Department, Interactive Research School for Health Affairs, Bharati Vidyapeeth Deemed University, Pune Satara Road, Pune.2= Department of Obstetrics and Gynecology, Bharati Medical College and Hospital, Bharati Vidyapeeth University, Pune. Email:- bvduirsha@gmail.com.

Background & Objectives: Placenta is an interface between the mother and the fetus, and transports various nutrients and hormones for fetal growth and development. Evidence suggests that the placenta plays a central role in fetal programming of diseases in later life. Nutrients like long-chain polyunsaturated fatty acids (LCPUFA) are essential for placental development from implantation. However, the influence of maternal fatty acid status in early pregnancy on placental size is not well understood. The current study aims to explore the association of maternal LCPUFA levels in early pregnancy with placental dimensions. **Materials & Methods:** This study is a part of a large ongoing ICMR study which recruits women in early pregnancy and follows them till delivery. 45 women with singleton pregnancy delivering at term (≥37 weeks of gestation), were included in this study. Maternal blood was collected at 11-14 weeks of gestation. Placenta was collected at delivery and its dimensions like shape, major axis, minor axis, breath, thickness, circumference and weight were recorded. Maternal erythrocyte fatty acids levels were estimated by gas chromatograph. **Result:** Maternal arachidonic acid (AA) levels were positively associated with placental breadth ($n=45$, $r=0.429$, $p<0.01$) and weight ($n=45$, $r=0.326$, $p<0.01$). Similarly maternal omega-6 fatty acids ($n=45$, $r=0.339$, $p<0.05$) and total PUFA ($n=45$, $r=0.323$, $p<0.05$) levels were positively associated with placental breadth. Placental dimensions like major axis, minor axis, breadth, circumference and weight were positively associated with birth weight ($p<0.001$ for all).**Conclusion:** Our results suggest that maternal LCPUFA status in early pregnancy influences placental growth and development. This may have implications for better pregnancy outcome and reduced risk of diseases in the offspring in later life. **Keywords:** placental dimensions, placental growth, fatty acids

ORAL - FOOD SCIENCE NUTRITION

17th November 2018 **11:00 AM – 1:00 PM**

Code No.	Name and Address	Title of Presentation
OPFSN-01	Rukaiya Noman Erenpurwala, Degree and P.G college for Women, Affiliated to Osmania University Hyderabad Telangana. Email:-nutrition5253@gmail.com	Evaluation of nutrient retention in products developed using drumstick fresh leaves and powder (moringa oleifera) by the application of different heat treatments.
OPFSN-02	Ramakrishna Vadde, Dept.of Biotechnology & Bioinformatics, Yogi Vemana University, Andhra Pradesh. Email:- vrkrishna70@gmail.com	Tamarind pulp suppresses the growth of ESBL produced multidrug resistance bacteria.
OPFSN-03	Suman Chakrabarty. Department of Anthropology, Mrinalini Datta Mahavidyapith, Birati, Kolkata. Email:- sumanshabar@gmail.com	Household food security and nutritional status among the rabha tribe living in fringe forest areas of North Bengal, West Bengal.
OPFSN-04	Yogeshwari R. Community Science College and Research Institute, Tamil Nadu Agricultural University, Madurai. Email:- yogeshfsn@gmail.com	Development of multigrain simulated rice analogues.
OPFSN-05	Sindhu Kashyap St. John's Research Institute, St. John's National Academy of Health Sciences, Bangalore, India Email:-sindhu.k@sjri.res.in	Effect of black tea on hen's egg protein digestibility using dual isotope tracer approach in Indian adults.
OPFSN-06	Swati Tiwari National Dairy Research institute, Karnal. Email:- swatitiwari838@gmail.com	Green bio refinery approach: A novel way for extraction of carotenoids from carrot bio-waste.
OPFSN-07	Shunmukha Priya.S, Truweight Wellness Pvt., Ltd., Bangalore, Email:-jayanthisreenivasan@gmail.com	In vitro bioaccessibility of iron and zinc in selected regional diets of Tamil Nadu.
OPFSN-08	PA.Raajeswari, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore. Email:-raajraajeswari@gmail.com	Impact of low cost functional food supplementation on HIV positive women - a clinical trial.
OPFSN-09	Seema Vijay Medhe, Email:- sam_medhe@rediffmail.com	Physiochemical and functionalities evaluation of raw and processed moth bean - underutilized legume in India.

OPFSN-01 Evaluation of nutrient retention in products developed using drumstick fresh leaves and powder (Moringa oleifera) by the application of different heat treatments. ***Rukaiya Noman Erenpurwala***. Dr.A.V. Vasundhara Madina. Degree and P.G college for Women, Affiliated to Osmania University Hyderabad Telangana. Email:-nutrition5253@gmail.com

Background & Objectives: Moringa, a multipurpose tree, is the most credible plant providing worthy nutrition. Pharmacologically, studies have reported the effects of this plant including antimicrobial, antioxidant, anti-inflammatory and analgesic hypotensive, antiulcer, cardioprotective and wound healing activity. (Journal of coastal life medicine – Muhammad shoib Amjad et al.,2010). However, these innumerable benefits can be of maximum help only when the right heat processing technique is employed while preparation of the food product incorporated with it. As, the right heat processing technique assures the maximum retention of the nutrients in the developed products and therefore maximum benefit. Due to the effect of different heat processing techniques on the nutrient's retention capacity, the study was planned with the following objectives BROAD OBJECTIVE – Four heat processing techniques i.e Roasting, Microwave heating, Frying and Steaming were employed to develop products incorporated with moringa fresh leaves and moringa leaf powder, in order to understand the difference within the heat processing techniques in the products ML and MP, and between the same processing techniques effect on products ML vs MP SPECIFIC OBJECTIVES – 1) To develop and standardise products made by incorporating moringa fresh leaves in roti, puri khakhra and dhokla form using different heat processing techniques i.e. roasting, frying, microwave heating and steaming, respectively 2) To develop and standardise products made by incorporating moringa leaf powder in roti , puri khakhra and dhokla form using different heat processing techniques i.e. roasting , frying , microwave heating and steaming respectively 3) To calculate the nutritive value of all the developed products 4) To conduct sensory evaluation by numerical scoring test in order to assess the acceptability of the developed products 5) To check the acceptability by using mean and standard deviation formulas 6) To determine the moisture and ash content in the developed products 7) To compare the.**Materials & Methods:** The ingredients used for the preparation of Roti, Pori, Khakhra and Dhokla were wheat flour, moringa fresh leaves, moringa leaf powder, jaggery and oil (Table 1). Most of the products were procured from the super market except moringa fresh leaves, which were freshly plucked and moringa leaf powder, which were de-moisturized using a hot air oven. Four heat processing techniques i.e. roasting, microwave heating, frying and steaming were employed to develop roti, pori. khakhra and dhokla, each incorporated with moringa fresh leaves and moringa leaf powder respectively (Fig 1). All the products were evaluated using numerical scoring method on an untrained panelist (n=30) and statistically analyzed using mean, standard deviation and ANOVA scores. The moisture content of all the developed products was determined followed by its ash analysis. Ash solutions were prepared of all the developed products for the estimation of Iron and Calcium. Iron was estimated using Wong's method where in iron was determined calorimetrically with ferric iron which gave a blood red color with potassium thiocyanate and Calcium by titrimetric method wherein the ionic calcium present in the medium precipitated as calcium oxalate when treated with ammonium oxalate. **Result** : The medium used for cooking food determines to a great extent the nutrients which shall be retained while consumption. The effect of different heat processing techniques on the retention of iron and calcium within the products developed by incorporation of moringa fresh leaves and leaf powder, respectively and in between the products i.e. products developed by incorporation of moringa fresh leaves vs moringa leaf powder was found to be having a significant difference at 5% level. 1) For the estimation of retention of iron content in the developed products made using four heat processing techniques a) In products incorporated with ML and MP, respectively b) Comparison between products ML vs MP Fig 2: Estimation of iron in the developed products/100g a) On comparison of nutrient retention (Iron) in between different heat treatments for the products incorporated with ML and MP ,respectively , it was observed that for the products incorporated with Moringa fresh leaves the maximum retention of the nutrient iron was observed in the cooking method steaming (6.46 mg/100 grams) followed by roasting (5.8 mg/100 grams), microwave heating (4.6 mg/100gms) and the least nutrient retention was observed in frying (4.3 mg/100 grams).Where as for the products incorporated with Moringa leaf powder the maximum retention was observed in the cooking method roasting and microwave heating (13.8 mg/100 grams) respectively, followed by steaming (10.1 mg/100gms) and the least nutrient retention was observed in frying (9.23 mg/100 grams) (Fig 2) b) On comparison of nutrient retention (Iron) in between the effect of the same heat treatment in the the products incorporated with ML vs MP it was observed that Roasting (Roti), Microwave heating (Khakhra), Frying(Pori) and Steaming(Dhokla) made by the incorporation of moringa leaf powder (10gm) showed better iron retention (Roasting = MP – 13.8mg > ML -5.8mg Microwave heating **Conclusion :** Thus, the amount of time food is subjected to heat and the medium used for cooking food determine to a great extent the nutrients which shall be retained while consumption. The study highlights the importance of using the right heat processing treatment to get maximum nutritional benefits in the products incorporated with moringa fresh leaves and moringa leaf powder,

respectively. It also depicts the difference in the effect of the same heat treatment between products incorporated with moringa fresh leaves and powder. **Keywords:** Keywords–Moringa fresh leaves, Moringa leaf powder, Heat processing techniques, Roasting, Microwave heating, Frying, Steaming.

OPFSN-02 Tamarind pulp suppresses the growth of ESBL produced Multidrug resistance bacteria. ***Ramakrishna Vadde***, Siddhartha Eadlapalli***.*** Dept.of Biotechnology & Bioinformatics, Yogi Vemana University, Andhra Pradesh.
Email:- vrkrishna70@gmail.com

Background & Objectives: Multidrug resistance (MDR) among bacteria is increasing worldwide due to the production of extended spectrum β-lactamases (ESBL). Plants are being used from centuries to treat various ailments, so these will the reliable sources for the discovery of the novel antibiotics. The present study aimed to identify bioactive molecules and their antibacterial activity against ESBL produced MDR bacteria from routinely used tamarind pulp in Indian culinary.**Materials & Methods:** Ethanolic extract of tamarind pulp was prepared and tested against four ESBL positive bacteria (E.coli, Klebsiella pnumoniae, Pseudomonas auregonosa and Staphylococcus aureus), which were isolated from clinical samples. Biochemical characterization, β-lactamase activity, membrane permeability and membrane integrity, scanning electron microscopy performed for cell morphology and LC-MS identified bioactives were subjected to docking against ESBLs of MDR bacteria. **Result :** Bioactive enriched tamarind exhibited higher antioxidant properties and antibacterial activities against all four ESBL bacteria with β-lactamase inhibition, increased membrane permeability and decreased integrity. External morphological changes (membrane damage) were noticed among the all tested bacteria through SEM. Further, LC-MS analysis identified bioactives on in silico docking studies identified the octadecanoic acid of tamarind pulp is the best lead molecule for inhibition of extended spectrum β-lactamases (CTX, SHV, and TEM) showing strong interaction as compared to other molecules, whose interaction is stronger than the standard β-lactamase inhibitor drug (clavulanic acid). **Conclusion :** Tamarind pulp showed an effective antibiotic activity against ESBL produced multidrug resistant bacteria with identified octodecanoic acid. This lead compounds can be used in the drug development. **Keywords:** Tamarind, ESBL, Multidrug resistance bacteria, antibacterial activity.

OPFSN-03 HOUSEHOLD FOOD SECURITY AND NUTRITIONAL STATUS AMONG THE RABHA TRIBE LIVING IN FRINGE FOREST AREAS OF NORTH BENGAL, WEST BENGAL. **Suman Chakrabarty**. Department of Anthropology, Mrinalini Datta Mahavidyapith, Birati, Kolkata. Email:- sumanshabar@gmail.com

Background & Objectives: Since independence the Indian tribes are the marginalized sections of the society with recurrent food shortage and immense nutritional stress. These conditions are further complicated among the tribes, who live in fringe forest areas. In order to understand this habitat specific dilemma on food security and nutritional condition, the present study aims to investigate the status of household food security, consumption coping strategies and nutritional status of the Rabha tribe living in fringe forest areas. **Materials & Methods:** The cross-section data of household food security status, consumption coping strategies, dietary intake, anthropometric variables and socio-economic characteristics was collected through pre-tested structured schedules and standard techniques from 207 sampled households from four forest villages located in Kalchini block of Alipurduar district in North Bengal, West Bengal, India by using cluster sampling. **Result :** The results revealed that 34.30% of households were food insecure and food insecure households were significantly ($p<0.01$) low per capita income, living in Kaccha houses, did not possess any cultivable land, low standard of living index, low possession of livestock, BPL card absent and illiterate household head. Individuals in food insecure group had either normal or undernourished (10.67%) with less food expenses and calorie consumption. In contrast, 22.13% of individuals had overnutrition problem and majorities of them belonged to food secure households. They had less physical activity and high consumption of dietary fat and alcohol. Interestingly they relied more on purchased food on credit (77.78%) from local market rather than PDS system and forest sources. **Conclusion:** Therefore, the Rabha tribe living in forest fringe areas of north Bengal had moderate food insecurity problem but they suffered by double burden of malnutrition. These may be due to the influence of modernization and urbanization in the life style and food habits of the studied tribe even if they live in remote condition. **Keywords:** Food Security, Double Burden of Malnutrition, Tribe, Forest Fringe Areas, India

OPFSN-04 DEVELOPMENT OF MULTIGRAIN SIMULATED RICE ANALOGUES. ***Yogeshwari R***. Community Science College and Research Institute, Tamil Nadu Agricultural University, Madurai. Email:- yogeshfsn@gmail.com

Background & Objectives: The purpose of the study was to investigate the feasibility of developing simulated rice analogues from multi-grains using extrusion technology. Objectives: i) To optimize multigrain mix formulation by using Response Surface Methodology for developing simulated rice analogues ii) To evaluate physical, nutritional and sensory qualities of the developed simulated rice analogues. **Materials & Methods:** Response Surface Methodology was carried out based on dependent and independent variables to optimize the multigrain mix formulation to develop micronutrient enriched simulated rice analogues. Independent variables were kodo millet (10-20%), little millet (5-10%), barnyard millet (30-40%), foxtail millet (30-40%) and pearl millet (5-10%). Dependent variables included nutrients, protein, iron, calcium, phosphorous, thiamine, riboflavin, fibre and antioxidant activity. **Result:** Twenty-six formulations were generated and the nutrient content were analysed. The multigrain mix having a desirability value of 0.518, which comprised of kodo millet-10.01g, little millet-10g, barnyard millet-31.31g, foxtail millet-38.68g, pearl millet-10g having higher nutrient content was optimized. Extrusion cooking was carried out using a twin screw extruder at optimised extrusion parameters such as barrel temperature: 35, 60 and 35oC for zone 1 to zone 3, die diameter of 3mm and screw speed of 180 rpm. The rice shaped extrudates were dried in cabinet tray drier to 11% moisture content at 650C for 4 hours. The developed simulated rice analogues had 8.64g of protein, 2.84g of fat, 2.40g of zinc, 2.34mg of iron, 18.05mg of calcium, 268.22mg of phosphorous, 0.37mg of thiamine, 22.46mg of β-carotene, 4.68g of fiber and 5.54% of resistant starch. The simulated rice analogues were observed to have 0.59g/ml of bulk density, 4.25g/g of Water Absorption Index, 15.7g/g of Water Solubility Index and 147.39g of Hardness. The organoleptic characteristics of the cooked rice analogues and variety rice (lime rice, pepper rice, tamarind rice and coconut rice) prepared from the rice analogues were highly acceptable. The multigrain formulation comprising of kodo millet-10.01g, little millet-10g, barnyard millet-31.31g, foxtail millet-38.68g, pearl millet-10g could be used to produce quality extrudates with high nutrient content and acceptable sensory quality. **Conclusion:** The simulated rice analogues could serve as a micronutrient enriched food to address micronutrient malnutrition. The technology is versatile and lends for blending with pulses, vegetables and other foods to further improve taste and nutrient content. **Keywords:** millets, extrusion, micronutrients, rice analogues, response surface methodology.

OPFSN-05 EFFECT OF BLACK TEA ON HEN'S EGG PROTEIN DIGESTIBILITY USING DUAL ISOTOPE TRACER APPROACH IN INDIAN ADULTS. ***Sindhu Kashyap*[1]**, Nirupama Shivakumar[1], Aneesia Varkey[1], Sarita Devi[1], Thomas Preston[2], Anura V Kurpad[1].1=St. John's Research Institute, St. John's National Academy of Health Sciences, Bangalore, India.2= Scottish Universities Environmental Research Centre, East Kilbride, Scotland, United Kingdom. Email:-sindhu.k@sjri.res.in

Background & Objectives: Protein digestibility, a component of protein quality, partly depends on the matrix in which the food is consumed. Anti-nutritional factors such as polyphenols have been shown to reduce protein digestibility, in vitro. Tea, a commonly consumed beverage worldwide, contains high amounts of polyphenols that could impair protein digestibility. There is lack of human studies examining the effect of tea on protein digestibility. Therefore the aim of the study was to determine the effect of black tea on whole boiled egg protein digestibility in adult humans.**Materials & Methods**: 2H intrinsically labelled eggs were obtained by dosing two layer hens with [U-2H] labelled crystalline amino acid mix. Repeated experiments were conducted in the same human volunteers, a week apart, to determine the effect of tea on egg protein digestibility. The experiments included, digestibility of whole boiled egg with and without black tea, where [U-13C] spirulina was used a standard protein with known digestibility. Subsequently, the digestibility of spirulina protein with and without black tea was determined by using [U-2H] cell free amino acid mix as a standard with 100% digestibility. This experiment was conducted to differentiate the effect tea had on egg or spirulina. The dual isotope tracer approach was used in all four experiments. **Result:** The true ileal IAA digestibility of whole boiled egg significantly decreased by 16% when consumed with tea. This decrease ranged from 10% for leucine and 21% for threonine. However, there was no significant reduction in spirulina protein digestibility with tea. **Conclusion**: Tea polyphenol and protein interactions decreased egg but not spirulina digestibility. For the latter, this could be due to the presence of intrinsic polyphenol protein binding. In populations which consume mainly plant protein, which is a relatively lower quality protein, consumption of tea during or after a meal can further increase the risk of amino acid inadequacy.

Select Type: Oral **Keywords:** tea, polyphenols, egg protein, protein digestibility, dual tracer technique, intrinsic labeling.

OPFSN-06 Green bio refinery approach: A novel way for extraction of carotenoids from carrot bio-waste. ***Swati Tiwari***, Neelam Upadhyay, Ashish Kumar Singh, Bhavesh Baria. National Dairy Research institute, Karnal. Email:- swatitiwari838@gmail.com

Background & Objectives: Colourants in one or another form are added to the foods since centuries as it is an important component of any food which reflects the food quality. Synthetic food colorants possess various health safety issues, while natural food colorants possess various health beneficial properties. Carrot is one of the important root vegetables. During the manufacturing of juices, higher amounts of pomace portion is produced which is generally disposed off. So, an attempt was taken to utilize the carrot bio-waste for the extraction of natural pigments using green bio-refinery approach. **Materials & Methods:** Carrots were procured from local market of Karnal, and processed to obtain the carrot pomace. The blanching efficiency of carrot pomace was tested to store the pomace for longer period and afterwards enzymatic hydrolysis was done to enhance the extraction after thawing of frozen pomace. Different time and extraction techniques were employed for extraction including high shear dispersion and ultrasonication. The extract was evaluated for different physico-chemical parameters such as total carotenoid content, antioxidant activity, L*a*b* value using hunter system and β-carotene using HPLC. **Result:** The blanching efficiency revealed that 90°C and 2.5 min treatment is sufficient to inactivate the peroxidase enzyme thereafter enzymatic hydrolysis pre-treatment of pomace was done before extraction which increased the recovery of carotenoids. Carotenoids were extracted from enzyme treated carrot pomace in flaxseed oil by keeping them in the ratio of 1:1. Ultrasonication and high shear disperser techniques were adopted for extraction. The results revealed that high shear dispersion at 20000 rpm for 12 min yielded maximum carotenoids i.e. 82.66±0.06µg/g with recovery of 94.8±0.08%. The total carotenoid content, antioxidant activity in terms of ABTS, DDPH and FRAP and β-carotene of carotenoid rich extract (CRE) i.e. 82.66±0.06 µg/g, 1596.04±69.45µg Trolox eq./ml, 380.21±39.62µg Trolox eq./ml, 941.20±19.91µM Trolox eq./ml, 78.37µg/g, respectively, were significantly higher ($p<0.05$) as compare to corresponding values of flaxseed oil (extracting medium) that are 13.38±0.141 µg/g, 930.33±64.61µg Trolox eq./ml, 255.32±9.05µg Trolox eq./ml, 521.91±12.65µM Trolox eq./ml, 6.75µg/g. The L*, a* and b* values of CRE were 18.66±0.04, 19.42±0.21, 27.947±0.65, respectively and these were significantly different than flaxseed oil. **Conclusion:** The carotenoid rich extract possess strong antioxidant and provitamin A activity. The main outcome is that prepared extract containing carotenoids could be utilized as natural colourant in food applications also as a dietary supplements. **Keywords:** Extraction, carrot pomace, flaxseed oil, SEM, β-carotene, HPLC

OPFSN-07 IN VITRO BIOACCESSIBILITY OF IRON AND ZINC IN SELECTED REGIONAL DIETS OF TAMIL NADU. ***Shunmukha Priya*.S**[1], S.Kowsalya[2]. 1= Truweight Wellness Pvt., Ltd., Bangalore. 2=Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore. Email:-jayanthisreenivasan@gmail.com

Background & Objectives: One-sixth of the global population resides in India, and among them, around two billion people suffer from micronutrient malnutrition mainly iron (Fe) and zinc (Zn) deficiencies. The non-nutrient food constituents like phytate and polyphenols present in plant-based diets hinder the bioavailability of non-haeme iron and zinc present in the diets. The specific objective of the present study was to assess the in vitro bioaccessibility of iron and zinc in selected regional diets of Tamil Nadu. **Materials & Methods:** From the selected districts of Tamil Nadu, using 24 hr dietary recall method, most frequently consumed regional diets were identified. Regional diets prepared and standardized in the present study include breakfast, lunch and dinner menus. The in vitro bioaccessibility of iron and zinc were assessed by the in-vitro method of Luten et al (1996). **Result :** The results of the present study revealed, fermented cereal and pulse based products such as dosa and idli also had iron and zinc bioaccessibility of 19.05 to 21.05 per cent and 17.01 and 16.42 respectively. The regional diets which is made of green leaves and pulse combination, sprouts, with lime enhanced the bioavailability of iron and zinc, should include ingredients rich in ascorbic acid or Vitamin A (β-carotene). The average oxalate content of recipes varied between 0.13 to 5.57 g per cent. The oxalates were found to be higher in green leafy vegetables ranging from 0.02 to 1.37g per cent. **Conclusion:** The results of the study revealed that the bioaccessibility of iron and zinc in certain foods enhanced on cooking, processing, and with the help of enhancers' or reducing the inhibitors. This may be the reason that most of the regional diets enhanced iron and zinc bioavailability on cooking. **Keywords:**in-vitro bioaccessibility, regional diets, micronutrient malnutrition

OPFSN-08 IMPACT OF LOW COST FUNCTIONAL FOOD SUPPLEMENTATION ON HIV POSITIVE WOMEN - A CLINICAL TRIAL. ***PA.Raajeswari***. Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore.
Email:-raajraajeswari@gmail.com

Background & Objectives: Nutritional approach to HIV/AIDS forms an important pillar and challenging aspects of HIV care, as opportunistic infections increases micronutrient deficiencies, hence it is imperative to assess the impact of low cost functional foods with special emphasis on increase in immunity among HIV positive women. The present study was aimed to reduce the occurrence of opportunistic infections there by correcting their micro nutrient deficiencies to next stage among the HIV positive women and also to improve the immune status and clinical profile through functional food supplement (Wheat, wheat germ, soy protein, tomato, beetroot and jaggery). **Materials & Methods:** The study was conducted on HIV positive women in the age group of 21-40 years, with two to three years HIV infection with CD4 cell count in the range of 300-400 cells. From 2484 initially surveyed 240 HIV positive women were selected for the supplementation study and they were divided into four groups of 60 HIV each. HIV positive women in EGI received nutrition education, EGII received 100g of functional food supplement, EGIII received 100g of functional food supplement and nutrition education and control group received no supplementation for a period of eight months. The impact of supplementation was studied initially and finally in terms of weight, CD4 cell count, total protein, total leukocyte count and anti oxidant profile. **Result:** The findings of the research study showed an significant improvement in the CD4 cell count and the above mentioned blood parameters proving the efficacy of the supplement as a potent functional food. **Conclusion:** The consumption of low cost locally available functional foods daily is an effective strategy to combat multiple micronutrient deficiencies and thus promote overall heath and well being of the HIV positive women thereby increasing their longitivity and preventing them from moving on to the next stage of HIV/AIDS. **Keywords:** HIV/AIDS, CD4 cell count, micronutrient, functional food.

OPFSN-09 PHYSIOCHEMICAL AND FUNCTIONALITIES EVALUATION OF RAW AND PROCESSED MOTH BEAN -UNDERUTILIZED LEGUME IN INDIA. ***Seema Vijay Medhe***, Anil Kumar Anal. Email:- sam_medhe@rediffmail.com

Background & Objectives: Moth bean (Vigna aconitifoia), an underutilized legume is known to be a potential source of protein and other nutrients.To the best of our knowledge, none of the report has yet been published on the physiochemical properties and phytochemical content of raw, germinated and cooked moth bean flours. The objective of this study was, thus to evaluate the impact of cooking and germination on the physical properties, functional properties of moth bean (Vigna aconitifolia). **Materials & Methods:** Moth bean raw, germinated (48 hours) and cooked (till soft completely) samples were powdered and sieved to obtain a particle size of 500 µm (U.S.A Standard Testing Sieve (No.35). Ultrasound-assisted extraction method was used. Proximate analysis was carried out by following the AOAC standard procedures. Physiochemical properties seed weight, seed volume, bulk density, husk content, minimum cooking time and least gelation concentration were assessed. Extract yield, total phenolic content (TPC), total flavonoid content (TFC), DPPH %inhibition, FRAP activity, reducing power were assessed. **Result :** Raw moth bean flour content ash, moisture and protein 3.5 g 100 g-1 , 3.4 g 100 g-1 , 23.63 g 100 g-1 respectively which were significantly higher ($p>0.05$) than sprouted and cooked moth bean flour. Physical parameters seed weight, volume, bulk density, husk content and minimum cooking time were 3.9 g (100 seeds), 3 mL, 1.3 g mL-1, 8.39 (% w/w) and 32 minutes respectively. The complete gelation observed at 14 g/100 ml for sprouted and cooked bean flour and 26 g/100ml for raw flour. Saponins were present in all three extracts. Flavonoids and terpenoids was absent in cooked and tannin was absent in all three extracts. Sprouted bean flour was reported with significantly higher ($p>0.05$) extract yield as compared to raw and cooked moth bean. Moth bean raw was content significantly higher ($p>0.05$) TPC content (22mg GAE/g). There were no significance differences in TFC of raw and processed moth beans. DPPH percent inhibition was observed significantly higher ($p>0.05$) in moth bean cooked extract (54.87 µg/ml) followed by moth bean germinated and moth bean raw. Moth bean cooked was reported with significantly higher ($p>0.05$) FRAP activity (0.131 µg/ml), but there were no significant difference in FRAP values of germinated and raw moth bean. Similarly significantly higher ($p>0.05$) reducing. **Conclusion:** This study demonstrated the diversity in physicochemical properties and phytochemical content of seeds and flours of raw, sprouted and cooked moth bean. The information on these properties is important for developing new products using bean flours. **Keywords:** Moth bean, underutilized legume

ORAL PRESENTATIONS - COMMUNITY NUTRITION

17th November 2018 **11:00 AM – 1:00 PM**

Code No.	Name and Address	Title of Presentation
OPCN-01	P. Vasantha Kumari, Depart of Food Product Development. Email:-vasanthi.phd@gmail.com	Impact of multi cereal legumes made cookies supplement on the underweight children (7-9 age groups).
OPCN-02	Richa Srivastava Department of Food and Nutrition, Home Science, Banasthali Vidyapith, Rajasthan, Email:- richa.ravindra@gmail.com	Association of nutritional status at baseline with clinical outcomes of cancer in children.
OPCN-03	Urmimala Baruah, Email:-urmibaruah17@gmail.com	Nutritional status: Anthropometric perspective of pre-school children.
OPCN-04	Afifa Jahan, Department of Food and Nutrition, PJTSAU, Krishi Vigyan Kendra, Palem, Nagarkurnool district. Email:- afifajahan26@gmail.com	Sorghum idli- low GI breakfast product for preventing diabetes.
OPCN-05	Aishwarya Kanneganti, Fernandez Hospital. Email: draishwarya_k@fernandezhospital.com	Risk factors and incidence of excess gestational weight gain in Indian women.
OPCN-06	Anamika Singh, National Dairy Research Institute, Email:- anamikanshu@gmail.com	An approach to enhancement the bioavailability of iron in the meals of adult farm women.
OPCN-07	Zakera, Truweight Wellness Pvt. Ltd. Email:- zakera_m@truweight.in	Prevalence and pattern of polycystic ovarian syndrome among obese clients: A prospective observational study from true weight.
OPCN-08	Maryam Hussain, Fernandez Hospital, Email:- raishwarya_k@fernandezhospital.com	Knowledge and perceptions of human milk banking.
OPCN-09	Monisha S, Division of Nutrition, St. John's Research Institute,Bangalore, Email:- monisha.s@sjri.res.in	Characterization of dietary calcium among pregnant women at Bruhat Bangalore Mahanagara Palike Hospital, Bangalore.
OPCN-10	Sushmita Khatoniar, Assam Agricultural University, Jorhat, Assam, Email:sushmitakhatoniar@gmail.com	Consumption pattern and indigenous traditional knowledge on medicinal plants in Upper Assam.
OPCN-11	Ramaa Subramanian, Kolhan University , Chaibasa, Jharkhand, Email:- teach.ram@gmail.com	Study on prevalence and management of malnutrition in selected tribal communities in West Singhbhum district of Jharkhand.
OPCN-12	Rutuja Chhajed, St. John's Research Institute Email:- rutuja.c@sjri.res.in	Mustard oil – undeserved bad press.
OPCN-13	Rupali Waghode, Symbiosis International University (SIU), Lavale, Pune, India, Email:- dr.rupali.waghode@gmail.com	Mustard oil – impact of working status of mother on nutritional status of preschool children from selected rural areas and urban slums of Pune.
OPCN-14	Deeksha Naik, Department of Food science and nutrition, College of Community science, UAS,Dharwad, Email:- diksharhsc@yahoo.in	Nutrition insecurity existing among nomadic families in North Karnataka.

OPCN-01 Impact of multi cereal legumes made cookies supplement on the underweight children (7-9 age groups).***P. Vasantha Kumari,*** Depart of Food Product Development. Email:-vasanthi.phd@gmail.com

Background & Objectives:- Underweight is a major public health problem and widely prevalent among children in India. The existing study was designed to decrease the prevalence of underweight and to improve the nutritional status through dietary supplementation with Protein rich foods. **Materials & Methods:-** The present study was conducted on children in the age group of 7 - 9 years (N: 100) from urban slums of puducherry. Out of 914 children, 101 (11%) children are underweight. Out of 101 children who were moderately underweight, 100 children were randomly selected for the supplementation study. They were further divided into two groups of 50 children each one group receive the food based supplement and the other group constituted the control group. The supplementation study was conducted for six months. The effect of supplementation was studied initially and at the end of 6 months in terms of anthropometric measurements, morbidity pattern and dietary assessment. **Result:-** The findings discovered that, supplementation in the food form resulted in significant (p?0.05), improvement in the intervention group when compared with control group in parameters studied. **Conclusion:-** The findings of this research leads to the conclusion beyond doubt that the food based approach will serve as an effective strategy to combat malnutrition and to promote health and well being of the children and ensure global security.
Keywords:- underweight, slums, cookies, cereal and legume

OPCN-02 ASSOCIATION OF NUTRITIONAL STATUS AT BASELINE WITH CLINICAL OUTCOMES OF CANCER IN CHILDREN. ***Richa Srivastava*** [1]**,** Kumari Geeta[1], Sameer Bakhshi[2], Deepam Pushpam[2]. 1=Department of Food and Nutrition, Home Science, Banasthali Vidyapith, Rajasthan, 2= Department of Medical Oncology, Dr. B.R.A. Institute Rotary Cancer Hospital, All India Institute of Medical Sciences, New Delhi. Email:-richa.ravindra@gmail.com

Background & Objectives: This study aimed at assessment of nutritional status at baseline and its association with clinical outcomes of cancer in children.**Materials & Methods**: This was a prospective analytical cross sectional study conducted in the pediatric oncology outpatient department (AIIMS), from October 2012 to April, 2018. A total of 700 cancer subjects were enrolled and after attrition,626 subjects were analyzed for results. Subjects were assessed for their weight for age, height for age, weight for height and BMI for age. WHO standards and criterias were used to categorize the subjects for nutritional status. The patients were grouped for hematological and solid tumors and further as ALL, AML, lymphoma, sarcoma and other solid tumors.**Result :** Findings revealed that age and gender had no significant association with overall survival (OS) and event free survival (EFS). However, OS (52.00%) and EFS (51.70%) was better in <5 year children. Boys showed better OS and EFs than girls. ALL, AML, Lymphomas and other solid tumors as per weight-for-age, height-for-age, weight-for-height and BMI-for-age at baseline did not show any significant association with OS and EFS. Severe malnourished children (weight for age) of sarcomas had significantly lower OS (HR=2.58,95% CI=1.13-5.90, p=0.024) and EFS (HR=2.39,95% CI=1.05-5.44, p=0.037) as compared to moderate and normal children. However, BMI for age did not show any significant association of nutritional status with OS and EFS for any type of cancers but EFS was better in overweight children in all type of cancer and also OS except for AML.**Conclusion :** Nutritional status (weight for age) showed significant association with outcomes of cancer in children in sarcomas but not in other types of cancer. However insignificant, overweight (at baseline) children had better OS and EFS. Thus, nutritional status at baseline may have impact on outcomes of cancers. **Keywords:** Cancer, Children, Baseline nutritional status, outcome of cancer

OPCN-03 NUTRITIONAL STATUS: ANTHROPOMETRIC PERSPECTIVE OF PRE-SCHOOL CHILDREN. ***Urmimala Baruah*****,** Ruma Bhattacharyya. Email:-urmibaruah17@gmail.com

Background & Objectives: The present investigation was undertaken with the aim of assessing the nutritional status of pre-school children (4-6 years) of Jorhat, Assam through anthropometric indices. **Materials & Methods:** A total of 200 pre-school children (4-6 years) were selected by a multistage random sampling technique from four schools of Jorhat town of Assam. A schedule was formulated to record the

data on anthropometric measurements, viz. height, weight and mid-upper arm circumference of the target population. Anthropometric measurements namely height, weight and mid-upper arm circumference of each respondent was recorded using standardized tools and techniques. The mean and standard deviation was calculated from the data obtained on measurement of height, weight and mid-upper arm circumference of the target population. 't' test for single was also employed for determining the level of significance. The BMI was also calculated. The results obtained were compared with 95th centile values of ICMR, NCHS standard, Waterlow classification of height-for- age, Indian Academy of Pediatrics (IAP) classification of weight-for-age and WHO (2007) Z-scores. **Result:** The present study revealed that the height measurements of the target children were significantly lower than the 95th centile values of height (ICMR) ($p<0.01$). The 4 years children had normal heights which were quite comparable with NCHS standard while the 5 and 6 years children had significantly lower height than the NCHS standard ($p<0.01$).Waterlow classification of height-for- age revealed that 63 per cent of the children had normal height while 32 per cent had marginal malnutrition, 2.5 per cent had moderate malnutrition and a negligible quantam (0.5%) had severe malnutrition. WHO (2007) Z-scores of height-for-age revealed that 71.5 per cent of the children had normal height-for-age while 28.5 per cent were stunted. The weight measurements revealed that the 4-6 years boys and 4 year girls had normal weight as compared to 95th centile values of weight (ICMR) and NCHS standard whereas the mean weights of the 5 and 6 years girls were significantly lower than the 95th centile values of weight (ICMR) as well as the international (NCHS) standard ($p<0.05$). The Indian Academy of Pediatrics (IAP) classification of weight-for-age revealed that 85 per cent were in the normal range of nutritional status whereas 15 per cent had Grade I malnutrition and 0.5 per cent had Grade II malnutrition. WHO (2007) Z-scores of weight-for-age showed that majority (84.5 per %) were in the normal category whereas 15.5 per cent were underweight. The mean Mid- Upper Arm Circumference (MUAC) of the 5 year boys and girls were significantly lower than the ICMR standards ($p<0.05$). WHO (2007) Z-scores of BMI-for-age categorized majority (66.5 per cent) of the children as normal while 12 per cent as moderate undernourished and 3 per cent as severely undernourished and 17.5 and 4 per cent of the respondents as overweight and obese respectively.
Conclusion : The present study revealed that majority (84.5 per cent) of the respondents had normal nutritional status while (17 per cent) had different grades of malnutrition ranging from mild to moderate malnutrition. **Keywords:** Nutritional status, Anthropometric indices, Malnutrition, Pre-school

OPCN-04 SORGHUM IDLI- LOW GI BREAKFAST PRODUCT FOR PREVENTING DIABETES.***AFIFA JAHAN*****,** B. K. SINGH. Department of Food and Nutrition, PJTSAU, Krishi Vigyan Kendra, Palem, Nagarkurnool district.Email:- afifajahan26@gmail.com

Background & Objectives: Diabetes is a metabolic disorder with many potential complications over the long term. Diabetes affects more than 230 million people worldwide and is expected to affect 350 million by 2025. Idli, a very popular fermented breakfast food staple consumed in the Indian subcontinent, consists mainly of rice and black gram. Idli fermentation was carried out in the conventional way in a batter having rice to black gram in the ratios of 2:1.The aim of present study is to compare blood glucose levels (Glycemic Index) of individuals consuming rice rawa idli and sorghum rawa idl and correlate with the invitro carbohydrate digestibility (IVCD). **Materials & Methods:** The glycemic index of the breakfast product-idli made with rice rawa and sorghum rawa was assessed in non diabetic young subjects using blood sampling schedule and method of Incremental area under the curve (IAUC) using glucose as reference food. Glycemic index of the test idli (made with rice rawa and sorghum rawa) were calculated by applying the formula given Wolever et al., 1991. In vitro starch digestibility was estimated as mg of maltose released per gram sample according to the procedure of Singh and Jambunathan (1982). **Result:** The glycemic index of the rice rawa idli was 60.0, which is considered as moderate glycemic index food. The glycemic load of the experimental rice rawa idli was calculated as 26.65, which is considered as high glycemic load. The glycemic index of the sorgum rawa idli was 50.6, which is considered as low glycemic index food. The 50g of carbohydrate can be taken in one serving. The glycemic load of the experimental rice rawa idli was calculated as 25, which is lower than rice rawa idli. The invitro carbohydrate digestibility (IVCD) value of rice rawa idli 18.9 and IVCD value of sorghum rawa idli 20.92. IVCD value of rice rawa idli is lower than IVCD value of sorghum rawa idli. Two sample t-test was done between the glycemic index of sorghum idli and rice idli, p=0.0035**. There is significant difference between glycemic index of rice rawa idli and sorghum rawa idli at 1% level.Two sample t-test was done between the IVCD of sorghum idli and rice idli, p=0.0066**. There is significant difference between IVCD of rice rawa idli and sorghum rawa idli at 1% level. **Conclusion:** The correlation value of the GI and IVCD of the idli made with rice rawa is 0.899 which is found

significant at 5 percent level and similarly the sorghum rawa idli is calculated and the value is 0.849 which is found significant at 5 percent level. **Results** obtained indicate that least glycemic response was observed with sorghum rawa idli. Thus the inclusion of sorghum based breakfast product-idli may be recommended to the habitual diet for achieving a good glycemic control in diabetics. These findings should assist in development of high fiber and glycemic index sorghum products with good amount of IVCD, which will help in development of functional foods.**Keywords:** GLYCEMIC INDEX, INVITRO CARBOHYDRATE DIGESTIBILITY, IDLI

OPCN-05 RISK FACTORS AND INCIDENCE OF EXCESS GESTATIONAL WEIGHT GAIN IN INDIAN WOMEN. ***Aishwarya Kanneganti*****,** Aakash Chowdhury, Asma Sajid, Latha Sashi. Fernandez Hospital. Email:-draishwarya_k@fernandezhospital.com

Background & Objectives: Excess gestational weight gain (EGWG) increases risks of adverse obstetric outcomes, long-term obesity and metabolic disorders in mothers and children. The objective of this study was to identify the risk factors and incidence of EGWG in the Indian context in order to develop effective preventative measures. **Materials & Methods**: A prospective cohort study to evaluate gestational weight gain (GWG) in pregnant women who completed a validated knowledge survey on GWG in 4 urban maternity tertiary centres and subsequently delivered at the same centres. Chi square test and Fisher's exact test were used to identify risk factors associated with EGWG. **Result**: 245 women completed the study. Gestational weight gain was classified as per the Institute of Medicine's BMI-specific recommendations. Of the total women surveyed, 37.5 % exceeded the GWG recommendation. The overweight and obese women constituted 50.2% of the entire population. In the overweight-obese category, 52% of women exceeded GWG recommendations. Risk factors for EGWG were high pre-pregnancy BMI ($P<0.001$), underestimation of pre-pregnancy weight category ($P=0.003$) and overestimation of GWG recommendations ($P<0.001$). In overweight-obese women, primiparity also increased risk of EGWG ($P=0.04$). Maternal age, education and perception of EGWG associated risks did not influence GWG. **Conclusion**: Ensuring women begin their pregnancies at a normal weight and provision of individualised GWG related counselling, either pre-conception or in the early stages of pregnancy may help foster appropriate weight gain in pregnancy. A modification in the current model of care involving detailed screening at the first visit itself could ensure effectiveness. **Keywords**: Excess gestational weight gain; risk factors, incidence, India

OPCN-06 An approach to enhancement the bioavailability of iron in the meals of Adult farm women. ***Anamika Singh*[1]****,** Kiran Bains[2]. 1= National Dairy Research Institute. 2= Punjab Agricultural University. Email:- anamikanshu@gmail.com

Background & Objectives: Iron deficiency is a common cause of anemia in the world, affecting more than 2 billion. There are so many approaches has been done by government to control iron deficiency anemia which are not mutually exclusive. As such, the supplementation strategy has proved to be inadequate. Therefore, looking to these attempts, one slant that needs attention is the enhancement of bioavailability of iron which is highly affected by the inhibitors and enhancers present in Indian traditional meals. **Materials & Methods**: In this study 60 adult women from AyaliKala village of Ludhiana (Punjab) in the age group of 25-35 years belonging to farm were selected to collect information regarding their meal. The representative meals i.e. breakfast, lunch and dinner of 50% of the surveyed subjects were collected and analyzed for protein, ascorbic acid, beta carotene, phytin phosphorous, polyphenols, neutral detergent fibre (NDF), total iron, dialyzable iron and in vitro bioavailability. The relationship of meal constituents with dialyzable iron and in vitro iron bioavailability was assessed to identify the determinants of iron absorption in the meals of rural women. The individual foods namely chapati, rice, dal and saag and four basic meals with the combination of dal+chapati, dal+rice, saag+chapati and saag+rice were prepared and analyzed for total iron, dialyzable iron and in vitro iron bioavailability. These basic meals were fortified with enhancer and inhibitor of iron. **Result:** The best enhancer of iron absorption for vegetarian women was lemonade (250 ml) which resulted in 70.2 and 61.0% increase of in vitro bioavailability of iron to the rice based meals with dal and saag, respectively. However, in chapati based meals, the inclusion of lemonade resulted in 1.3 fold increase in iron bioavailability. The nutrition education intervention through a developed visual aid proved effective in improving their knowledge regarding anemia and its prevention especially through dietary approach, the post intervention increase in knowledge being 3.1 folds. **Conclusion:** The women should be encouraged to increase overall intake of iron from iron rich foods to obtain the optimum level of recommended dietary

allowance of iron. The increase should be coupled with efforts to combine appropriate foods in the diet to enhance the bioavailability of iron and reduce inhibitory factors. The use of milk along with meals should be avoided. The strong inhibitors of iron bioavailability namely egg and tea should be restricted in meals. These messages should be transferred to rural women through appropriate educational aids. **Keywords:** %Bioavailability, meal combination, inhibitors, enhancer, dialyzable iron.

OPCN-07 PREVALENCE AND PATTERN OF POLYCYSTIC OVARIAN SYNDROME AMONG OBESE CLIENTS: A PROSPECTIVE OBSERVATIONAL STUDY FROM TRUWEIGHT. ***Zakera*****,** Suhasini Mudraganam, Shunmukha Priya, G.Jyothsna. Truweight Wellness Pvt. Ltd. Email:- zakera_m@truweight.in

Background & Objectives: Polycystic Ovarian Syndrome (PCOS) occurs among females of reproductive age and the prevalence ranges from 3.7 to 22 per cent in Indian women. Weight management is recommended as one of the first line of treatment for PCOS, the present study was conducted to assess the impact of weight loss on improvement of selected symptoms of PCOS subjects and to determine the correlation between the macro nutrient (carbohydrates, protein, fat and fibre) intake with weight loss among PCOS subjects enrolled in Truweight program. **Materials & Methods**: The study was a prospective observational study undertaken for a period of 6 months among obese females enrolled in the Truweight program. Inclusion criteria: females between age of 17 to 40 years who were known cases of PCOS, BMI > 30kg/m2. The subjects were selected using purposive sampling technique. Data collected includes, Weight, BMI, Diet recall, medical reports, menstrual cycle details and selected symptoms. Initial and final readings were recorded and the data was analysed using statistical procedures like Paired t-test, correlation coefficient, model F-test and regression methods. **Result**: In the present study, there was significant reduction in BMI (35.28± 5.79 to 30.65 ±5.56) among subjects following the Truweight program. The per cent weight loss among the subjects was between 8 to 20 percent of their initial body weight. During the course of the program, major symptoms associated with PCOS like irregular cycles (84 per cent), Facial hair (54 per cent) and Acne (32 per cent) have improvement among the study subjects. Macro nutrient intake were positively correlated with weight loss. The mean intake of carbohydrates (154.38g), protein (46.22g) and fat (25g) were associated with significant weight loss among subjects. The mean intake of fibre (34.34g) was also associated with weight loss. **Conclusion**: Obesity is common findings in PCOS subjects. The present study concludes that Truweight Dietary Management approach contributes to significant reduction in BMI and help improving the PCOS condition and the symptoms associated. **Keywords:** Polycystic Ovarian Syndrome, Weight loss, Body Mass Index, Truweight

OPCN-08 KNOWLEDGE AND PERCEPTIONS OF HUMAN MILK BANKING. ***AishwaryaKanneganti***[1]**,**MaryamHussain[1],TejoPratap[1], Latha Sashi[1], Aslesha Pendli[2], 1=Fernandez Hospital,2= Department of Food and Nutrition, University College For Women, Email:- draishwarya_k@fernandezhospital.com

Background & Objectives: Use of milk banks is advocated when mother's own milk is insufficient. To broaden the use and establishment of human milk banks in India, societal acceptance is required. Identifying the knowledge gaps and sociocultural perceptions will aid in preparation of educational programs. **Materials & Methods:** A cross-sectional observational study in the maternity wards of 2 private and 2 public hospitals in South India. A face-to-face interview was conducted using a 21-item structured multiple choice questionnaire. **Result:** Of 418 women, 15.1% (n=63) were aware of human milk banks and 10.5% (n=44) knew they were available in India. 73.7% (n=308) of women perceived milk from milk banks as safe. When asked which is better for the baby's health, 46.9% (n=196) believed donor milk is better, 19.1% (n=80) believed formula is better and 33.9% (n=142) did not know. In case of insufficient breast milk, although most women believed donor milk was better, 55.5% (n=232) still preferred to use formula milk. 73.9% (n=309) were willing to donate extra breast milk but only 60.5% (n=253) were willing to accept donor milk. Of mothers willing to donate, 19.4% (n=60) were willing to donate only to family or acquaintances, 62.5 % (n=193) were willing to donate to a milk bank and 69.9% (n=216) were willing to donate to any baby who needed breast milk. Of those willing to accept donated milk, 31.6% (n=80) were comfortable accepting from family or acquaintances only and 56.9% (n=144) were comfortable accepting from milk banks. Reasons for non-acceptance were convenience of formula, family objections, personal dislike, risk of infections and

religious concerns. **Conclusion:** Knowledge of milk banks and their availability in India is poor. Formula is still the preferred alternative when there is insufficient breast milk. Women are more willing to donate than accept donor milk. Interventions aimed at increasing acceptability of donor milk are required. **Keywords:** human milk bank, knowledge, perception, India.

OPCN-09 CHARACTERIZATION OF DIETARY CALCIUM AMONG PREGNANT WOMEN AT BRUHAT BANGALORE MAHANAGARA PALIKE HOSPITAL, BANGALORE.
Monisha S,Division of Nutrition, St. John's Research Institute, Bangalore,
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Background & Objectives: Growing evidence suggests that calcium has a pivotal role in reducing pregnancy-induced-hypertension, pre-eclampsia and preterm-births. Indian National guidelines suggest a daily consumption of 1000mg during pregnancy. However, there is a dearth of data on the compliance to calcium supplements, as well as on habitual dietary calcium intakes. While the World Health Organization recommends a daily calcium intake of 1500-2000mg in populations with low-calcium intakes, the intakes in a low-middle-income-country like India, with diverse dietary intakes, range from 150-750mg/d (tatanin.org). There is a need for comprehensive characterization of diet intake especially during pregnancy, to guide provision of optimal counseling regarding supplementation and dietary sources of calcium. Therefore, this study aimed at measuring dietary calcium intake and its food sources among urban pregnant women at Bruhat-Bangalore-Mahanagara-Palike (BBMP) hospitals, Bangalore. **Materials & Methods:** A cross-sectional pilot-study was conducted in apparently-healthy pregnant women (n=259) attending routine antenatal-care at BBMP hospitals, within 20-weeks of gestation to assess their dietary patterns. At baseline; socio-economic status, obstetrics history, anthropometry and anemia were assessed. Dietary intake of various nutrients and food-groups were assessed using two-consecutive 24-hour diet recalls within the interval of 1-month. **Result:** The mean age of the study participants was 25 years, 61% had education upto high-school and 49.3% were anemic at recruitment. The median dietary calcium intake was 510.9mg/d. The dietary calcium sources were milk and milk products contributing to 45.5% followed by cereals and millets with 23.6%. Fruits, green-leafy vegetables, vegetables, meat and meat-products and others contributed to 8.2%, 8.0%, 5.4%, 1.9%, 7.4% respectively. Almost 50% consumed non-vegetarian diet in the form of eggs, fish, or meat and meat-products. **Conclusion:** Our data suggest that calcium intake is low during pregnancy, and that milk and milk products, cereal and millet were the major calcium-contributing foods. Dietary assessment during pregnancy is important and would help in planning supplementation guidelines during pregnancy. **Keywords:** Dietary calcium intake, food-groups, National guidelines.

OPCN-10 CONSUMPTION PATTERN AND INDIGENOUS TRADITIONAL KNOWLEDGE ON MEDICINAL PLANTS IN UPPER ASSAM, ***Sushmita Khatoniar*** **,** Mridula Saikia Barooah, Assam Agricultural University, Jorhat, Assam,
Email:- sushmitakhatoniar@gmail.com

Background & Objectives: Assam is endowed in flora and fauna and a homeland of different medicinal plant species. Plants are being used as a mainstay of Indian medicines since time immemorial. These plants are very important sources of the diet in the rural areas of India, as they play significant role in food security, health and nutritional status of the rural population. Hence, the present study was undertaken to study the consumption pattern and traditional knowledge of medicinal plants in Upper Assam. **Materials & Methods:** The study was conducted in 120 households from 3 districts (40 households from each district) namely Jorhat, Golaghat and Lakhimpur. A pretested questionnaire was used to observe the parameters such as consumption pattern, traditional use of locally available greens. The amount of greens consumed was estimated using weighment method. **Result :** The consumption pattern of greens revealed that about 14.50 % of total households consumes greens regularly, 48.20 % consume thrice a week and 23.70 % households consume once a week. The greens are mostly consumed as curry, sabji or as chutney. The average daily intake of greens was 26.46 g which is much below than the recommended intake. While assessing the traditional knowledge and practice of these greens as medicinal plants for treating various ailments, it was found that 42 different greens were being used for treating various diseases like gastro-intestinal diseases, hypertension, infections, fever, cough, diabetes, urinary disorders etc. **Conclusion:** Green leafy vegetables are treasure trove of micronutrients and also posses medicinal properties. Inventory and documentation of

these traditional knowledge and practice is a pre-requisite for the development of Indian Ayurvedic medicine and also other pharmaceuticals. Awareness about these underutilized greens will help to combat micronutrient deficiencies along with its other health protective factors at community level.**Keywords:** medicinal plants, consumption pattern, ethnomedicine

OPCN-11 Study on Prevalence and management of Malnutrition in selected Tribal Communities in West Singhbhum district of Jharkhand. ***Ramaa Subramanian*****,** D.Pushplata **,** Kolhan University , Chaibasa, Jharkhand, Email:- teach.ram@gmail.com

Background & Objectives: Malnutrition in tribal Women of Jharkhand is still remains as a serious challenge. The nutritional problems of different tribal communities located at various stages of development are full of obscurities and very little scientific information on dietary habit and nutritional status are available due to lack of comprehensive investigation. The present study was undertaken with the objectives of studying prevalence of malnutrition among tribal women and management of it using locally available foods and to know about various herbal remedies to overcome deficiency diseases. **Materials & Methods:** The present study was conducted in two villages of West Singhbhum districts of Jhrkhand.1 00 tribal women were selected from each village by random sampling method of age range 21-40 years. The data regarding their dietary intake, presence of deficiency disorders were collected through interview schedule. Qualitative analysis was done using different methods of interaction in the communities to know about their knowledge regarding use of local foods and herbal remedies to manage malnutrition. **Result:** The result revealed that their average diet was much inferior to balance diet and Malnutrition is present with high prevalence of Anemia. Recurring fever, irregular menstruation,, low vision, Angular Stomatitis, are common deficiency diseases seen in the subjects. Tribal women mostly depend on Maad bhat,Kodo Pitha,Mar jhor etc. for meeting calorie needs and they use number of green leaves like Putu sag, Chench bhaji,Sahjan leaves as sources of Iron .Many herbal remedies are also used by them to cure various deficiency disorders. **Conclusion:** It can be concluded that several factors are responsible for prevalence of malnutrition among tribal women. Special attention needs to be given to local foods and herbs as they can be wonderful community resources in management of malnutrition. **Keywords:** Malnutrition, Anemia

OPCN-12 Mustard oil – undeserved bad press. ***Rutuja Chhajed***[1]**,** Sumathi Swaminathan[1,] Satvik Kishore[1,] Vishnu GP[1,] Jeswin Baby[1,] Anura Kurpad[1,] Indu Mani1[1,] Tinku Thomas[2,] Santo Ghosh[2],1= St. John's Research Institute, 2= St. John's Medical College , Email:- rutuja.c@sjri.res.in

Background & Objectives: Mustard oil is used as the major cooking oil in most parts of North India and East India. In terms of fatty acid composition, mustard oil contains almost an ideal ratio of SFA: MUFA: PUFA and of n-6/n-3 as well. However, till date most nutritionists and doctors believe that high levels of MUFA (erucic acid, 22:1 n-9) present in mustard oil are harmful since they can cause lipid accumulation in the liver. This belief is based on a few studies conducted in the 1980s. In the 1990's erucic acid gained a lot support as a key component of Lorenzo's Oil, which was used to treat adrenoleukodystrophy. However, it is the former reputation that has remained in the minds of nutritionists as well as doctors. **Materials & Methods:** This paper combines data from two national data sets (NSSO and NFHS) to examine the association between mustard oil intake and high BMI. BMI was obtained from the NFHS-4 (2015-2016), while data on per-capita daily nutrient and food intake were computed from the household food expenditure data of NSSO-68th round (2011-2012). The NFHS-4 data was triangulated with NSSO at the household level for the same district of a state using common matching variables 'family size', 'religion', 'locality (rural/urban)', 'socio-economic status' using Nearest Neighbor Hot Deck statistical matching. The odds of high BMI with mustard oil being the predominant oil consumed in the household was computed using logistic regression, adjusted for household wealth quintile, place of residence (rural/urban), daily per-capita fat and energy intake. High BMI was classified as BMI>25 kg/m2. All analysis were performed with survey weights. **Result:** Mustard oil was the predominant oil for 46% of the household followed by refined oil and others. The average daily per-capita consumption of mustard oil was around 16 g in household where it was the predominant oil. It was lower than the average consumption for other oils in their predominant groups. Among households with mustard oil as predominant oil, 18% women, and 16% men had high BMI, which is a lower proportion as compared to the other groups. The overall fat consumption was positively associated with high BMI. The odds ratio, 95% Confidence Intervals of high BMI among women with mustard oil as

predominant was lower at 0.83 (0.82, 0.85) and was 0.71 (0.68, 0.73) for men, compared to other oils. **Conclusion:** The results suggest that mustard oil consumption is negatively associated with BMI and that consumption of any oil other than mustard oil as the predominant oil is associated with increased odds of high BMI. **Keywords:** Mustard Oil, Obesity, Fats, Oils.

OPCN-13 Mustard oil – IMPACT OF WORKING STATUS OF MOTHER ON NUTRITIONAL STATUS OF PRESCHOOL CHILDREN FROM SELECTED RURAL AREAS AND URBAN SLUMS OF PUNE. ***RupaliWaghode*[1]**, Kavitha Menon[1] Ravindra Ghooi[2],1= Symbiosis International University (SIU), Lavale, Pune, India,2= Scientia Clinical Services, Pune, India, Email:- dr.rupali.waghode@gmail.com

Background & Objectives: Background: Women augment family income by working; however, this reduces the time for child care. Inadequate time for childcare may adversely influence the health and nutritional status of children. **Objective:** The study was aimed to assess the impact of mother's working on the nutritional status of preschool children (2 - 5 years). **Materials & Methods:** A cross sectional study was carried out in an urban slum and selected rural areas of Pune. The data were collected from 80 households (40 from rural areas, and 40 from urban slums). Mother's working status and socio demographic status of participants were collected through personal interviews of mothers. Child anthropometric indices, namely, weight-for-height (WHZ), weight-for-age (WAZ), height-for-age (HAZ) were used to estimate the nutritional status of children. **Result:** The study found that 52.5% of mothers were working and 47.5% mothers were non-working. Among children of working mothers, 59.5% were stunted, 9% were wasted, and 47.6% children were underweight while among nonworking mother's children 50% were stunted,10.5% wasted and 36.8% underweight. The study did not find any significant difference in the nutrition status of children with respect to the working status of their mothers, however significant difference in the nutritional status of children were observed with respect to mother's education, occupation of parent, child care strategies used when mother was at work and children's frequency of consumption of savory and processed foods ($P<0.05$). **Conclusion:** Malnutrition was more common in children of working mothers from urban slums than rural areas, though the difference was not statistically significant. Future research, using a larger sample size of children would help to understand the relationship between working status of mothers and nutritional status of their children. **Keywords:** Working status of Mothers, Preschool children, Nutrition status of children, urban slums, and rural area.

OPCN- 14 NUTRITION INSECURITY EXISTING AMONG NOMADIC FAMILIES IN NORTH KARNATAKA. ***Deeksha Naik***, Kasturiba B, Department of Food science and nutrition, College of Community science, UAS,Dharwad, Email:- diksharhsc@yahoo.in

Background & Objectives: Nomads are the group of communities who travel from place to place for their livelihood. They do not have a fix settlement. Investigation was carried out with an objective to assess nutritional status of vulnerable members of nomadic families in North Karnataka. **Materials & Methods:** Nomadic tribal families migrated from different states to North Karnataka were selected for the study. Six districts namely Dharwad, Hubli, Bijapur, Bagalkot, Gulbarga and Yadgiri of North Karnataka is the study location. A total of 30 families were the study population. The selected sample comprised of adult women of 18-45 years (n=30), adolescent girls of 12-18 years (18) and children of 2-12 years (74). Nutritional status of women was assessed based anthropometry, dietary assessment, biochemical, clinical examination and morbidity pattern. Nutritional status of adolescent girls and children was assessed in terms of anthropometry, clinical examination and morbidity pattern. **Result:** More than half (53.34 per cent) of the nomadic tribal women had ideal BMI, 40 per cent of the subjects belonged to underweight category and 87% of nomadic tribal women were anemic. Majority (56 per cent) of preschool children belonged to different degrees of malnutrition when Gomez classification was used, but majority of children were in normal group (68.75 per cent) when they were classified by using IAP classification. **Conclusion:** In general this study clearly revealed that vulnerable groups of nomadic tribes are in poor nutritional status. The type of environment in which these families are residing is very poor. They have no security. They are deprived of all the facilities. So it is alarming situation, immediate measures are to be taken for upliftment of these tribes, so that they can also lead a decent life. The need for food supplementation programmes and long term nutritional education intervention is required to improve the nutritional status of vulnerable groups. Intensive skill developmental programmes can be planned to improve their socio-economic status and standard of living. **Keywords:** Tribes, Nomads, North Karnataka

FREE COMMMUNICATIONS

POSTER PRESENTATIONS - CLINICAL NUTRITION

16th Nov 2018 **9:30Am –11.30Am**

Code No.	Name and Address	Title of Presentation
PPCLN-01	Susmita Chandra, Maulana Abul Kalam Azad University Of Technology, WB, College Of Medicine And Sagore Dutta Hospital, Email:- usmita2506@Yahoo.Com	Change In The Chemistry Of Deep Frying Oil Contributes Towards Fat Accumulation And Obesity.
PPCLN-02	Chithra R Psg College Of Arts And Science, Coimbatore, Email:- Chithramuthu18@Yahoo.Co.In	Nutritional Status, Indian Diabetes Risk Score And Energy Balance Among Selected Obese / Overweight Female College Students In Coimbatore City And Impact Of Nutrition Education.
PPCLN-03	Dr.Shweta Joshi, Bfit Group Of Institutions, Dehradun, Uttarakhand, Email:- Shweta29joshi@Gmail.Com	Suitability Of Barnyard Millet (Jeera Jhangora) As Compared To Rice (Jeera Rice) In Control Of Diabetes.
PPCLN-04	Jaishree Bhalerao, Department Of Food Science & Nutrition College Of Community Science, Vnmkv, Parbhani, Email:- Jaishreebhalerao10@Gmail.Com	Effect Of Supplementation Of Multipurpose Functional Food Mix On Blood Glucose Level Of Selected Diabetic Subjects.
PPCLN-05	Wagle SS, Diabetes Unit, King Edward Memorial Hospital And Research Centre, Pune, India. Email:- Sonalishree@Gmail.Com	Food Frequency Consumption And Its Association With Body Size And Composition Among Offspring Of Diabetic And Non-Diabetic Mothers In India.
PPCLN-06	Pooja Goyal, Lovely Professional University, Phagwara, Punjab Email:- Pooja_Goyal9@Yahoo.Com	The Effect Of Probiotic Vsl#3 And Lifestyle Intervention In Obese Children With Non-Alcoholic Fatty Liver Disease: A Randomized Controlled Trial.
PPCLN-07	Samina Vora,	Withdraw
PPCLN-08	Tarvinderjeet Kaur, Department Of Home Science, Kurukshetra University, Kurukshetra, Haryana, India. Email:- Tarvin_Khushi@Rediffmail.Com	Discarded Greens Enriched Laddoo Intervention On Haematological Profile Of Anaemic Adolescent Girls.
PPCLN-09	Madhumathi.P, Sri Padmavati Mahila Viswavidyalayam, Tirupati. Email:- Madhumathi.Velamakanni@Gmail.Com	Formulation And Evaluation Of Sensory And Glycaemic Properties Of A Multigrain Mix For Type 2 Diabetics.
PPCLN-10	Mrs. Manorama Gupta, Dr. N.G.P. College of Arts and Science, Coimbatore. Email:- guptamanorama@gmail.com	Impact Of Meal Replacement On The Health Status Of Type Ii Diabetes.
PPCLN-11	Premagowri.B, Department of Nutrition & Dietetics, Dr.NGP ASC, Coimbatore. Email:- premagowri@drngpasc.ac.in	Impact of HIBI Health Drink on Pre-Hypertensive Young Adult Males in Tirupur.

CLINICAL NUTRITION (Contd...)

Code No.	Name and Address	Title of Presentation
PPCLN-12	Aditi Rikhari, Department of Food Science and Nutrition, Banasthali Vidyapith, Rajasthan, Email:- aditirikhari7@gmail.com	Vitamin D Deficiency Among Adolescent Girls And Its Correlation With Serum Lipid.
PPCLN-13	Shruti Dwivedi, Department of Foods and Nutrition, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara. Email:- shruti.dwivedi19@gmail.com	Fermenfermented Milk As Dietary Intervention To Improve Gut Health And Depression.
PPCLN-14	ANITHA.C, Department of Studies in Food Science and Nutrition, Karnataka State Open University, Muktagangothri, Mysuru, Email:- anithaksou@gmail.com	Effectiveness Of Weight Management Intervention On Women With Polycystic Ovarian Syndrome.
PPCLN-15	Hemalatha M *S*, Food Science and Nutrition, Karnataka State Open University, Mysuru, Email:- drmshemap@gmail.com	Evaluation Of Indian Amaranthus Leaves On Anemia Affected Adolescents.
PPCLN-16	Meghana Patel, Dept. of Foods and Nutrition, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat, Email:- meghanapatel2412@gmail.com	Raised Hs-Crp Levels, Low Vitamin D Levels And High Diastolic Blood Pressure-Emerging As Strong Predictors Of Type 2 Diabetes Mellitus
PPCLN-17	Namratha Pai Kotebagilu, Food Science and Nutrition, University of Mysore, Manasagangotri, Mysuru, Karnataka, India. Email:- namspai@gmail.com	A Critical Appraisal Of Factors Influencing Functional Status In Cancer Patients.
PPCLN-18	Aishwarya Kanneganti Department of Clinical Nutrition and Dietetics, Fernandez Hospital, Email:- draishwarya_k@fernandezhospital.com	Low Glycemic Index, Moderate Carbohydrate Breakfasts Maintain Glycemic Control In Pregnant Diabetics.
PPCLN-19	Manisha Sharma, Deptt. of Food Science and Nutrition, Assam Agricultural University Email:- 2509manisha@gmail.com	Functional efficacy of sorghum based composite flour mix on the blood lipid profile of experimental rats.
PPCLN-20	Ms.Charu Agarwal, St. Ann's Degree College for Women affiliated by Osmania University, Email:- cagarwal660@gmail.com	Osteoporosis-An Emerging Disease.
PPCLN-21	Bhagysri Goud Akki, Sunshine hospital secundrabad. Email:- bhagyasrigoudakki@gmail.com	Nutritional Assessment And Monitoring Of Food Consumption Among Hospitalized Patients.
PPCLN-22	Malathi.V, Email:- drmalathi.v@rainbowhospitals.in	Nutrition Intervention With Flax Seed Powder And Flax Seed Oil Capsules In Type.2 Diabetes And Overweight Subjects.

CLINICAL NUTRITION (Contd...)

Code No.	Name and Address	Title of Presentation
PPCLN-23	Padmini Thakore, Department of Foods and Nutrition, Faculty of Family and Community Sciences, Maharaja Sayajirao University of Baroda. Email:- padmini.thakore@gmail.com	An Intervention Study On The Supplementation Of Guava Leaves Powder Incorporated Khakhra On The Glycemic, Lipemic And Inflammatory Status Of Type 2 Diabetes Mellitus Subjects.
PPCLN-24	Nidhi Prakash, Women's College Calcutta, West Bengal, India. Email:- nidhiprakash17@gmail.com	Effects Of Lifestyle Modification In Obese Adults With Non-Alcoholic Fatty Liver And Non-Alcoholic Steatohepatitis
PPCLN-25	Arti Muley, Email:- arti.muley@ssbs.edu.in	Prevalence And Determinants Of Vitamin-D Status In Subjects With Type Ii Diabetes Mellitus.
PPCLN-26	Akshatha.N, Priyanka Rohatgi. University Of Mysore, Mysore. Email:- thantryakshatha@gmail.com	Assessment Of Patients In Intensive Care Unit (ICU) On Enteral Feeds Using Subjective Global Assessment (SGA) And Acute Physiological And Chronic Health Evaluation-2(APACHE-2) For Prevalence Of Malnutrition.
PPCLN-27	Srishti Sinha, St. John's Research Institute, St. John's National Academy of Health Sciences, Bangalore, Email:- srishti.s@sjri.res.in	Declining Energy Expenditure Among Millennials: Revisiting The Daily Energy Requirement.
PPCLN-28	Swati Balapure, Government Medical College, Akola. Email:- swatibalapure4007@gmail.com	Effect Of Ultrasonic Homogenization On Fat, Protein And Carbohydrate Analysis Of Fresh Human Milk.
PPCLN-29	Shraddha Mandale, Government Medical College,Akola. Email:mandaleshraddha22@gmail.com	Effect Of Four Weeks Of Freezing On Macronutrients In Human Milk.
PPCLN-30	N.Deepa Sathish, Department of Food Science and Nutrition. Email:- deepasathis@gmail.com	Effect Of Value Added Health Mix On Surgical Outcome Among Selected Subjects.
PPCLN-31	Anjali Jadhav, Bharati Vidyapeeth Deemed University, Pune Satara Road, Pune Email:- bvduirsha@gmail.com	Women With Higher BMI In Early Pregnancy Have Lower Long Chain Polyunsaturated Levels.
PPCLN-32	Sethuraman Vishnupriya, Ms.G.K Gomathi. Stet Women's College Mannargudi Tamilnadu Email:sethuramanvishnupriya@gmail.com	Halitosis - A Disgusting Phenomenon Of Social Stigma.
PPCLN-33	Muneeshwari	Withdraw
PPCLN-34	Kinjal Dave, Bharati Vidyapeeth(Deemed to be University),Pune, Email:- bvduirsha@gmail.com.	Maternal micronutrient status in early pregnancy in two different socioeconomic groups.
PPCLN-35	Monosweta Gracy Shaw, Ruma Bhattacharyya. Email:- monoswetashaw@gmail.com.	Cardiovascular Risk Factors And Lifestyle Practices Among Adult Population Of Jorhat, Assam

CLINICAL NUTRITION (Contd...)

Code No.	Name and Address	Title of Presentation
PPCLN-36	Rajul Gala,	withdraw
PPCLN-37	Nidhi Prakash. Guest Faculty At Women's College Calcutta, West Bengal, India. Email:-Nidhiprakash17@Gmail.Com	Effects Of Lifestyle Modification In Obese Adults With Non-Alcoholic Fatty Liver And Non-Alcoholic Steato-Hepatitis
PPCLN-38	Malathi.V. Email:- drmalathi.v@rainbowhospitals.in.	Nutrition Management Of Langerhans Cell Histiocytosis -A Case Report.
PPCLN-39	R.Arivuchudar.	Withdraw
PPCLN-40	Sanchita Guha. Clinical Nutrition and Dietetics, Jamshedpur Women's College, Jharkhand. Email:-guha.sanchita11@gmail.com.	Study On Effect Of Semi Elemental Formula In Early Recovery Of Acute Pancreatitis.
PPCLN-41	Bibi Sara.	Withdraw
PPCLN-42	Puspanjali Mishra. IMS and SUM Hospital, Kalingnagar-8, Bhubaneswar, Odisha Email:- Puspanjalimishra@soa.ac.in.	A Study On Complication Of Enteral Nutrition In Critical Care Patients.
PPCLN-43	Varakantham V, ICMR- National Institute of Nutrition, Hyderabad. Email:- varshareddi@gmail.com.	Role Of 25-Hydroxy Vitamin D Serum Levels And Vitamin D Receptor Polymorphisms In Risk Of Essential Hypertension.
PPCLN- 44	**Blessy Prabhu Priyanka S** Department Of Biochemistry Kurnool Medical College Email:Blessy-medico@yahoo.co.in	A study of serum lipid profile in pregnancy induced hypertension (PIH)

PPCLN-01 CHANGE IN THE CHEMISTRY OF DEEP FRYING OIL CONTRIBUTES TOWARDS FAT ACCUMULATION AND OBESITY. ***Susmita Chandra***, Abhishek Sharma, Subrata Kumar Dey, Maulana Abul Kalam Azad University of Technology, WB, College of Medicine and Sagore Dutta Hospital, Maulana Abul Kalam Azad University of Technology, Email:- susmita2506@yahoo.com

Introduction & Objectives: Deep frying is one of the oldest and popular method of food preparation. A huge economy is also involved in deep fried food production and market worldwide. But recent studies show that deep fried food contributes towards obesity and increased fat accumulation in different parts of the body. Our objective is to find the link between chemically changed components towards fat accumulation in the system.
Materials & Methods: A study was performed among 200 patients and 384 normal subjects (age within 06-85 years, both men and women) at College of Medicine and Sagore Dutta Hospital. The frequency of deep fried food habit was counted by directly communicating the patients and normals. An epidemiological data were prepared for each participant. The exclusion criterion was followed where patients were using anti obesity drugs, suffering from known endocrine diseases, women in pregnancy. The fat samples were collected from the participants used in their home, were analysed in mass spectra. The obesity parameters and BMI were measured and correlated statistically with standard statistical methods.**Main Findings:** The results showed presence of hydrolysed oil, polymerised and Cyclised polymeric forms, triacylglycerol polymers and oxidised polymers as suspected components towards the contributors of obesity. The study showed a positive correlation between the deep fried food habit and obesity among the patients.**Conclusion & Recommendations:** Patients with regular frequency of use of deep fried food were more prone towards developing obesity. This regular habit of deep frying food is the major contributor of chronic obesity rather than regular use of fresh oil with less deep frying food preparations.
Keywords: Deep fried food, Deep frying fat, Obesity

PPCLN-02 NUTRITIONAL STATUS, INDIAN DIABETES RISK SCORE AND ENERGY BALANCE AMONG SELECTED OBESE / OVERWEIGHT FEMALE COLLEGE STUDENTS IN COIMBATORE CITY AND IMPACT OF NUTRITION EDUCATION. ***CHITHRA R***, Anjali Joseph, Psg College Of Arts And Science, Coimbatore, Email:- chithramuthu18@yahoo.co.in

Background & Objectives: As obesity is a modifiable etiological factor of several metabolic disorders, an attempt was made in this study to educate the selected obese.**Materials & Methods:** Obese / overweight female college students (200 no.) were chosen. Questionnaires were framed and data on anthropometric measurements, food habits, exercising habits, family history of obesity, diabetes risk and knowledge on nutrition were collected. For a sub sample (50 no.), food and nutrient intake and energy expenditure were studied. Nutrition education was imparted to all and the impact was studied. **Result:** Grade I, grade II and grade III obesity were recorded by 19.5, 46.5 and 18.5% of the selected students respectively. The waist hip ratio was above normal (0.7 - 0.85) for all the selected students. It was discouraging to note that 87.5% of the students were not doing any kind of physical exercise. Family history of obesity and diabetes was found among 68.5 and 78% of the students respectively. Study on “degree of risk of developing diabetes” revealed “high” and “moderate” risk in 73% and 27% of the students respectively. Mean intake of pulses, greens, tubers and vegetables were significantly lower when compared to the ICMR recommendations. Fruits, milk and milk products and non vegetarian foods were consumed in excess. The intake of protein, fat and energy were much higher and there was a positive energy balance. The mean score obtained by the students was 4.25 out of 15 in the pre test which increased to 12.70 in the post test registering a significant improvement in their knowledge on nutrition as proved by paired ‘t’ test.**Conclusion:** Nutrition education should be widely conducted to prevent obesity and related disorders.
Keywords: Obesity, Overweight, IDRS, Diabetes risk and Energy balance

PPCLN-03 SUITABILITY OF BARNYARD MILLET (JEERA JHANGORA) AS COMPARED TO RICE (JEERA RICE) IN CONTROL OF DIABETES. ***Dr.Shweta Joshi***[1], Dr. Sarita Srivastava[2],1= Bfit Group Of Institutions, Dehradun, Uttarakhand, 2= Department Of Foods And Nutrition, G.B Pant University Of Agriculture And Technology, Pant Nagar, Uttarakhand, Email:- shweta29joshi@gmail.com

Background & Objectives: India is among the top most countries striving with diabetic population. Among the management goals of diabetes, dietary intervention plays a very important role. Choosing a diet with low glycemic

index inducing slow release of sugar in blood is the most crucial part. Millets are termed as “nutricereals” due to their highly nutritious and therapeutic effects as compared to cereals. Barnyard millet (Echinochloa frumentacaea) being one of them is rich source of nutrients and especially in dietary fibre which plays a major role in reducing the glycemic index of food. In contrast rice being most consumable cereal after wheat is among the most restricted cereal to be consumed by diabetics due to its high blood sugar rising capacity. According to International Rice Research Institute (IRRI), India’s most widely grown rice varieties, Swarna and Mahsuri had low GI. Thus the study was conducted with the objective to compare the nutritional quality, antioxidant activity, resistant starch, Total dietary fibre, sensory and glycemic index of barnyard millet varieties with rice varieties Swarna and Mahsuri. **Materials & Methods:** For the present investigation, two varieties of barnyard millet, PRJ-1 and local cultivar were procured from Pauri garhwal, Uttarakhand while two rice varieties, Swarna (MTU-7029) and Mahsuri (BPT-5204) were procured from Breeders Seed Production Center, G.B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand. The proximate composition of barnyard millet and rice varieties was estimated using method given by AOAC (1995). Estimation of calcium, iron, zinc, magnesium and chromium was done using Atomic absorption spectrophotometer. Phosphorus content was estimated using method given by Fiske and Subbarow (1925). Dietary fibre was determined by the method given by Asp and Johanson (1981). Resistant starch, yield was determined by using the glucose oxidase assay given by McCleary et al. (2002). Tannic acid was estimated by colorimetric method according to the procedure given by AOAC (1970). The antioxidant activity of barnyard millet flour and rice flour was estimated by the method of Zhang and Hamauzu (2004). Sensory evaluation was done using score card method and 9 point Hedonic scale. Glycemic index evaluation was done using method given by Wolever (1990). **Result:** The results indicate that barnyard millet varieties had significantly higher proximate values (except for carbohydrate and physiological energy), mineral composition, total dietary fibre, resistant starch, tannin and antioxidant activity as compared to rice varieties. Non-significant difference was found in sensory quality of jeera jhangora and jeera rice on 9 point Hedonic scale. Evaluation by score card method also revealed similar results. Highly significant difference was found between glycemic index of barnyard millet food product and rice food product. The Jeera jhangora from PRJ-1 variety showed the lowest glycemic index value (35.9) followed by Jeera jhangora from local cultivar (39.5). The glycemic index values of Jeera rice prepared from Mahsuri variety and Swarna was 73.9 and 64.9, respectively. **Conclusion:** The result indicates that barnyard millet can be a best substitute of rice due to its high nutritional profile, low glycemic index value. The other most favorable point is that it is cooked and consumed similar to rice. Thus the consumption of millets should be increased to take advantage of their nutritional ad therapeutic effects especially to fight against various degenerative diseases. **Keywords:** BARNYARD MILLET, RICE, DIABETES, NUTRITION, GLYCEMIC INDEX

PPCLN-04 EFFECT OF SUPPLEMENTATION OF MULTIPURPOSE FUNCTIONAL FOOD MIX ON BLOOD GLUCOSE LEVEL OF SELECTED DIABETIC SUBJECTS. ***Jaishree Bhalerao***, Asha Arya, Department of Food Science & Nutrition College of Community Science, VNMKV, Parbhani, Email:- jaishreebhalerao10@gmail.com

Background & Objectives: Diabetes mellitus is the universal problem affecting human societies at all stages of development. Hence, the study was under taken to develop multipurpose functional food mix (MFFM) and to assess its impact on blood glucose level of selected diabetic subjects. **Materials & Methods:** MFFM was developed by using functional ingredients. The mix was organoleptically evaluated and analyzed for its Glycemic Index and nutrient content. Fourty noninsulin dependent diabetic subjects as control group (20) and experimental group (20) were selected. Supplement of 50 g of developed MFFM was given daily to the subjects of experimental group for 60 days. Data regarding fasting and post prandial blood glucose level of the selected subjects of control and experimental group was recorded initially, at 30th day and 60th day of experiment. Data was analyzed statistically to interpret the results. **Result:** The developed MFFM is very well accepted by the judges. The developed MFFM is low in GI (38.69) rich in protein (27.33 %), dietary fiber (24.46 %), iron (18.6 mg/100g) and calcium (433 mg/100g). Mean fasting and post prandial blood glucose level of the selected diabetic subjects of experimental group were significantly decreased from 202.1 + 27.39 mg/dl to 160.05+ 32.80 mg/dl and from 294.3 + 34.54 mg/dl to 240.8 + 31.92 mg/dl respectively after 60 days of supplementation of MFFM. Whereas, Fasting and post prandial blood glucose level of control group subjects did not show significant difference at the end of the supplementation period. **Conclusion:** Supplementation of MFFM for two months resulted in reducing the blood glucose level of diabetic subjects hence, it could be considered as effective measure for management of diabetes mellitus. **Keywords:** Sensory evaluation, Nutrition analysis, Glycemic Index, Supplementation.

PPCLN-05 FOOD FREQUENCY CONSUMPTION AND ITS ASSOCIATION WITH BODY SIZE AND COMPOSITION AMONG OFFSPRING OF DIABETIC AND NON-DIABETIC MOTHERS IN INDIA. ***Wagle SS[1],*** Kumaran K[2], Ladkat R[1],Yajnik PC[1], Baptist A[1], Yajnik CS[1],1= Diabetes Unit, King Edward Memorial Hospital and Research Centre, Pune, India.2= MRC Lifecourse Epidemiology Unit, University of Southampton, UK. Email:- sonalishree@gmail.com

Background & Objectives: Limited studies have assessed nutrition and studied its association with overweight and adiposity among offspring of diabetic mothers (ODM). With this in view, we followed children born to diabetic and non-diabetic mothers 2-26 years after delivery to assess their food frequency consumption and its association with risk of overweight and adiposity. **Materials & Methods:** We studied 200 ODM and 177 offspring of non-diabetic mothers (ONDM) who were matched for age, gender and socioeconomic status. We measured their body size (height, weight) and composition (DXA scan) using standard techniques. Overweight (IOTF for 2-18 y and WHO for >18 y) and adiposity (Khadilkar et.al. 2015) was defined based on the international and Indian reference standards. Child's nutrition was assessed using FFQ with 85 food items (during last 6 months), monthly consumption scores were calculated, categorized and compared between ODM and ONDM. The associations of food frequency consumption categories with body size and composition (age-gender specific SD scores) were studied using trend analysis. We also did interaction analysis to test whether risk of overweight-adiposity in ODM is modified by their food frequency consumption. **Result:** ODM consumed sweets, milk and milk products and vegetables and salads more frequently and cereals less frequently than ONDM. Frequent consumption of 'healthy foods' (dry fruits, milk and milk products, vegetables and salads) was associated with lower BMI. Frequent consumption of bakery products, fats, packed and preservative containing foods increased the risk for overweight and adiposity whereas consumption of oilseeds decreased the risk for the same. Interaction analysis showed that, food frequency consumption did not have an additive effect on the risk of obesity-adiposity in ODM, nor did they reduce the influence of maternal diabetes on the offspring's risk of obesity-adiposity. **Conclusion**: Our study demonstrates increased risk of obesity-adiposity in the children born in diabetic pregnancies which was not modified by their current lifestyle. **Keywords:** offspring of diabetic mothers, overweight, adiposity, food frequency consumption

PPCLN-06 THE EFFECT OF PROBIOTIC VSL#3 AND LIFESTYLE INTERVENTION IN OBESE CHILDREN WITH NON-ALCOHOLIC FATTY LIVER DISEASE: A RANDOMIZED CONTROLLED TRIAL. ***Pooja Goyal[1],*** BR Thapa[2], Neeta Raj Sharma[1], Jagadeesh Menon[2], Anmol Bhatia[2].1=Lovely Professional University, Phagwara, Punjab (India), 2=Post Graduate Institute of Medical Education and Research Chandigarh (India).
Email:- pooja_goyal9@yahoo.com.

Background & Objectives: Non alcoholic fatty liver disease (NAFLD) is the most upcoming causes of chronic liver disease in pediatric population in India. Poor lifestyle and faulty dietary habits are an epidemic of obesity and NAFLD. Objectives: This study aims to evaluate the effects of probiotic (VSL#3) and Lifestyle intervention in obese children with NAFLD. **Materials & Methods:**: we conducted clinical trial in 106 obese children in age group of 5-18 years and divided in to four groups; Group 1.VSL#3 plus lifestyle intervention (n=26), 2.VSL#3 (n=27), 3. Lifestyle intervention (Hypo-caloric diet+ physical activity) (n=26) and 4. Placebo (n=27) received interventions for four months. Their anthropometric, biochemical measurements and ultrasonography were carried out to identify NAFLD in them. Z-score of body mass index (Z- BMI), mid arm circumference (MAC), waist circumference (WC) and triceps skinfold thickness (TSF) were done. Serum alanine aminotranferase (ALT), aspartate aminotranferase (AST), low-density lipoprotein cholesterol(LDL-C), high-density lipoprotein cholesterol (HDL-C), triglyceride (TG), cholesterol, fasting blood glucose(FBG), high sensitivity C-reactive protein (HSCRP) and uric acid were measured and their dietary intake were also recorded at baseline and post trial. **Result:** Different intervention groups had significant weight loss, also reduction in MAC, TSF and WC ($p<0.001$) rather than in placebo. Probiotic VSL#3 plus lifestyle intervention group had (9%), VSL#3 only group had (4.5%) and lifestyle group had (5%) weight reduction. VSL#3 is significantly effective therapy for reducing serum AST, ALT, LDL-C, HSCRP, cholesterol, TG, uric acid, FBG and increase in HDL-C($p<0.05$). Lifestyle intervention is also significantly effective for reducing serum AST, ALT, TG and FBG ($p<0.05$). Addition of VSL#3 plus lifestyle intervention significantly the most pronounced therapy for reducing serum AST, ALT, LDL-C, HSCRP, cholesterol, TG, uric acid, FBG and increase in HDL-C($p<0.001$). **Conclusion:** Combine therapy of Probiotic VSL#3 plus lifestyle intervention is promising therapeutic treatment for management of NAFLD in children. **Keywords:** Probiotic VSL#3, Lifestyle intervention, NAFLD, Obese children.

PPCLN-07 NUTRIOTIONAL MANAGEMENT OF ACTIVE VARICELLA ZOSTER AND PNUEMONIA WITH COAGULOPATHY IN PATIENT DIAGNOSED WITH T CELL-LYMPHOBLASTIC LEUKEMIA (T-LBL). ***Samina Vora,*** Cuddles foundation (Tata Memorial Hospital), Email:- saminavora9@gmail.com

Background & Objectives: 12 year boy case of T-LBL on maintenance protocol (6 mercaptopurine) presented in Intensive Care Unit (ICU) with Fever, Florid varicella hemorrhagic rashes, Cold extremities, Altered sensorium, hypo-tension and tachycardia. **In-Ward presentation-Anthropometric measurements**:- Weight- 23kg. Height-140cm. Body Mass Index-11.17 kg/m2. MUAC- unavailable. Clinical signs and symptoms: Severe Muscle and fat loss, Grade 2 mucositis (oral varicella lesions), Depressed and Poor verbal response, Difficulty with mobilization, Nil oral intake , Odynophagia . **Materials & Methods:** In ICU(4 days): On day 2 child was started on continuous enteral feeds at the rate of 20 ml/ hour and later stepped up to 60 ml/hour. **In ward(19 days):-** Continuous enteral feedings: Patient was on continuous feeds for 6 days due to respiratory issues and to build the nutritional status as oral intake was nil due to mucositis and odynophagia. Bolus enteral feeds: Gradually continuous feeds were shifted to bolus feeds for 2 days as the patient was getting clinically better, also was able to tolerate liquid diet along with bolus feeds. **Partial parenteral nutrition:-** Patient complained of on and off diarrhoea episodes during the ward stay, thus polymeric enteral feeds were modified to semi-elemental and lactose free and was also intervened parentally with essential fatty acid formula of Soyabean oil, Medium chain triglyceride oil, Olive oil and Fish oil (SMOF lipid) for 3 days with the purpose of promoting anti-inflammation, and for it's effect on immune function. **Oral diet:-** Patient was then successively weaned off enteral feeds to oral high protein and energy dense diet. Multi-vitamins and anti-oxidant supplementation, improved patient's inflammation, oral varicella lesions, gut motility which progressed his enteral feeds to oral diet. **Result:** On discharge, patient's body mass index according to Indian Academy of Paediatrics progressed to (13.47kg/m2)– 3SD from (11.7kg/m2) <-3SD along with muscle and fat gain and improved motor development. **Conclusion:** Every mode of Nutrition has been intervened that helped the child meet his nutritional requirement along with micro-nutrient supplementation to recover from the trauma and inflammation. **Keywords:** Enteral feeding, infection, malnutrition

PPCLN-08 DISCARDED GREENS ENRICHED LADDOO INTERVENTION ON HAEMATOLOGICAL PROFILE OF ANAEMIC ADOLESCENT GIRLS. ***Tarvinderjeet Kaur***, Suman Bala, Department of Home Science, Kurukshetra University, Kurukshetra 136 119, Haryana, India. Email:- tarvin_khushi@rediffmail.com

Background & Objectives: Common form of malnutrition in the world, Iron deficiency anemia is the eight leading cause of diseases among young female of fertile age in developing countries. Cauliflower greens, one of the most under-exploited discarded greens despite of high nutritional value especially in β carotene, ascorbic acid, folic acid and iron can be used to meet dietary micronutrient requirements. In daily diet, an increased intake of this inexpensive discarded green may be one of the strategies for improving the nutritional status. **Materials & Methods:** Commonly consumed food preparation namely laddoo was developed by incorporating cauliflower greens. Developed enriched food preparation was organoleptically evaluated by a panel of ten judges using nine point hedonic scale. The impact of feeding of cauliflower greens enriched laddoo (for a period of sixty days) on haematological parameters of young anemic girls residing in Kurukshetra (Haryana) was studied. **Result :** Significant ($p < 0.05$) increased in haemoglobin and serum iron level and significant ($p < 0.05$) decreased in TIBC and UIBC level was observed on feeding cauliflower greens enriched laddoo for sixty days. **Conclusion:** Cauliflower greens enriched food preparation (laddoo) is not only a good source of iron but also beneficial source of other essential nutrients required by the body. Hence, there is a need for the identification and awareness of such unconventional sources which are nutritious, inexpensive, locally available and may be helpful in achieving nutritional security. Keywords: anemia, cauliflower greens, laddoo, adolescent girls

PPCLN-09 FORMULATION AND EVALUATION OF SENSORY AND GLYCAEMIC PROPERTIES OF A MULTIGRAIN MIX FOR TYPE 2 DIABETICS. ***Madhumathi.P***, Jyothi.A, Sri Padmavati Mahila Viswavidyalayam, Tirupati. Email:- madhumathi.velamakanni@gmail.com

Background & Objectives: Diabetes mellitus is a rapidly growing public health problem worldwide, causing substantial morbidity and mortality. The efficacy of low glycaemic index (GI) diets has been proven to control blood sugar levels and improve lipid profiles in type 2 diabetes. Glycaemic index is a system of ranking of foods which contain carbohydrate, from 0 to 100 based on their glycaemic response. The aim of the present study was to formulate and evaluate the sensory and glycaemic properties of a multigrain mix for type 2 diabetics. The study was conducted in 2016-17 in Hyderabad city, Telangana. **Materials & Methods:** Sensory evaluation was carried

out using 5-point hedonic scale with 20 panel members for two different multigrain mix formulations, product-I and product-II. Sensory evaluation revealed moderate acceptance for both the products, with mean overall acceptance scores of 3.41 and 3.64 respectively, but Product-II, which got better overall acceptance score was opted for GI test. The selected multigrain mix contains coarsely ground raw ingredients like whole wheat (Triticum Aestivum), barley (Hordeum Vulgare), finger millet (Eleusine coracana), defatted soy chunks (Glycine max), drumstick leaf powder (Moringa oleifera) and kalonji (Nigella Sativa) in right proportions. For both sensory evaluation and GI test, the multigrain mix was presented in the form of upma, cooked with little seasoning, green chilli, and salt to taste to enhance the palatability. Assessment of GI was conducted in 11 healthy young adult volunteers using the method recommended by WHO/FAO 1998. **Result**: The results revealed GI of the product as 51.51±3.53 (mean±SEM). **Conclusion:** GI of 55 or less is classified (WHO) as low GI foods. Hence the formulated multigrain mix is a low glycemic index food and is a healthier option for type 2 diabetics. **Keywords:** Diabetes mellitus, glycaemic index, sensory evaluation, multigrain mix, formulation

PPCLN-10 IMPACT OF MEAL REPLACEMENT ON THE HEALTH STATUS OF TYPE II DIABETES.
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Background & Objectives: Diabetes mellitus is one of the pandemic disorder affecting approximately 347 million people in world. The WHO identified and announced India as the capital of Diabetes. Food products that can induce a slow release of glucose are the demand for managing diabetes. Hence researchers are accelerated to bring into focus the same.Considering rotis (Indian bread made out of wheat) is a staple diet of India, a need arises to prepare a low glycemic roti, low glycemic load and higher fibre. These are essential for the management of a diabetes. The researcher intends to replace the regular rotis in the meal with a better managed roti which is low in the glycemic index and glycemic load. **Materials & Methods:** The study was conducted in the urban locale of Bangalore city. The subjects chosen for the study were adults in the age group of 30-60 years. These subjects were screened on the basis of a questionnaire which collected information on their background, socioeconomic profile, dietary habits, life style patterns, psychological symptoms and anthropometric measurements. Around 30 subjects were chosen from this set who were willing to participate. Rotis were prepared with different compositions of wheat flour, oats, bajra, soyabean, Bengal gram and barley which are very easily available in India. Five different variations of the formulated rotis were prepared. E.g. one variation contains wheat flour at 40%, soyabean at 20%, bengal gram at 10%, oats at 10%, barley at 10% and bajra at 10%. The best suited rotis were tested with 10 healthy subjects. These subjects were within the age of 35-55, both male and female who largely lead a sedentary lifestyle. These rotis were tested for nutrient analysis and organoleptic test (texture, taste, flavour, appearance and overall acceptability). The rise in blood sugar before and after the consumption were noted for 15 subjects at every 30 mins interval for 2 hours. Each roti consisted of 50g of the formulated mix. The control set of the experiment was conducted with white bread on the remaining 15 subjects. Fasting, post prandial blood glucose levels were measured for these subjects. HbA1C levels of the selected subjects were also measured before and after supplementation(after 3 months).Statistical tests such as Student's T test, Friedman's analysis were used to generalize the outcome to a larger population. **Result:** The formulated roti with the most acceptable had wheat flour at 40%, soyabean at 10%, bengal gram at 10%, oats at 10%, barley at 10% and bajra at 20%. This variation had the most favourable score of 2.48 compared to other variations. This roti had a glycemic index of 53 and glycemic load of 18. The mean fasting blood glucose level in the experimental group were found to be (initial) 206.53 34.33 mg/100ml and (final) 151 45.31 mg/100ml with a p-value of 0.00000012. The mean fasting blood glucose level in the control group were found to be (initial) 178.26 69.71 mg/100ml and (final) 168.27 51.37 mg/100ml with a p-value of 0.2668. These tests were conducted at 1% significance level.The mean post prandial blood glucose level in the experimental group were found to be (initial) 298.48 60.13 mg/100ml and (final) 222.13 68.16 mg/100ml with a p-value of 0.00000088.The mean post prandial blood glucose level in the control group were found to be (initial) 291.8 33.24 mg/100ml and (final) 289.2 35.63 mg/100ml with a p-value of 0.6569. These tests were conducted at 1% significance level. The mean HbA1C level in the experimental group were found to be (initial) 9.44 2.21 and (final) 7.17 1.43 with a p-value of 0.00000065.The mean HbA1C level in the control group were found to be (initial) 9.98 2.82 and (final) 9.54 2.76 with a p-value of 0.3529. These tests were conducted at 1% significance level. **Conclusion:** Clearly, the formulated hypoglycemic roti had lower glycemic index and glycemic load. The subjects under study also had lower glucose levels when the roti was consumed over a period of time. The ingredients of preparing such a dough mix are easily available across India. Blood sugar levels can be better controlled using such a formulated mix instead of regular wheat flour. **Keywords:** Type 2 diabetes, meal replacement, roti

PPCLN-11 Impact of HIBI Health Drink on Pre- Hypertensive Young Adult Males in Tirupur.
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Background & Objectives: Health is a dynamic process, which being at birth and is governed by genetics, nutritional and environmental factors throughout the life. Hypertension is a common co-morbidity of diabetes affecting 20-60%of persons with diabetes depending on the person age, obesity and ethnicity. Hypertension is a risk factor for among heart diseases, stroke and congestive heart failure. Hibiscus Sabdarifa which is grown in China, India and Taiwan is used as a traditional remedy to treat high blood pressure and liver disorders .The purpose of this study is to know the impact of hibiscus flower extract on hypertension samples. **Materials & Methods:** The subject chosen for the study was 100 pre- hypertensive young male adults (18- 35 years) in Tirupur who were not suffering from other complications like respiratory diseases, cardio vascular diseases, osteoporosis, hormonal imbalances, diabetes and renal diseases. The questionnaire was given to all the selected 100 subjects to collect background, anthropometric and nutritional status. Nearly 50 subjects were selected for supplementation study. They were divided into experimental group (n= 25) and control group (n=25). The experimental samples were only taken for the supplementation study. it was carried out for a period of 60 days. **Result:** Among the selected subjects 51% of the males were overweight, whereas only 39% stood with normal BMI, 7% were Grade-I obesity and 3% grade-II obesity. It was concluded that higher intake of carbohydrates and fat contribute to increased energy intake. There was protein and fibre inadequacy. After the supplementation of HIBI health drink, there was change in mean weight of experimental group about 2.6 kg and control group was 0.5 kg. The systolic blood pressure in the selected subject at 5% significant level (t=3.9) and there is no significant difference in the control groups (t=1.1).the diastolic pressure of experimental group has significantly reduced at 5% significant level (t=2.5) and there is no significant difference in the control groups (t=1.3). **Conclusion:** Hibiscus flower exhibited antihypertensive and cardio protective effects and also lower both systolic and diastolic pressure. The daily consumption of HIBI juice lowers blood pressure in pre and mild hypertensive adults. **Keywords:** Hibiscus, hypertension, anthropometric, antihypertensive

PPCLN-12 VITAMIN D DEFICIENCY AMONG ADOLESCENT GIRLS AND ITS CORRELATION WITH SERUM LIPID.
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Background & Objectives: Vitamin D is a steroid hormone with extensive action in the human body. Vitamin D deficiency is being recognized as one of the serious nutritional health problem which is untreated and undiagnosed among the tropical countries like India. The deficiency has also been associated with various chronic diseases and cardiovascular disease (CVD) is one of them. Worldwide CVD is seen to be a major risk factor for mortality. The aim of the study was to determine the prevalence of vitamin D among school going girls and to investigate the correlation between serum lipid profile and vitamin D. **Materials & Methods:** The study area was Banasthali university and the study was conducted on 280 school going girls (age 12-15) S sample size the on the basis of prevalence method. Fasting blood was collected and serum concentration of 25(OH) D, total cholesterol, triglycerides, high-density lipoprotein (HDL) and the lipoprotein (LDL), very a lipoprotein (VLDL) were measured. Then the values were correlated to see the association. **Result:** Mean serum 25(OH) D was 15.89±1.9ng/ml. out of total population 21.8% girls were seen to have normal vitamin D level were 78.2 were deficient. The mean total cholesterol, total triglycerides, HDL, LDL AND VLDL was 147.8± 67mg/dl, 93.79 ±41.6mg/dl, 41.83±9mg/dl, 79.53 ±17.4 mg/dl, and 15.95±7mg/dl respectively. There was negative correlation between Serum 25(OH) D and total triglycerides(r = -0.002), whereas when serum 25(OH) D was correlated with HDL(r = 0.113), LDL(r = 0.043), VLDL(r = 0.017) and total cholesterol(r = 0.054) then positive correlation was seen. **Conclusion:** A high prevalence of vitamin D exits in the adolescent girls in the state of Rajasthan. When lipid profile the with serum 25 (OH) D then the weak correlation was seen between them. **Keywords:** Vitamin D, Cardiovascular disease, lipid profile

PPCLN-13 FERMENFERMENTED MILK AS DIETARY INTERVENTION TO IMPROVE GUT HEALTH AND DEPRESSION.
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Background & Objectives: The bioactive peptides released during fermentation of milk and the prebiotics carry significant implications for research on gut–brain axis including gut–brain communication, brain cognitive function

and behavior. The Present study was designed to determine the relationship between consumption of prebiotic enriched milk based fermented beverage and depression. **Materials & Methods:** Subjects (291) aged 20-50 years from The MS University of Baroda who were willing to participate were screened using Beck's Depression Inventory (BDI). Further enrollment of 30 subjects was done by systemized random sampling of the population. Baseline data was collected for mild to moderately depressed subjects (n=30) regarding general information, daily habits and medical history using semi structured questionnaire and available health records. Dietary intakes were determined using 24 hours dietary recall and food frequency questionnaire, the gut microflora was determined with respect to the microorganisms- Lactobacillus, Bifidobacteria and E.coli in fecal sample. Serum cortisol levels were determined using fully automated bidirectional interfaced Chemi Luminescent Immuno assay, in ROCHE machine. Intervention trials included supplementing 200 ml rice based fermented buttermilk enriched with prebiotic (Fructooligosaccharide) for period of 30 days to 35 subjects. **Result:** Significant decrease in mean depression scores and cortisol values was seen by 46.5% and 4.2 % respectively. The fecal log count of Lactobacillus and Bifidobacterium showed a significant increase by 10.2% and 36 % respectively and a reduction by 2.7% in E.coli. **Conclusion:** Prebiotic enriched fermented buttermilk has potential to improve gut environment and lower mild to moderate status of depression in human subjects. **Keywords:** Gut -Brain axis, Depression, Perbiotics, Fermented milk, Cortisol

PPCLN-14 EFFECTIVENESS OF WEIGHT MANAGEMENT INTERVENTION ON WOMEN WITH POLYCYSTIC OVARIAN SYNDROME. ***ANITHA.C*[1],Hemalatha MS[1],Sushma BV[2] 1= Department of Studies in Food Science and Nutrition, Karnataka State Open University, Muktagangothri,Mysuru,2=Division of Nutrition and Dietetics, Department of Water and Health – Faculty of Life Science, JSS Academic of Higher Education and Research, Mysuru. Email:- anithaksou@gmail.com

Background & Objectives: Polycystic ovary syndrome (PCOS), a common endocrine condition in women, often improves with weight loss. Obesity has an important impact on the severity of these manifestations in proportion to its degree. Treatment of obesity through dietary and lifestyle intervention is a key treatment strategy in PCOS and improves insulin resistance, reproductive and metabolic features. The objective of this study was to evaluate the effectiveness of dietary management and the beneficial effect of weight loss on the hormonal and metabolic abnormalities and menstrual cyclicity in PCOS women. **Materials & Methods:** 30 Overweight women with PCOS between the age group of 25-29 yrs, who gave their consent formed the study subjects. A 16 weeks' weight loss regime, where 3 large meals were replaced by 5 small meals with Calorie recommendation of 1500±150 kcals was followed. Dietary modification as a short-term weight loss strategy with carbohydrate and fat restriction was recommended. The meal consisted of<120 g/day carbohydrate with low glycemic index and fat restricted to <50 g/day (saturated fat). **Result:** During the 8 weeks' phase marked reduction in weight (1.8±0.58), waist circumference (1.04±0.89cm), insulin (2.8±1.1 mU/L), total testosterone (2.18±1.20 nmol/L) and free androgen index (3.1±4.6) (P<0.001) was noted. By the end of 16thweek significant reductions in weight (3.56±0.867kgs), waist circumference (1.52±1.046), testosterone (1.08±1.2) and improvement in menstrual cyclicity was observed among the subjects. **Conclusion:** In conclusion, dietary modification is an effective strategy for the short-term management of PCOS. Predominantly body weight reduction by means of moderate fat and carbohydrate intake have been noted to correct irregular menstrual cyclicity, abnormalities and clinical manifestations related to PCOS women. **Keywords:** Polycystic ovary syndrome, obesity, waist circumference, testosterone, menstrual cyclicity, androgen index

PPCLN-15 EVALUATION OF INDIAN AMARANTHUS LEAVES ON ANEMIA AFFECTED ADOLESCENTS. ***Hemalatha M S* [1], Anitha C[1],Chandrashekar GK[1],Satish B[2] 1= Food Science and Nutrition, Karnataka State Open University, Mysuru,2= SNMC and HSK Hospital, Navanagar, Bagalkot. Email:- drmshemap@gmail.com

Background & Objectives: Amaranthus is being used in the form of grain, seed flour and leaves in different products. Indian amaranthus leaves are good source of Iron, Calcium and Vitamins. Hence this study aimed to evaluate the efficacy of Indian amaranthus leaves in combating anemia in adolescents. **Materials & Methods:** Sample of 100 adolescents were considered for the study at Hanagal Shree Kumareshwar Hospital, Navanagar, Bagalkot. Subjects were screened based on their Haemoglobin levels. 50 adolescents were administered 100 ml of Amaranthus leaves soup for 3 months daily. 50 adolescents were administered regular Iron Tablets prescribed by the Physician (Control). The interventions were done for every one month. The data collected were subjected to suitable statistics. **Result:** The study showed increase in Hemoglobin levels of adolescents after intervention of Amaranthus leaves soup. 20% of adolescents Hemoglobin levels had increased by 3gm%, 40% of adolescents

Hemoglobin levels increased by 2gm%, 30% of adolescents Hemoglobin levels increased by 1gm% and 10% of adolescents did not show any significant change in the Hemoglobin levels after 3 months of intervention. The Hemoglobin levels of experimental subjects were comparable to control subjects. **Conclusion:** The study showed significant increase in the Hemoglobin levels of adolescents. These findings suggest that dietary supplementation of Amaranthus leaves may be beneficial in increasing the Hemoglobin levels for subjects suffering from Iron deficiency anemia. Amaranthus leaves needs to be intruded to use in abundance in order to prevent anemia. **Keywords:** Anemia, Adolescents, Amaranthus leaves, Hemoglobin, Intervention

PPCLN-16 RAISED HS-CRP LEVELS, LOW VITAMIN D LEVELS AND HIGH DIASTOLIC BLOOD PRESSURE-EMERGING AS STRONG PREDICTORS OF TYPE 2 DIABETES MELLITUS. ***Meghana Patel***, Mini Sheth, Dept. of Foods and Nutrition, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat, India. Email:- meghanapatel2412@gmail.com

Background & Objectives: To determine putative role of various risk factors involved in occurrence of type 2 diabetes mellitus in urban Vadodara. **Materials & Methods:** A cross-sectional study was undertaken wherein forty seven adult type 2 DM subjects who willingly signed the written informed consent form were enrolled for the study from private clinics of urban Vadodara. Subjects were briefed on the objectives and benefits of the study. Blood, stool and urine were collected for the study. **Result:** It was observed that 40.5% of the subjects had hypertension of which 50% of the subjects were obese. The mean values for FBS, average blood sugar level, HbA1c, fructosamine and urinary glucose were 158.5, 190.8, 8.25, 279.7 and 42.5 respectively. The mean values for hs-CRP and homocysteine of the subjects were 3.17 mg/L and 22.6 µmol/L respectively. Almost half of the type 2 DM subjects (42.6%) had high hs-CRP levels. BMI, WC and WSR were significantly correlated with systolic and diastolic blood pressure. Also, a significant positive correlation was observed for BMI, SBP and DBP with Fasting blood sugar. Whereas, Average blood sugar and HbA1c was found to be positively correlated with WHR and WSR. hs-CRP was positively correlated with BMI whereas homocysteine was positively correlated with WHR. The inflammatory marker hs-CRP was found to be positively correlated with HbA1c and Average blood sugar whereas homocysteine was found to be positively correlated with glycemic parameters. Bifidobacteria was found to be negatively correlated with glycemic parameters whereas E.coli was positively correlated with glycemic parameters and homocysteine. Factors that contributed to diabetes ranked in the order of contribution were hs-CRP followed by vitamin D levels and diastolic blood pressure and were found to be the significant contributors. **Conclusion:** The strongest predictors of type 2 diabetes mellitus in the present cross-sectional study emerged as raised hs-CRP followed by low Vitamin D levels and high diastolic blood pressure. **Keywords:** Type 2 diabetes mellitus, raised hs-CRP levels, low vitamin D levels, high diastolic blood presssure

PPCLN-17 A CRITICAL APPRAISAL OF FACTORS INFLUENCING FUNCTIONAL STATUS IN CANCER PATIENTS. ***Namratha Pai Kotebagilu***, Lohith Mysuru Shivanna, Asna Urooj, Food Science and Nutrition, University of Mysore, Manasagangotri, Mysuru, Karnataka,India. Email:- namspai@gmail.com

Background & Objectives: Functional status is an individual's ability to perform normal daily activities required to meet basic needs, fulfill usual roles, maintain health and well-being. On the other hand, quality of life emphasizes the effects of disease on various functional parameters such as physical, social/role, psychological/emotional, and cognitive functioning. This study focused on assessing various factors that influence functional status in cancer patients. **Materials & Methods:** A descriptive cross sectional study was conducted to recruit 152 cancer patients undergoing treatment in three cancer hospitals situated in Mysuru, of which 137 patients completed the study. Relevant questions on the functional status were chosen from standard tools such as ECOG, EORTC– QLQ C30 and PG-SGA to elicit information. The impact of type of cancer, treatment associated symptoms, stage, nutritional status and treatment on the functional status was studied. **Result:** Among the different types of cancer, the functional parameters were affected greatly in subjects with head and neck cancers (HNC) followed by gastrointestinal cancers (GIC) and other cancers (OC). Role function was also significantly lower (p=0.006) in HNC. Type of cancer had no effect on the cognitive function. Symptoms such as mouth sores, dry mouth and swallowing problems were more prevalent (p=0.0001) in HNC than GC and OC. Only 8% of the study population had normal activity as per the ECOG tool, while 47.4% had presence of symptoms. A positive relationship was observed between nutritional and functional status. However, the stage of cancer and treatment had no association with the functional status. **Conclusion:** The type of cancer, presence of malnutrition and nutrition impact symptoms affected the functional status negatively. However no association was observed between stage

of cancer or the treatment modality. Therefore, management of symptoms during treatment and improving the nutritional status before initiation/during treatment can be vital in improving functional status of cancer patients. **Keywords:** Functional Status, Quality Of Life, Symptoms, Cancer, Mysuru

PPCLN-18 LOW GLYCEMIC INDEX, MODERATE CARBOHYDRATE BREAKFASTS MAINTAIN GLYCEMIC CONTROL IN PREGNANT DIABETICS. ***Aishwarya Kanneganti*[1]**, Asma Sajid[1], Raman Boddula[2], Latha Sashi[1], 1= Department of Clinical Nutrition and Dietetics, Fernandez Hospital,2= Department of Endocrinology, Fernandez Hospital. Email:- draishwarya_k@fernandezhospital.com

Background & Objectives: Carbohydrate restriction, particularly at breakfast has traditionally been advocated in management of pregnant women with diabetes. Indian breakfasts are primarily carbohydrate based and such restriction may not be acceptable to patients. The objective of this study was to assess if low glycemic index (GI), moderate carbohydrate breakfasts are as effective as low GI, lower carbohydrate breakfasts in maintaining post prandial glycemic targets. **Materials & Methods:** This was a cross sectional study of 2-hour post prandial glycemic response to diabetic breakfasts served at an urban tertiary maternity centre. Women with gestational diabetes or pre-gestational diabetes were served a breakfast with carbohydrate content of either <40 g, 40-50g or >50g. Glycemic values were measured using finger prick capillary blood sampling and a 5-point Likert scale was used to assess satiety. Multivariate logistic regression was used to compare glycemic response and generalised logistic regression was done to assess if carbohydrate content affected satiety. **Result:** 34 women with a mean age of 30.76 ± 7.56 completed the study. Mean 2-hour post prandial glycemic response to the breakfasts containing <40 g, 40-50g and >50g carbohydrate was 113.44 ± 10.97 mg/dL, 109.69 ± 21.49 mg/dL and 120.33 ± 19.82 mg/dL respectively (P value=0.45). There was no significant difference in satiety scores (P value=0.31).**Conclusion:** This study showed that a moderate amount of low GI carbohydrate can be safely consumed at breakfast by pregnant diabetics and is acceptable to patients. **Keywords:** Low GI, Moderate Carbohydrate, Breakfast, Pregnancy, Diabetes

PPCLN-19 Functional efficacy of sorghum based composite flour mix on the blood lipid profile of experimental rats. ***Manisha Sharma*[1]**, Mamoni Das[1], Jadav Sarma[2],1= Deptt. of Food Science and Nutrition, Assam Agricultural University,2= Deptt. of Pharmacology and toxicology, Assam Agricultural University. Email:- 2509manisha@gmail.com

Background & Objectives: Epidemiological studies have provided evidence about the beneficial role of functional foods in reducing the risk of non communicable diseases like diabetes, cardiovascular diseases and cancers because of its hypoglycemic and hypolipidemic effects as they are rich in dietary fiber, phytonutrients and antioxidants. In the present study an approach was made to develop and assess the functional efficacy of sorghum based composite flour mix for a period of 21 days on the plasma lipid profile of Experimental rats fed on a high fat diet. **Materials & Methods:** The blood lipid profile was assessed by determining the plasma HDL, LDL, triglycerides and total cholesterol through standard kits. Hypolipidemic and hypocholestrolemic effects of the developed functional foods was donewith the use of standard commercial kits coral: HDL-D-160ml, LDL-D-160 ml, Cholesterol 250 ml, Triglycerides 250ml. **Result :** For the present study the Experimental rats were formed into five groups namely Group I (rat ration), Group II (reference group),Group III (80% SBCFM1), Group IV (70% SBCFM2) and Group V (60% SBCFM3) and each group was fed with 40% sorghum based composite flour mix(SBCFM) from each formulation along with 40% rat ration and 20% coconut oil respectively. Out of all the five groups Group I showed no significant improvement in the plasma HDL, LDL, triglycerides and total cholesterol at the end of the supplementation period,Group II showed significant increase in plasma HDL, LDL, triglycerides and total cholesterol while Groups III, IV and V fed with Sorghum based composite flour mix showed increase in the plasma HDL and lowered the LDL, triglycerides and total cholesterol level. **Conclusion :** Thus,it can be concluded that, all the functional ingredients used for the development of sorghum based composite flour mix has positive significant effect in the blood lipid profile but the effects of feed 80% SBCFM1 was significantly higher in comparison with the other formulations to increase the plasma HDL and lower the plasma LDL, triglycerides and total cholesterol. **Keywords:** Functional, composite flour, lipid profile, HDL,LDL, triglycerides, total cholesterol

PPCLN-20 OSTEOPOROSIS-AN EMERGING DISEASE. ***Ms.Charu Agarwal***[1], Mrs.Shalini Agarwal[2]. 1= St. Ann's Degree College for Women affiliated by Osmania University, 2=Saraswati Institute of Medical Sciences. Email:- cagarwal660@gmail.com

Background & Objectives: There are several diseases related with bone. Osteoporosis is the most common bone disease, means "porous bones". It as a chronic, asymptomatic skeletal disease, osteoporosis is characterized by decreased bone mass with a consequent increase in bone fragility and risk of fracture, particularly of the wrist, spine, hip and ribs. It can be manifested in both males and females at any age but mostly it is found to be prevalent mainly in aged women. The objective of this study was to check the bone mineral density (BMD) and threat of osteoporosis to different age groups and based upon their life style. **Materials & Methods:** A study was conducted on 60 people including both men and women from age group 30-70. Duel Energy X-ray Absorptiometer (DEXA) was used for diagnosis which measures bone density. **Result :** Findings of the study that after the age of 40, slow resorption of bone occurs in both sexes but after menopause in women loss of additional bone mass for a decade leading to decreased bone mineral density (BMD). Lower bone mineral density and an increased fracture risk were found in more women than men and in more postmenopausal women than premenopausal women. It was due to decreased intestinal absorption of calcium resulting in the body withdrawing calcium from the bone reservoir. This problem of absorption increases with an increase of age. And also lack of vitamin D which effects the absorption of calcium. It was found that apart from ageing, the lifestyle has a huge impact on the bone density like intake of caffeine and salt, smoking, sedentary lifestyle, emotional stress and inappropriate diet. People having healthy diet and daily exercise are found to have healthy bones as compared to others. **Conclusion :** Osteoporosis is a silent disease which is rapidly increasing in modern era due to ignorant behavior. But by changing the lifestyle and taking precautions beforehand, the strength of the bone can be maintained and risk of osteoporosis can be reduced. **Keywords:** Osteoporosis, fragility, age and lifestyle

PPCLN-21 NUTRITIONAL ASSESSMENT AND MONITORING OF FOOD CONSUMPTION AMONG HOSPITALIZED PATIENTS. ***Bhagysri Goud Akki***, Radha R Chada, sunshine hospital secundrabad. Email:- bhagyasrigoudakki@gmail.com

Background & Objectives: Under-nutrition of hospitalized patients has been a problem recognized for nearly 40years, with disease specific malnutrition being very significant. It is associated with increased risk of hospital infections, delayed wound healing, increased LOS and cost of the treatment, higher morbidity and mortality risk. The problem of iatrogenic malnutrition adds to the existing poor nutritional status. The aim of the study is to identify malnutrition and the determinants of the dietary intake among hospitalized patients. **Materials & Methods:** Prospective observational study of patients admitted to the hospital wards of a tertiary-care hospital. Every patient admitted to the hospital was assessed by using Patient Generated Subjective Global Assessment (PGSGA) tool. Of them, 25% of the patents were monitored for their intake of food during the course of hospital stay. Visual estimation of the food left in the plate after the consumption was performed to obtain the information on consumption. Anthropometric data, LOS and mean intake of energy and protein against delivered quantities of one meal (lunch) were assessed. **Result:** 1250 patients with 538 females and 712 males (mean age 54.98±15.61) years were assessed. The mean BMI of the study group was 25.5±5.8kg/m2. Of them 46.8% and 0.8% were moderately, severely malnourished respectively. 52.4% of the patients were well nourished at admission. The mean delivered calorie and protein of the one monitored meal was 570±100.6kcal and 21.7±4.25gms respectively. The mean consumed energy and protein were 464.535±142.86)(81.4%) and (18.1904±5.33)(82.9%) respectively. There was a significant difference in consumption of energy ($p<0.0377$) and protein ($p<0.029$) among the well-nourished as compared to malnourished patients which possibly contributes to iatrogenic malnutrition. **Conclusion:** Maintaining good nutritional status during hospitalization is vital. Estimation of plate wastage will facilitate early recognition of poor intake of food that would contribute to malnutrition during hospitalization. Early recognition would help to optimize nutritional intervention. **Keywords:** LOS, PGSGA tool, energy, protein, plate wastage.

PPCLN-22 NUTRITION INTERVENTION WITH FLAX SEED POWDER AND FLAX SEED OIL CAPSULES IN TYPE.2 DIABETES AND OVERWEIGHT SUBJECTS. ***Malathi.V***, Dr.Kavitha Waghrey. Email:- drmalathi.v@rainbowhospitals.in

Background & Objectives: Medical nutritionists, play a key role in the prevention and treatment of Obesity and Diabetes. Life style intervention means weight loss, exercise and healthy eating habits.The study was undertaken to observe the effect of dietary intervention of flax seed powder and flaxseed oil on glycemic control, lipid profile, body weight and plasma Adiponectin levels of subjects before, during and after the study period. Effect of Diet

counselling was studied. **Materials & Methods:** The study was conducted on 2 groups, 120 Type.2 D.M and 120 overweight subjects. Each group is divided into 4 subgroups. Initial screening and periodic assessment was done by using Interviewschedule. Body weight and BMI were recorded at each visit. Personalized diet was advised at each visit. Biochemical investigations were done as per the protocol.Chi-Square and Fisher Exact tests and other tests were used for statistical analysis of data. **Result:** The reduction in body weight, FBS and Lipid profile is consistent even in post intervention. The oil group has shown highly significant reduction in 3rd month of intervention and post intervention.In combination group,1st and 2nd month of intervention has shown reduction significant at 5% level whereas third month and post intervention has shown highly significant reduction at 1%level in oil group.Triglycerides reduction is highly significant (at 1% level) in all the three groups and at all visits. Highly significant reduction is observed in comparison with controls. Highly significant reduction in body weight is observed in all groups of overweight subjects. **Conclusion:** Flax seed in powder and oil form has been effective in diabetes and weight loss management. **Keywords:** nutrition intervention,flax seed powder,flax seed oil ,plasma adiponectin,glycemic control,weight loss.

PPCLN-23 AN INTERVENTION STUDY ON THE SUPPLEMENTATION OF GUAVA LEAVES POWDER INCORPORATED KHAKHRA ON THE GLYCEMIC, LIPEMIC AND INFLAMMATORY STATUS OF TYPE 2 DIABETES MELLITUS SUBJECTS. ***Padmini Thakore***, Uma Iyer, Mini Sheth,Komal Chauhan,Swati Dhruv,Shonima Venugopal, Vijayata Sengar, Swati Parnami, Meghana Patel, Unnati Bhavsar, Neha Soni, Riya Rammohan, Charanjeet Salooja, Jesna Matthew, K.Chamthoi. Department of Foods and Nutrition, Faculty of Family and Community Sciences, Maharaja Sayajirao University of Baroda. Email:- padmini.thakore@gmail.com

Background & Objectives: Multiple animal model and in vitro studies using guava leaves extract have proved that guava leaves posses hypoglycemic and hypolipidemic properties. The lack of human trials using guava leaves gave rise to the objective of the study which was, to incorporate guava leaves powder in a traditional Indian snack khakhra, supplement and evaluate its impact on the glycemic and lipemic status, inflammatory markers, liver and kidney function of type 2 diabetes mellitus (T2DM) subjects. **Materials & Methods:** A randomized controlled trial was carried out in two clinics of Vadodara city. The clinics were randomly divided into control and experimental group. 20 subjects enrolled in the control and 29 in the experimental group were supplemented with placebo khakhra and experimental khakhra respectively, for a period of 45 days. 2 khakhras were to be consumed per day. Each experimental khakhra contained 2g of guava leaves powder. Biochemical and anthropometric parameters were analysed at baseline and on the 45th day. Blood pressure and fasting blood sugar (FBS) measurement was carried out at an interval of 15 days. Student's t test, paired t test and f test were performed to analyse the data. **Result :** A significant reduction in the FBS levels was found on the 15th ($p < 0.001$) and 30th ($p < 0.01$) day of the study however, it was not sustained till the 45th day. A non significant reduction in glycated haemoglobin, lipid profile and inflammatory marker levels was found in the subjects post supplementation. No changes were observed in the liver and kidney function tests. **Conclusion :** Despite strong evidence of the therapeutic potential of guava leaves, supplementation with 4g of guava leaves powder per day, for 45 days did not alter the glycemic status, lipid profile and inflammatory marker levels or have a detrimental effect on the liver and kidney of T2DM subjects. **Keywords:** Guava leaves, Type 2 Diabetes Mellitus

PPCLN-24 EFFECTS OF LIFESTYLE MODIFICATION IN OBESE ADULTS WITH NON-ALCOHOLIC FATTY LIVER AND NON-ALCOHOLIC STEATOHEPATITIS. ***Nidhi Prakash.*** Women's College Calcutta, West Bengal, India. Email:- nidhiprakash17@gmail.com

Background & Objectives: Non-alcoholic fatty liver disease (NAFLD) encompasses liver conditions ranging from hepatic steatosis, liver fibrosis, steatohepatitis (NASH) and NASH-related cirrhosis. It is now more common than ALD due to rapid rise in the prevalence of Obesity. Its prevalence has been estimated between 9% to 35% in India. Excess liver fat is also linked to metabolic syndrome. Pharmacologic treatments of NAFLD are limited. Lifestyle modification is believed to be effective in reducing features of NAFLD, although the effect of high fiber diet with exercise on NASH and NASH related cirrhosis, is unclear. The intervention based study was aimed to evaluate the efficacy of high fiber diet on liver enzyme (SGPT)and fibroscan values. **Materials & Methods**: In this 6-months long prospective follow-up study, initially, 38NAFLD subjects, were selected from the 4 Diagnostic Clinics of Kolkata. Only 29subjects, 41.4%pre-obese and 58.6%obese, could follow the prescribed diet and lifestyle modification. Fibroscan and biochemical tests were carried out twice (pre and post-trial) but anthropometric measurements were taken 4times (baseline, 2, 4 &6 months. Only 29obese subjects followed the program of restricted diet (ideal weight x 20-25Cal) and exercise(brisk walking &jogging). **Result:** After 6 months of lifestyle modification, the mean Fibroscan and mean Serum glutamic pyruvic transaminase (SGPT/ALT)values

improved significantly(p≤0.05)(17.76□±□13.31 kPa vs 8.84□±□3.31 kPa; p=0.0002) and (82.20□±□13.63 U/L vs 66.69□±□3.95U/L; p=0.0001) respectively. The paired-t-test results revealed that oats based high fiber diet reduced body weight, BMI, blood pressure, total cholesterol and fasting blood glucose significantly(p≤0.05) after the trial. The mean bodyweight of the subjects improved from (88.57 ± 10.19□kg) to (77.99 ± 5.96□kg). **Conclusion:** The study revealed that lifestyle modification including intense physical exercise and diet restriction is an effective therapy to treat NAFLD patients. However, further clinical trials with bigger study populations are required. NASH-related cirrhosis, the advanced stage fibrosis, can also be improved by lifestyle modification. **Keywords:** NAFLD, NASH, SGPT, Fibroscan, BMI, Blood pressure, Obese

PPCLN-25 PREVALENCE AND DETERMINANTS OF VITAMIN-D STATUS IN SUBJECTS WITH TYPE II DIABETES MELLITUS. ***Arti Muley,*** Uma Iyer, Mona Shah. Email:- arti.muley@ssbs.edu.in

Background & Objectives: Vitamin-D deficiency (VDD) is more evident in diabetic subjects as evidence shows its role in regulating some pathways related to diabetes development. It is hypothesized that vitamin-D influences glucose homeostasis by modulating inflammatory response. Hence the present study was planned to map the prevalence of VDD and identify the associated determinants among type-II diabetic subjects. **Materials & Methods:** 209 type-II diabetic subjects (30-65 years) attending a diabetic clinic in Vadodara city were enrolled. 114 subjects (62 males & 52 females) gave written consent for biochemical estimations. Background information and medical history was collected using a pre-tested semi-structured questionnaire and anthropometric measurements by standard procedures. Serum 25(OH)D, lipid profile, blood glucose and HbA1c levels, were estimated in an accredited laboratory using fasting blood samples. Data was analysed using SPSS version 20. Prevalence was reported as percentages. Pearson correlation was applied to find the association between determinants and multivariate analysis (stepwise linear regression) was performed to identify the predictor variables of vitamin-D status. Results were considered significant at p<0.05. **Result:** About 89% of the subjects had VDD (serum 25(OH)D <20ng/ml). Significant higher values (p<0.05) were observed for waist-stature-ratio and %body fat in the low vitamin-D group (<20ng/ml) when compared with the high vitamin-D group (â‰¥20ng/ml). A significant negative correlation was observed between the vitamin-D levels and waist-circumference, waist-stature-ratio, BMI, %body fat, total-cholesterol and LDL-C. Hypercholesterolemia (OR 7.5, 95% CI 0.9-60.3) and inflammation (OR 3.95; 95% CI 1.2-13.2) was significantly high (p<0.05) among the low vitamin-D group. WSR, total T4, duration of diabetes, total proteins and LDL-C were identified as predictor variables of vitamin-D status through the regression model. **Conclusion:** VDD was highly prevalent among the diabetic subjects suggesting regular monitoring of serum vitamin-D levels. Anthropometric measurements and lipid values emerged as modifiable risk factor for poor vitamin-D status which calls for positive behaviour change and lifestyle modification among the subjects. **Keywords:** Vitamin-D deficiency, type-II diabetes mellitus, prevalence, risk factors, determinants

PPCLN-26 ASSESSMENT OF PATIENTS IN INTENSIVE CARE UNIT(ICU) ON ENTERAL FEEDS USING SUBJECTIVE GLOBAL ASSESSMENT(SGA) AND ACUTE PHYSIOLOGICAL AND CHRONIC HEALTH EVALUATION-2(APACHE-2) FOR PREVALENCE OF MALNUTRITION. ***Akshatha.N***, Priyanka Rohatgi. UNIVERSITY OF MYSORE, MYSORE. Email:- thantryakshatha@gmail.com

Background & Objectives: The prevalence of malnutrition is high in ICU patients. Patients being treated in ICU are considered as malnourished when their endogenous and exogenous supply of calories is not sufficient to meet their metabolic requirement.**Objectives:**1.Assessment of nutritional status of ICU patients on Enteral feed.2.To check the prevalence of malnutrition in ICU patients on Enteral feeds by checking the deficit nutrient intake and correlate the energy intake.**Materials & Methods:** A total of 33 ICU patients above the age of 18yrs on enteral feeds were selected regardless of genders, ethnicity or reason for hospitalization, Standardized questionnaire was used to collect information regarding socio, demographic details and standard SGA and APACHE-2 tools were used to assess the degree of malnutrition. **Result:** A significant difference was evident in weight and Body Mass Index (BMI) from Date of Admission (DOA) and Date of Shift Out (DOSO). A significant inverse relationship was evident in terms of nutrient consumption (protein and calorie) with the length of stay(LOS) in the ICU. Using APACHE-2 score as a predictor for mortality risk among ICU patients, it was evident that majority of the subject i.e., 58% had a score (10-19) which indicates low mortality risk. **Conclusion:** Patient's admission weight and nutritional status plays a major role in length of hospital stay. Most of the patients in ICU are malnourished due to weight loss, stress, water loss, prolonged Nil per oral (NPO) status and the disease

prognosis are indicated with relation to the above mentioned fact hence it is imperative to monitor weight, feeds and APACHE score regularly. **Keywords:** Prevalence, Malnutrition, Nutritional Status, ICU, Enteral feeds.

PPCLN-27 DECLINING ENERGY EXPENDITURE AMONG MILLENNIALS: REVISITING THE DAILY ENERGY REQUIREMENT. ***Srishti Sinha***, Sarita Devi, Anura V Kurpad, Rebecca Kuriyan.St. John's Research Institute, St. John's National Academy of Health Sciences, Bangalore, India. Email:- srishti.s@sjri.res.in

Background & Objectives: The daily energy requirement is based on the daily energy expenditure. Millennials are the next generation of adults in India, and their risk for chronic disease depends on their energy balance. It is thought that the Schofield equation overestimates the basal metabolic rate (BMR) in Indian adults by 5-12%; combining this with decreased physical activity energy expenditure (PAEE) among millennials leads to considerable error in estimating total energy expenditure (TEE). The present study aimed to measure BMR, PAEE and TEE in young adults (millennials) and to compare these with predictions based on weight and activity counters. **Materials & Methods**: A total of 20 male subjects (10 normal weight and 10 overweight), 18-20 years old, were recruited from student population of St. John's Medical College, Bangalore. The TEE of subjects was measured using doubly labelled water (2H2O-0.07 g/kg body weight and 18O-1.25 g/kg body weight) and urine samples were collected at baseline and post dose days-0, 7 and 10. The physical activity of the subjects was measured using tri-axial accelerometer (Actigraph, GT3X+) for 7 days. BMR was measured using indirect calorimetry. **Result:** From the preliminary results, the TEE of subjects (n=5) with average BMI of 19.28 kg/m2 was 1916±456 kcal/d (8.01±1.9 MJ/d) with BMR of 1524±105 kcal/d (6.37±0.43 MJ/d) and physical activity level (PAL) of 1.25±0.2. The physical activity energy expenditure as assessed by accelerometer was 284±108 kcal/d (1.18±0.45 MJ/d) with average step counts of 6672±1853 steps/d. The Schofield equations over-estimated the BMR of the subjects by 3.9%. When compared with RDA for Indian adults, the measured TEE was lower by 400 kcal/d. The data collection is ongoing and the results will be presented during conference. **Conclusion:** The data suggest that TEE among millennials is very low. Therefore, it is critical to revisit the daily energy requirement and physical activity recommendations for Indian adults to avoid positive energy balance and its consequences. **Keywords:** Total Energy Expenditure, Basal Metabolic Rate, Physical Activity Level, Daily energy requirement

PPCLN-28 EFFECT OF ULTRASONIC HOMOGENIZATION ON FAT, PROTEIN AND CARBOHYDRATE ANALYSIS OF FRESH HUMAN MILK. ***Swati Balapure***, Shraddha Mandale1, Vinit Warthe1, Urmila Deshmukh. Government Medical College, Akola. Email:- swatibalapure4007@gmail.com

Background & Objectives: Homogenization of milk sample is done before analyzing it for macronutrient contents. Using sonicator reduces the particle size distribution in milk, making the milk sample more homogenous. Our objective was to find out if macronutrient content of an unhomogenized fresh human milk (HM) sample differs significantly from homogenized HM sample. **Materials & Methods:** Samples of HM were obtained from mothers who regularly expressed breastmilk for their offspring admitted to NICU. A sonicator (MIRIS, Sweden), set at 1.5 sec/ml, was used for homogenization of 2.5ml HM aliquot, pre-warmed to 400C. Paired aliquots (one homogenized and one unhomogenized) were analysed using Human Milk Analyzer (MIRIS, Sweden), within 4 hours of collection. Readings of fat, protein, carbohydrate and energy were compared using Paired t test. The Ethics Committee permission was obtained. **Result:** In 116 paired samples, the mean (sd) macronutrient fat, protein, carbohydrate and energy concentrations in unhomogenized vs. homogenized HM were: Fat 3.36 (1.40) vs. 3.28 (1.40) g/dL; Protein 1.72 (0.94) vs. 1.56 (0.79) g/dL; Carbohydrate 6.50 (0.99) vs. 6.47 (0.99) g/dL, and Energy 66.67 (14.10) vs. 64.90 (14.45) kcal/dL, respectively. Homogenization had no effect on fat (p=0.233) and carbohydrate (p=0.544) concentrations, but protein and energy contents were significantly different (p= 0.002 and 0.023, respectively). Homogenized HM samples showed 9.5% less proteins and 2.7% less energy compared to unhomogenized HM samples. **Conclusion:** Our observations indicate need of following a uniform protocol of HM sample processing before analysing them for macronutrient contents. This may be relevant when fortification of donor HM is practiced in Human Milk Banks, and also during analysis of HM in lactation research. **Funding:** The Indian Council of Medical Research, New Delhi, India. **Keywords:** human milk, homogenization, macronutrient.

PPCLN-29 EFFECT OF FOUR WEEKS OF FREEZING ON MACRONUTRIENTS IN HUMAN MILK. ***Shraddha Mandale***,Swati Balapure, Vinit Warthe, Urmila Deshmukh. Government Medical College,Akola.Email:mandaleshraddha22@gmail.com

Background & Objectives: Human milk (HM) is frozen at -20 or -80˚C for its later use, in Human Milk Banks and in lactation research projects. Freezing and thawing may affect macronutrient content of HM. Our objective was to study the effect of four weeks of freezing HM at -20˚C, on its fat, protein and carbohydrate content. **Materials & Methods:** Two aliquots of 2 ml each were prepared from fresh, expressed breast milk of mothers whose offspring were admitted to the NICU. One aliquot of HM was analyzed within 3 hours of collection, and the other was stored at -20˚C to be analyzed after 4 weeks. Samples were homogenized, and analyzed using mid-infrared transmission spectroscopy (MIRIS, Sweden). Paired t test was used. The Ethics Committee permission was obtained. **Result:** Thirty paired HM samples from 30 mothers were analyzed. The mean (sd) concentrations of macronutrients in fresh vs. stored HM were: fat 2.77 (1.21) vs. 2.30 (1.05) g/dL, carbohydrate 6.17 (1.20) vs. 6.14 (1.20) g/dL, protein 1.60 (0.52) vs. 1.46 (0.56) g/dL, total solids 11.13 (2.11) vs. 10.46 (1.88) g/dL, and energy 59.10 (14.04) vs. 53.88 (12.03) kcal/dL. The mean (95% Confidence Interval, CI) fall in macronutrients was, fat 0.47 g/dL [95% CI (0.19, 0.74); p=0.002], protein 0.15 g/dL [95% CI (0.03, 0.27); p=0.019], total solids 0.68 g/dL [95% CI (0.34, 1.02); p<0.001], and energy 5.22 kcal/dL [95% CI (2.47, 7.98); p=0.001], and no change in carbohydrate (p=0.641). Fat content reduced by 17%, and protein and energy by 8.8%.
Conclusion: The significant fall in fat, protein and energy content of HM frozen at -20˚C for 4 weeks should be considered while using or fortifying donor HM stored in Human Milk Banks. Also, our findings indicate need of careful interpretation while comparing reported macronutrient contents from published lactation research. **Funding:**The Indian Council of Medical Research, New Delhi. **Keywords:** human milk, freezing, macronutrients, mid-infrared transmission spectroscopy

PPCLN-30 EFFECT OF VALUE ADDED HEALTH MIX ON SURGICAL OUTCOME AMONG SELECTED SUBJECTS. ***N.Deepa Sathish***, A.ThirumaniDevi, Department of Food Science and Nutrition. Email:- deepasathis@gmail.com

Background & Objectives: Food value addition with protein isolates is continued to be an important tool to promote a health and wellbeing of an individual irrespective of all age groups and also to prevent diseases. Time dependent optimal nutrition support and energy production after severe illness becomes increasingly protein dependent (1.5g–2.0g/kg of body weight),also prevents malnutrition and specific nutrient deficiencies. **Materials & Methods:** Keeping these factors the investigator carried out this study with the objective of formulating and evaluating value added health mix incorporated with protein isolates such as Soy protein isolates, Whey protein, Egg white and Skimmed milk powders. The best accepted health mix was considered for the preparation of the selected breakfast recipes namely chappathi, dosa, kozhukattai (momos), pongal and puttu. Hypoglycemic effect of the recipes were studied among the selected Type 2 diabetics with and without lower limb injury of the study groups using Continuous Glucose Monitoring System. **Result:** Sensory evaluation showed that the health mix incorporated with soy protein isolate (15 per cent) was highly acceptable with the overall acceptability score of 4.8±0.4.The overall acceptability score increases with the proportion of protein isolates. Nutrient analysis of the selected health mix revealed higher amount of protein of 25.4g and energy (450.6 Kcal) and supplied less amount of carbohydrate of 76g among the other mixes with 6 mg of iron content. Significant reduction of the mean pre and post operative fasting and postprandial glucose level, and mean level of Glycosylated Haemoglobin(HbA1C) with increased level of Albumin and Haemoglobin were observed among the study group with the maintenance of body weight. **Conclusion:** Health mix with the incorporation of value added protein isolates is one of the most significant product and widely used in the Medical Nutrition therapy with an impact of enhancing hypoglycaemic effect among Type 2 diabetic subjects. **Keywords:** Value added health mix, Sensory evaluation, protein isolates, Hypoglycemic effect

PPCLN-31 WOMEN WITH HIGHER BMI IN EARLY PREGNANCY HAVE LOWER LONG CHAIN POLYUNSATURATED LEVELS. ***Anjali Jadhav***[1],Amrita Khaire[1],Karuna Randhir[1],Sagar Bhosale[1],Shridevi Gundu[1],Prachi Joshi[1],Girija Wagh[1],Sanjay Gupte[2],Sadhana Joshi[1].1=Bharati Vidyapeeth Deemed University, Pune Satara Road, Pune 411043,India,2=Gupte Hospital and Research Centre, Pune, India. Email:- bvduirsha@gmail.com

Background & Objectives: Studies have demonstrated that higher maternal body mass index (BMI) and inadequate long chain polyunsaturated fatty acid (LCPUFA) status are implicated in adverse pregnancy

outcomes. However, the association of maternal BMI and LCPUFA status is not clear. The present study aims to examine the association of maternal BMI in early gestation and LCPUFA levels and their influence on pregnancy outcome. **Materials & Methods:** This study is a part of a large ongoing ICMR study which recruits women in early pregnancy and follows them till delivery. Pregnant women (n=92) recruited at 11-14 wks of gestation were included in the present study. Women were categorized based on early pregnancy BMI as (i) Women having BMI <25 kg/m2 (normal) (ii) Women having BMI â‰¥25 kg/m2 (overweight). Maternal blood was collected and erythrocyte fatty acids were analyzed using gas chromatography. **Result:** The levels of arachidonic acid (omega-6 fatty acid) and stearic acid (saturated fatty acid) was higher ($p<0.05$ for both) in women having higher BMI as compared to women having normal BMI. There was no difference in the levels of omega-3 fatty acids and monounsaturated fatty acids between the groups. There was a a negative association of alpha-linolenic acid (omega-3 fatty acid) and diastolic blood pressure (n=60, $p=0.010$, $r=-0.330$) in women having a higher BMI. **Conclusion:** The findings of the present study suggest that higher BMI is associated with lower levels of LCPUFA in early pregnancy. This study has implications for maintaining an optimal LCPUFA status and BMI for a better pregnancy outcome. **Keywords:** BMI , early gestation, fatty acids, overweight

PPCLN-32 HALITOSIS - A DISGUSTING PHENOMENON OF SOCIAL STIGMA.***SETHURAMAN VISHNUPRIYA***, Ms.G.K Gomathi. STET WOMEN'S COLLEGE MANNARGUDI614 016 TAMILNADU INDIA. Email:- sethuramanvishnupriya@gmail.com

Background & Objectives: Also known as bad breathe or fetor oris widespread problem that cause considerable discomfiture leads to psychological stress. It's been estimated that 1 in every 4 person is being affected from halitosis. Though number of causative factors leads to halitosis, poor oral/ dental hygiene is the leading cause. The food particle broken down by the oral microbial flora results in the release of unpleasant gas that cause halitosis. Good flossing, brushing teeth, tongue cleaning and by using regular mouth wash agents are generally recommended preventive/treatment methods. The purpose of the study is to prove the efficacy of simple coconut oil could be a possible therapy and more potential than traditional Gingelly oil used in oil pulling. **Materials & Methods:** A total of 118 students were enrolled in the study. simple techniques were applied to study the efficacy of coconut oil in treating Halitosis. **Result:** 85% of the study group showed an enhanced breathe and reduced Halitosis 48% of the studied population were also reported with reduced gum bleeding along with halitosis. **Conclusion:** Conclusion: The result concludes to use solely the coconut oil rather the Gingelly oil. **Keywords:** Bad breathe, Halitosis, microbes gingelly oil, coconut oil

PPCLN-33 Muneeshwari - Withdraw.

PPCLN-34 Maternal micronutrient status in early pregnancy in two different socioeconomic groups. ***Kinjal Dave[1]***, Nisha Wadhwani[1],Yasmin Aktar[1], Aditi Mane[1],Girija Wagh[1],Savita Mehendale[1],Sanjay Gupte[2],Sadhana Joshi[1].1=Bharati Vidyapeeth(Deemed to be University),Pune, India,2= Gupte Hospital and Research Centre, Pune, India.
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Background & Objectives: Maternal micronutrient status is recognized to play an important role in the well-being of the mother and infant. Vitamin B12 and folate play an important role in nucleic acid metabolism, cell growth and proliferation and are important determinants of fetal growth. Assessment of these micronutrients in early pregnancy is essential since later in pregnancy there may be reductions in the plasma concentrations of these micronutrients and its metabolites due to plasma volume expansion. The levels of these micronutrients are likely to be associated with socioeconomic groups. Therefore the current study aims to assess the levels of folate, vitamin B12 and homocysteine early in pregnancy in two different socioeconomic groups. **Materials & Methods:** The current study is a part of the ICMR Centre for Advanced Research Project which was set up in March 2017 that aims to recruit women in early pregnancy and follow them till delivery. 87 normotensive control women with singleton pregnancy delivering at term (≥37 weeks of gestation) from two socioeconomic groups are included in the study. Data on socioeconomic status of the subjects was collected using the standard of living index (SLI). Maternal blood was collected at 11-14 weeks of gestation. Maternal folate, vitamin B12 and homocysteine levels were estimated by chemiluminescent microparticle immunoassay method. Baby weight, height, head and chest circumference were recorded at birth. **Result:** Maternal levels of folate ($p<0.01$) and vitamin B12 ($p<0.01$) were higher while homocysteine levels were lower ($p<0.01$) in the higher socioeconomic group as compared to lower socioeconomic group. Vitamin B12 and folate deficiency in early pregnancy was higher in the lower socioeconomic population. Furthermore, baby weight and height were also lower ($p<0.05$ for both) in the lower

socioeconomic group as compared to higher socioeconomic group.**Conclusion:** Our results suggest that improved maternal micronutrient status during early pregnancy influences fetal growth and development. **Keywords:** Pregnancy, Folate, Vitamin B12, Socioeconomic.

PPCLN-35 CARDIOVASCULAR RISK FACTORS AND LIFESTYLE PRACTICES AMONG ADULT POPULATION OF JORHAT, ASSAM. ***Monosweta Gracy Shaw***, Ruma Bhattacharyya. Email:- monoswetashaw@gmail.com.

Background & Objectives: Cardio-vascular disease is one amongst the diet related non communicable diseases and its prevalence among adult population across the globe is ever increasing. The study of cardiovascular risk factors among the adult population of North Eastern states is either sporadic or scanty. Therefore the present investigation has been conducted with the objective of assessing relationship between cardiovascular risk factors and lifestyle practices amongst the adult population of Jorhat, Assam. **Materials & Methods:** A sample size of 100 patients was selected randomly, from the hospital records of a government and a private hospital. Survey was conducted using a pre-tested schedule to study the socio demographic, medical history, lifestyle and dietary practices. The risk factors of cardiovascular like obesity, hypertension and diabetes mellitus were studied by using the data available in the hospital records and regular monitoring of patients. **Result:** Results revealed that 32% of the population were from low income group,49%were middle income group and 19% were high income group. The education level indicated 22% were illiterate,31% were higher secondary passed, 47% were graduates. BMI of the respondents were 23%, 42%, 13% and 22% who were underweight, overweight, obese and normal respectively. Past medical history revealed that 46% had diabetes mellitus,61% were hypertensive and 19% had chronic kidney disease. Physical activity of the respondents was low, 71% of the population had a sedentary lifestyle. Among the respondents 53% had regular smoking habits, 66% had betel nut chewing practices while 38% with alcohol consumption. Dietary practices revealed that 91% were non vegetarian, 26% had the habit of taking extra salt in their meals. Cent percent of the population used mustard oil as their cooking medium. Fast food and processed food consumption was frequent for 68% and 41%of the population respectively. **Conclusion:** It was observed that dietary risk factors and lifestyle practices were positively correlated to the underlying causes leading to cardiovascular diseases. Moreover lack of proper education and knowledge regarding the proper diet to be taken in such conditions leads to the increasing population suffering from CVD. **Keywords:** cardiovascular, hypertension, diabetes mellitus, salt, lifestyle, sample, obesity, salt

PPCLN-36 TOLERANCE AND ACCEPTABILITY OF READY-TO-USE THERAPEUTIC FOOD (RUTF) IN CHILDREN WITH MALIGNANCY RELATED MALNUTRITION. ***Rajul Gala*[1]**, Maya Prasad[1], Sneha Tandon[1],Brijesh Arora[1],Amey Paradkar[1], Alka Jadhav[2].1=Tata Memorial hospital, Paediatric Oncology, Mumbai, India.2=Lokmanya Tilak Municipal Medical College and General Hospital, Paediatrics, Mumbai, India. Email:- rajulgala1@gmail.com.

Background & Objectives: Malnutrition in children with cancer is associated with decreased treatment tolerance, unfavorable response to chemotherapy, treatment delays, increased risk of infection and poor quality of life. RUTF is a medical nutrition therapy that is extensively used for severely malnourished children without malignancy. This study aims to assess the tolerance and acceptability of RUTF in children with malignancy related malnutrition. **Materials & Methods**: Severely & moderately malnourished children with cancer, aged 5 to 15 years, were enrolled in a prospective study. Those on RUTF arm were given RUTF for 6 weeks while those on control arm received standard nutrition therapy. Children were monitored weekly for compliance and complications like vomiting, diarrhea & constipation from baseline to 6 weeks. **Result :** 260 children were enrolled in the study out of which data regarding complications was available in 253 (127 in RUTF arm & 126 in control arm). Average RUTF intake was 2 sachets/day from RUTF arm. Out of 127 children on RUTF arm, 103 (81%) met >75% of RUTF requirement, 19 (15%) met 50-74% of requirement while 5 (4%) children met <50% of requirement during 6 weeks. Grade 2 vomiting was seen in 32/127 (25.2%) children on RUTF arm vs 14/126 (11.1%) on control arm during 6 weeks. 10/127 (7.9%) children on RUTF arm had grade 2 diarrhea vs 7/126 (5.6%) on control arm. Of these, 5/32 children had vomiting (2 with grade II & 3 with grade III) & 3/10 had grade 2 diarrhea which could be attributed to RUTF. 6/127 (4.7%) children on RUTF arm had constipation vs 17/126 (13.5%) on control arm. **Conclusion:** Although children on RUTF arm experienced higher incidence of gastrointestinal side effects, grade 3 gastrointestinal toxicity was rare. RUTF is well tolerated and accepted in children with malignancy related malnutrition. **Keywords:** RUTF, Malnutrition, Malignancy, Children

PPCLN-37 EFFECTS OF LIFESTYLE MODIFICATION IN OBESE ADULTS WITH NON-ALCOHOLIC FATTY LIVER AND NON-ALCOHOLIC STEATO-HEPATITIS. ***Nidhi Prakash***. Guest Faculty at Women's College Calcutta, West Bengal, India. Email:- nidhiprakash17@gmail.com .

Background & Objectives: Non-alcoholic fatty liver disease(NAFLD) encompasses liver conditions ranging from hepatic steatosis, liver fibrosis, steatohepatitis(NASH) and NASH-related cirrhosis. It is now more common than ALD due to rapid rise in the prevalence of Obesity and type2 Diabetes. Its prevalence has been estimated between 9% to35% in India. Pharmacologic treatments of NAFLD are limited. Lifestyle modification is believed to be effective in reducing features of NAFLD, although the effect of high fiber diet with physical exercise on NASH and NASH related cirrhosis, is unclear. The intervention based study was aimed to evaluate the efficacy of high fiber diet on liver enzyme (SGPT), bodyweight and fibroscan values. **Materials & Methods:** In this 6-months long prospective follow-up study, initially, 38NAFLD subjects, were selected from the 4 Diagnostic Clinics of Kolkata. Only 29subjects, 41.4%pre-obese and 58.6%obese, could follow the prescribed diet and lifestyle modification. Fibroscan and biochemical tests were carried out twice (pre and post-trial) but anthropometric measurements were taken 4times (baseline,2,4&6 months. Only 29obese subjects followed the program of restricted diet (ideal weight x20-25Cal) and daily exercise (45minutes brisk walking/jogging). **Result:** After 6□months of lifestyle modification, the mean Fibroscan and mean Serum glutamic pyruvic transaminase (SGPT/ALT) values improved significantly (p≤0.05) (16.67□±□12.96kPa vs 8.81□±□3.23kPa;p=0.0002) and (83.41□±□15.11U/L vs 45.24□±□11.54U/L; p=0.0001) respectively. In the beginning, 9(3.1%), (3.1%)%), 8(27.6%) and 11(37.8%) of the study populations were in F1,F2,F3and F4stages, respectively. After 6□months, it was 13.8%,24.2%,37.9%, 17.2%and6.9%in F0,F1,F2,F3 andF4 stages. The paired-t-test results revealed that oats based high fiber diet reduced body weight, BMI, blood pressure, total cholesterol and fasting blood glucose significantly(p≤0.05) after the trial. The mean bodyweight of the subjects improved from (88.97 ± 11.4□kg) to (77.39 ± 6.50kg).12obese subjects entered the overweight group and 3obese subject entered the normal-weight group. **Conclusion:** The study revealed that lifestyle modification including intense physical exercise and diet restriction is an effective therapy to treat NAFLD patients. However, further clinical trials with bigger study populations are required. NASH-related cirrhosis, the advanced stage fibrosis, can also be improved by lifestyle modification. **Keywords:** NAFLD, NASH, BMI, Obese, Fibroscan, SGPT.

PPCLN-38 NUTRITION MANAGEMENT OF LANGERHANS CELL HISTIOCYTOSIS -A CASE REPORT. ***Malathi.V***. Email:- drmalathi.v@rainbowhospitals.in.

Background & Objectives: Langerhans cell histiocytosis (LCH),is an uncommon hematological disorder affecting infants and young children. It is characterized by uncontrolled stimulation and proliferation of normal antigen presenting cells called as Langerhan cells.These are abnormal cells deriving from bone marrow and capable of migrating from skin to lymph nodes. 2-10 cases per million children suffer from LCH,which is a rare disease. It Is caused due to immune dysregulation.Clinical features affect single system or multi system.They include prolonged illness, Hepatosplenomegaly, Failureto thrive, Leukocytosis with neutrophilia, Elevated CRP,Direct Hyperbilirubinemia with high GGT,Hypoalbuminemia and skin lesions. This case was studied with objectives and challenges to manage nutritionally during medical treatment and improve body weight. **Materials & Methods:** Growth and Mile stones assessment was done. Anthropometry, Objective data, subjective data, clinical examinations, Biochemical investigations and Dietary assessment methods were followed. Dietary intervention was continued with high protein feeds. Nutrition Reassessment and continuous monitoring was done for a period of one year. W.H.O GROWTH CHARTS were used for growth assessment. **Result:** Child was Severe Under weight. He had GERD grade.3 and Malabsorption.Diet monitoring and Diet Recall and Family counseling was done to cope up with treatment at every visit.Diet calculations were done with actual intake. Alternative Feeding methods were followed. GERD diet with high protein, partially hydrolysed formula was suggested initially. Diet was progressed regular solids later.After 6 weeks of chemotherapy, child was gaining weight. There was no fever and Hepatosplenomegaly. saturation was 97% in air. After One year of treatment, child was Well gaining weight and no evidence of disease. **Conclusion:** Clinical manifestations were studied and dietary management was done.Positive Outcomes were observed. Nutrition management during hospital stay and after discharge with periodic follow ups has played very important role in overall improvement of the child. **Keywords:** Langerhans cells, skin lesionsagerd, Failure to thrive

PPCLN-39 ***R.ARIVUCHUDAR*** - Withdraw

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PPCLN-40 STUDY ON EFFECT OF SEMI ELEMENTAL FORMULA IN EARLY RECOVERY OF ACUTE PANCREATITIS. ***Sanchita Guha***. Clinical Nutrition and Dietetics, Jamshedpur Women's College, Jharkhand. Email:- guha.sanchita11@gmail.com.

Background & Objectives: Acute pancreatitis is an inflammatory condition of the pancreas that is painful and at times deadly. It is characterized by edema, cellular exudate and fat necrosis. Gallstones and alcohol abuse are the main causes of acute pancreatitis. The metabolism of acute pancreatitis involves a stress state characterized by hyperdynamic changes, hypermetabolism and hypercatabolism. These changes are important in considering appropriate feeding.The use of semi-elemental formulas presents several theoretical advantages over polymeric formulas and /or standard feeds, but their clinical value has been poorly documented. My aim was to evaluate in patients with acute pancreatitis the effect of enteral nutrition by a semi-elemental formula compared with a polymeric formulas and/or standard feeds. **Materials & Methods:** A randomized prospective pilot study, stratified according to severity, was performed in 100 consecutive patients with acute pancreatitis requiring jejunal nutrition. The patients were divided into two groups – control and experimental. The experimental group was given semi elemental formula and control group was given standard feed. The semi-elemental formula group and the polymeric formula group received the same calorie of the feeds. Tolerance was evaluated after 3 days of stool frequency. Outcome was evaluated by weight loss, length of hospital stay, and blood parameters of lipase and amylase. **Result:** It was found that Semi-elemental formulas are very well tolerated and blood parameters of lipase and amylase normalize faster which helped in their early recovery than polymeric or standard feeds in patients with acute pancreatitis. **Conclusion:** Nutrition with a semi-elemental formula supports the hypothesis of a more favorable clinical course than nutrition with a polymeric formula, but this conclusion needs to be established in larger adequately powered clinical trials. **Keywords:** semi elemental formula, lipase, polymeric feed

PPCLN-41 ***Bibi Sara*** - Withdraw

PPCLN-42 A STUDY ON COMPLICATION OF ENTERAL NUTRITION IN CRITICAL CARE PATIENTS. ***Puspanjali Mishra***. IMS and SUM Hospital, Kalingnagar-8, Bhubaneswar, Odisha, India. Email:- Puspanjalimishra@soa.ac.in.

Background & Objectives: Enteral feeding refers to the delivery of a nutrient-enriched feed, containing carbohydrates, protein, fat, water, minerals, and vitamins, directly into the stomach, duodenum, or jejunum. It is administered to patient who is not able to eat normally owing to diseases such as cancer gastrointestinal injuries, surgery and other nervous disorders etc. Now a days enteral feedings market has grown in all over the world. The global enteral feeding formulas market size was at USD 4.39 billion in 2016 and is expected to grow at an increasing rate of 7.3 within 2-3 years. In India enteral feeding device market is expected to increase by 8.5% during the forecast period, 2018 to 2023. Besides this, an increasing prevalence of cancer, gastrointestinal injuries, surgery cases, parkinson's disease and other nervous disorders etc are of the factors leading to the growth of eneteral feeding formulas market. Ensuring nutritional support during the treatment is of utmost importance. Particularly patients recovery during pre surgery, post surgery and during chemotherapy, and during various treatments in case of critical care patients is greatly affected by patients diets and nutrition. The role of enteral nutrition in patients with all these disease is to provide the required macro and micro nutrients including energy, protein, vitamins and minerals in part or whole in order to reduce the risk of malnutrition in these patients. Therefore enteral feeding is becoming a necessary part and has got largest application in future. More and more research is going on the materials development for tubes and also for various diets etc.In this report, a study on complication during the enteral feeding in different types of critically ill patients having different diseases admitted in IMS and SUM Hospital, Bhubaneswar, Odisha (INDIA) is discussed here. **Materials & Methods:** A no of patients having Type2 diabetes mellitus, hypertension, cardiovascular, hyponatrimia, hypercalimia, Sepsis, Septic shock, patients with cancer, pancreatitis, stomach problems etc. are subjected to enteral feeding using different types of tubes(Rumsons FG10, 14 and FG 16) and therapeutic nutrition (sago porridge, palua,barli, ragi, oats, dalia, vegetable smashed khichdi, fruit juice, and vegetable soup etc.) feeding with additional formula feeding (Ensure diabetic, Pentasure 2.0 , Peptamin and Resource high protein and Essential 2.20 etc.) that contains glucose, amino acids and lipids, vitamins and dietary minerals. Further to this, comparison of different types of tubes used for enteral feeding has been done and results on issues related complications such as infection, blood clots, constipation, diarrhea, uneasiness to the patients at throat etc.are presented.**Result :** Keeping all the mechanical positioning in correct form, it has been observed that by using different types of tubes (Rumsons make FG10, 14 and FG16) that using FG14 and FG16 ,in 90% of the cases did not have any complication but in 10% of the patients complained about nasal erosion which has been solved later on.In case of therapeutic liquid feeding, in some cases, irregular bowel syndromes, micro and macro nutrients deficiency

and diarrhoea occurred whereas with additional formula feeding such as Ensure diabetic, Essential 2.20 and other fibre and peptide based diets in proper volume and feeding rate these above problems could be solved in case of 90-95%. **Conclusion :** It has been observed that by keeping the mechanical positioning and insertion of the tubes, many of the problems encountered with enteral feeding can be avoided by using a very smooth, nontoxic, FG10, 14 and 16 Rumsons tube and by careful monitoring of the patients for metabolic abnormalities. Further to this, by using the proper nutritional diet through both local therapeutic nutritional diet with additional formulae diet, patients complications can be reduced to a large extent. Details will be discussed in the poster presentation. **Keywords:** enteral, therapeutic , formula feeding, diabetes, Ensure, IMS &SUM hospital,

PPCLN-43 ROLE OF 25-HYDROXY VITAMIN D SERUM LEVELS AND VITAMIN D RECEPTOR POLYMORPHISMS IN RISK OF ESSENTIAL HYPERTENSION**.** ***Varakantham V***, Ale K, Kurakula Sailoo AK, Nagalla B , Bharatraj DK. ICMR- National Institute of Nutrition, Hyderabad. Email:- varshareddi@gmail.com.

Background: Essential Hypertension [EH] is a multi-etiological disease with unknown cause. Emerging trend between EH and nutritional factor, Vitamin D is observed as it regulates the renin-angiotensin system. In addition, the genetic predisposition of Vitamin D Receptor [*VDR*] is also noted. Therefore, we aim to investigate the serum 25-hydroxy Vitamin D [25(OH)D] in conjunction with VDR variants in risk of EH. **Method:** We have conducted an investigation on 292 hypertensives and 324 controls to evaluate the association of the genetic variant of *VDR* and 25(OH)D along with Total Renin Concentrations [TRC], in an Indian population with EH after obtaining ethical approval. **Results:** The risk of EH was associated with *VDR* Fok1 AA (OR=1.87, P=0.04) of pooled population while only in males with Taq1 AG (OR=2.01, P=0.03). In the TRC levels, *VDR* Taq1 polymorphism of control population has shown significant differences. The *VDR* rs2228570 was not seen to influence 25(OH)D levels in both the cases and controls. While the *VDR* rs731236 were found to play a role in the serum levels of 25(OH)D in the hypertensives alone. The study participants were then grouped based on 25(OH)D the levels. We found that the *VDR* rs2228570 AA genotype was highly susceptible to hypertension (OR=2.21, P=0.02) in the 25(OH)D deficient group (<20 ng/mL). **Conclusion:** The study has demonstrated the impact of Vitamin D deficiency leading to the risk of hypertension due to presence of gene variants.

PPCLN- 44 **A STUDY OF SERUM LIPID PROFILE IN PREGNANCY INDUCED HYPERTENSION (PIH),** ***Blessy Prabhu Priyanka*** **S,** Department Of Biochemistry Kurnool Medical College, Email:Blessy-medico@yahoo.co.in

BACKGROUND: PIH is a syndrome of hypertension in pregnancy, with or without edema and proteinuria which affects maternal health as well as fetal growth. It accounts for 12% of maternal mortality during pregnancy and puerperium. Dyslipidemias are associated with endothelial dysfunction that may result in proteinuria and hypertension which is a clinical hallmark of PIH. **METHODOLOGY:** This case-control observational study was conducted at Department of Biochemistry, Government General Hospital, Kurnool during November 2015 to 2017. Study subjects were recruited from the Department of Obstetrics and Gynecology, with singleton pregnancy, primi/multigravida in the age group 20-35 years. Subjects with history of multiple pregnancies, pregnancy with congenital anomalies, chronic hypertension, diabetes mellitus, cardiac/thyroid/hepatic/renal disease, dyslipidemia were excluded. Age matched normotensive pregnant women were recruited as controls. Total cholesterol, Triglyceride, HDL-cholesterol, LDL-cholesterol, VLDL-cholesterol was analyzed using ERBA Semi Auto analyzer. **RESULTS**: Subjects were divided into 39 gestational hypertensives (BP ≥140/80) and 111 preeclamptic women (≥140/80 and proteinuria) as cases, 150 normotensive pregnant women (BP 120/80) as controlswith >20 weeks of gestation. The Mean±SD of lipid profile in cases (TC:228±17.6, TG:206±34.6, LDL:152±18.2, VLDL:41.3±6.9) was more when compared to controls (TC:164±14.5, TG:98±15.3, LDL;91.1±15.8, VLDL:19.7±3.0). Statistically significant ($p<0.001$) differences were noted. The Mean±SD of HDL in cases (28.7±3.16) was decreased when compared to controls (54±5.5). The difference was statistically significant (p value 0.0001). LDL:HDL and TG:HDL ratios were higher in PIH group and were found highly significant ($p<0.0001$). **CONCLUSION**: The results of this study suggests an abnormal lipid metabolism, predominantly high TG concentrations and low HDL-C, which may add to the promotion of vascular dysfunction and oxidative stress seen in PIH. This association is significant in understanding the development of hypertension during pregnancy and is useful in early diagnosis and prevention of PIH.

POSTER PRESENTATIONS - EXPERIMENTAL NUTRITION

16th Nov 2018 **9:30Am –11.30Am**

Code No.	Name and Address	Title of Presentation
PPEN-01	Shubham popat salunkhe	Withdraw.
PPEN-02	V.Srivastava, Department of Energy and Environment, TERI University, VasantKunj, New Delhi. Email:- varsha.srivastava79@gmail.com	Phytochemicals' Recovery From Fruit And Vegetable Processing Waste: An Opportunity To Improve Global Nutrition Security
PPEN-03	Suman Bala, Department.of Home Science Kurukshetra University, Kurukshetra, Haryana,India. Email:- suman_81@yahoo.co.in	Probiotic: Formulation Of Value Added Food Preparations.
PPEN-04	Dr.S.Radhai Sri, Department of Nutrition and Dietetics, PSG College of Arts and Science, Coimbatore. Email:- radhaisris@yahoo.com	Development Of Instant Multigrain Health Mix Using Twin Screw Extruder.
PPEN-05	Kavita B. University of Agricultural Sciences, Dharwad, Karnataka, India, Email:- kavita.kotagi@gmail.com	Development And Quality Evaluation Of Dicoccum Wheat Flakes- A Speciality Food Product
PPEN-06	A Lakshmi Department of Food and Nutritional Sciences, Sri Sathya Sai Institute of Higher Learning, Anantapur. Email:- alakshmi2016@gmail.com	Formulation And Shelf Life Studies Of Nutritional Cookies Made From Millet Flour And Banana Flour.
PPEN-07	D.Triveni.	Withdraw.
PPEN-08	Meena Kumari, Amity Institute of Food Technology, Amity University, Noida,U.P Email:- meena3020@gmail.com	Influence Of Onion And Garlic On The Bioaccessibility Of Trace Minerals From Selected Cereals And Pulses
PPEN-09	Lohith Mysuru Shivanna, Sarjan Halugudde Nagaraja, Asna Urooj. Manasagangotri, University of Mysore, Mysuru, Karnataka, India. Email:- lohith.ms@gmail.com	Acute Toxicity Study Of Annona Reticulata Leaves Extract In Swiss Albino Mice.
PPEN-10	Maharshi Bhaswant.	Withdraw.
PPEN-11	SUSHMA B.V, JSS Academic of Higher Education and Research, Mysuru, Email:- sushmabv@jssuni.edu.in	Determination Of Psychopharmacological Effect Of Benincasa Hispida Using Invitro Model.
PPEN-12	Vineeta Kharkwal Punjab Agricultural University, Ludhiana, Punjab. Email:- vineetakharkwal5@gmail.com	Accumulation Of Lead And Cadmium In Vegetables – A Potential Health Hazard.
PPEN-13	Syeda Farha S, Department of Studies in Food Science and Nutrition, University of Mysore, Manasagangothri, Mysuru. Email:- farhasiraj7@gmail.com	Characterization Of Flavonoids By Uplc-Ms And Its Antibacterial Activity From Brassica Oleracea Var. Capitata L

EXPERIMENTAL NUTRITION (Contd…)

Code No.	Name and Address	Title of Presentation
PPEN-12	Vineeta Kharkwal Punjab Agricultural University, Ludhiana, Punjab. Email:- vineetakharkwal5@gmail.com	Accumulation Of Lead And Cadmium In Vegetables – A Potential Health Hazard.
PPEN-13	Syeda Farha S, Department of Studies in Food Science and Nutrition, University of Mysore, Manasagangothri, Mysuru. Email:- farhasiraj7@gmail.com	Characterization Of Flavonoids By Uplc-Ms And Its Antibacterial Activity From Brassica Oleracea Var. Capitata L
PPEN-14	Satish Anandan, Department of Studies in Food Science and Nutrition, University of Mysore, Manasagangothri, Mysuru. Email:- satishanandan84@gmail.com	Bioactive Compounds From Morus Indica L As Inhibitors Of Advanced Glycation End Products Formation.
PPEN-15	Yousrah Yousuf St.Anns College for Women affliated to Osmania, Email:- yousrahyousuf@gmail.com	Effects Of Tourette Syndrome On Attention-Deficit Disorder (Add) And Associated Behaviours.
PPEN-16	Manpreet Kaur. Punjab Agricultural University, Ludhiana. Email:- manatwalpau@gmail.com	Effect Of Roasting And Storage Conditions On Microbial Quality Of Pumpkin Seed Flour.
PPEN-17	Remya. M.J, Department of Food Science and Nutrition. Email:- remyasabs@gmail.com	Mineral Analysis Of Diplazium Esculentum Using Field Emission Scanning Electron Microscope.
PPEN-18	Himani Joshi, Department of Foods and Nutrition, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Udham Singh Nagar, Uttarakhand, Email:- joshi.himanijoshi@gmail.com	Effect Of Maturity Stages And Ripening Process On The Physico-Chemical And Bioactive Composition Of Mango (Mangifera Indica L.) Var. Manjeera
PPEN-19	Amrutha B. Department of Food Science and Nutrition Avinashilingam Institute for Home Science and Higher Education for Women Coimbatore. Email:- bnairamrutha93@gmail.com	Pumpkin Seeds: A Repository Of Natural Stress Alleviators.
PPEN-21	Anvita Kale, Department of Nutritional Medicine, Interactive Research School for Health Affairs, Bharati Vidyapeeth Deemed University, Pune. Email:- bvduirsha@gmail.com	Short And Long Term Effects Of Maternal Butter Consumption On Adult Wistar Rat Offspring Cardiometabolic And Neurodevelopmental Health.
PPEN-22	Sethuraman Vishnupriya Stet Women's College MannargudiTamilnadu, Email:sethuramanvishnupriya@gmail.com	Prelimnary Phytochemical Potentials Of Glycine Max (Soy Bean).
PPEN-23	Samja Sabu, Department of Food Science and Nutrition, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore. Email:sethuramanvishnupriya@gmail.com	Antioxidant Activity And Acute Toxicity Of Fresh And Cooked Solanum Nigrum Leaf Extract.

EXPERIMENTAL NUTRITION (Contd…)

Code No.	Name and Address	Title of Presentation
PPEN-24	Pragya Pandey	Withdraw
PPEN-25	Ananya Kashyap, Dept.of Food, Nutrition and Dietetics, Assam town University, Guwahati, Email: ananyakashyap82@gmail.com	Analysis Of Physicochemical Properties Of A Process Standardised Traditional Assamese Breakfast Cereal - Kumal Chawl.
PPEN-26	Rohini Jain, Department of Food and Nutrition, Punjab Agricultural University, Ludhiana, Punjab. Email: rohinijain@pau.edu	Bioactive Components And Total Antioxidant Capacity (Tac) Of Some Plant Foods Commonly Consumed In Punjab.
PPEN-27	Daisy Sharma Assam down town University. Email: daisysharma8991@gmail.com	Development Of A Food Multi-Mix For Post-Menopausal Women.
PPEN-28	Dr.Vijayalaxmi Kamaraddi, Extension Education Unit, Organic Farming Research Station, Naganahalli, Mysuru. Email: vkuasb@gmail.com	Assessment Of Suitability Of Selected Rice Varieties For Production Of Rice Flakes.
PPEN-29	Vidhyashree S, Department of Home Science, Gandhigram Rural Institute – Deemed to be University, Dindigul, Email: shreeopositive@gmail.com	Heavy Metal Toxicity On Germinated Seeds Of Macrotyloma Uniflorum By Using Ferric Chloride.
PPEN-30	Anitha Singh, Food & Drug Toxicology Research Centre. National Institute of Nutrition. Email: anita_singh88@ymail.com	Anti-Inflammatory Activity Of Poly Herbal Combination From The Extract Of Cuscuta Reflexa, Cocculus Hirsutus&Tinospora Cordofolia In Rat Paw
PPEN-31	Pushpa Dhami, Email: dhami01@yahoo.com	Development Of Traditional Ready-To-Use Mix For Calamity Evacuees And Evaluation Of Its Sensory, Nutritional And Storage Parameters.

PPEN-01 Shubham popat salunkhe - withdraw

PPEN-02 PHYTOCHEMICALS' RECOVERY FROM FRUIT AND VEGETABLE PROCESSING WASTE: AN OPPORTUNITY TO IMPROVE GLOBAL NUTRITION SECURITY. ***V.Srivastava,*** M. Balakrishnan1.Department of Energy and Environment, TERI University, VasantKunj, New Delhi. Email:- varsha.srivastava79@gmail.com

Background & Objectives: India is striving hard to achieve zero hunger by 2030 as a commitment to meet the Sustainable Development Goals-2.There is a major shortfall in the micronutrient intake due to unequal distribution of the insufficient macronutrients (in the underprivileged) and micronutrients (in the self-reliant) segment of the population. Non-edible portions of fruits and vegetables, which are rich in micronutrients & phytochemicals, are discarded as waste during preliminary preparation and processing. A study was carried out in the hotels of Delhi-NCR to quantify the fruit and vegetable wastes generated and to determine their phytochemicals content. **Materials & Methods:**A questionnaire based survey was carried out among 15 hotels in Delhi-NCR. Based on the survey results, common fruits and vegetables consumed were identified and their peels were subjected to ultrasonic assisted extraction in acetone/water(70:30,v/v). Spectrophotometric method was used for analysis of phytochemicals (total extractable polyphenols[TEP] and total extractable flavonoids[TEF]), proximate composition and antioxidant (2,2-diphenyl-1-icrylhydrazyl[DPPH]) assay. Further identification of phytochemicals was done by high-performance liquid chromatography[HPLC] using C-18 column with different mobile phases. All analysis was done in triplicate. **Result:** As per the survey, papaya, potato, pineapple, pomegranate, onion, oranges and apples were the most commonly consumed items. The TEP (mcg/g of gallic acid equivalent[GAE]) and TEF(mg/g of rutin trihydrate equivalent[RtE]) respectively are: papaya[747±3.316 & 44.2±5.70], potato[516.5±34.58 & 46.85±1.58], pineapple[408±18.96 & 43.47±2.46], pomegranate[35135±1937 & 150.1±5.95], onion[1220±100.8 & 53.01±10.9], orange[3325±98.93 & 454.20±2.90] and apple[168.8±24.27 & 49.81±2.69].The antioxidant activity (µM of trolox equivalent, TE)was: papaya[283.70±22.90], potato[256±4.16], pineapple[261.60±6.35], pomegranate[1029±47.96], onion[396±2.40], orange[454.20±22.90] and apple[344.70±22.90]. HPLC analysis showed presence of gallic acid, ferulic acid, catechin and rutin. **Conclusion:** Waste (peels) from commonly consumed fruits and vegetables in Delhi-NCR hotels are a potential source of phytochemicals possessing antioxidant activity. **Keywords:** fruit and vegetable waste, phytochemicals, nutrition security

PPEN-03 PROBIOTIC: FORMULATION OF VALUE ADDED FOOD PREPARATIONS. ***Suman Bala,*** M.Tarvinderjeet Kaur. Department.of Home Science Kurukshetra University, Kurukshetra,Haryana,India. Email:- suman_81@yahoo.co.in

Background & Objectives: Economic growth, modernization, urbanization and socialization have changed the life style of Indian families. With a shift in unhealthy eating practices and adoption of sedentary life style has lead to the increasing prevalence of life style disorders. Recently probiotics emerged as the bio therapeutics with proven efficacy. Probiotics have become increasingly popular as a result of their beneficial effects on human health The manipulation of composition of gut micro flora in human beings through dietary supplementation is possible by probiotic products. It improves nutritional profile of many food and beverages delivering health benefits, increased immunity and digestive health without changing taste and texture of food. There is a growing interest in probiotics within the scientific community, with consumer and in the food industry. So, the purpose of this research was to develop, enriched probiotic commonly consumed food preparations. **Materials & Methods:** The present study was undertaken to enrich commonly food preparations such as fruit smoothie, carrot kanji, cucumber buttermilk, soup and sauerkraut with probiotics. The sensory evaluation was done by a panel of ten judges using nine point hedonic scales. **Result:** The overall acceptability of fruit smoothie (8.80+0.91) was found to be maximum followed by carrot kanji (8.61+0.88), cucumber buttermilk (8.32+0.84), soup (7.90+0.76) and sauerkraut (7.71+0.56). **Conclusion:** Incorporation of probiotics in commonly consumed food preparations is a non-complicated method to improve the nutritional value of a diet. **Keywords:**probiotics, commonly food preparations, sensory evaluation

PPEN-04 DEVELOPMENT OF INSTANT MULTIGRAIN HEALTH MIX USING TWIN SCREW EXTRUDER. ***Dr.S.Radhai Sri,*** Mrs. M.Thamarai Selvi. Department of Nutrition and Dietetics, PSG College of Arts and Science, Coimbatore. Email:- radhaisris@yahoo.com

Background & Objectives: Traditionally, porridge preparation involved roasting of cereals followed by grinding and packaging. With progression in food processing techniques, instant health mixes are developed using

extruder owing to less burdensome cooking. The study was designed to develop instant multigrain health mix through extrusion technology. **Materials & Methods:** Six different formulations (Control, V1, V2, V3, V4 and V5) using Wheat, Bajra, Sorghum, Ragi, Green gram, Bengal gram and Soya were developed using a twin screw extruder. Extrusion parameters were set at screw speed - 350 rpm, feed rate - 15 kg / hour, temperature - 80±5°C and 100 ± 10°C, die diameter - 2 mm and cutter speed - 100 rpm. The extrudates were dried at 60°C for 10 minutes, milled into fine powder, sieved through a 60 mm sieve and packed. They were evaluated for physical, functional and sensory characteristics. **Result:** Expansion ratio of the extrudates was between 2.45 ± 0.19 (V5) and 4.03 ± 0.28 (Control). Water solubility index, water absorption index, bulk and tapped density of the heath mixes were in the range of 0.25 to 0.37 percent, 3.17 to 3.83 g/g, 0.55 to 0.71 g/ml and 0.89 to 1.02 g /ml respectively. Among the formulations, variation V4 with 20 percent soya flour was highly acceptable with a overall acceptability score of 7.80 ± 0.23. Instant multigrain health mix provided 363 Kcal of energy, 70 g of carbohydrates, 17.5 g of protein, 3.5 g of fat and 88 mg of calcium. **Conclusion:** Quality characteristics of developed instant multigrain health mix showed a strong potential for commercial production of nutritious extruded health mix for alleviating malnutrition. **Keywords:** Extrusion, Multigrain, Quality characteristics

PPEN-05 DEVELOPMENT AND QUALITY EVALUATION OF DICOCCUM WHEAT FLAKES- A SPECIALITY FOOD PRODUCT. ***Kavita B. Patil*[1],** Kashibai Khyadgi[2]. 1= University of Agricultural Sciences, Dharwad, Karnataka, India, 2= College of Agriculture, Vijayapur, Karnataka. Email:- kavita.kotagi@gmail.com

Background & Objectives: Dicoccum wheat is particularly appreciated for its content of dietary fibre, resistant starch and antioxidants compounds. The products of this have low glycaemic index values and are being popularized in the management of diabetes. However, this wheat is not popular as it represents a small percentage and there are no popular diversified novel foods similar to other wheats. Hence the present investigation was undertaken with following objectives, 1. Development of dicoccum (Triticum dicoccum Schrank Suhulb) wheat flakes. 2. Characterization of flakes for Physical, functional, nutrient and sensory characteristics. 3. Exploring the utilisation of flakes for daily consumption. **Materials & Methods:** Dicoccum wheat was dehusked in roller mill and manually sorted to remove broken wheat and foreign particles. Conventional batch processing methods were followed for the development of flakes in a commercial flakes' processing unit. Physical and functional characteristics were assessed following standard procedures. Organoleptic evaluation was performed by a semi trained panel of 10-12 members using a nine point hedonic scale. **Result:** Dicoccum wheat, was successfully processed to Ready to eat (RTE) flakes. The flakes were acceptable organoleptically and recorded an acceptability index of 78.95. It exhibited a better bowl life compared to commercial corn flakes. RTE dicoccum flakes found to be a good source of protein (12.42%), total minerals (2.39%) and total dietary fiber (20.11%). The flakes recorded lower fat (0.75%) and total carbohydrates (71.11%). The iron content of flakes was a high of 32.40 mg/100g. Copper, zinc and manganese were 1.28 mg, 2.76 mg and 0.29 mg per 100g, respectively. Dicoccum wheat flakes were free from food borne micro organism as both Total bacteria and E Coli count was zero. The flakes found suitable to prepare many types of traditional and novel savories viz., salad, upma, cutlet, bhel, avalakki, chewda etc. Sweets such as laddu, payasa, chikki, karadantu, bananti-khara, chocolate flakes etc prepared by the flakes were well accepted.
Conclusion: Dicoccum wheat could be successfully processed to RTE flakes which are nutritious and possess good acceptability. Several promising food applications could be ascertained to suit our daily cuisine. **Keywords:** Dicoccum wheat, flakes, Ready to eat, organoleptic evaluation

PPEN-06 FORMULATION AND SHELF LIFE STUDIES OF NUTRITIONAL COOKIES MADE FROM MILLET FLOUR AND BANANA FLOUR. ***A Lakshmi,*** Meera M. Department of Food and Nutritional Sciences, Sri Sathya Sai Institute of Higher Learning, Anantapur. Email:- alakshmi2016@gmail.com

Background & Objectives: Background: Incorporation of banana flour in food products improve the total dietary fibre, resistant starch, total starch and essential minerals like phosphorus, magnesium, potassium and calcium. Development of new healthy foods helps in preventing diseases by nutritional therapy. **Objectives:** Formulation and shelf life evaluation of nutritious cookies with millet flour and banana flour. **Materials & Methods:** Methods: Nutritional cookies were prepared with composite millet flour and banana flour blends in the ratio of 90:10, 80:20 and 70:30 and compared with control sample. Quality of the cookies were tested for their proximate, physico-chemical parameters, antioxidant, anti-nutrient, microbial and sensorial attributes. The effect of storage on acidity, pH, color, sensory evaluation and microbial quality were assessed during the four months storage period. The developed products were packed in polyethylene packaging material. The effects of storage and packaging

material on moisture content and moisture uptake were studied using standard methods. **Result:** Results: The developed nutrient enriched cookies were well accepted compared to respective control cookies using nine point hedonic scale and found nutritionally superior to control cookies. The products were found shelf stable for four months. **Conclusion:** Conclusion: The obtained results proved the utilization of banana flour incorporation into millet flour to develop nutrient rich novel bakery products to add a new dimension in baking industry. **Keywords:** Key words: shelf stability, millet, composite flour.

PPEN-07 ***D.Triveni.*** withdraw

PPEN-08 INFLUENCE OF ONION AND GARLIC ON THE BIOACCESSIBILITY OF TRACE MINERALS FROM SELECTED CEREALS AND PULSES. ***Meena Kumari[1],*** Kalpana Platel[2]***.1=*** Amity Institute of Food Technology, Amity University, Noida,U.P.,2=Department of Biochemistry, CSIR- Central Food Technological Research Institute, Mysuru. Email:- meena3020@gmail.com

Background & Objectives: Many studies have reported the health benefits of onion and garlic, and one of them is their role in mineral bioavailability. Several studies have reported the effect of garlic and onion on Ca, Mg, Fe, and Zn absorption, but there is lack of studies on copper (Cu), manganese (Mn) and chromium (Cr). Therefore, this study was undertaken to determine whether the exogenous addition of onion and garlic have any influence over bioaccessibility of Cu, Mn, and Cr from selected cereals and pulses. **Materials & Methods:** For this, we determined the effect of two levels of garlic (0.25 and 0.5 g/10g of grain) and onion (1.5 and 3 g/10g of grain) on two representative cereals (rice and sorghum) and pulses (green gram and bengal gram) in both raw and cooked form. The bioaccessibility of these minerals was determined by FAAS (flame atomic absorption spectrophotometry) and ICP-AES (inductive coupled plasma-atomic emission spectrophotometry) employing an in vitro dialysability procedure. **Result:** The percent increase in Cu bioaccessibility from cooked sorghum, green gram, and chickpea, was 108, 144, 96 % and 139, 167, 89 % at the two levels of added garlic, respectively. Onion enhanced Cu bioaccessibility only at the higher level of added onion, from cooked sorghum, green gram and chickpea to 54, 56, and 52%, respectively. Garlic and onion enhanced the bioaccessibility of Mn from cooked chickpea only, the percent increase being 108, 69 and 108, 100 % at both the levels of added garlic. **Conclusion:** The Allium spices (garlic and onion) were found to have a significant enhancing effect on the bioaccessibility of Cu, and Mn, from representative cereals and pulses. The positive effect was more pronounced when the spices were added at the higher level. The effect of garlic was more significant than that of onion. Thus, incorporating onion and garlic to the diet seems to be a feasible strategy to enhance the bioaccessibility of Cu and Mn.
Keywords: Copper, manganese, chromium, bioaccessibility, onion, garlic.

PPEN-09 ACUTE TOXICITY STUDY OF ANNONA RETICULATA LEAVES EXTRACT IN SWISS ALBINO MICE. ***Lohith Mysuru Shivanna,*** Sarjan Halugudde Nagaraja, Asna Urooj***.*** Manasagangotri, University of Mysore, Mysuru, Karnataka, India. Email:- lohith.ms@gmail.com

Background & Objectives: Annona reticulata (AR) or custard apple belongs to family Annonaceae. The plant is traditionally used to treat various ailments and also known for its medicinal properties. The aim of this research was to evaluate the safety of usage of AR leaf extract in nutraceutical formulations through acute toxicity study. **Materials & Methods:** The leaves of AR were cleaned, dried and powdered; and aqueous extract (ARAQ) was prepared. The acute toxicity test was conducted using female swiss albino mice. As per Organization for Economic Co-operation and Development (OECD) 420 guideline, a single dose of 2000 mg/kg body weight of ARAQ was administered via oral gavage for 14 days. Mortality, signs of toxicity, body weight and behavioral changes were observed during the study period. Following the 14-day treatment, the mice were sacrificed for hematological, biochemical and histopathology studies. **Result:** No mortality, signs of toxicity and changes in behavior were observed at 2000 mg/kg body weight. In addition, no significant differences ($P < 0.05$) were noticed in the body and organ weight between the control and ARAQ groups. Also, there were no significant elevations observed in hematological and biochemical blood parameters. Further, histopathological examination revealed normal architecture and no significant adverse effects were observed on the kidney, liver, and pancreas. **Conclusion:** Overall, ARAQ did not produce any significant toxic effect in mice and the results also indicate the safety of the oral administration of ARAQ at 2000 mg/kg body weight. Hence, ARAQ can be utilized for nutraceutical formulations. **Keywords:** Acute Toxicity, Annona reticulata, Nutraceutical, Animal studies.

PPEN-10 Maharshi Bhaswant - withdraw

PPEN-11 DETERMINATION OF PSYCHOPHARMACOLOGICAL EFFECT OF BENINCASA HISPIDA USING INVITRO MODEL. ***SUSHMA B.V*[1]*,***Anitha.C[2], Shreevathsa[2],Hemalatha M S[2].1=JSS Academic of Higher Education and Research, Mysuru,2= Karnataka State Open University, Muktagangothri, Mysuru. Email:- sushmabv@jssuni.edu.in

Background & Objectives: Physiological and psychological stresses are the outcome of current life style disturbing the homeostasis in human being often requiring proper management to prevent further psychiatric complications. Findings based on traditional plant have been shown to possess pharmacological effects on central nervous system and immune system. Chiefly Benincasa hispida fruits contains significant proportions of flavonoids, glycosides, saccharides, carotenes, vitamins, minerals, ß-sitosterin and uronic acid. In addition it contains antidepressant, antioxidant, anti-inflammatory, analgesic, antiasthmatic, diuretic, nephroprotective, antidiabetic, hypolipidemic and antimicrobial effects. Thereby study was taken with an objective to determine the psychopharmacology of Benincasa hispidia. **Materials & Methods:** Dietary regime consisting benincasa hispida extracts were subjected to Swiss Albino mice (20-25 g) with obtaining animal ethical consent to evaluate anti-depressant and analgesic activity based on the principles of nutraceutics and experimental psychopharmacology. In control group distilled water was administered (2ml/kg body weight), in standard group diazepam was administered (2mg/kg body weight), in test group -1 pallet of B Hispida in the dose of 250 mg/kg body weight and in t -2, juice of B. hispida in the dose of 500 mg/ kg body weight were administered orally for 7 days. On 8th day one hour of administration of drugs, mice were subjected for immobilization induced stress test. Blood were drawn through retro orbital route from all mice and plasma cortico sterol, serum cholesterol, serum triglyceride and blood sugar levels were estimated. **Result:** Findings indicated a decrease in Plasma corticosterol level, serum cholesterol level, serum triglycerides level and Blood sugar, the bio-markers to assess the stress level in the test drug- diet group. **Conclusion:** Henceforth it can be stated that significantly Benincasa hispida showed an anti-depressant and analgesic effect in treating psychological stress problems. **Keywords:** Psychological stresses, Benincasa hispidia, body weight, anti-depressant and analgesic effect

PPEN-12 ACCUMULATION OF LEAD AND CADMIUM IN VEGETABLES – A POTENTIAL HEALTH HAZARD. ***Vineeta Kharkwal*[1]*,*** Kiran Bains[1], Mahendra Bishnoi[2]. 1= Punjab Agricultural University, Ludhiana, Punjab,2=National Agri-food Biotechnology Institute, Mohali, Punjab. Email:- vineetakharkwal5@gmail.com

Background & Objectives: Inorganic lead, cadmium and its compounds are classified as carcinogenic to humans by the International Agency for Research on Cancer. They lead to multiple organ damage in the human body. In India, vegetables are the most common part of daily life and their exposure to heavy metals like lead and cadmium adversely affect health of the consumers. **Materials & Methods:** The data on heavy metal content of lead and cadmium in different vegetables grown in different parts of India and reported total target hazard quotient (TTHQ) was studied and analysed.

Result: The reported studies from different parts of India revealed that the lead content in vegetables like brinjal, radish, cauliflower, tomato and spinach ranges from 1.75 to 35.15, 3.74 to 13.69, 2.09 to 10.94, 0.19 to 6.42, and 2.78 to 86.67 mg/kg, respectively. The cadmium content of 0.05 to 10.13, 2.17 to 3.65, 0.29 to 3.44, 0.27 to 2.59 and 0.05 to 2.62 mg/kg were found in brinjal, radish, cauliflower, tomato and spinach, respectively. It was observed that all these values were higher than the permissible limits of prescribed by FSSAI and of FAO/WHO. The average TTHQ across all vegetable species sampled was higher than the safety threshold of 1.0, indicating a health risk. **Conclusion:** It was concluded that the lead and cadmium content in brinjal, radish, cauliflower, tomato and spinach were higher than the permissible limit, which poses the consumers to high risk of various cancers. To prevent the disease, home gardens need to be promoted. The consumers should be educated to wash the vegetables properly to reduce heavy metals in the vegetables and to avoid vegetables grown in polluted soil and water. **Keywords:** lead, cadmium, vegetables, carcinogenic, total target hazard quotient

PPEN-13 CHARACTERIZATION OF FLAVONOIDS BY UPLC-MS AND ITS ANTIBACTERIAL ACTIVITY FROM BRASSICA OLERACEA VAR. CAPITATA L. ***SYEDA FARHA S,*** Satish A, Asna Urooj. Department of Studies in Food Science and Nutrition, University of Mysore, Manasagangothri, Mysuru. Email:- farhasiraj7@gmail.com

Background & Objectives: Foodborne diseases remain considerable topic of concern and food safety is an important health, social and economical issue. Food borne illnesses caused by the contamination of microbes increases the concerns to find alternate natural antimicrobials which are safe to human health and environment. **Materials & Methods:** The study focused on the identification and quantification of bioactive compounds in

organic white cabbage (Brassica oleracea var. capitata L.) by UPLC-MS and the antibacterial activity was determined by disc diffusion method. **Result:** The UPLC-MS profile highlighted the presence of flavonoids such as genistein > kaempherol > naringenin and catechin. The antibacterial results showed that extract of 50µg disc-1 from organic white cabbage showed maximum inhibition zone of 19 ± 0.35mm and 17 ± 0.3mm against the gram positive Staphylococcus aureus and the gram negative E. coli respectively. **Conclusion:** The present study revealed the potential for developing antimicrobials from organic white cabbage appears rewarding for the development of phytomedicine to act against microbes. Further studies are needed to determine the precise active principles from Brassica oleracea var. capitata L.**Keywords:** Phytochemicals; Pathogenic bacteria; Cabbage; UPLC-MS

PPEN-14 BIOACTIVE COMPOUNDS FROM MORUS INDICA L AS INHIBITORS OF ADVANCED GLYCATION END PRODUCTS FORMATION. ***Satish Anandan,*** Asna Urooj. Department of Studies in Food Science and Nutrition, University of Mysore, Manasagangothri, Mysuru. Email:- satishanandan84@gmail.com

Background & Objectives: Advanced glycation end products (AGEs) formations are associated with different pathophysiological conditions, including diabetes mellitus. Researchers are focusing on new compounds that may be used as potential AGEs inhibitors without affecting the normal structure and function of biomolecules. Our study aimed at finding the effect of Apigenin rich extract of 80% methanol of leaves (API) of Morus indica L (MI) on the in vitro protein glycation using a Bovine serum albumin (BSA)-Methylglyoxal (MGO) model. **Materials & Methods:** The anti-glycation activity of the API was confirmed using FT-IR spectroscopy to investigate the changes in structure in BSA-MGO and fluorescence microscopy was used to detect protein aggregation of BSA-MGO by Thioflavin-T dye. **Result:** The FTIR analysis of native BSA spectra showed at 1645.48 cm-1 and 1547.0 cm-1 in the Amide I and II region, respectively. The change in band position and increase in transmission in BSA-MGO was due to the BSA reaction with MGO which indicates that the altered secondary structural elements evolved due to the glycation reaction. As in the presence of API in BSA-MGO solution, transmission and band positions (amide I & II) showed minimal changes, indicating more unaffected amide bonds and amino groups. Fluorescence microscopy study revealed that in the presence of API with BSA-MGO showed less intense fluorescence images compared to BSA incubated with MGO by preventing protein aggregation. **Conclusion:** The inhibitory properties of protein glycation and aggregation of MI may be due to the presence of apigenin. MI enhances the scavenging of free radicals due to antioxidant ability. Further studies to confirm the AGEs effect using animal model are underway. Keywords: Morus species, Advanced glycation endproducts (AGEs), Thioflavin-T

PPEN-15 EFFECTS OF TOURETTE SYNDROME ON ATTENTION-DEFICIT DISORDER(ADD) AND ASSOCIATED BEHAVIOURS. ***Yousrah Yousuf*[1]*,*** Afifa Jahan[2].1= St.Anns College for Women affliated to Osmania,2= Krishi Vigyan Kendra. Email:- yousrahyousuf@gmail.com

Background & Objectives: Tourette syndrome (TS) is a neurological disorder characterized by repetitive, stereotyped, involuntary movements and vocalizations called tics. The disorder is named for Dr. Georges Gilles de la Tourette, the pioneering French neurologist. Tourette's syndrome (TS) is characterised by changing motor and phonic tics, compulsive actions, and other behavioural symptoms. TS occurs in people from all ethnic groups; males are affected about three to four times more often than females. The aim of present study is to analyze the multiple ways in which TS impacts school performance, as well as potential remedies. Most of the TS effected students have Attention Deficit Disorder(ADD) with hyperactivity and also other associated behaviours like impulsivity, distractibility ,executive dysfunction, severe test anxiety, stuttering, letter, number, or word reversal, reading very slowly and poor retention of material read. **Materials & Methods:** To determine the frequency of various behavioral manifestations, a comparision of 47 random normal controls to 246 patients with TS, 17 with attention-deficit disorder (ADD) was held. All subjects were examined prospectively with a 425-item questionnaire based on the Diagnostic and Statistical Manual of Mental Disorders (DSM III). The TS patients were divided into grade 1 (too mild to treat [17.5%]), grade 2 (requiring treatment [58.9%]), and grade 3 (severe [23.6%]). **Result:** It was found that patients in all three grades of TS were significantly different from controls for DSM III symptoms of inattention, impulsivity, and hyperactivity. Sixty-two percent of TS patients had ADD, compared with 6.3% of controls; and 48.8% had ADD with hyperactivity (ADDH), compared with 4.2% of controls. In the majority of TS patients, the natural history of the disease was to start with ADDH and 2.4 years later develop motor and vocal tics. **Conclusion:** It can be concluded that ADD ,ADD with hyperactivity and other associated symptoms are common in TS patients and are an integral part of the disorder rather than being

secondary to motor or vocal tics, concluding that there is much more to Tourette than just simple ticks. **Keywords:** Tourette syndrome, Attention Deficit Disorders, Associated behaviour

PPEN-16 EFFECT OF ROASTING AND STORAGE CONDITIONS ON MICROBIAL QUALITY OF PUMPKIN SEED FLOUR. ***Manpreet Kaur***. Punjab Agricultural University, Ludhiana. Email:- manatwalpau@gmail.com

Background & Objectives: Pumpkin seeds are cheapest and nutrient dense. They are rich source of protein, fat, fiber, iron and zinc. The foods fortified with pumpkin seed flour are also economical with higher acceptability of sensory parameters and high nutrient content. Besides the nutritious properties, it is also important to analyze the storage properties of pumpkin seed flour. The main objective of the study was to effect of roasting and storage conditions on microbial properties of pumpkin seed flour. **Materials & Methods:** Raw and roasted pumpkin seed flour was stored in air-tight glass container for two months and analyzed for total plate count, yeast and mould count every fortnightly. **Result:** Results showed that on the initial day of storage, bacterial count of raw pumpkin seed flour was 1.9 x 103 CFU/g (Colony Formation Units) and of roasted pumpkin seed flour was 1.2 x 103 CFU/g. After two months, bacterial count of raw pumpkin seed flour was 10 x 103 CFU and roasted pumpkin seed flour was 8.8 x 103 CFU/g. It was observed that bacterial count of roasted pumpkin seed flour was lower than the raw pumpkin seed flour. No yeast and mould growth was detected at initial, 15th, 30th day of storage in both raw and roasted pumpkin seed flour. On 45th day of storage, yeast and mould growth in raw and roasted pumpkin seed flour was observed as 1.2 x 103 and 1 x 103 CFU/g respectively. **Conclusion:** It was found that the roasted pumpkin seed flour had better shelf life than the raw pumpkin seed flour as roasting of the flour would kill the microorganisms and increase the shelf life. **Keywords:** Pumpkin seeds, Nutrient dense, Roasting, Microbial properties

PPEN-17 MINERAL ANALYSIS OF DIPLAZIUM ESCULENTUM USING FIELD EMISSION SCANNING ELECTRON MICROSCOPE. ***Remya.M.J,*** A.ThirumaniDevi. Department of Food Science and Nutrition. Email:- remyasabs@gmail.com

Background & Objectives: Kerala is the state which possesses large figures of tribal population. Tribals especially tribal adolescents are suffering from nutritional deficiency. Diplazium esculentum is an edible flora widely distributed in the forest areas and river sides of Kerala. FESEM is a microscope that works with electrons instead of light. The elemental distribution graph provides the ultimate information about the qualitative and quantitative distribution of mineral content of the sample. So the objectives of this study is to, 1. Assess the surface topography of Diplazium esculentum by using FESEM. 2. The elemental composition of Diplazium esculentum by Energy Dispersive X-ray Spectroscopy (EDX). **Materials & Methods:** Diplazium esculentum leaves were collected from Pulppally pachayath, Wayanad District of Kerala,Coarse grinded the leaves by using a finer abrasive,Wet it to prevent heating and to get better surface finish, Polished it to produce flat and stretch free surface and dry it well, Sputtered with gold and fixed on a metal stub by using double sided carbon tape to observe the sample through microscope. **Result:** The Diplazium esculentum is a good source of, Sodium, Calcium, Potassium, Iron, magnesium, and Aluminum. The topography and surface morphologies of the samples were distinguished. The elemental distribution with its atomic weight could measure through the Micro graph by IDAX image. **Conclusion:** FESEM technology is used to analysis the quality and quantity of the surface elements and estimates the proportion at different spots and thus gave an overall and minute topographical mapping of the sample. This technique can reveal the spatial interrelationships and three-dimensional structure of plant cell organelles, pictured cytoskeletal elements, probably microtubules, in leaf mesophyll cells and thus provided an overall idea about the tested sample. The elements like Calcium, Iron, Potassium, and Magnesium which present in the sample have important roles in human nutriture, especially for the overall boosting of the adolescent growth. **Keywords:** Tribal Adolescent girls, Field Emission Scanning Electron Microscope (FESEM), Diplazium esculentum, Energy Dispersive X-ray Spectroscopy (EDX).

PPEN-18 EFFECT OF MATURITY STAGES AND RIPENING PROCESS ON THE PHYSICO-CHEMICAL AND BIOACTIVE COMPOSITION OF MANGO (MANGIFERA INDICA L.) VAR. MANJEERA. ***Himani Joshi[1],*** Aparna Kuna[2].1= Department of Foods and Nutrition, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Udham Singh Nagar, Uttarakhand,2= Professor Jayashankar Telengana State Agriculture University, Rajendra Nagar, Hyderabad. Email:- joshi.himanijoshi@gmail.com

Background & Objectives: Post-harvest treatment of fruits is major issue and artificial ripening is nowadays practiced all over the world. Knowledge regarding the right stage of mango harvesting and consumption with higher nutritive and bioactive potential is necessary for good health outcomes. Therefore, present study was focused on analyzing the physico-chemical and bioactive composition of ethylene treated mangoes at different days of storage. **Materials & Methods:** Sixty mature green undamaged and healthy fruits of the Manjeera cultivar were harvested at two maturity stages (7-9°brix TSS and 9-11°brix TSS) and two ethylene ripening treatments (100ppm & 150ppm ethylene doses) were carried out at Fruit Research Station, SKLTSHU, Sangareddy. Control fruits were stored at 27°C-30°C in well-ventilated area and for accelerated ripening (100ppm & 150ppm ethylene) fruits were placed in chamber for 24 hours and withdrawn on 4th day, 8th day and 12th day for analysis. Analysis of pH (digital pH meter), titrable acidity (IS 13844: 2003), TSS (AOAC, 1980), β-Carotene & total carotenes: (Zakaria et al., 1979), vitamin C (AOAC, 1997), total flavonoid and phenols (Lin & Tang 2007). Three factorial experiment (maturity stage, ethylene treatment and storage period) was conducted and analysis of variance table was used to conduct a mixed factorial statistical analysis. **Result:** TSS content increased from 4th day to 8th day and there was only small increase from 8th day to 12th day whereas pH and titrable acidity increased from 4th day to 12th day. Total phenol and vitamin C content were higher on 4th day of storage whereas β-Carotene, total carotene and total flavonoids content were higher on 12th day of storage for both maturity stages and all three treatments. Bioactive composition of 7-9°brix TSS 150ppm ethylene treatment on 12th day was higher among all the treatments and maturity stages. **Conclusion:** 7-9°brix TSS 150ppm ethylene treatment being rich in bioactive components can be consumed uptil 12th day of storage for better health outcomes. **Keywords:** Manjeera, ethylene, maturity stages, bioactive

PPEN-19 PUMPKIN SEEDS: A REPOSITORY OF NATURAL STRESS ALLEVIATORS. ***Amrutha B. Nair*[1]*,*** P.A. Raajeswari[2].Department of Food Science and Nutrition Avinashilingam Institute for Home Science and Higher Education for Women Coimbatore. Email:- bnairamrutha93@gmail.com

Background & Objectives: Recent years in research field are throwing light on oxidative stress and their adverse effects on human body which are manifested as various diseases and disorders. Plants and their metabolites are used as natural antioxidants in pharmaceuticals to combat stress and stress mediated disorders like infertility. Pumpkin (Cucurbita pepo) L. seed has received a considerable attention in meeting the global nutritional demands and is thought to be a potential reservoir of antioxidants. In the present scenario, stress has become the root cause of many health hazards and thus isolating the nutrients and phytochemicals from natural sources have become the need of the hour. **Materials & Methods**: The present study was designed to investigate the nutritional composition of pumpkin seeds using standard methods. Pumpkin seeds were washed, cleaned, powdered and were subjected to oil extraction by solvent extraction method using petroleum ether (40°-60°C). **Result:** The proximate compositions of the powdered seeds were obtained. The analysis of mineral content such as Na (170 mg / 100g), Zn (14.14±0.02mg/100g), P (47.68±0.04mg/100g), Fe (3.75±0.02mg/100g), Ca (9.78mg/100g) and Mg (67.41±0.05mg/100g) indicated that Cucurbita pepo seeds are a good alternative source of minerals (Mg, Zn, Ca, P and Fe) that could greatly contribute to human nutritional requirements. **Conclusion:** The present study revealed an interesting and significant data on the magnesium and zinc content of pumpkin (Cucurbita pepo) L. seeds. A meager amount of pumpkin seed powder in the diet could contribute largely to magnesium and zinc content which act as potent antioxidants. Information obtained from this research could help to assess the potential of pumpkin seed to be commercially exploited for nutraceutical application, and incorporated into food formulations to benefit human health. **Keywords:** Oxidative stress, Antioxidants, Pumpkin seed extract, Nutritional composition

PPEN-21 SHORT AND LONG TERM EFFECTS OF MATERNAL BUTTER CONSUMPTION ON ADULT WISTAR RAT OFFSPRING CARDIOMETABOLIC AND NEURODEVELOPMENTAL HEALTH. ***Anvita Kale,*** Shruti Jawale, Sadhana Joshi. Department of Nutritional Medicine, Interactive Research School for Health Affairs, Bharati Vidyapeeth Deemed University, Pune. Email:- bvduirsha@gmail.com

Background & Objectives: Increased maternal butter consumption may be a risk factor for developing non communicable diseases in the offspring in later life. The present study examines short and long term effects of maternal butter consumption on cardiometabolic and neurodevelopmental risk in the offspring. **Materials & Methods:** Pregnant Wistar rats were randomly assigned the five treatment groups 1) Control (C) 2) High butter diet (HBD), 3) High butter diet supplemented with omega-3 fatty acids (HBDO), 4) High butter diet deficient in vitamin B12 (HBBD), 5) High Butter deficient in vitamin B12 supplemented with omega-3 fatty acids (HBBDO).

Half the dams and their pups were dissected on d20 of gestation to collect dam blood, placenta and pup brain and half the dams were allowed to deliver normally on d22 of gestation and were assigned a postnatal control diet. The offspring were dissected at 6 mo of age to collect tissues for various analyses. **Result:** Maternal butter consumption did not affect pregnancy outcome, maternal fatty acids (plasma, erythrocytes and liver), pup brain fatty acids and neurotrophic factors but lowered ($p<0.05$) the levels of placental DHA, increased maternal oxidative stress ($p<0.01$) and dam plasma triglycerides ($p<0.05$) . At 6 mo of age the offspring born to dams fed butter showed no change in levels of fatty acids (plasma and brain), metabolic markers, BDNF and cognitive performance. **Conclusion:** The findings in the present study suggest that maternal butter consumption showed short term deleterious effects on dam cardiometabolic health but does not show any adverse effects on the offspring at adult age. **Keywords:** Maternal Butter Consumption, Cardiometbolic variables

PPEN-22 PRELIMNARY PHYTOCHEMICAL POTENTIALS OF GLYCINE MAX (SOY BEAN). ***SETHURAMAN VISHNUPRIYA[1],*** DR S KOWSALYA[2].1=STET WOMEN'S COLLEGE MANNARGUDI614 016 TAMILNADU INDIA, 2=DEPARTMENT OF FOOD SCIENCE AND NUTRITION,AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN,COIMBATORE.Email:sethuramanvishnupriya@gmail.com

Background & Objectives: The basic groundwork investigation of phytochemical potentials of any one plant is crucial step and has great significance in pharmaceutical companies for the production of the new drugs for curing of various diseases. It is expected that the important phytochemical properties recognized by our said study will be very useful in the curing of certain specific cirrhotic liver. We have focused on plant cultivated in Tamilnadu and selected Glycine max genes from legume crop family. **Materials & Methods:** The main objective of the research work was to carryout micro macroscopical characterization and preliminary phytochemical test by adopting standard procedures for the said Genus. Methonol, ethonol and water extracts were used for analysis Alkaloids, tannins, saponins, steroid, terpenoid, flavonoids, phenolic compounds and cardiac glycoside distribution in Glycine max (Roasted and unroasted) medicinal plant belonging to leguminous family were assessed and compared.
Result: Both the type were found to contain Phenols, Cardiac glycosides, Steroids, Saponins and Tannin except for the low level of flavonoids and Terpenoids in raw soybean. The significance of the plant in traditional medicine and the importance of the distribution of these chemical constituents were discussed with respect to the role of these plant in ethnomedicine in India.**Conclusion:** The Glycine max. showed to possess promising therapeutic and protective drug. **Keywords:** Glycine max, Fabaceae, macro and microscopic characterization

PPEN-23 ANTIOXIDANT ACTIVITY AND ACUTE TOXICITY OF FRESH AND COOKED Solanum nigrum LEAF EXTRACT. ***Samja Sabu,*** Kalpana C.A. Department of Food Science and Nutrition, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore. Email:sethuramanvishnupriya@gmail.com

Background & Objectives: Solanum nigrum is a herbal plant which belongs to the family Solanacea.The plant is high in nutrients, phytochemicals and possesses high nutraceutical potential. It is common in hilly areas of Kerala, consumed mainly by the tribes. The present study is an attempt to find out the antioxidant activity of Solanum nigrum leaves and its acute toxicity level to undertake further studies on its consumption. **Materials & Methods:** Solanum nigrum leaves were cooked using different cooking and steaming methods was selected for antioxidant and acute toxicity study. The aqueous extracts of fresh and steam cooked leaves were collected through Soxhlet extraction and their antioxidant activity tested by DPPH and FRAP. High dose (2000 mg/Kg) of the aqueous extract was supplemented in Sprague dawley rats(female) to test acute toxicity level as per OECD 423 guidelines and the animals were observed twice daily for any symptoms of ill- health or behavioral changes in clinical signs of toxicity daily for 14 days. Ethical clearance for acute toxicity study was obtained from the IAEC of our Institution.**Result:** The test extracts of fresh Solanum nigrum leaves possess marked percentage of inhibition in DPPH with IC50 value of 9.51µg/ml (standard value of 12.97µg/ml) and FRAP with IC50 value of 48.63µg/ml (standard value of 50.70µg/ml). The steam cooked leaf extract possess IC50 value of 4.24µg/ml in DPPH and 27.75µg/ml in FRAP.There were no remarkable changes in clinical signs of toxicity over high dose of aqueous extract of both fresh and cooked leaves during the observation period except salivation immediately after the supplementation which consequently subsides within three hours. **Conclusion:** The aqueous extracts of Solanum nigrum leaves possess antioxidant activity in DPPH and FRAP methods and not showing notable toxicity in experimental animal over single, high dose supplementation. Hence, the extracts can be used for experimental

studies related to oxidative stress in low dose. **Keywords:** antioxidant activity, Solanum nigrum, acute toxicity, phytochemicals

PPEN-24 withdraw

PPEN-25 ANALYSIS OF PHYSICOCHEMICAL PROPERTIES OF A PROCESS STANDARDISED TRADITIONAL ASSAMESE BREAKFAST CEREAL - KUMAL CHAWL. ***Ananya Kashyap[1],*** Charu Lata Mahanta[2].1=Dept.of Food, Nutrition and Dietetics, Assam town University, Guwahati,2=Department of Food Engineering and Technology, (SoE), Tezpur University
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Background & Objectives: This investigation was an effort to standardise the traditional process of making a popular Assamese breakfast cereal i.e. Kumal chawl.The physicochemical properties of the Kumal chawl along with their raw samples were analysed. **Materials & Methods**: Rice samples were collected from Jorhat district of Assam.Three processing variables for each Teli (TC) and Xaru Chowkua (XC) varieties and one processing variable was followed for both Kola (KB) and Jengoni Bora (JB) varieties were selected for the study. The processing variables were also coded in brief. The codes showed the pressure of steaming and the time of steaming. To illustrate, KB-98o(1□)-0-20□ means Kola bora paddy was boiled for 1 min prior to soaking and parboiled at open steaming pressure of 10 min. **Result :** On the basis sensory evaluation one processing variety each from TC (TC-98o(1□)-1-10□) and KB (KB-98o(1□)-0-20□) were selected for physicochemical studies. The amylose content of TC and KB kumal chawl were 12.02 and 4.48% respectively whereas raw TC and KB contained 10.84 and 4.79% amylose respectively. The equilibrium moisture contents were 71.27 and 79.99% for TC and KB kumal chawl respectively whereas raw TC and KB varieties contained 35.70 and 36.30% . The sediment volume obtained for raw TC and KB were 6ml and 9.5 ml whereas in case of TC and KB kumal chawl samples this was 15ml and 19.5ml respectively. On the other hand the hydration capacity of TC kumal chawl was 58.40% and 57.38% for KB kumal chawl. In case of TC and KB kumal chawl the alkali score were found to be 6 and 8 respectively. **Conclusion:** Processing variations were observed in both the rice varieties. In the physiocochemical properties in both of the samples distinct differences were observed. **Keywords:** Kumal chawl, Teli chowkua, Xaru chowkua, Kola bora, Jengoni bora, physicochemical

PPEN-26 BIOACTIVE COMPONENTS AND TOTAL ANTIOXIDANT CAPACITY (TAC) OF SOME PLANT FOODS COMMONLY CONSUMED IN PUNJAB. ***Rohini Jain,*** Neerja Singla Priya Singla. Department of Food and Nutrition, Punjab Agricultural University, Ludhiana, Punjab. Email: rohinijain@pau.edu

Background & Objectives: Bioactive compounds in plants can be defined as secondary plant metabolites eliciting pharmacological or toxicological effects in man and animals. Phytochemicals are non-nutrient bioactive compounds found in plant foods including fruits, vegetables, grains, nuts and seeds, which are known to have health benefits to humans. The present study was conducted to generate the database for various bioactive components and total antioxidant activity present in 35 different foods selected from various food groups namely, cereals and pulses, green leafy and other vegetables, roots and tubers, fruits, nuts and oilseeds and condiments and spices. **Materials & Methods:** Different foods were procured from the local market of Ludhiana district of Punjab. Total Phenolic content (TPC) by Folin-Ciocalteu method and Flavonoid content (TFC) were assessed as part of bioactive components. Total Antioxidant Capacity (TAC) by Ferric Reducing Antioxidant Power (FRAP) and by DPPH Radical Scavenging Activity, of raw foods from each food group was also assessed using standardized methods. **Result :** The total phenolic and flavonoid content varied from 11in green chilly to 351 mg GAE/100 g in guava and from 2 in flaxseeds to 225 in bathua leaves mgRE/100g on fresh weight basis. Total antioxidant activity of methanolic extract evaluated according to Ferric Reducing Antioxidant Power (FRAP) and DPPH Radical Scavenging Activity ranged from 19 in colocassia and 11 in carrot to 171 in fenugreek leaves and 434 mgTE/100g in groundnut on fresh basis, respectively. The correlation coefficient between total phenolics,flavonoids and antioxidant activities was statistically significant. **Conclusion:** Due to the detection of many bioactive compounds in food with possible antioxidant activity, there has been increased interest in the relationship between antioxidant and disease risks. The generated data will be useful to the health professionals for formulation of antioxidant rich diets or preparations from plant foods for prevention of various lifestyle diseases. **Keywords:** Phenols, Antioxidants, Radical scavanging, Plant foods, Flavonoids

PPEN-27 DEVELOPMENT OF A FOOD MULTI-MIX FOR POST- MENOPAUSAL WOMEN. ***Daisy Sharma,*** Ajanta Hijam. Assam down town University. Email: daisysharma8991@gmail.com

Background & Objectives: The present study was planned to screen out the nutritional status and menopausal symptoms of women under the age group of 40-60 years and to develop a nutraceutical rich food multi mix for post menopausal women. The effect of supplementation of the developed food multi on their health was also studied. **Materials & Methods:** A survey was undertaken with a 100 respondents under the age group of 40-60 years and the data was collected from Imphal East District (Manipur) by using a pre-tested questionnaire. **Result:** From the survey it was found that most of the women are suffering from menopausal symptoms like fatigue, hot flashes, back pain, constipation, mood swings, depressed mood, poor concentration, hypertension etc. After getting results from the survey, a food multi mix was developed for improvement of health status of the women.The developed multi- mix is highly acceptable in terms of sensory attributes and rich in nutritients. The food multi mix was distributed to the 50 respondents who were mostly affected by menopause symptoms and feeding trial was conducted for 30days. While another group of 50 respondents were kept as control group. After completion of 30 days of supplementation the survey was conducted again and the result shows that 90% of respondents improved their health. **Conclusion:** From the present study it can be concluded that post-menopausal women suffer from various health problem-physical, psychiatric as well as vasomotor, related to menopausal hormonal changes. In rural area there is need to address the women group separately and give nutrition education as there hasn't been a specific health program for those women. They had lack of knowledge regarding the nutritious foods and their benefits. Moreover development of functional food products for post-menopausal women will not only minimize the frequencies and the severity of such symptoms but also improve their overall health status. **Keywords:** menopause, food multi-mix, nutraceutical, supplementation,health.

PPEN-28 ASSESSMENT OF SUITABILITY OF SELECTED RICE VARIETIES FOR PRODUCTION OF RICE FLAKES. ***Dr.Vijayalaxmi Kamaraddi[1],*** Dr.Jamuna Prakash[2]. Extension Education Unit, Organic Farming Research Station, Naganahalli, Mysuru. Email: vkuasb@gmail.com

Background & Objectives: Rice breakfast cereals are mainly ready to eat type. They include rice flakes, puffed rice (puffed by oven, gun or extruder), shredded-rice-cereal and multigrain cereals. The use of rice and its products in prepared cereals has assumed considerable importance because of some unique properties of its starch which imparts special flavor due to processing. Flaked and puffed are popular in rice-eating populations for snacks instead of for dry breakfast cereals. Five high yielding rice varieties of Hill zone of Karnataka state, viz., IET-13901, KHP-2, KHP-5, KHP-10 and Intan were screened for flaking quality based on their physicochemical, functional, nutritional and organoleptic parameters with Rajamudi as a local check. **Materials & Methods:** The effect of varietal differences on flaking quality parameters, in vitro digestibility of starch and protein as well as bioaccessibility of iron, zinc, and calcium were determined. **Result :** The process consisted of steeping rough rice in warm water and dry heating the steeped grain in a shallow iron pan over a strong fire (about 2500C) with or without sound until the grain nears the puffing stage. The roasted grain was tempered for a few minutes and flattened either by pounding in a wooden mortar with a pestle or by an edge-runner. The hull and a part of the bran which were rendered brittle by roasting were removed during flaking. The yield of flaked or beaten rice was 60-65%, which was increased to 70% by a continuous process using edge runner. Roasting time ranged from 40-60 sec, and the final temperature of the roasted grain reached 100-1020C. Rice flakes were more stable with respect to crispiness than was puffed rice. Results indicated a strong positive correlation between amylose content and flaking ratio and a negative correlation between protein and amylose content, length expansion ratio and volume expansion ratio. Flaking expansion characteristics showed that the varieties suitable for the production of rice flakes were KHP-2, IET-13901, and Intan. Nutritional analysis showed the following ranges of nutrient content in rice flakes of different varieties: protein, 7.42±0.35g to 8.17±0.15g; Ash: 0.81±0.13g to 0.89±0.12g ;Total Fat:1.12±0.11g to 1.82±0.31g ; Dietary fibre: Total:3.40±0.12 g to 4.40±0.32 g ; Insoluble :2.25±0.31g to 2.29±0.33g; Soluble: 0.81±0.12g to 0.90±0.38g; CHO: 76.75±0.96 g to 78.05±0.16 g and as mg/100 g calcium, 9.19±1.33 to 12.11±1.30; iron, 4.06±0.01 to 4.48±0.61 mg ; zinc, 1.29±0.22 to 1.52±0.11mg ; thiamine, 0.12±0.020 to 0.13±0.018 mg ; riboflavin, 0.036±0.002 to 0.04±0.008; niacin, 1.56±0.02 mg to 1.61±0.06 mg and folate, 7.42±0.93 µg to 8.41±0.90 µg. Nearly 78.3–80.2% starch and 69.6–84.2% protein was digestible. **Conclusion:** Among all varieties, Rice flakes of KHP-2 had the lowest amount of rapidly digestible starch (59.6%). Mineral bioaccessibility ranged from 52.7 to 58.1%. Sensory analysis indicated that Intan, KHP-2 and IET-13901 were superior and suited for the production of rice flakes followed by KHP-5. **Keywords:** Rice flakes, Physical characteristics, Flaking characteristics, Nutritional composition, Starch digestibility, Mineral bio accessibility, Sensory quality.

PPEN-29 HEAVY METAL TOXICITY ON GERMINATED SEEDS OF Macrotyloma uniflorum BY USING FERRIC CHLORIDE. ***Vidhyashree S[1],*** Dr. B. Ramesh[2], Dr.S.S.Vijayanchali[1].1=Department of Home Science, Gandhigram Rural Institute – Deemed to be University, Dindigul,2= Department of Biochemistry, PSG College of Arts & Science, Coimbatore. Email: shreeopositive@gmail.com

Background & Objectives: Heavy metal contamination of soil and water is a serious problem for ecosystem and causes a strong negative effects on plant growth and development. Heavy metal toxicity in plant varies with plant species, specific metal, concentration, chemical form and soil composition and pH, as many heavy metals are considered to be essential for plant growth. Here the toxicity of Ferric chloride on germinated seeds of Macrotyloma uniflorum was evaluated, since Macrotyloma uniflorum is a protein rich seeds and also widely used in many communities.**Materials & Methods:** The seeds of Macrotyloma uniflorum is soaked in different concentrations of Ferric chloride i.e., 10−5 mM, 10−4 mM, 10−3 mM, 10−2 mM, and 10−1 mM and normal tap water as control for 4 hours and allowed to germinate in a petri plate and moistened with their respective concentrations and then evaluated for 5 days regularly and the growth parameters evaluated are: root length, shoot length, whereas the nutritional parameters are: protein (Lowry's method), proline (Wren, 1965), catalase (Beers and Sizer, 1952) and peroxidase (Trinder et al., 1966). **Result:** The present study indicates that Ferric chloride caused an increase in the proline content and severely decrease in the protein, catalase and peroxidase level and the growth of root and shoot length when compared to healthy control seedlings, this clearly indicates that seedling growth has been affected by stress due to ferric chloride toxicity. **Conclusion:** The result shows that when heavy metals come in contact with the seeds through pesticides, unclean water and due to soil and air pollution leads to the toxicity, so to decrease the heavy metal toxicity environmental protection and the use of less pesticides is suggested. **Keywords:** heavy metal toxicity, Ferric chloride, Macrotyloma uniflorum, germination, protein, pesticides, environmental pollution.

PPEN-30 ANTI-INFLAMMATORY ACTIVITY OF POLY HERBAL COMBINATION FROM THE EXTRACT OF *CUSCUTA REFLEXA, COCCULUS HIRSUTUS&TINOSPORA CORDOFOLIA* IN RAT PAW**.** ***Anitha Singh***,Vandana Singh, B. Dinesh Kumar. Food & Drug Toxicology Research Centre. National Institute of Nutrition.
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Introduction: The anti-inflammatory property of certain herbs / traditional preparationsare documented. In the present investigation we have selected the rare plants *Cocculushirsutus (Ch)* which is used as green leafy vegetable locally and*Cuscutareflexa (Cr), Tinosporacordofolia (Tc)* for medicinal purposes. The current study is undertaken as a part of investigations to evaluate anti-inflammatory property with potential extracts of mentioned plants. **Methodology:** *Poly herbal combination (PHC)* formulation comprises of *Cr, Ch, Tc* extracts of water, alcoholic & hydro-alcoholic extracts *respectively.* The anti-inflammatory property has been evaluated in SD rats (weighing 150-200g, 6-8weeks old) after inducing with Carrageenan (1%) in right hind paw. This was followed by monitoring inflammatory activity using plethysmometer for every hour till 24, 48, 96 hours. The test formulation was administered orally in various dose strengths (250 & 500 mg/kg BW). The Ibuprofen (100 mg/kg) was used as standard drug. ***Results:*** The Carrageenan induced paw inflammation was between 0.458 & 0.801 ml and it persistence for three days at a highest level at 3rd hour (0.801±.052 ml) The test material has shown the inhibition of 53% (500 mg/kg b.wt) & 23% (250mg/kg b.wt) at 3rd hour, suggesting of anti-inflammatory property. The group received Ibuprofen was ineffective after 5 hours whereas, PHC (500mg/kg) was effective till three days. **Conclusion: T**he anti-inflammatory property was dose depended and the activity was persisting for more than 48hours. The test compound has shown potential anti-inflammatory role till the three days as compared to standard drug.

PPEN-31 DEVELOPMENT OF TRADITIONAL READY-TO-USE MIX FOR CALAMITY EVACUEES AND EVALUATION OF ITS SENSORY, NUTRITIONAL AND STORAGE PARAMETERS. ***Pushpa Dhami,*** Kiran Bians, Harpreet Kaur.Email: dhami01@yahoo.com

Background & Objectives: Assam, a north eastern state in India is vulnerable to multiple disasters including earthquake, floods and landslides. Food assistance is an important factor aftermath of disaster which helps the stranded evacuees to recover fast and reduce the stress due to shock. Traditional food which is well known to the local population helps in its wider acceptance and its ready-to-use form with increased shelf life and time saving quality paves way the necessity of utensils and other kitchen preparations to prepare food in refugee

shelters.**Materials & Methods:** Ready-to-use traditional food sandah guri mix was developed using cooked rice flour, roasted wheat flour and bengal gram flour in different formulations with 40% skimmed milk powder, 30% jaggery powder and some dry fruits. The sensory analysis was done by semi-trained panelists and students from the identified disaster prone state Assam. It was analyzed for its sensory and nutritional parameters including proximate composition, essential amino acid lysine, NDP cal %, in vitro protein digestibility, minerals like calcium, iron and zinc. The shelf life was also assessed for two months in different packaging materials namely high density poly propylene (HDPE) and aluminium laminate pouches.**Result:** The ready-to-use mix was widely accepted by the sensory panelists and showcased high protein (16.23 %), fibre (0.82 %), ash (1.06%), NDP cal % (10.5 %), in vitro protein digestibility (87.1 %), lysine (444.7 mg), calcium (206.2 mg) and iron (3.14 mg). The product was acceptable for 60 days in HDPE and laminate pouches at ambient temperature with no compromise in its overall quality, however, laminate pouches offered the best option for packaging. **Conclusion:** This ready-to-use sandah guri mix was found to be nutrient dense with adequate balance of protein quality and quantity thus capable of meeting the increased nutrient needs of calamity victims. The cultural familiarity of the product to the stranded population helps in its easy acceptance. This mix can also be put in the food baskets of defense personnel, astronauts, school children and included in the feeding programs running by the respective state.
Keywords: sandah guri, ready-to-use, protein, disaster, evacuees

POSTER PRESENTATIONS - NUTRITION EDUCATION & COMMUNICATION

16th Nov 2018 **3.00 pm – 5.00 pm**

Code No.	Name and Address	Title of Presentation
PPNEC-01	Dr Aditya Bhandari Jodhpur School Of Public Health, Maulana Azad University. Email:- dradibhandari@gmail.com.	Knowledge, Attitude and Behaviour Practice among the People of Jodhpur City for Progress towards Sustainable Utilisation and Management of Food Wastes in the Global Economy.
PPNEC-02	Manisha Parelkar, S.P.N.D College, Cama Lane, Ghatkopar (West), Mumbai, Mumbai. Email:- manisha.parelkar@gmail.com.	Relevance And Comprehension Of Nutrition Messages On Food Labels By Consumers – Revisiting Nutrition Labels.
PPNEC-03	A.Simha, Mount Carmel College, Autonomous, Bengaluru, India. Email:- anjanasimha@gmail.com.	Development Of Nutrition Education Materials For The Management Of Polycystic Ovary Syndrome (PCOS).
PPNEC-04	Ranjani Raman, Nutrition Tattva & Indian Dietetic Association, Bangalore chapter. Email:- ranjaninutritionist@gmail.com	Positive Impact Of Diabetes Education, Nutrition Counseling And Periodical Monitoring In Individuals Diagnosed With Type Ii Diabetes Mellitus.
PPNEC-05	*Anjana singh,* Vasant Kanya Mahavidyalay (BHU) Varanasi. Email:- anjanas68@gmail.com	Dietary Practices Of Adolescent Girls In Varanasi In Context To Ready-To-Eat Food Products.
PPNEC-06	Suman Bala, Home Science Kurukshetra University,Kurukshetra, Haryana, Vasant Kanya Mahavidyalay (BHU)Varanasi. Email:- suman_81@yahoo.co.in	An Educational Intervention On Knowledge, Attitude And Practices Of Diabetic Male Subjects.
PPNEC-07	Anitha.M.C Home Psg College Of Arts And Science. Email:- anithamc85@gmail.com	A 21 Day Multimodal Nutrition Education Intervention (Mmnei) Improves Snacking Knowledge, Attitude And Behaviour Among Pre-Adolescents-A Follow Up Study In Coimbatore City, Tamil Nadu, India.
PPNEC-08	P.Lakshmi Priya, Department of Food and Nutritional sciences, Sri sathya Sai Institute of Higher Learning, Anantapur Email:- meeram@sssihl.edu.in	Development Of Multigrain Based Products.
PPNEC-09	D. Tejasri, Department of Food and Nutritional sciences, Sri sathya Sai Institute of Higher Learning, Anantapur-515001. Email:- tejasridevarintti4@gmail.com	Development And Popularisation Of Millet Based Products
PPNEC-10	*Mrs.Kanchan Deshmukh*, Women's College Of Home Science & Bca Loni, Ta-Rahata Dist- Ahmednagar Maharashtra, India. Email:- Kanchansamish2008@rediffmail.com	Impact Of Food Hygiene Counseling On Knowledge, Attitude And Practices Of The Mothers Towards Preschool Children
PPNEC-11	Withdraw	
PPNEC-12	Yamini Chaturvedi, Commisionerate College Education, Jaipur, Rajasthan. Email:-	Treating Thyroid Disorder: - An Integrated Approach

	Yaminichaturvedi@yahoo.co.uk	
PPNEC-13	Withdraw	
PPNEC-14	Tasneem Naheed Khan, Email:- K_Naheed@rediffmail.com	Assessment Of Nutritional Status Of Rural Adolescent Girls(13-15 Years).
PPNEC-15	Suruchi Gupta1 Department Of Food And Nutrition, Lady Irwin College Email:- suruchi2310@gmail.com	Factors Affecting Food Label Usage Among Delhi College Students
PPNEC-16	Manisha Chatterjee National Institute Of Nutrition. Email:- manishachatterjee95@gmail.com	Fitness Bands As Activity Trackers– Impact Of Nutrition Education On Physical Activity And Food Consumption Of Users
PPNEC-17	Majidha Nasrin Kadambodan Dept. Of Home Science, Kahm Unity Women's College Manjeri , Under University Of Calicut, Kerala Email:- nasrin.majidha@gmail.com	Assessment Of Nutritional Awareness Among Rural Housewives
PPNEC-18	Sharda Padghane S.R.T.M.University, Nanded, Maharashtra. Email:- shardapadghane@gmail.com	Nutrition Security For Fisher Tribes In Godavari River Basin Through Captive Breeding And Maintenance Of Freshwater Black Crab Barytelphusa Cunicularis
PPNEC-19	Smita Sahu Department Of Food & Nutrition, Budge Budge College (Affiliated To University Of Calcutta) Email:- supriyagaur561@gmail.com	Nutritional Adequacy And Resilient Agricultural Procedures In The Changing Scenario Of Seasonality And Climate Variability.
PPNEC-20	Supriya Singh Gaur Punjab Agricultural University, Ludhiana. Email:- supriyagaur561@gmail.com	Assessment Of Mothers' Nutrition Education And Its Effect On Child's Overall Health
PPNEC-21	Rupali Babare Swami Ramanand Teerth Marathwada University, Nanded, Maharashtra State, India. Email:- rbabare788@gmail.com	Nutritive Value Of Freshwater Fishes Sperata Seenghala And Wallago Attu Based On What Kind Of Food They Consume
PPNEC-22	Sujatha, K Institute For Home Science And Higher Education For Women, Coimbatore. Email:- saisujatha622@gmail.com	Green Garden (G. Garden) Activities To Enhance Iron Nutriture Of Adolescent Girls (13-18yrs) From Rural Coimbatore
PPNEC-23	Komal Chauhan The Maharaja Sayajirao University, Vadodara. Email:- komal.chauhan-fn@msubaroda.ac.in	Impact Evaluation Of Nutrition Health Education On Nutritional And Physiological Knowledge Scores Of Hockey Athletes
PPNEC-24	Divya Raghuwanshi	Withdraw
PPNEC-25	Himlesh Bhutani Punjab Agricultural University, Ludhiana. Email:- himlesh-fn@pau.edu	Dietary Pattern And Nutritional Status Of College Going Females In The Age Group Of 18-24 Years
PPNEC-26	Gitashree Phukan Unicef. Email:- gitashreephukan@gmail.com	Study On Knowledge And Sensitization On Infant And Young Child Nutrition Practices In Tea Gardens Of Dibrugarh And Tinsukia District
PPNEC-27	Prarthana Sonowal Nhm Nutrition Rehabilitation Centre Moran Tiloi Chc Dibrugarh. Email:-prarthanasonowal315@gmail.com	Knowledge On Proper Nutrition Among Mothers Of Under Five Children In Selected Tea Garden Areas Under Khowang Block Of Dibrugarh District Assam

PPNEC-01 Knowledge, Attitude and Behaviour Practice among the People of Jodhpur City for Progress towards Sustainable Utilisation and Management of Food Wastes in the Global Economy. ***Dr ADITYA BHANDARI***. Jodhpur School Of Public Health, Maulana Azad University. Email:- dradibhandari@gmail.com.

Introduction & Objectives: According to the United Nations Development Programme, up to 40% of the food produced in India is wasted by its people. About 21 million tonnes of wheat produced is wasted and 50% of all food across the world meets the same fate and never reaches the needy. The value of the food lost is INR 96,000 crore, which is nearly two-thirds of what it costs the government. OBJECTIVE to study and find the widespread (Self-reported) awareness of wasted food as an issue, efforts to reduced it and knowledge about how to do so, plus performance of waste reducing behaviour. **Materials & Methods:** Study participants were from age 15 to 80. They were requested to complete a pretested, self-administered, semi-structured questionnaire. Data analysis was done using Strata, version 13 and MS-excel. **Main Findings:** Total 411 (208 males, 203 females) were the participants in this study with the age range of 15-80 years (mean age 29.07yrs). The survey found widespread (Self-reported) awareness about food wastage; efforts to reduce it, and knowledge about how to do so, plus a moderate performance of waste reducing behaviour. 79% respondents said they discard less food than average Indian. The leading motivation behind waste reduction was thinking about the hungry people, followed by waste reduction in general with environmental concerns ranked last. The most common reason for discarding food was concern about food born illness and desire to eat fresh food. **Conclusion & Recommendations:** The finding suggests approaches including recognizing that many consumers perceive themselves as being already knowledgeable and engaged, It suggests approaches including avoiding treating consumers as if they are completely new to the issue of wasted food, In addition, there is a need to sharpen our messages about food safety and freshness in order to expand acceptability of those foods that may be less attractive or nearing their expiration dates but is unlikely to be hazardous, while avoiding waste prevention messaging that could increase food safety hazards. **Keywords:** Food wastage; food security; food system; Hunger

PPNEC-02 RELEVANCE AND COMPREHENSION OF NUTRITION MESSAGES ON FOOD LABELS BY CONSUMERS – REVISITING NUTRITION LABELS. ***Manisha Parelkar[1],*** Jagmeet Madan[2].1=S.P.N.D College, Cama Lane, Ghatkopar (West), Mumbai,2=Sir Vithaldas Thackersey College of Home Science (Autonomous),SNDT Women's University, Juhu , Mumbai. Email:- manisha.parelkar@gmail.com.

Background & Objectives: Nutrition information on Food labels is a mode of communicating health related messages to consumers. Current research suggests that most consumers do not access nutrition labels during purchase. The aim of the study was to gain deeper insights into the relevance and comprehension of select nutrition label formats and their influence on the behaviour of consumers'. **Materials & Methods:** Focus group discussions, with 25 participants, were conducted in Mumbai City. A semi-structured discussion guide was used to elicit factors influencing food purchases and understand the influence of select nutrition label formats.**Result :** The findings support that consumers find it difficult to comprehend the messages on the Nutrition Information Panel (NIP). The situation is further aggravated by poor relevance and the lack of trust in the nutrition information on food labels. Thematic analysis revealed that while most consumers' desired to select "healthy" food for their families, other practical factors dictated their decisions. The current Nutrition label format had little reported influence on food choice, largely because the purchasers face competing demands when selecting food for their families. These factors outweighed the use of detailed nutrition information, especially formats that require considerable effort to comprehend. Most participants preferred the Front-of-Pack formats (FOP) to Back-of-Pack (BOP) formats; nevertheless further research is needed to reach a consensus about the preferred FOP format. **Conclusion:** Poor relevance and comprehension of the Nutrition Information Panel(NIP)are major barriers to the use of nutrition messages on food labels for reaching health promoting food choices. Consumer-centric nutrition label formats supported by nutrition education initiatives are recommended. **Keywords:** Nutrition Label Formats, Consumer, Relevance, Comprehension

PPNEC-03 DEVELOPMENT OF NUTRITION EDUCATION MATERIALS FOR THE MANAGEMENT OF POLYCYSTIC OVARY SYNDROME (PCOS). ***A.Simha,*** S. Agarwal. Mount Carmel College, Autonomous, Bengaluru, India. Email:- anjanasimha@gmail.com.

Background & Objectives: Polycystic Ovary Syndrome (PCOS) is an endocrine disorder. It is characterized by hyperandrogenism (clinical or biochemical), anovulation (chronic) and polycystic ovaries. Management of PCOS requires various kinds of intervention as it is associated with various metabolic disorders such as

obesity, diabetes and other long term complications. The study aimed at developing Nutrition Education Materials in order to improve the knowledge, attitude and practices towards PCOS. **Materials & Methods:** Random sampling technique was used for screening and out of 521 respondents, 40 respondents were selected for this study based on the inclusion criteria. Majority of the selected subjects were college students (15 - 30 years). Screening questionnaire was used to select subjects as well as to elicit information about PCOS, menstrual health, characteristics of PCOS, diagnosis and treatment for PCOS, nutrition and presence of any psychological conditions. Validated KAP questionnaire was used to assess their knowledge, attitude and practices pertaining to nutrition and PCOS. **Result:** The analysis of validated KAP questionnaire revealed that the mean score of Knowledge was 80.9, Attitude was 45.27 and Practices were 61.72. From the results it is evident that the subjects had low attitude and their practices were not commensurate with the knowledge they had about PCOS and Nutrition. **Conclusion:** To address the gaps in knowledge, attitude and practices, the development of Nutrition Education Materials was required. Therefore, Nutrition Education materials such as Powerpoint presentation, Brochures, Pamphlets, Handbook, Memory games and videos of experts from various specializations were developed. **Keywords:** PCOS, Nutrition Education Materials, Questionnaires, Knowledge, Attitude and Practices

PPNEC-04 POSITIVE IMPACT OF DIABETES EDUCATION, NUTRITION COUNSELING AND PERIODICAL MONITORING IN INDIVIDUALS DIAGNOSED WITH TYPE II DIABETES MELLITUS. ***Ranjani Raman,*** Nutrition Tattva & Indian Dietetic Association, Bangalore chapter. Email:- ranjaninutritionist@gmail.com

Background & Objectives: Most individuals diagnosed with Type 2 Diabetes Mellitus have very minimal knowledge about the disorder. The objective of the study was to understand the positive impact of diabetes education, nutrition counseling & periodical monitoring in individuals diagnosed with Type 2 Diabetes Mellitus. **Materials & Methods:** Ten Patients, both male & female, aged between 30 and 60 years of age, were provided with individual nutrition counseling & periodical diabetes education through a personalized nutrition programme. Overall survey was taken at the end of the programme to understand their diabetes awareness quotient, dietary management quotient & the overall mindset shift towards dealing with the medical condition, before and after the programme. The responses were gathered, compiled, analyzed and represented graphically to show the comparison. Testimonials & patient feedback were also documented/recorded emphasizing the importance of nutrition education, effective counseling & communication. Supporting tools include Workshop slide samples, blood glucose periodical monitoring tracker, graph and patient testimonials.
Result: It was observed that educating about Type 2 Diabetes Mellitus from the nutrition point of view in simple terms & providing logical reasoning, helped patients handle the lifestyle disorder with a positive approach, making wise choices, long term strategies & modifications. **Conclusion**: It was observed that educating about Type 2 Diabetes Mellitus from the nutrition point of view in simple terms & providing logical reasoning, helped patients handle the lifestyle disorder with a positive approach, making wise choices, long term strategies & modifications. **Keywords:** Diabetes Mellitus, nutrition education, diabetes education, lifestyle changes, counseling, communication, education, Diet, Nutrition, Type 2 Diabetes Mellitus, Diagnosed, Personalized nutrition, Monitor

PPNEC-05 DIETARY PRACTICES OF ADOLESCENT GIRLS IN VARANASI IN CONTEXT TO READY-TO-EAT FOOD PRODUCTS. ***Anjana singh,*** Vasant Kanya Mahavidyalay (BHU) Varanasi. Email:- anjanas68@gmail.com

Background & Objectives: Adolescence is an important stage of physical growth and development. The increased need for energy and nutrients among adolescents, combined with increasing financial independence, increasing need for autonomy when making food choices, and immature cognitive abilities, also leads to inclination towards ready-to-eat (RTE) food products placing adolescents at nutritional risk .Dietary practices have profound influence on the nutritional health of individual and communities. Dietary practices refer to a person's choices in food consumption (NCI Thesaurus). The present research is an effort to study dietary practices of adolescent girls in Varanasi in context to ready-to-eat food products. **Materials & Methods:** The study was conducted on 384 girls who lived at hostels of Banaras Hindu University, Varanasi between age group of 16-19 years. Data was collected through self-designed and pre-tested closed schedule questionnaire. Qualitative variables were tested by using the Chi-square and level of significance test. Data was analyzed using SPSS 16 software. **Result:** It was found that out of total respondents' 42.4% of subjects were age group of 17-18-year-old, followed by 37.2% were age group of 18-19-year-oldand more than half of selected subjects belonged to city/metro city. The observation shows that maximum51.3% of subjects were from medium economic status. The result shows that majority of respondents 90.6% gained knowledge regarding RTE food products from

advertisement of electronic and print media. It was also found that out of total selected subject majority 46.4% used the RTE products for the taste. It revealed that out of total respondents only 48.4% of respondents had nutritional knowledge of RTE food products. **Conclusion:** There is a need to educate adolescent girls regarding food labels of ready-to-eat food products. Keywords: RTE:- ready to eat

PPNEC-06 AN EDUCATIONAL INTERVENTION ON KNOWLEDGE, ATTITUDE AND PRACTICES OF DIABETIC MALE SUBJECTS. ***Suman Bala,*** Tarvinderjeet Kaur.Home Science Kurukshetra University,Kurukshetra,Haryana, India Vasant Kanya Mahavidyalay (BHU)Varanasi. Email:- suman_81@yahoo.co.in

Background & Objectives: Nutrition education is an important educational tool for inducing signifying behavioral changes for the improvement in the nutritional status of an individual and family. Effective communication and nutrition education play an important role to enhance the nutritional knowledge, awareness, and good health. It improves clinical outcomes and quality of life. Nutrition education also increases confidence and ability to be healthier in food choices. Nutritional deficiencies or ailments can be prevented or handled more efficiently with nutrition education. So, the purpose of this research was to educate, make aware and improve their nutrional status with nutrition education. **Materials & Methods:** Sixty non insulin dependent diabetic subjects in the age group of 40-60 years free from serious complications were selected purposively from district karnal, Haryana. A self structured questionnaire was prepared based on knowledge, attitude and practices (KAP) of non insulin dependent diabetic subjects. Nutrition education was imparted for four months through audio visual aids. **Result:** Nutrition education improved KAP scores significantly ($p<0.01$) obtained by subjects. **Conclusion:** Nutrition education is an effective measure to bring about the positive and significant effects on health and nutritional status of diabetics subjects. **Keywords:** Nutrition education, knowledge, attitude, practices

PPNEC-07 A 21 DAY MULTIMODAL NUTRITION EDUCATION INTERVENTION (MMNEI) IMPROVES SNACKING KNOWLEDGE, ATTITUDE AND BEHAVIOUR AMONG PRE-ADOLESCENTS-A FOLLOW UP STUDY IN COIMBATORE CITY, TAMIL NADU, INDIA. ***Anitha.M.C,*** Dr. Anusuya Devi.K.Home PSG COLLEGE OF ARTS AND SCIENCE. Email:- anithamc85@gmail.com

Background & Objectives: The objective of the study was to evaluate the effectiveness of implementing multimodal nutrition education intervention (MMNEI) to improve snacking knowledge, attitude and behavior. **Materials & Methods:** The random sampling design was used. A total of 384 pre-adolescents participated in the study. They were randomly selected and assigned into three arms, that is, Participatory group (PG) (n=127), Observatory group (OG) (n=127) control group (CG) (n=130). The PG and OG group received 21days multimodal nutrition education intervention using fourteen fun based activities which includes Participatory group (Crossword puzzle, word search game, learning box, hands on training, snake and ladder, electro light game, magic box), Observatory group (animation movies, short films, videos, nutrition info-graphics, misleading advertisements, nutrition information), while CG group did not receive any intervention. Snacking knowledge, attitude and practices was assessed before and after intervention (after 21 days, after 3 months, after 6 months). Outcomes reported through post intervention KAB (Knowledge, Attitude and Behavior) questionnaire. Scores were given accordingly. **Result:** The highest mean values for knowledge of control group, Observatory group and Participatory group (13.91±4.74, 25.20 ± 2.49 and 25.30 ± 2.43), attitude (50.71±5.76, 60.23 ± 2.96 and 60.11 ± 2.96) and practices (10.56±3.56, 14.24 ± 2.61 and 14.43 ± 2.67). Comparing to CG, participants in PG and OG significantly improved their snacking behavior by increasing their healthy snack intake. **Conclusion:** Multimodal Nutrition Education Intervention (MMNEI) focusing on healthy eating promotion is an effective approach to improve snack consumption among selected pre-adolescents. **Keywords:** Key Words Multimodal Nutrition Education Intervention, Pre-adolescents, Observatory group, Participatory Group, Snack Intake

PPNEC-08 DEVELOPMENT OF MULTIGRAIN BASED PRODUCTS. ***P.Lakshmi Priya***, Meera M.Department of Food and Nutritional sciences, Sri sathya Sai Institute of Higher Learning, Anantapur-515001. Email:- meeram@sssihl.edu.in

Background & Objectives: Background: Millets are used as traditional and novel food source due to its high content of starch, protein, fiber, niacin, magnesium, iron, potassium and essential amino acids. India ranks high in the production of coarse cereals namely foxtail millet, kodo millet, little millet, barnyard millet and proso millet. **Objective:** To develop multi grain based products. **Materials & Methods:** Methodology: Multi grain composite flour was developed by partial substitution of wheat with millets (barnyard, pearl, foxtail, finger, little, kodo and

proso) at various proportions. A total of nine products were developed namely perishable breakfast items: pancake, chapathi, momos, halwa and non-perishable snack items: nimki, murukku, ladoo, khakras and cookies were prepared using most acceptable flour mix. The products nutritive value was calculated by computational method. The developed products were subjected to sensorial analysis by 25 semi trained panelist using 9-point hedonic scale. Physical parameters were estimated for cookies and khakras. **Result:** Results: Sensory analysis of the multi grain composite flour products revealed products acceptability was similar to their respective control samples prepared with traditional cereals. Nutritional composition was similar to control with respect to macro-nutrients, however composite flour based products had higher micro-nutrient content. The developed products were found nutritionally superior compared to control samples. **Conclusion:** Conclusion: The study indicated the incorporation of millets at 80% with wheat at 20% was found acceptable and did not affect the sensorial parameters of the developed products. Hence, millets could be used for substituting cereals for the development of novel functional foods and could be used as a strategy to overcome micro-nutrient malnutrition by popularizing the usage at large. **Keywords:** Key words: composite flour, millets, hedonic scale, malnutrition

PPNEC-09 DEVELOPMENT AND POPULARISATION OF MILLET BASED PRODUCTS.***D. Tejasri***, Meera M.Department of Food and Nutritional sciences, Sri sathya Sai Institute of Higher Learning, Anantapur-515001. Email:- tejasridevarintti4@gmail.com

Background & Objectives: Background: The adoption of healthy eating practices is considered as fundamental effort to improve heath and prevent diseases. Therefore it becomes important and challenging to educate adolescents to foster good eating practices in daily dietaries. **Objectives:** Development and popularization of millet based products. **Materials & Methods:** Four variations of composite flour was tried by using wheat four with millets: pearl, foxtail, barnyard and finger millet by changing the proportions. All the variations based experimental cookies were evaluated for acceptability by conducting organoleptic evaluation. The most accepted composition was used for developing snack foods: laddu, bites, omelettes, halwa, bonda, spring rolls, malai puri, noodles, parathas, puttu and idiapam. A sample of ninety adolescent girl students aged 17-18 years studying first year under graduate course were randomly selected for the study and divided into experimental group consists of sixty students exposed to popularization and compared with control group (30 students) not exposed to treatment. A pretested, validated questionnaire which included closed ended and open ended questions to obtain information related to demographic details, nutrition knowledge, dietary habits, 24 hour food recall, food frequency, clinical and anthropometric information was used. The participants answered the questionnaire in class room settings under the guidance of investigator.
Result: Results: The study observed the developed millet based products were well accepted by the panelist compared to respective controls and the nutrient content was found superior. The physical parameters of the cookies were tested and found in accordance with standards. Significant gain in knowledge level after imparting nutrition education was observed in experimental groups.**Conclusion:** Conclusion: Popularization of millet to use in recipes to enhance the nutrient content and to correct knowledge deficiencies to bring dietary modification was found effective. **Keywords:** Key words: Popularization, millet, treatment.

PPNEC-10 IMPACT OF FOOD HYGIENE COUNSELING ON KNOWLEDGE, ATTITUDE AND PRACTICES OF THE MOTHERS TOWARDS PRESCHOOL CHILDREN. ***Mrs.Kanchan Deshmukh***, Meera M. Women's College of Home Science & BCA Loni, Ta-Rahata Dist-Ahmednagar Maharashtra, India. Email:- kanchansamish2008@rediffmail.com

Background & Objectives: Mothers are considered the food handlers in the home; their role is to ensure food safety and hygiene for their infants and children. The hygienic practices dramatically reduce routine exposures to pathogenic microorganisms. The aim of this study was to evaluate the impact of the counselling intervention on food hygiene knowledge, attitude and practices of the mothers towards their preschool children. **Materials & Methods:** Mothers and their preschool children aged 3-5 years belongs to Pravaranagar region (40 Villages) of Ahmednagar District, Maharashtra State, India were selected for the study. The baseline survey was conducted to ascertain the knowledge of mothers about nutrition. A pre-tested questionnaire was used to collect the information on socio-economic/demographic and knowledge of mothers about nutrition of selected 504 mothers. Finding from the base line study, Out of selected 504 mothers, 308 mothers had poor knowledge on nutrition and food hygiene. Among the 308 mothers, 300 mothers were selected as samples for the counselling intervention programme study. Out of these 300 mothers153 mothers treated as the experimental group for intervention and the other 147 as the control group. A pre-test–post-test control group design was chosen. The experimental group received food hygiene education through counselling by the researcher, while the control group did not. The Food hygiene knowledge, attitude and practices level of the mothers in the experimental group and control group was assessed

after the intervention programme. KAP method was used to measure the impact of counselling. **Result:** The data showed that in the present study maximum number of the poor and fair scorers mothers had upgraded food hygiene knowledge, attitude and practices score to the upper levels i.e. fair and good levels. This shift was appreciable observed in the experimental group after imparting food hygiene education counseling (p-value < 0.05). While in the control group a significant improvement was not observed. **Conclusion:** It is overall concluded as from the Chi-square test, there is an improvement in the experimental groups due to the impact of the nutrition and food hygiene counselling intervention programme. Continuous educational program for mothers regarding food hygiene and food poisoning through trained extension worker should be provided. **Keywords:** Food hygiene, Knowledge, Attitude, Practices, Mother, Preschool children

PPNEC-12 TREATING THYROID DISORDER: - AN INTEGRATED APPROACH. ***Yamini Chaturvedi***, Commisionerate College Education, Jaipur, Rajasthan. Email:- yaminichaturvedi@yahoo.co.uk

Background & Objectives: Hyper or hypothyroidism is a disorder of thyroid gland and it can trigger a number of health problems ranging from goiter (enlarged gland) to life threatening CANCER. This study explores the treatment of thyroidism with a combination of DIET CONTROL, AYURVEDIC PREPARATION and SPECIFIC EXERCISE in particular reason. Gland activation differs from person to person and thyroxine hormone affects the hormonal balance of women in their reproductive age group (15-45 years). Average women of 40s who are in their pre and perimenopausal period, may face the imbalance of other hormones too, if they have thyroidism. **Materials & Methods:** The intervention included an Ayurvedic medicine, known as,' kachnar Guggul ' which consists of "Triphala " and " Trikutu". It was taken daily with basil, flax seeds and some other ancient Indian herbs. This was done with some specific exercise of thumb and ' pranayam'. Approximately 40 women between 35-40 years of age were given the treatment. **Result:** The results were seen in the hematological indices after 3, 6 and 12 months of intervention. The blood values for T3, T4 and TSH gradually attained their normal level making the patient also feel better. Here it is noteworthy , that the patients were not given any allopathic medicines after some time . So , it can be concluded that a holistic treatment proved more beneficial for treatment of thyroid. **Conclusion:** An ancient and holistic treatment of Thyroidism was followed by 40 women of Jaipur and it was seen that our age old procedures are quite strong and call for more interventions further. **Keywords:** kachnar Guggul ‘,'Triphala'," Trikutu, Pranayam

PPNEC-14 ASSESSMENT OF NUTRITIONAL STATUS OF RURAL ADOLESCENT GIRLS(13-15 YEARS). ***Tasneem Naheed Khan***, Jyotsna Nerlekar, AICRP(FN).Email:- k_naheed@rediffmail.com

Background & Objectives: Background: Lack of knowledge of the dietary requirements and the nutritive value of different foods is the main contributory cause for the widespread occurrence of malnutrition in developing countries. Hence, present study has been focused to examine the nutritional status of adolescent girls in terms of anthropometry, dietary adequacy and haemoglobin content of adolescent girls. **Objectives:** To Assess the impact nutrition education on socioeconomic status, nutritional stauts and haemoglobin content. **Materials & Methods:** A total number of 300 adolescent girls were surveyed from villages of Parbhani district and divided into two groups i.e control (150) and experimental (150). The pre information regarding socioeconomic status, anthropometric measurements, haemoglobin content, knowledge, aptitude and practice was collected with the help of questionnaire. Food and nutrient intake of sub sample (70) was collected . The IEC programme was conducted to the experimental group. The nutrition knowledge was imparted through messages , charts, posters, talk and demonstration, etc. The impact of IEC programme was evaluated and appropriate statistical methods were applied. **Result:** The results indicated that there was a significant increase in the haemoglobin content from 9.50 to 10.21 g/dl. The improvement in the existing knowledge, aptitude and practice ultimately resulted significant increase in the protein (45.56 to 49.74 g/100g) and iron content (22.01 to 26.95 mg/100g) of experimental group. **Conclusion:** IEC programme exerted positive effect in the enhancement of nutrient intake of adolescent girls from experimental group thereby achieving an improvement in the nutritional status and haemoglobin content of adolescent girls for better quality of life for next generation. **Keywords:** Anthropometry, nutrient intake, haemoglobin content

PPNEC-15 FACTORS AFFECTING FOOD LABEL USAGE AMONG DELHI COLLEGE STUDENTS. ***Suruchi Gupta*[1]**, Lalita Verma[1], Suman Kumari[2]. 1= Department of Food and Nutrition, Lady Irwin College, University of Delhi, 2= ICT Mumbai. Email:- suruchi2310@gmail.com

Background & Objectives: To identify the information used by college students on food labels, the difficulties they experience as well as reasons limiting their usage. A theoretical frame-work was developed to understand the factors facilitating and limiting food label usage. **Materials & Methods:** This was a cross-sectional study consisting of 140 college students belonging to 2 different educational backgrounds i.e. nutritional and non-nutritional background. Pre-coded KABP questionnaire and focus group discussions were used for data collection. Descriptive statistics, t-test and Chi-square test were used for analyzing differences between the two groups. **Result :** Students with nutritional background reported more food label usage than those with non-nutritional background. Manufacturing date/best before date, vegetarian-non-vegetarian mark & quality assurance mark were the most frequently used labeling attributes. Chi-square tests showed a significant difference in frequency of checking different label attributes with different socio-demographic factors (<0.05). Primary barriers in reading food labels were that it was too time consuming to read a food label & too small font size. **Conclusion :** The study provides an opportunity to understand the barriers and facilitators of food label usage. Demographic characteristics of the study population also have a role in the understanding and use of food labels. **Keywords:** Food labels, College students

PPNEC-16 FITNESS BANDS AS ACTIVITY TRACKERS–IMPACT OF NUTRITION EDUCATION ON PHYSICAL ACTIVITY AND FOOD CONSUMPTION OF USERS. ***Manisha Chatterjee***, Paromita Banerjee, V. Bhaskar, G.M. SubbaRao. National Institute of Nutrition. Email:- manishachatterjee95@gmail.com

Background & Objectives: With the advancement of modern technology, fitness bands are taking over the market to fight obesity and related problems. These bands help counting steps, calories burnt, monitoring heart rate, etc. This study aimed to assess perceptions of users about the utility of fitness bands in tracking physical activity and checking the effectiveness of fitness bands in promoting structured physical activity and changes in food consumption in response to set goals and nutrition education through social media. **Materials & Methods:** It was a prospective cross-sectional study. The data were collected from 205 subjects from different parts of India through snowball sampling, using both an online questionnaire and one-to-one interview methods over a period of 1 month to assess their perception. In the next phase, a group was created on a social networking platform to analyze the nutrition knowledge and practice of 40 participants who were unable to meet recommended physical activity goals. Interactive physical activity challenges and nutrition education were planned. Participants were asked to send screenshots of their step count tracked by their fitness bands daily. Data about their knowledge and practices was recollected after the 4-weeks intervention. Chi-square test, paired t-test and McNemar's test were used to analyze data. **Result:** There was a significant increase in the motivational level of users by checking their synchronized app data daily compared to weekly once, occasionally or never (N=205,p=0.001). Among 205 subjects, 84.4% convinced fitness bands helped them improving motivational level for increasing physical activity. Most of the participants significantly improved their step count from baseline (p=0.007). A significant improvement was noticed in terms of both knowledge and practices of participants. **Conclusion:** Fitness bands can be useful for increasing motivation and self-awareness to make users more active, but along with Social media push users can yield better results in terms of both diet and physical activity. **Keywords:** Fitness bands, nutrition education, social media, screenshots, physical activity.

PPNEC-17 ASSESSMENT OF NUTRITIONAL AWARENESS AMONG RURAL HOUSEWIVES. ***Majidha nasrin kadambodan*[1]**, Kochurani J Thayil [2]. 1=Dept. Of Home Science, kahm Unity Women's college Manjeri , under University of Calicut, Kerala.2=Dept.Of Home Science,Vimala College Thrissur, under University of Calicut,Kerala. Email:- nasrin.majidha@gmail.com

Background & Objectives: Healthy eating habits are essential for the development and maintenance of a healthy body and mind. Nutritional culture is shaped by various socio-cultural factors. Housewive's knowledge on food influence household's nutrition status. Mother's educational level, position, health and nutrition status is central to the quality of life and is a key ingredient of health of children and other members of the family. Therefore a study was conducted to assess"the nutritional awareness of rural housewives". The objectives of the study was to ascertain the socio-economic status of rural households and to understand the existing nutrition awareness among the rural housewives. **Materials & Methods:** It was conducted among 100 rural household of

Madakkathara Panchayat of Thrissur district, Kerala. The data were collected using survey method. A questionnaire with forty objective questions to assess the nutritional awareness and socio economics status of the respondents was prepared. The result obtained was analyzed using statistical tools (mean, variance and standard deviation). Further a nutritional education programme was conducted to improve their awareness. **Result :** From the study the socio economic status of the subjects revealed that majority of the housewives belonged to the age group of 40-44 years of age (32%) and had high school education (38%). They were under below poverty line (73%) and were a part of nuclear families (74%). The study conducted revealed that majority of the subjects (74%) had sufficient knowledge regarding food and nutrition. Majority of them were aware of the nutritional benefits of green leafy vegetables, germinated pulses, drinking milk daily, etc. and the harmful effects of eating junk foods, drinking excess of tea, reheating of used oil, etc. but they were not aware of the specific nutrients present in food group such as fruits and vegetables. **Conclusion :** The study concluded that rural households have enough knowledge regarding food and nutrition, but lacks scientific knowledge regarding the same. Their knowledge can be improved through nutrition education programmes.

PPNEC-18 NUTRITION SECURITY FOR FISHER TRIBES IN GODAVARI RIVER BASIN THROUGH CAPTIVE BREEDING AND MAINTENANCE OF FRESHWATER BLACK CRAB BARYTELPHUSA CUNICULARIS. ***Sharda Padghane***, Shivaji Chavan. S.R.T.M.University, Nanded, Maharashtra. Email:- shardapadghane@gmail.com

Background & Objectives: Introduction: Human consumption on freshwater crab has increased day by day in world wide. As a whole, seafood products, freshwater fishery products like fishes, prawns, and crustaceans are commonly used. The nutritive value of crustacean's meat has been extensively investigated in various parts of country. Chemical composition like proteins, fats, carbohydrates, minerals, vitamins etc. has great importance due to their nutritive role in human health. Freshwater crab is well known for having antioxidants, which reduces risk of chronic diseases including cancer and heart diseases. Crab meat consists of Omega 3 fatty acids, selenium, riboflavin, copper and phosphate that are useful for storage and absorption of iron. **Materials & Methods:** In the present review the crab byproducts useful in regular diet of fisher tribes are highlighted. Our aim was to review on how to increase the population of black crab species through captive breeding and to determine the chemical composition and their current applications. **Results**: The suggested captive breeding technique is one successful step towards captive rearing as backyard crab hatchery as nutritional security, instead of time spending hunting of this crab resulting in to its ecological vulnerability. **Conclusion:** In this area, Barytelphusa cunicularis was highly commercialized and consumed. But, in our state these crabs utilization is limited due to lack of knowledge. The present review has shown that crab meat is good source of protein and minerals especially Calcium, Potassium and Sodium. This study reveals that the crab is ideal diet food and consumption of crab may help to prevent nutrition deficiency in the future. **Keywords:** Keywords: Barytelphusa cunicularis, captive breeding, by-products, Nutrition.

PPNEC-19 NUTRITIONAL ADEQUACY AND RESILIENT AGRICULTURAL PROCEDURES IN THE CHANGING SCENARIO OF SEASONALITY AND CLIMATE VARIABILITY. ***Smita Sahu***[1], Purba Chattopadhyay[2].1=Department of Food & Nutrition, Budge Budge College (Affiliated to University of Calcutta), 2= Department of Home Science, University of Calcutta. Email:- sahsmita12@gmail.com

Background & Objectives: Background: The staple grain supply approach through green revolution led to an increase in calorie availability, but diversity in food system was compromised. Rapid demographic, social, climatic and economic changes have resulted in increased urbanization and changes in food systems because of shifts in dietary patterns. This has led the developing countries to get entrapped in triple burden of malnutrition. The aim of this secondary data based study was to analyze the role of the agricultural procedures on food security and nutritional status to mitigate the impact of seasonality and climate variability. **Materials & Methods:** Methods: The present paper is an analytical paper based on studies published in PubMed, Google Scholar and scanning the bibliographies of the relevant articles published in English since 2000. After the first-stage screening of titles and abstracts two hundred seven studies were sorted, from which one hundred forty two full-text articles were obtained through second-stage screening. Finally, ninety one studies were included in this paper, based on their research question, inclusion criteria and its study design, population, intervention and outcome were considered. **Result :** Results: Current agricultural policies failed to address micronutrient malnutrition, problem of hidden hunger and dietary diversity. The prevalence of food insecurity, wasting, and inadequate growth was significantly higher during monsoon seasons as compared with dry seasons. Use of food prices to assess climate variability

impacts on food security was misleading. Elevated atmospheric CO2 made million people prey to micronutrient and protein deficiency due to reduced nutritional value of staple food crops. **Conclusion :** Conclusion: The paper would argue that Government policies need to emphasize on nutrition-sensitive agriculture to achieve nutritional goals and reduce poverty, which are key contributors to undernutrition. The paper would conclude with the suggestion that social and gender dimensions of climate change need to be considered better realization of nutritional security through adopting sustainable diet. **Keywords:** Keywords: Dietary diversity, climate variability, sustainable diet.

PPNEC-20 ASSESSMENT OF MOTHERS' NUTRITION EDUCATION AND ITS EFFECT ON CHILD'S OVERALL HEALTH. ***Supriya Singh Gaur*[1]**, Archana Chakravarty[2]. 1= Punjab Agricultural University, Ludhiana.2=Banaras Hindu University, Varanasi. Email:- supriyagaur561@gmail.com

Background & Objectives: Health and nutritional status of a nation, foremost that of the children are the important determinants reflecting its development. Unfortunately in India, still child malnutrition affects many of children and imposes a biggest challenge that we are yet to overcome. Globally, the prevalence rate of malnutrition is accounted to be 150.8 billion.This study has been taken into consideration because women play a central role in child rearing. Women awareness in regards to maternal health and child care is significant as her education leads to holistic development of children. The main objective of this study was to assess the nutritional knowledge of mothers from different areas of Varanasi.**Materials & Methods:** A total sample of 100 mothers was selected randomly from different areas of Varanasi. Their socio-economic condition, education level, nutritional knowledge, health and diet-related beliefs and attitudes were assessed through questionnaire cum semi structured interview method. **Result:** Mothers who were school dropout (10%) had less nutritional knowledge compared to those who acquired higher education (50% postgraduate and 40% graduate). 70 percent mothers were aware about malnutrition and rest were unaware. 50 percent mothers had knowledge regarding carbohydrates and their benefits followed by fat (30%). They had least knowledge regarding importance of minerals as well as water. Only 30 percent mothers were aware that obesity is a type of malnutrition. Mothers' family income and educational status had a positive significant relation with their nutrition knowledge in the study area. Viewing the knowledge gap of mothers, they were educated for a period of three months and then were post-tested on the above aspects. Significant differences were seen in all the aspects of childcare and nutrition in mothers during post-testing. **Conclusion:** Mothers' awareness regarding child nutrition exists but it can be further improved with basic health education, awareness and proper counseling by the health workers. **Keywords:** nutrition, malnutrition, mother and childcare

PPNEC-21 NUTRITIVE VALUE OF FRESHWATER FISHES SPERATA SEENGHALA AND WALLAGO ATTU BASED ON WHAT KIND OF FOOD THEY CONSUME. ***Rupali Babare***, Shivaji Chavan. Aquatic Parasitology and fisheries Research Laboratory, Swami Ramanand Teerth Marathwada University, Nanded PIN-431606, Maharashtra State, India. Email:- rbabare788@gmail.com

Background & Objectives: Gut contents of freshwater common catfishes Wallago attu (standard length groups 30-35 to 105-110) and Sperata seenghala (standard length groups 20-25 to 60-65) which indicates higher animal matter in the diet of both the species of fishes from Godavari river system in Maharashtra state of India were examined. **Materials & Methods:** Weed fish species Puntius ticto, Chela phulo, Ambasis nama are major food components. With increase in body size of both fish species percentage of animal matter were increased. Over the period of study, moisture content (80.95%), total protein content (7.89±0.63 mg/g), total lipid content (2.43±0.20 mg/g), total amino acid content (20.57±1.31 mg/g) in the body muscle tissues of Wallago attu was observed highest during summer season and moisture content (79.93%) total protein content (1.14±0.53 mg/g), total amino acid content (9.67±0.70 mg/g) in the body muscle tissues of Sperata seenghala was observed lowest during winter season, total lipid content (0.48±0.06 mg/g) during monsoon season.**Result :** There are no major variations in the gut content of Wallago attu and Sperata seenghala with difference in their habitat, indicating the food of the both fish species do not change though they live in different habitats of a major ecological niche. **Conclusion :** As increased animal matter in both fish gut content associated with biochemical composition of the body muscle, was observed in summer season. During this period, nutritive value were increased when compared with other seasons. This indicates that summer season is good to consume these species. **Keywords:** Gut content, Biochemical composition, Catfishes, Godavari River, Maharashtra state, India

PPNEC-22 GREEN GARDEN (g. GARDEN) ACTIVITIES TO ENHANCE IRON NUTRITURE OF ADOLESCENT GIRLS (13-18YRS) FROM RURAL COIMBATORE. ***SUJATHA, K***, KOWSALYA, S. Department of Food Science and Nutrition, Avinashilingam Institute for Home Science and Higher Education for women, Coimbatore. Email:- saisujatha622@gmail.com

Background & Objectives: India the country were prevalence of anemia is the highest in all walks of life. The risk of developing anaemia and other malnutrition related health problems common among the vulnerable group of population especially among the adolescent girls. Nutrition inadequacy during the crucial period of adolescence may have serious health related consequences and continuous throughout life. A cross sectional community based study was conducted to estimate the prevalence of anaemia among adolescent girls in rural areas and to assess the iron nutriture of 920 adolescent (13-18 years) studied in Government Higher Secondary Schools hailing from different rural areas of Karamadai blocks of Coimbatore District. **Materials & Methods:** A subsample of 165 moderate anemic subjects were divided into Group 1 (Nutrition Education+ Food supplement intervention), Group 2 (Nutrition Education+ Kitchen garden intervention) and Group 3 (Nutrition Education intervention) and subjected to respective intervention for four months. Data on anthropometric measurements, biochemical investigations and dietary details were recorded using a pre-designed, pre-tested proforma. Data were analyzed statistically using mean, standard deviation and ANOVA. **Result :** Biochemical analysis revealed that there was a significant increase ($p<0.01$) in haemoglobin level of the subjects belonging to Group 1($t = 14.56^{**}$), Group 2 ($t = 8.73^{**}$) and Group 3 ($t = 10.45^{**}$) after intervention. In general the intervention has brought about reduction of anemia from moderate level to mild anemia (83.7 per cent) and from mild anaemia to normal level (16 per cent). **Conclusion :** The study showed that the intervention measures are more effective when they are integrated with other approaches namely better nutritional such as Continuous nutrition education, kitchen garden activity and adequate intake of micronutrients. Disseminating knowledge and awareness through participatory approach and social actions proved to be the best strategy for combating anemia. **Keywords:** Anaemia, cyanmethaemoglobin, food supplement, intervention, kitchen garden

PPNEC-23 IMPACT EVALUATION OF NUTRITION HEALTH EDUCATION ON NUTRITIONAL AND PHYSIOLOGICAL KNOWLEDGE SCORES OF HOCKEY ATHLETES. ***KOMAL CHAUHAN***, NIKITA JOSHI. THE MAHARAJA SAYAJIRAO UNIVERSITY, VADODARA. Email:- komal.chauhan-fn@msubaroda.ac.in

Background & Objectives: Nutrition education among athletes is important to maximize athletic performance. It has been well documented that high school athletes lack the knowledge to make good nutritional decisions to improve health, performance and growth. Few athletes also depend on their coaches for nutrition knowledge in certain sports. Also extensive research has proven that there is deficiency in nutrition knowledge among coaches, trainers and parents at the high school and collegiate level. **Materials & Methods:** 50 Hockey Athletes (29 boys and 21 girls) above age 14 years who were registered in Sports academy of Vadodara city were enrolled in the study. Data on knowledge regarding nutritional and physiological aspect were collected. Nutrition health education was given in the form of booklets, brochure and presentation. Post data was collected after 90 days on same knowledge based questions. **Result:** Mean age of hockey athletes was 16.06±2.0 years. 31.11% of boys and 21.33% of girls were shifted in to good knowledge score from fair category after the intervention. Highly Significant difference ($p\leq0.001$) was found in knowledge score of girls in both of aspects. With respect to boys, highly significant difference was found in knowledge scores of nutritional aspects as well as total knowledge score followed by ($p\leq0.01$) for physiological aspect. None of the players were under poor and fair category after intervention. **Conclusion:** After the intervention knowledge score of boys and girls were improved significantly. Majority of players agreed that nutrition education and nutritionist play very important role in sports activity. **Keywords:** Hockey, Sports nutrition, Athlete, Knowledge

PPNEC-24 Divya Raghuwanshi - withdraw

PPNEC-25 DIETARY PATTERN AND NUTRITIONAL STATUS OF COLLEGE GOING FEMALES IN THE AGE GROUP OF 18-24 YEARS. ***Himlesh Bhutani*[1],** AMANDEEP KAUR[1], BARINDER KAUR[2].1=PUNJAB AGRICULTURAL UNIVERSITY, LUDHIANA, 2= GOVERNMENT COLLEGE FOR GIRLS PATIALA. Email:- himlesh-fn@pau.edu

Background & Objectives: Good nutrition is a pillar for survival, health and development for current and succeeding generations. Adult period is relatively healthy as compared to other life cycle groups. The objectives of the study were to assess the dietary pattern and food habits of young adult females of age group 18-24 years and the effect of consumption of beetroot juice on the hemoglobin level of the subjects. **Materials & Methods:** A sample of 150 females of age 18-24 years was selected from Government College for Girls, Patiala. Questionnaire-cum-schedule method was used to elicit information. Hemoglobin estimation among subjects by standard method was done before and after the consumption of 100 ml of beetroot juice once a day for 20 days. **Result:** Results showed that the consumption of cereals, pulses, milk and milk products was more than per cent adequate intake i.e. 197.2 per cent, 156.67 per cent and 261.467 per cent respectively. The consumption of green leafy vegetables and fruits was lesser as compared to Recommended Dietary Allowances. Average hemoglobin level was 10.32 g/dl. Only 19 per cent of the subjects were non-anemic, while the percentage of mildly, moderately and severely anemic subjects was 17.33, 39.33 and 2 respectively. There was insignificant effect of beetroot juice consumption on Hemoglobin levels of the subjects. Diet counselling of all the subjects for balanced diet was done and a module on general dietary guidelines was distributed. **Conclusion:** The inadequate consumption of nutrients and food groups lead to anemia. Effective diet counselling can help in creating awareness about improved nutritional status. **Keywords:** Dietary pattern, anemia, beetroot,diet counselling

PPNEC-26 STUDY ON KNOWLEDGE AND SENSITIZATION ON INFANT AND YOUNG CHILD NUTRITION PRACTICES IN TEA GARDENS OF DIBRUGARH AND TINSUKIA DISTRICT. ***Gitashree Phukan*[1],** Barnali Deori[2].1=UNICEF,2=Arya Nursing College, Sangsari. Email:- gitashreephukan@gmail.com

Background & Objectives: Infant and young child nutrition (IYCN) practices are crucial for optimal growth and development during infancy. Tea is a labour intensive agro industry where mostly female employees are used as manual pluckers of tea leaves. Tea garden people are involved in IYCN practices in a wrong way. Considering the importance of IYCN practices among mothers of tea garden area, present study was undertaken to access the knowledge of mother of under two years on IYCN practices and to orient the Child Protection Committee (CPC) members on IYCN components. **Materials & Methods:** The study was carried out in 6 tea gardens of Dibrugarh and Tinsukia district of Assam. Interview method was used to access the knowledge and practice of tea garden worker on IYCF with a self-administered, pre-designed semi-structured interview schedule.**Result :** Most of the mothers of tea garden area continue exclusive breastfeeding up to 7 to 8 months of age. They continue complementary feeding in-between the age of 6-9 months. The working mothers of tea garden area could not exclusively breastfed their child. They fed them only 3 times in the whole day, which is the main reason of malnutrition. There is availability of mobile crèche where mother can feed their babies during working hours also. But the working mothers don't want to fed them as they have a belief that when they work outside, their body becomes hot so it's not good for baby to feed breast milk in that situation. Crèche house facility is also available in the tea garden for above 1 year children but provision of proper complementary feeding is not available there. Children above 1 year are given homemade foods like rice, daal or khichdi. Most of the people have a concept that 'cerelac' (a ready to eat baby food) is better for babies than home made products. So there is an urgent need of sensitizing those tea garden people in IYCN practices. The CPC is formed with the frontline workers including Welfare manager of Tea Estate. All the members used to visit respective lines of their area for health and social issues etc. **Conclusion :** The study reveals that knowledge of mother's as well as care givers of crèches of tea garden regarding IYCN practices is very poor. It is important to sensitize them on proper IYCN practices. Though CPC members were targeted to sensitize them on IYCN, but it is also necessary to organize training for them on IYCN practices. **Keywords:** IYCN, tea garden, complementary feeding, breastfeeding

PPNEC-27 KNOWLEDGE ON PROPER NUTRITION AMONG MOTHERS OF UNDER FIVE CHILDREN IN SELECTED TEA GARDEN AREAS UNDER KHOWANG BLOCK OF DIBRUGARH DISTRICT ASSAM. ***Prarthana Sonowal*[1],**Gitashree Phukan[2].
1= NHM Nutrition Rehabilitation Centre Moran Tiloi CHC Dibrugarh
,2= UNICEF office Guwahati. Email:-prarthanasonowal315@gmail.com

Background & Objectives: BACKGROUND:- Nutrition knowledge among mothers has significant impact on dietary habit of the child. Mother is the first caregiver of a child, lacking knowledge in nutrition, health and hygiene sometimes lead to malnutrition in child under five.The study was made to assess the mothers knowledge in nutrition and hence to improve their nutritional needs through counselling. Health and nutrition messages were usually targeted to mothers, most of whom have not received formal education. **OBJECTIVE:**- To assess the knowledge of mothers regarding nutrition of under five children. **Materials & Methods**: The study was carried out in selected tea garden areas under Khowang block of Dibrugarh district Assam.The sample consisted of 50 mothers of the infants in the age group of 18-30 years.The data were collected through the use of interview method and the nutrition knowledge was calculated based on mothers responses. Appropriate statistical procedure was used for analysis.**Result :** The mothers were assessed on different aspects like knowledge on nutrition, time of initiating breastfeeding, importance of colostrum, age of introduction of supplementary foods, types of supplementary foods they include after six months and also about health and hygiene.From the study 90 percent mothers have inadequate knowledge on proper nutrition.98 percent mothers fed colostrum after 1 hour of delivery but most of them do not know about its importance.96 percent introduce supplementary feeding after the annaprashana ritual in between the age of 6-9 months but most mothers do not include all the food groups in feeding the child even after the age of 1 year. **Conclusion:** The results imply that mothers knowledge about nutrition is important for taking proper health care of the child and its the health care providers who could help the mothers through imparting nutrition knowledge. **Keywords:** Mothers Nutrition Knowledge, Interview method.

POSTER PRESENTATIONS - SPORTS NUTRITION

16th Nov 2018 **3.00 pm – 5.00 pm**

Code No.	Name and Address	Title of Presentation
PPSN-01	Bijaya Bramhachary Cricket Association Of Bengal Email:bijaya.brahmachary2014@gmail.com	The Nutritional Status And Lifestyle Assessment Of Female Cricketers As Compared To Female Adolescent
PPSN-02	Dipti Soni Jaipuriar, Department of Biochemistry, St. Francis College For Women, Begumpet, Hyderabad. Ex Faculty Department of Biochemistry IT'S Dental and Paramedical College Muradnagar, Ghaziabad, U.P. Email: - d15s@rediffmail.com	Single Dose Effect Of Citrulline Malate In Comparison To Placebo On The Exercising Muscles.
PPSN-03	Anushka Shrivastava, Department of Work Physiology & Sports Nutrition, National Institute of Nutrition, Indian Council of Medical Research, Telangana, Email: - anushka.shrivastava19@yahoo.com	Effect Of Eight-Week Web-Based Zumba Training On Body Composition And Quality Of Life Among Indian Females
PPSN-04	Jyotismita Konwar, Food Science and Nutrition Email: - konwarjyotismita9595@gmail.com	Study About The Food Practice And Nutrition Knowledge Among Sports Person Of Assam Agricultural University, Jorhat And Jorhat Sports Association.
PPSN-05	Nisha Vikraman, St. Teresa's College, Ernakulam Email: - nishavn2012@gmail.com	A Comparative Study On Body Composition Parameters Of Sports And Non-Sports Persons In Ernakulam.
PPSN-06	Suvam Das Gupta Sports Authority Of India, North East Regional Centre, Imphal, Email:- suvam.biochem@gmail.com	Major Nutrients Intake In High Performance Endurance Athletes Of Selected Sport Disciplines Of Manipur.
PPSN-07	Diksha Sood,	withdraw
PPSN-08	Sneha Majuumder, Sports Authority Of India, Nswc, Gandhinagar Email: - snehamajumder2012@gmail.com	Assessment Of Nutritional Adequacy And Evaluation Of Body Composition Of Sub Elite Players Of Different Sports Disciplines.
PPSN-09	Aditi Sewak,	withdraw

PPSN-01 THE NUTRITIONAL STATUS AND LIFESTYLE ASSESSMENT OF FEMALE CRICKETERS AS COMPARED TO FEMALE ADOLESCENT ***Bijaya Brahmachary,*** Cricket Association Of Bengal, Email: - bijaya.brahmachary2014@gmail.com

Background & Objectives: Sport s includes physical activity through casual or trained participation. There is multitude of challenges associated with women's access to participation in cricket. Good nutrition is an important component besides training for athletic success. Cricket is an endurance sports in which following a proper diet is essential. The purpose of the study was to investigate the nutrition and health status of the female cricketers as compared to adolescent and young adult individuals belongs to 17-22 years age group. Hypothesis is all girls are same. **Materials & Methods:** A total number of 60 participants (30 players and 30 non players) were selected randomly from four cricket clubs and one college. A self framed pre tested questionnaire was used. The study included questions each on sports, nutrition knowledge, anthropometries, dietary recall, hygiene, and overall life style assessments. **Result:** Anthropometric measurement differs but negligible (Mean player -56, Mean non player-54.64), standard deviation value (SD player-6.015, SD non player-5). Null hypothesis only accepted in case of chest circumference (t-score-0.037.).General appearances of normal girls and players lie between GOOD to FAIR. Functional assessment showed the similar result for players and non player adolescent and young adults. Hygienically players are superior to non players. Players have scored higher. Adolescent and young adult are more concern among their life style and diet than player. They are having the perfect diet, proper sense & maintenance. **Conclusion:** No significant difference was observed in the nutritional status between the female cricketers and adolescent and young adult. Dietary habit of the non player's women was better than players. However the hygienic practices of the sports women was better than non player. Both types of girls are ambitious. Player's girls who are involved in sport like cricket deserve better life help and support them. **Keywords:** Sport nutrition, Adolescent and young adult, players, Nutritional Status, Socio Economic Status, Dietary Habit, Comparison

PPSN-02 SINGLE DOSE EFFECT OF CITRULLINE MALATE IN COMPARISON TO PLACEBO ON THE EXERCISING MUSCLES. ***Dipti Soni Jaipuriar***, Department of Biochemistry, St. Francis College For Women, Begumpet, Hyderabad. Ex Faculty Department of Biochemistry IT'S Dental and Paramedical College Muradnagar, Ghaziabad, U.P. Email: - d15s@rediffmail.com

Background & Objectives: Citrulline Malate (CM) is a combination of the amino acid citrulline (essential for detoxification of ammonia) and the acid salt malate (metabolic shuttle for cellular energetics). Earlier studies have indicated that CM improves muscle performance. The accumulation of Lactate has been considered an essential element in muscular fatigue and performance .The potential use of CM as an ergogenic aid enables excess availability of citrulline and malate, which can limit accumulation of lactate and hence enhance muscular efficiency. **AIMS AND OBJECTIVES.** The purpose of the study was to see the effect of a Single Dose of Citrulline Malate (CM) in comparison to placebo on the exercising muscles. The study aimed to find the relationship between 'CM' and 'serum lactate levels' before and after exercise in young males of same age group and built. **Materials & Methods:** A crossover study was done including 20 healthy young males of same age group and built at ITS Physiotherapy College, Muradnagar, Ghaziabad, U.P. The subjects were randomly divided into two equal groups A (experimental) & B (control). Both the groups were blinded and proper consent was taken. Serum Lactate levels were assessed before and after supplementation with CM in experimental and placebo in control group respectively. Serum Lactate estimation was done in both the groups after exercise (pushup till exhaustion). **Result:** The mean difference of serum lactate (gained scores) for group A (experimental group) and group B (control group) were found to be 3.00 ± 0.79 and 6.59 ± 1.20 respectively with p = 0.0001 **Conclusion:** The result of the study showed enhancement in the performance of experimental group. Serum Lactate levels in subjects supplemented with CM was significantly lower than the levels in the control group. Thus even single dose of CM significantly improves performance and reduces fatigue. **Keywords:** Citrulline malate, performance enhancement, serum lactate.

PPSN-03 EFFECT OF EIGHT-WEEK WEB-BASED ZUMBA TRAINING ON BODY COMPOSITION AND QUALITY OF LIFE AMONG INDIAN FEMALES ***Anushka Shrivastava,*** Keren Susan Cherian ***,*** Brindha SA, Venkata Ramana YDepartment of Work Physiology & Sports Nutrition, National Institute of Nutrition, Indian Council of Medical Research, Telangana, Email: - anushka.shrivastava19@yahoo.com

Background & Objectives: Physical inactivity is a major cause for the rise in obesity and health complications and structured aerobic activity has shown to reduce morbidity and improve body composition. Thus, the present study aimed to examine the effect of Eight-week web-based Zumba training on body composition and Quality of life [QoL] of Indian females. **Materials & Methods:** In this pilot case-control study, 32 female participants were recruited into experimental [EXP: n=14: age: 26.6 (±6.00)] and control group [CON: n=18: age: 22.1 (±1.06)]. Eight-week Zumba training for 60 minutes per day and three to five times a week was provided to the EXP group. Body composition was measured using Bioelectrical Impedance Analysis [BIA]. QoL was assessed using the WHO-QoL-BREF questionnaire. Analyses of variables across three-time points (Initial, Mid-point and Final), were carried out using Repeated Measures ANOVA and paired t-test was employed to assess differences in variables before and after Zumba intervention. **Result:** Body composition across the three-time points showed no significant difference, irrespective of EXP or CON group. However, body fat mass ($p=0.070$), right arm fat ($p=0.080$) and trunk fat ($p=0.066$) showed a mean reduction with a trend towards significance across time points and groups. Out of the four domains in the WHO QoL-BREF Questionnaire, the scores of the Psychological domain showed a significant increase in EXP [pre: 40.1±7.45; post: 65.8±17.28, $p<0.001$]. On the other hand, the CON group showed no significant difference across the domains. **Conclusion:** Body composition showed no improvement, however, Psychological domain of the quality of life scores increased after Eight-week Zumba intervention. A prolonged Zumba intervention may be required for changes in body composition and more profound increase in QoL scores **Keywords:** physical inactivity, aerobic activity, zumba dance, body composition.

PPSN-04 STUDY ABOUT THE FOOD PRACTICE AND NUTRITION KNOWLEDGE AMONG SPORTS PERSON OF ASSAM AGRICULTURAL UNIVERSITY, JORHAT AND JORHAT SPORTS ASSOCIATION. ***Jyotismita Konwar,*** Mamoni Das***,*** Ruma Bhattacharyya***,*** Food Science and Nutrition, Email: - konwarjyotismita9595@gmail.com

Background & Objectives: Nutrition and nutritional knowledge plays an important role for attaining high level of achievement in sports and athletics, besides other factors such as motivation, skill, techniques, commitment, physical fitness and training. A study was designed to improve the knowledge of nutrition among persons involved in sports activity. **Materials & Methods:** Hundred sports persons (50 males and 50 females) in the age group of 20-35 yrs were selected through purposive random sampling from four colleges of Assam Agricultural University and Jorhat Sports Association. Interview schedule was designed to elicit information from all sportsperson on their nutritional status, food & dietary practices. **Result:** This study revealed that the mean height & weight of the male athletes was 168.9cm±6.48 and 58.32kg±7.48 respectively and female athletes was 156.2±12.24 and 52.12±7.07. Body Mass Index showed that selected players were underweight (65%). Dietary practices revealed that 92% athletes were non vegetarian and 8% were found to be vegetarian, 52% of sports person took two meals per day, 25% three meals/day, 8% more than three meals a day, 65% of athletes had a habit of skipping meals,15% skipped breakfast, 26% lunch, 24% dinner, 19% athletes indulged in eating junk food. Before an athletic event 35% of athletes had occasionally followed carbohydrate loading, 41% athletes restricted fat intake, 59% of the athletes consumed more than 10 glasses of water/day and 95% didn't have the habit of consuming sports drink. **Conclusion:** For the sports person, adequate energy and nutrition is essential for growth and repair of muscle tissue after exercise. The participants of the present study had a below average nutritional status. The reason for poor nutritional knowledge is reflected in their nutrient intake. Nutritional education among sports person can definitely create awareness regarding selection of right food and good dietary practices that could enhance to improve their nutritional status. **Keywords:** Sports person, nutritional status, nutritional knowledge, dietary practices, nutrition education

PPSN-05 A COMPARATIVE STUDY ON BODY COMPOSITION PARAMETERS OF SPORTS AND NON-SPORTS PERSONS IN ERNAKULAM. ***Nisha Vikraman***, AneesaJ. L, St. Teresa's College, Ernakulam, Email: - nishavn2012@gmail.com

Background & Objectives: The study has been carried out with the objective to analyze and compare the body composition parameters of sports persons with that of non-sports persons and to find out the relationships of body composition with reference to gender and activity levels. **Materials & Methods:** The study was carried out in two different colleges in Ernakulam district. A sample of 80 young adults (17-23yrs), 40 male and 40 female were selected for the study by convenient sampling and the tools used to collect the data were a self designed questionnaire and a body composition analyzer (In Body 720). Male sample for the study included 10 badminton players, 10 volleyball players and 20 non-sports persons. Similarly, female sample constituted 10 badminton players, 10 volleyball players and 20 non-sports persons. A questionnaire was used to collect general information

of the sample, regarding the age, height, gender, type of sport, institution of study, types of food consumed, etc. **Result:** The present study was done to compare the body composition parameters of sports and non-sports male and female in Ernakulam. There were major dissimilarities in body composition parameters like body mass index, body fat mass, percentage body fat, body fat mass and higher skeletal muscle mass. Sports samples had lower body mass index, percentage body fat, body fat mass and higher skeletal muscle mass, total body water, protein and mineral contents, which was good and they scored better for fitness. However, most of the non-sports sample had greater body mass index, waste hip ratio, obesity, percentage body fat, body fat mass and lower values of skeletal muscle mass, total body water, protein and mineral contents on comparison with the body composition parameters of sports sample. The rate of physical activity can have a positive effect on body composition. Sports sample had a better body composition and they scored better than non-sports sample. **Conclusion:** The study provided an insight to the current situation regarding increased sports activities and the importance of developing ideal body composition for better performance in the field. And also, the inclusion of sports as a compulsory option at college, which would encourage the students to maintain a better body compostion which in turn, would help evade many life-style diseases, promoting good and healthy body parameters. **Keywords:** Body composition parameters, Sports and Non Sports.

PPSN-06 MAJOR NUTRIENTS INTAKE IN HIGH PERFORMANCE ENDURANCE ATHLETES OF SELECTED SPORT DISCIPLINES OF MANIPUR. ***Suvam Das Gupta[1],*** Konthoujam Kosana Meitei[1],,Subir Das Gupta[2]***,*** 1=SPORTS AUTHORITY OF INDIA, NORTH EAST REGIONAL CENTRE, IMPHAL,2=CALCUTTA HEART CLINIC & HOSPITAL, KOLKATA***,*** Email:- suvam.biochem@gmail.com

Background & Objectives: Endurance athletes, with a view to achieving high level performance, requires strenuous physical activity as to enable athlete's body to adapt to maximum physical load, proper nutrient intake needed. Thus the main purpose of nutrition in athletes is to ensure the compensation of increased energy consumption to maintain optimum level of performance. The aim of the present study was to determine the major nutrients intake in high performance endurance athletes of Manipur in order to improve planning and management of the training of athletes using targeted measures to achieve improved level of performance. **Materials & Methods:** Sixty one (n=61) Endurance athletes (both sexes) from Sports Disciplines viz. Football (n=25), Hockey (n=22) & Cycling (n=14) of age group 15-18 years participated in the present study from Sports Authority of India, North East Regional Centre, Imphal excluding goalkeepers of Football & Hockey. Participating athletes were at least of state level performer with minimum of 3-4 years of formal training history. Dietary major nutrient intake of the athletes was calculated by 3-day dietary recall method viz. 24 hours recall method, for three days, was used through direct interview method. **Result:** It was found that female cycling athletes used lower-than-recommended amounts of carbohydrates, and 65% of endurance athletes both sexes used higher-than-recommended levels of fat in their diet. Also from the present study, it was observed that amount of protein intake was within recommended range for athletes, in about 75% of total athletes including both male and female. **Conclusion:** Major nutrient intake in most endurance athletes does not fully meet their requirements or exceed the amount required thus it may affect an athlete's maximum adaptation to long-duration physical loads. Thus nutrient intake of athletes must be optimized, adjusted and individualized with more focus on female athletes and also to provide nutritional awareness to athletes. **Keywords:** Endurance Athletes, Carbohydrate, Protein, Fat, Manipur

PPSN-07 Diksha Sood - withdraw

PPSN-08 ASSESSMENT OF NUTRITIONAL ADEQUACY AND EVALUATION OF BODY COMPOSITION OF SUB ELITE PLAYERS OF DIFFERENT SPORTS DISCIPLINES. ***Sneha Majuumder[1],*** Pooja Gaur[2], 1=SPORTS AUTHORITY OF INDIA, NSWC, GANDHINAGAR 2=NETAJI SUBHAS NATIONAL INSTITUTE OF SPORTS NSNIS), PATIALA, Email: - snehamajumder2012@gmail.com

Background & Objectives: An appropriate nutrient intake provides a lot of benefits to the athletes. It supports optimal body functions and maintains the body composition. This study tried to focus on nutrition adequacy with respect to body composition and may contribute to the dearth of data available in Indian context. **Materials & Methods:** Total 106 sportsperson between age group of 12 to 18 years from different sports background, undergoing training at Sports Authority of India, Gandhinagar were selected for this study by purposive sampling. Body composition was taken by Skinfold method using Durnin Womersley equation. 24 hours recall was recorded and calculated by DietSoft software for daily macro nutrient intake. Katch-McArdle equation and International

Olympic Committee guidelines were followed to calculate Resting Energy Expenditure and to assess daily nutrient requirement respectively. SPSS Software was used for descriptive and inferential statistical analysis. **Result:** The mean height and weight of total 87 boys and 19 girls from 7 different sports groups was 167 cm (±9.73) and 60 kgs (±9.51) respectively. The mean fat percentage and mean Resting Energy Expenditure was 1501 Kcal/day (±188.06) and 12.71% (±5.27) respectively. About 15.1% of them were overweight. About 61.3% of them were consuming higher energy per day than their requirement; where as 81.1% of them were not able to meet daily requirements of carbohydrate. About 74.5% and 83% of them were consuming protein and fat higher than daily requirement respectively. The supplement consumed was mainly whey protein, used by 10.4% of the population. Mean body fat percentage, mean fat free mass and mean consumption of protein varied significantly across the gender (p=.000). The mean consumption of protein (p=.000) and fat (0.005) varied across the different sports disciplines. There was significant association of consumption of carbohydrate and fat with body fat percentage (p=.000). The consumption of dietary fat (r= -.281, p=.004) and carbohydrate (r= -.293, p=.002) was negatively correlated to body fat percentage. **Conclusion:** An imbalance in nutrient intake and food pattern is prevalent among athletes which can be addressed with basic nutrition education. **Keywords:** Body composition, nutrient intake, fat percentage.

PPSN-09 Aditi Sewak - withdraw

POSTER PRESENTATION - COMMUNITY NUTRITION

16th Nov, 2018 **3.00PM – 5.00PM**

Code No.	Name And Address	Title Of Presentation
PPCN-01	Neha jain Department Of Food Science And Nutrition,Banasthalividyapith,Newai,Tonk, Email:- 282nehajain@gmail.com	Assessment Of Nutritional Status And Dietary Diversity In Young Women And Formulation Of Diversity Enhancing Recipes
PPCN-02	Anjali Kumari Department Of Food Science Andnutrition,anasthalividyapith,Newai,Tonk, Email:- kumari9457@gmail.com	Nutritional And Phytochemical Analysis Of Pineapple Pomace And Development Of Value Added Bread By Incorporating It
PPCN-03	Bidisha Maity Department Of Food And Nutrition, Netaji Nagar College For Women, Email: bidisha.maity@gmail.com;	A Comparative Study Of Appetite Between Older Adult Women Residing In Old-Age Homes And Community In Association With Food Intake And Depression
PPCN-04	Sunidhi Mishra, Department Of Food And Nutrition, Netaji Nagar College For Women, Email: sunidhi.mishra69@gmail.com	Department Of Food And Nutrition, Netaji Nagar College For Women,
PPCN-05	Archana Prabhat, Alva's Centre For Post Graduate Studies And Research, Moodbidri, Mangalore University, Karnataka. Email:-drarchanaprabhat@gmail.com	Effect Of Mid Day Meal Programme On The Nutritional Status Of School Children.
PPCN-06	Bharati Bhosale, Department Of Food Science & Nutrition S.R.M.P. College Of Home Science For Women, Akluj Email: bharati_1003@rediffmail.com	Anthropometric Measurements Of Selected Institutionalized Elderly Residing In Maharashtra State Of India.
PPCN-07	Dr. Anusuya Devi, Coimbatore, Email: Anusuyadevi@Psgcas.Ac.In.	Study Of Hemoglobin Level And Body Mass Index Among Female College Students At Coimbatore City.
PPCN-08	Vandana Saini, Email:- Vandana16saini@Gmail.Com.	Associaton Of Nutritional Status And Diet Quality In 7-10 Years Old School Going Chldren.
PPCN-09	Sumangala S, Email:-Ssbasapur555@Gmail.Com.	Acceptable Entity Of Black Soybean Genotypes (Glycine Max).
PPCN-10	Afifa Jahan	withdraw
PPCN-11	Pvvs Murty, Dangoria Charitable Trust, Hyderabad, Email:-dangoriatrust@yahoo.com.	Impact Of Farm And Food Based Approach Along With Health And Nutrition Education On: Farming Practices, Mothers' Awareness Of Health And Nutrition, Household Food Consumption And Nutrition Status Of Children 6-24 Months Old.

Community Nutrition (Contd...)

Code No.	Name And Address	Title Of Presentation
PPCN-12	Swiny Sandhvi, Email:- swinysandhvi@gmail.com.	Anthropometric And Nutritional Status Of Adolescent Students In Bihar.
PPCN-13	Daneswari Onkari, Email:-daneshwarimonkari@gmail.com	Nutritional Status Of Rural Orphans.
PPCN-14	Deepa Kannur, Email:- deepakannur0472@gmail.com.	Nutrition Status And Menopausal Problems Among Rural And Urban Middle Aged Women.
PPCN-15	Sunanada Itagi, Email:- itagi.sk@gmail.com.	Health Education And Knowledge On Menstrual Hygiene Among Rural Adolescents Of North Karnataka.
PPCN-16	Sunanda Biswas, Department Of Food & Nutrition, Acharya Prafulla Chandra College, New Barrackpore, Kolkata, Email:- sunanda_titu@yahoo.co.in.	The Prevalence And Factors Associated With Overweight And Obesity Among College Going Students Of West Bengal, India: Cross-Sectional Study.
PPCN-17	Monica Gajanan Oak, Department Of Food Science And Nutrition, SNDT Women's University,Juhu, Email:- monicaoak@gmail.com.	Consumption Of Vegetables And Fruits And Its Association With Adiposity And Blood Pressure In Urban Women Belonging To Low And Lower Middle Income Group
PPCN-18	Aishwarya S, Mount Carmel College, Email:-ashwaryaganjigunte@gmail.com	Effectiveness Of Millet Inclusion On The Anthropometric Measurements Of Children (11-14 Years) Consuming Mid Day Meal.
PPCN-19	Neelam Kumar, P.G.I.M.S.ROHTAK, Email:neelamkumar62@yahoo.com.	Performance Assessment Of Services Regarding Supplementary Nutrition Under Icds In A Rural Block of Haryana.
PPCN-20	Pooja Patil,	withdraw
PPCN-21	Vinutha U Muktamath	withdraw
PPCN-22	Tarvinderjeet Kaur, Department Of Home Science, Kurukshetra University, Kurukshetra, Haryana, Email:- tarvin_khushi@rediffmail.com	Value Addition Of Conventional Food Preparations With Discarded Greens.
PPCN-23	Raashika, Email:- rasikhashankaran96@gmail.com	Assessment Of Nutritional Status And Physical Fitness Of Selected Adolescent Girls (16-18 Years).
PPCN-24	Poonam Khanna, University Of Utah, Salt Lake City, Email: poonamkhanna05@gmail.com;	Impact Of Village Child Health And Nutrition Project Interventions On Nutritional Status Of Severely Acute Malnourished (Sam) Children In District Fatehgarh Sahib.
PPCN-25	Anitha Begum, St Theraas College ,Ernakulam, Email: anithaahemed@gmail.com	A Study On The Correlation Between Lifestyle Diseases And Food Habits Of Regular Eatery Consumers In Malappuram District.

Community Nutrition (Contd...)

Code No.	Name And Address	Title Of Presentation
PPCN-26	Rajya Lakshmi Devi Yenumula, Avinashilingam Institute For Home Science And Higher Education For Women, Email:- yenumula.rajee@gmail.com	Nutritional Status And Prevalance Of Nutritional Diseases Among 6 – 8 Years Old Children Of Fishermen Community Of East Godavari District, Andhrapradesh.
PPCN-27	S Raju, M S Swaminathan Research Foundation Email: raju@mssrf.res.in	Addressing Household Micro-Nutrient Intake Through Nutrition Garden Intervention In Rural India.
PPCN-24	Poonam Khanna, University Of Utah, Salt Lake City,	Impact Of Village Child Health And Nutrition Project Interventions On Nutritional Status Of Severely Acute Malnourished (Sam) Children In District Fatehgarh Sahib.
PPCN-28	Sayali Joshi, School Of Health Sciences (SHS), Savitribai Phule Pune University, Pune, Email:nutrisayali@gmail.com	Need For Customized Cutoffs For Anthropometric Indicators In Case Of Rural Indian Men.
PPCN-29	Chetna Singh, Department Of Food Science And Nutrition, Banasthali Vidyapith, Rajasthan, Email:- chetnasingh2057@gmail.com	Diet Related Needs Assessment Of Obese Working Adults.
PPCN-30	Suba G, Email:- subag74qmc@gmail.com	Influence Of Demographic Variables On Premenstrual Syndrome (Pms) Among Reproductive Age Women.
PPCN-31	Neelam Kumari, Isabella Thoburn College, Email:- neelamkumari0809@gmail.com	Knowledge About Traditional Nutritional Practices And Cooking Related Beliefs Of Adolescent Girls.
PPCN-32	Koyel Pal Chowdhury, Abbott Nutrition International, Email:- palchowdhurykoyel@gmail.com	Comparative Study Of Health, Nutrition & Psychological Conditions Between Sexually Victimized Girls And Normal Adolescent Girls – A Social Report.
PPCN-33	Vidhu Gupta, The Energy And Resources Institute (TERI), New Delhi, Email:- vidhu.gupta@teri.res.in.	Child Health Status And Climate Related Agricultural Variability: Case Study India.
PPCN-31	Neelam Kumari, Isabella Thoburn College, Email:- Neelamkumari0809@Gmail.Com	Knowledge About Traditional Nutritional Practices And Cooking Related Beliefs Of Adolescent Girls.
PPCN-32	Koyel Pal Chowdhury, Abbott Nutrition International, Email:- Palchowdhurykoyel@Gmail.Com	Comparative Study Of Health, Nutrition & Psychological Conditions Between Sexually Victimized Girls And Normal Adolescent Girls – A Social Report.
PPCN-33	Vidhu Gupta, The Energy And Resources Institute (TERI), New Delhi, Email:- Vidhu.Gupta@Teri.Res.In.	Child Health Status And Climate Related Agricultural Variability: Case Study India.

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Code No.	Name And Address	Title Of Presentation
PPCN-34	Neepa Banerjee, Department Of Physiology, University Of Calcutta, Email: - bneepa.15@gmail.com.	Nutritional Paradox Persists: Studies In Bengalee Female Adolescents.
PPCN-35	Aindrila Das, Kalyani University, Email:-aindrila_11@yahoo.co.in.	Does Physical Activity Improve Aging And/Or Excess Calorie- Induced Cognitive Impairment Of Male Humans?
PPCN-36	Netravati M. Ulavannavar,	withdraw
PPCN-37	Madhumati K Mantur,	withdraw
PPCN-38	Ms. R. Kaviyarasi, Email:- kavimanistet@gmail.com.	A Study On Nutritional Status, Prevalence Of Anaemia Among Early And Middle Stages Of Adolescent Girls In Nagapattinam District'.
PPCN-39	Anuradha Mitra, College Of Home Science Nirmala Niketan, Email:- mitraanuradha1@gmail.com.	Effect Of Anthropometry On Body Fat, Lipid Profile & Blood Pressure Of Young Muslim Girls From Mumbai City.
PPCN-40	D.J. Nithya, M.S.Swaminathan Research Foundation, Email:- djnithya@mssrf.res.in.	Farming System For Nutrition: Impact On Food Consumption Pattern And Dietary Diversity Across Different Age Groups.
PPCN-41	Shuchismita Behera, Department Of Zoology, Kendrapara Autonomous College, Kendrapara Odisha, Email:- shuchi.rmrc@gmail.com.	A Comparative Study On Physiochemical Properties Of Various Milk Samples Commercially Available In Kendrapara District, Odisha, India.
PPCN-42	Thamilovia.SA Department Of Food Service Management And Dietetics, Avinashilingam Institute For Home Science And Higher Education For Women, Coimbatore. Email:- ovia2611@gmail.com.	Novel Obese Indicators For The Management Of Obesity And Diabetes.
PPCN-43	Ms. Damanjeet Kaur, Deptt. Of Food Science & Nutrition Management, J.D.Birla Institute Jadavpur University Lower Rawdon Street, Kolkata. Email:- damanjeet1987@gmail.com.	To Assess The Nutritional Knowledge, Attitude And Practice Level Of Care-Givers & Food Handlers In Schools And Orphanages Through Pre And Post Intervention Design In West Bengal.
PPCN-44	Anamika Singh,	Withdraw
PPCN-45	Zakera, Truweight Wellness Pvt. Ltd, Email:- zakera_m@truweight.in.	Prevalence And Pattern Of Polycystic Ovarian Syndrome Among Obese Clients: A Prospective Observational Study From Truweight.
PPCN-46	Sirshendu Chaudhuri, Department Of Community Medicine, Apollo Institute Of Medical Sciences And Research, Chittoor, Email:- sirshendusisu@gmail.com.	Nutritional Status And Dietary Intake Among Unmarried Adolescent Girls In Rural Area Of Chittoor District- A Community-Based Survey.

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Code No.	Name And Address	Title Of Presentation
PPCN-47	Shareefa Salma, Truweight Wellness Pvt.Ltd, Email:- shareefa@truweight.in.	Impact Of Truweight Diet Program In Delivering Weight Loss And Relieving Symptoms Among Hypothyroid Subjects.
PPCN-48	K.Jyothi Reddy, College Of Horticulture, SKLTSHU, Rajendranagar, Hyderabad, Email:- jyothi.reddy934@gmail.com.	Nutritive Value Studies In Dolichos Bean (Dolichos Lablab L.Var. Typicus Prain) Germplasm.
PPCN-49	K. Vanitha, College Of Horticulture, Rajendranagar, Sri Konda Laxman Telangana State Horticultural University, Hyderabad, Email:- vanithareddy818@gmail.com	Maintaining Dolichos Bean (Dolichos Lablab L. Var. Typicus Prain) Seeds Nutrition After Harvest In Purdue Improved Crop Storage Bag Against Pest Attack.
PPCN-50	Yamini Gusain, Lady Irwin College, University Of Delhi, Email:- yaminigusain95@gmail.com.	Effectiveness Of Nutrition Education On Knowledge, Attitude And Practices Of Mothers Of Acute Malnourished Children (6-24 Months) In Anganwadi Centers Of Delhi, India.
PPCN-51	Yamini Gusain, Lady Irwin College, University Of Delhi, Email:- yaminigusain95@gmail.com.	Arriving At Mid Upper Arm Circumference Cut-Offs For Screening Of Acute Malnutrition Among Children 6-24 Months Of Age.
PPCN-52	Nandita Sanat Dhanaki, BJ Wadia Hospital For Children, Mumbai, Cuddles Foundation, Mumbai, Email:- Nandita@Cuddlesfoundation.Com.	Impact Of Nutritional Education Program On Pregnant Women In Mumbai Slums
PPCN-53	Charu Maheshwari, Email:- charumaheshwari09@gmail.com	Assessment Of Nutritional Status Of 1-3 Year Old Children In Association To Feeding And Weaning Practices.
PPCN-54	Ashwini H,	withdraw
PPCN-55	Deepali Sharma, Department Of Food Science And Nutrition, Banasthali Vidyapith, Rajasthan, Email:- jgdsharmad13792@gmail.com	Heavy Metal Concentration In Commonly Consumed Food Items In Bareilly City, Uttar Pradesh.
PPCN-56	Madhu Mitha M, St. John's Research Institute, St John's Medical College, Koramangala, Bangalore , Email:- madhumitha.m@sjri.res.in	Sensitivity And Specificity Of Mid Upper Arm Circumference In The Identification Of Severe Acute Malnutrition In Children Of Raichur.
PPCN-57	Chhavi Rohilla, Lady Irwin College Email:- chhavi170@gmail.com	Assessment Of Diet Quality And Nutritional Status Of Preschoolers Belonging To Low And Middle Income Groups Residing In Delhi.
PPCN-58	Dr. Saraswati Hunshal, HDFS, AICRP, University Of Agricultural Sciences Dharwad, Email:- hunshal2@gmail.com	Factors Influencing Physical Growth And Attainment Of Menarche Among School Girls.
PPCN-59	Binata Nayak, Dept Of Home Science (Food & Nutrition Division) University Of Calcutta 20 B Judges Court Road Kolkata Email:- binata_nayak@yahoo.com	Junk Food And Nutrition Insecurity Among Children And Adolescencts In Kolkata.

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Code No.	Name And Address	Title Of Presentation
PPCN-60	Madhuri R Nigudkar, Department Of Food, Nutrition And Dietetics, Sir Vithaldas Thackersey College Of Home Science SNDT Women's University, Santacruz, Mumbai, Email:- rvnigud@gmail.com	Intake Of Resistant Starch By Adults Residing In Mumbai And Its Association With Anthropometric Measurements.
PPCN-61	Pragnya Priyadarshini Panda,	withdraw
PPCN-62	Manoj Kumar, Kusum Bharti, Dr. Pramila Prasad, Dept. Of Home Science-Food & Nutrition,T.M. Bhagalpur .University, Email:- kumarmanoj9234@rediffmail.com	Food And Nutrition Security Among Preschool Children: An Assessment Of Of Rural Anganwadi Centre Of Icds.
PPCN-63	Monisha S, Division Of Nutrition, St. John's Research Institute, Bangalore Email:- monisha.s@sjri.res.in	Characterization Of Dietary Calcium Among Pregnant Women At Bruhat Bangalore Mahanagara Palike Hospital, Bangalore.
PPCN-64	Sehar Siddiqui	withdraw
PPCN-65	Punita, International Institute Of Research And Studies, Faridabad, Email:- punitagrak98@gmail.com	Prevalence Of Anemia In Pregnant Ladies In Rural Areas Thematic Area: Community Nutrition.
PPCN-66	Archana Tewari, Punjab Agricultural University, Ludhiana Email:- tiwariarchana587@gmail.com	A Comparison Of Macro And Micro Nutrient Intake Of Adult Men With Different Degrees Of Abdominal Obesity.
PPCN-67	Urmimala Baruah, Email:- Urmibaruah17@Gmail.Com	Food And Nutrient Intake Pattern Of 4-6 Years Children Of Jorhat, Assam
PPCN-68	Anupama J B, Bharthiar University, Coimbatore, Email:- anupama_suresh2000@yahoo.com	Correlation Of Economic Status And Level Of Nutrition Knowledge Aptitude Practices With Nutritional Adequacy Among Adolescents From Private And Government College Studying Different Streams.
PPCN-69	Vaibhav Rai, Cyanofarm Research Centre, Uttan Vanaushadhi Sanshodhan Sanstha, Keshav Srushti, Uttan, Thane, Email:- cyanofarm@gmail.com	Elucidating Senior Citizens' Health Through Nutritional Paradigms Studied At Two Different Time Periods.
PPCN-70	Suman Madan, Dayalbagh Educational Institute, Dayalbagh, Agra Email:- dr.sumanm@gmail.com	Consumption Pattern Of Fast Food By Undergraduate Students Of Dayalbagh Educational Institute.
PPCN-71	Jaya Krishna,	withdraw
PPCN-72	Vijayalakshmi D, Department Of Food Science And Nutrition, UAS, GKVK, Bengaluru, Email:- shilpayatnatti@gmail.com	Nutritional And Health Status Of Household Members In The Rural-Urban Interface Of Bangalore.
PPCN-73	Laishram Tombisana, National Institute Of Nutrition (ICMR), Hyderabad. Email: tombisanalaishram1994 @gmail.com	Nutrient Profiling Of Ultra Processed Packet Foods Preferred By Children And Adolescents In The Indian Market.

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Code No.	Name And Address	Title Of Presentation
PPCN-74	Avijna Ray, Department Of Home Science, Food & Nutrition, University Of Calcutta , Email:-avijnaroy@gmail.com	Exploring The Impact Of Sanitation Practices On Health Attainment: A Study Among School Kids In 24 Parganas North, West Bengal.
PPCN-75	Ankita Sharma, Department Of Foods And Nutrition, Faculty Of Family And Community Sciences, The Maharaja Sayajirao University Of Baroda Vadodara, Email:- suneeta.chandorkar-fn@msubaroda.ac.in	Role Of Food Environment On Food And Nutrition Security In School Going Children (10-15 Years Of Age) From Slum Households Of Vadodara.
PPCN-76	Ria Ahuja, Department Of Foods And Nutrition, Faculty Of Family And Community Sciences, The Maharaja Sayajirao University Of Baroda Vadodara, Email:-suneeta.chandorkar-fn@msubaroda.ac.in	Role Of Safety Net Programme (Targeted Public Distribution System) On Food And Nutritional Security In Adults Of Slum Households Of Vadodara.
PPCN-77	Anees Fathima Thabassum .Z, University Of Mysore, Email:- aneesshazi@gmail.com	Influence Of Women's Status In Their Family On Their Health And Nutritional Status- Considering Employment As A Rider.
PPCN-78	Richa Singh, Rani Dugavati University, Jabalpur, Madhya Pradesh, Email:- richa609@gmail.com	Study Of Pattern And Perception Of Exclusive Breastfeeding Among The Mothers And Factors Affecting Breastding In Population Of Jabalpur District (M.P).
PPCN-79	Jaspreet Kaur, Govt. College For Girls, Ludhiana, Rani Dugavati University, Jabalpur, Email:-jaspreet71k@gmail.com	A Study Of Infant Feeding Practices Among Mothers In Urban Ludhiana, Punjab.
PPCN-80	Sushmita Khatoniar department Of Food Science & Nutrition, Assam Agricultural University, Jorhat, Email:-sushmitakhatoniar@gmail.com	Consumption Pattern And Indigenous Traditional Knowledge On Medicinal Plants In Upper Assam.
PPCN-81	Nalinitrivedi, Department Of Foods And Nutrition, GB Pant University Of Agriculture And Technology, Pantnagar, Uttarakhand-Email:-n4nalinitrivedi@gmail.com	Threat Of Diabetes Among Farm Women Of Uttarakhand Tarai.
PPCN-82	Samina Vora	Withdraw
PPCN-83	Mansi Tiwari, Department Of Food Science And Nutrition, College Of Community Science, Assam Agricultural University, Jorhat, Assam.Email:-mansi4148@gmail.com	Nutritional Status Of Postmenopausal Women Of Jorhat District, Assam.
PPCN-84	D.Pushplata, PG Deptt. Of Home Science, Kolhan University,Chaibasa,Jharkhand. Email:- lata123sai@gmail.com	Development Of Low Cost Weaning Food To Combat Malnutrition At Individual Level.
PPCN-85	Rama Das, Barrackpore Rastraguru Surendranath College, Email:-ramadasbpd@gmail.com	Elucidating Health Perception: The Socio-Economic And Ecological Interpretation.

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Code No.	Name And Address	Title Of Presentation
PPCN-86	Shukrani Chetan Shinde. CNCVCW, CSIBER, Kolhapur India. Email:- shuks_6584@yahoo.co.in	Prevalence Of Menopausal Symptoms Among Post-Menopausal Women In Kolhapur City, Maharashtra.
PPCN-87	Priyanka Bhattacharyya, Food Science And Nutrition. Email:- mukulbhatta30@rediffmail.com.	Prevalence Of Menopausal Symptoms Among Post-Menopausal Women In Kolhapur City, Maharashtra.
PPCN-88	Shuchismita Behera, Department Of Zoology, Kendrapara Autonomous College, Odisha. Email:-shuchi.rmrc@gmail.com.	A Comparative Study Of Health Status Among Students And Service Holders.
PPCN-89	Archana P. Email:- archanaajay1996@gmail.com	A Study On The Health And Nutritional Status Of Married Women Working In Garment Industries In Mysore City.
PPCN-90	Sruthi Sreedhar, Dept. Of Food Science And Nutrition, Nehru Arts And Science College, Coimbatore Email:- sruthysreedhar5@gmail.com.	Prevalence Of Hypertension Among Adults Working In Higher Education.
PPCN-91	Okram Abemsana Devi,	Withdraw
PPCN-92	PRIYANKA KUMARI, Department Of Home Science, G.B.M. College, Magadh University, Gaya, Bihar, Email:- kumari.priyanka.2004@gmail.com	Behaviour Change Communication For Nutrition Security To Rural Women Of Bihar.
PPCN-93	K.Vignesh, Dept.Of Food Science And Nutrition, Nehru Arts And Science College, Coimbatore Email:- vikkyrr78@gmail.com	Prevalence Of Obesity Among Higher Education Students.
PPCN-94	Sarita Srivastava, Department Of Home Science, B.R.A.Bihar University, Muzaffarpur, Bihar, Email:- kumari.priyanka.2004@gmail.com	Impact Of Nutritional Supplementation On The Nutritional Status Of Adolescent Girls.
PPCN-95	Srishti Sinha, Division Of Nutrition, St. John's Research Institute, St. John's National Academy Of Health Sciences, Bangalore, India. Email:- srishti.s@sjri.res.in	Declining Energy Expenditure Among Millennials: Revisiting The Daily Energy Requirement.
PPCN-96	Pratima Singh, Department Of Nutrition And Dietetics, Faculty Of Applied Sciences, Manav Rachna International Institute Of Research And Studies, Faridabad, Haryana. Email:- pratima05singh@gmail.com	Application Of Health Belief Model To Assess The Nutrient Intake In Children Of Rural Areas In Faridabad.
PPCN-97	Dr Pratibha Singh.	Withdraw
PPCN-98	Reddy Jyothsna Challagundla, Sakra World Hospital, Bangalore. Email:- jyothsnard@gmail.com	Incidence Of Metabolic Syndrome In Urban Adults Of Bangalore.
PPCN-99	Priyanshu Tripathi,	Withdraw

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Code No.	Name And Address	Title Of Presentation
PPCN-100	Aiswarya Ashok, M.C. Nehru Arts And Science College. Email:- aishuaishukarchi@gmail.com.	Ubiquity Of Overweight And Obesity Among Selected Adults In A Private College In Coimbatore: A Pilot Study.
PPCN-101	Haritha.U, Nehru Arts And Scienc College. Email:itsmeharitha069@gmail.com	Nutritional Scenario Of Selected College Female Students In Coimbatore, Tamilnadu-A Pilot Study.
PPCN-102	Senorita Gogoi, Pranati Das, Ruma Bhattacharyya. Food Science And Nutrition.Email:- mariajorhat@gmail.com	Fast Food Consumption Pattern And Awareness Among College Students Of Jorhat District.
PPCN-103	Suneeta Chandorkar Email:- suneeta.chandorkar-fn@msubaroda.ac.in	Mapping Food And Nutrition Security Among The Vulnerable Groups In Vadu Village In Rural Vadodara.
PPCN-104	Sheena Arora, Department Of Physiotherapy, Manav Rachna International Institute For Research And Studies.Email:- sheena.fas@mriu.edu.in	Comparison Between Body Composition Of Basketball Players And Badminton Players Following Same Caloric Intake.
PPCN-105	Dr.A.Swarnalatha, Nehru Arts And Science College, Coimbatore. Email:- swarna.latha041@gmail.com	Dietary Habits And Physical Activity Among The Selected Hypertensives.
PPCN-106	Shweta Patel, Department Of Foods And Nutrition, Faculty Of Family And Community Sciences, The Maharaja Sayajirao University Of Baroda.Email:- patelshweta8625@gmail.com	Microbial Food Safety Of Mid Day Meal Prepared At The Centralised Kitchen And Served In Government Primary Schools In Rural Petrochemicals Area Of Vadodara.
PPCN-107	Amrita Khaire, Bharati Vidyapeeth Deemed University, Pune Satara Road, Pune,Email:- bvduirsha@gmail.com	Micronutrient Levels In Women With Preeclampsia And Their Association With Birth Outcome.
PPCN-108	Megha Rose, Dept. Of Food Science And Nutrition, Nehru Arts And Science College, Coimbatore Email:- meghakshibu14@gmail.com	Prevalence Of Overall Obesity And Central Obesity Among Selected Adults.
PPCN-109	Laishram Maria Devi, Food Science And Nutrition, Email: - marialaishram3@gmail.com	A Study To Evaluate The Anthropometric Profile Among Hostels Borders Of Assam Agricultural University (Aau), Assam.
PPCN-110	Nataraj A Durgannavar, Assistant Professor, Department Of Food Processing And Nutrition, Akkamahadevi Women's University, Vijayapura, Karnataka, , Email:- natrajdurgannavar@gmail.com.	Association Between Breakfast Consumption Pattern And Cognitive Performance Among School Going Children.
PPCN-111	Priyanka Yadav, Email:- priyankathegoodsoul@gmail.com	Societal Stigma: Obesity Transition From Childhood To Pre Adolescent In Reflection Of Lifestyle.
PPCN-112	Akanksha Arora	Withdraw
PPCN-113	Shekhara Naik R, Department Of Food Science And Nutrition, Yuvaraja'as College, University Of Mysore, Email:- rsnaik1967@gmail.com	Micronutrients Adequacy Among Selected School Children Based On The Dietary History.

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Code No.	Name And Address	Title Of Presentation
PPCN-114	Pratibha Dwarkanath, Division Of Nutrition, St. John's Research Institute, Bangalore,	Proof Of Concept Of A Culturally Appropriate Iron Fortified Biscuits To Reduce Maternal And Perinatal Anaemia.
PPCN-115	M. S. Sindusha, A. Email: - Mysoresindu@Gmail.Com	Eating Disorders Influence The Health Status Of Young Adult Women (20-25 Years).
PPCN-116	Deepika Palanivel, Email: - Dpka374@Gmail.Com	Dietary Pattern And Nutritional Status Of Transgender Aged Between 20-40 Years.
PPCN-117	Zoomi Singh, Centre Of Food Technology, University Of Allahabad, Email:- Zoomisingh@Gmail.Com	Influence Of Body Composition And Sarcopenic Obesity On Age And Blood Pressure Of Urban Allahabad Women.
PPCN-118	Vishnu G P, Tinku Thomas, Anura V Kurpad, Sumathi Swaminathan, St. John's Research Institute, Email:- Vishnu.Gp@Sjri.Res.In	Changes In Dietary Fat Intake Over 25 Years.
PPCN-119	Prasant Kumarsahoo, Aparna Rath, Subasis Satapathy, Shuchismita Behera,Department Of Zoology, Kendrapara Autonomous College, Kendrapara Odisha.Email:- Biju9439@Gmail.Com	Assessment Of Nutritional Status Of Students Of Kendrapara Autonomous College Using Anthropometric Indicators.
PPCN-120	Nuzhat Sultana M.B., Home Science Mrs. K.S.K. College, Beed (M.S.), Email: - Nuzhatsultanamb@Gmail.Com	Food Insecurity And Food Consumption Pattern By Season In Household Level With Children In Beed District.
PPCN-121	Radhika Hedaoo, Department Of Nutrition And Dietetics, Symbiosis School Of Biological Sciences, Symbiosis International University, Pune, Email: - Radhika.Hedaoo@Ssbs.Edu.In	Twigging Adolescent Wellbeing Through Development And Validation Of Comprehensive Healthy Eating And Living Index For Adolescents (Cheli).
PPCN-122	Asma Banu, Department Of Water And Health - Faculty Of Life Sciences, Division Of Nutrition & Dietetics, Jss Academy Of Higher Education & Research, Mysore-15, Karnataka, Email:- Ashuasma678@Gmail.Com	Study On Food Habits, Physical Activity & Nutritional Status Of Young Adults Residing In Hostel, Pg (Paying Guest) And Personal Room With Self-Cooking.
PPCN-123	Nandita S Dhanaki, Bai Jerbai Wadia Hospital For Children, Mumbai, Cuddles Foundation, Email: -Nandita@Cuddlesfoundation.Com	To Study Dietary Pattern And Anthropometry Of Preschool Children Between 3-6 Years Of Age In Mumbai.
PPCN-124	Barnali Deori, Arya Nursing College, Changsari, Kamrup(R), Assam, Email:- Barnalideori@Gmail.Com	Consumption Pattern Of Junk Food And Knowledge About Its Ill Effects Among The School Going Children Of Rural Areas Of Goalpara District, Assam.

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Code No.	Name And Address	Title Of Presentation
PPCN-125	Shruti Kantawala, Department Of Foods And Nutrition, Faculty Of Family And Community Sciences, The Maharaja Sayajirao University Of Baroda, Vadodara, Email:- Shruti_Kg@Yahoo.Co.In	Use Of Composite Index Of Anthropometric Failure Index (Ciaf) To Assess The Burden Of Undernutrition Among Primary School Children (10-19 Years Of Age) From Municipal Schools Of Urban Vadodara.
PPCN-126	Jennifer Saulam, Dept. Of Food Processing And Nutrition, Akkamahadevi Women's University, Vijayapura, Email:- Jennifersaulam27@Gmail.Com	Effect Of Flaxseed On Postmenopausal Women.
PPCN-127	Anannya Chakraborty Email:- chakraborty.ext@gmail.com	The Voice Of Hunger And Poverty: The Nexus And Nemesis
PPCN-128	Jyoti Tak, Department Of Food Science And Nutrition, College Of Community And Applied Science, Mpuat, Udaipur, Email:- jyotistak@gmail.com	Dietary Adequacy And Consumption Pattern Of Micronutrient Rich Foods Among Adolescent Girls.
PPCN-129	Shekhara Naik R, Department Of Food Science And Nutrition, University Of Mysore, Mysuru, India, Email:- rsnaik1967@gmail.com	A Reflection Of Nutrition Insecurity: Nutritional Deficiency Manifestation And Morbidity Status Among Selcted School Children From Mysore.
PPCN-130	Komala M, Department Of Studies In Food Science And Nutrition, University Of Mysore, Manasagangotri, Mysuru , Email:- komalagangadhar71@gmail.com	The Relationship Between Sleep Duration And Obesity Among Adolescents.
PPCN-131	Chandrama Baruah, Dept Of Food, Nutrition & Dietetics, Assam Down Town University, Email:- chandramabaruah11@gmail.com	Nutrition Knowledge, Attitude And Practices (Kap) Among School Going Children In Guwahati, Assam.
PPCN-132	Kejal Joshi Reddy, Kamalnayan Bajaj Diabetes Unit, Kem Hospital And Research Centre, Rasta Peth, Pune,Email:- kejaljoshi@gmail.com	Prevalence And Determinants Of Picky Eating Behaviour Among Indian Preschoolers.
PPCN-133	Preeti Singh, Email:- singhpreeti.1104@gmail.com	Comparative Analysis Of A Global Perspective Related To Myths During Pregnancy In Oriental And Occidental Societies.
PPCN-134	Alomib Austina Ribanar, Department Of Food Science And Nutrition, College Of Community Science University Of Agriculture Science, Dharwad, Email:- a.austina.r@gmail.com	Nutritional And Quality Characteristics Of Pasta Incorporated With Finger Millet (Eleusine Coracana).
PPCN-135	Monisha Choudhury Indian Institute Of Food Processing Technology, Email:- urjhaa@gmail.com	Traditional Therapeutic Food Habits For Child-Birth Related Physical Conditions Of Two Indigenous Tribes Of Assam: Sema And Lama.

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Code No.	Name And Address	Title Of Presentation
PPCN-138	Franciosalgeo, St. John's Research Institute & St John's Medical College. Email:- franciosalgeo.g@sjri.res.in	Unexplained Etiology Of Anemia In Jharkhand.
PPCN-139	Sripriya Dubey.	Withdraw
PPCN-140	Naziya Fathima, Smt. Vhd Central Institute Of Home Science .Email:- naziyafathima96@gmail.com	Chocolaty Kernels.
PPCN-141	Qudshiya I. Motiwala Department Of Foods And Nutrition, Faculty Of Family And Community Sciences, The M.S University Of Baroda, Vadodara, Gujarat .Email:- qudshiya.motiwala@gmail.com	Understanding The Drivers Of Foods And Nutrition Security Among Tribal Mother Child Pairs In Kawant Block Of Chhota Udepur District.
PPCN-142	Djiazet Steve, Department Of Food Science And Technology, Pondicherry University, Pondicherry India. Email:- qudshiya.motiwala@gmail.com	Ethno-Nutritional Study Of Spices Used For The Preparation Of Nkwi, A Traditional Food Of Western Cameroon: Influence On Food Security.
PPCN-143	Richa Malik, Institute Of Home Economics, F-4, Hauz Khas, University Of Delhi, India. Email:- richamalik@hotmail.com	Societal Transition And Emerging Double Malnutrition Burden In Urban Poor Settings In India: A Cross-Sectional Study.

PPCN-01 ASSESSMENT OF NUTRITIONAL STATUS AND DIETARY DIVERSITY IN YOUNG WOMEN AND FORMULATION OF DIVERSITY ENHANCING RECIPES. ***Neha Jain,*** Anjali Goswami. Department of Food Science and Nutrition, BanasthaliVidyapith,Newai,Tonk, Email:- 282nehajain@gmail.com

Background & Objectives: A variety of foods in diet should be consumed which are imperative in ensuring an adequate intake of essential nutrients and preventive against certain non communicable diseases. This study was undertaken to assess the nutritional status, dietary intake and consequent dietary diversity in hostel resident young women, observe the limiting food groups and formulate recipes incorporating those. **Materials & Methods:** The sample comprised 100 hostel resident college going women (18-23 years), selected randomly. Locale of the study was Banasthali Vidyapith campus. Anthropometric measurements included height, weight, BMI and waist circumference (WC). Dietary assessment included 24-hour dietary recall, calculation of nutrient adequacy ratio (NAR) and food frequency appraisal for consumption of 13 food groups. Dietary diversity score was then calculated. Considering the limiting food groups, three snack recipes were formulated, each having more than four food groups. Sensory analysis of all recipes and nutritional analysis of most acceptable recipe was carried out.**Result :** As per BMI 30% women were overnourished and according to WC 44% women were at risk of metabolic complications. NAR for fat was over 1 while that of energy, iron, vitamin A inadequate. Mean MAR was 0.73±0.18. The limiting food groups were other vegetables, green leafy vegetables, fruits and nuts and oilseeds. Out of maximum possible DDS of 13, DDSFFQ mean was 7.83±1.89 and DDS24 hr mean was 8.59±0.71. Baked palak mathri, bhakadwadi and apple coconut barfi were formulated in a manner to incorporate multiple limiting food groups. Bhakadwadi had high acceptability and it also excelled on various sensory attributes. **Conclusion:** Young women have a compromised DDS primarily due to the lack of fruits and vegetables in the diet. Compared to standard Bhakadwadi, formulated diverse food group containing recipe had lower fat and higher protein. **Keywords:** Anthropometric measurements, Dietary diversity, Dietary diversity score, Sensory evaluation

PPCN-02 NUTRITIONAL AND PHYTOCHEMICAL ANALYSIS OF PINEAPPLE POMACE AND DEVELOPMENT OF VALUE ADDED BREAD BY INCORPORATING IT. ***Anjali Kumari,*** Navita Pareek, Department of Food Science and Nutrition, Banasthali Vidyapith, Newai, Tonk, Email:- anjali.kumari9457@gmail.com

Background & Objectives: Bread can serve as an excellent vehicle for fortification and value addition. Breads are usually rich in starch but depleted of fibre. Fruit pulp waste can serve as a valuable source of enrichment of fibre in bakery products. Therefore, this study was undertaken in order to explore the possibility of utilization of waste residue of pineapple for value addition to the bread as a source of fibre. Thus, the objective of this study was to assess the nutritional and phytochemical content of pineapple pomace and development of value added bread by incorporating it. **Materials & Methods:** Nutritional analysis of pineapple pomace powder included moisture, ash, crude fibre, protein, fat, iron, calcium and vitamin C. Phytochemical profile (qualitative) included alkaloids, tannins, saponins, phenols. Subsequently, bread (brown and multigrain) were formulated by the incorporation of pineapple pomace at 5%, 8% and 10% levels. Sensory analysis was done by semi trained panel.**Result :** The nutritional and phytochemical analysis showed pineapple pomace to be rich in fibre (8.53 g/100g), calcium (9.00 mg/100g), iron (3.60 mg/100g) and low in fat (0.26 g/100g). Presence of all tested phytochemicals was recorded. It was evident from the product evaluation that brown bread with 5% and multigrain bread with 8% were highly acceptable among all bread samples.**Conclusion :** Pineapple pomace can be used to increase the fibre content of bakery products without compromising the sensory properties, providing healthier options to the public. **Keywords:** Nutritional analysis, Phytochemical analysis.

PPCN-03 A COMPARATIVE STUDY OF APPETITE BETWEEN OLDER ADULT WOMEN RESIDING IN OLD-AGE HOMES AND COMMUNITY IN ASSOCIATION WITH FOOD INTAKE AND DEPRESSION. ***Bidisha Maity[1],*** Debnath Chaudhuri[2], Indranil Saha[3], Minati Sen[4]. 1= Department of Food and Nutrition, Netaji Nagar College for Women, 2= Society for Nutrition and Dietetics, Kolkata,3= IQ City Medical College and Narayana Hrudayalaya Hospitals, Durgapur,4= Department of Home Science (Food and Nutrition), University of Calcutta. Email:- bidisha.maity@gmail.com.

Background & Objectives: Decreasing appetite is found among older people living in the community, care homes or even in the hospitals. Depression in the psychological domain, can lead to appetite loss. Loss of appetite leads to decrease in food intake and malnutrition. Therefore the objective of the study was to assess the

appetite of the older adult women and to find out the relationship of appetite with their food intake and level of depression. **Materials & Methods:** A cross sectional study was performed among 365 older adult women (age ≥ 60 years) living both in the community and old-age homes of Kolkata. Eight items Council on Nutrition Appetite Questionnaire (CNAQ) was used to assess appetite among the participants. Self-structured Food Frequency Questionnaire (FFQ) was used to assess the protein and calorie intake pattern of the participants. Depression assessment was done by Geriatric Depression Scale (GDS-30).**Result:** 44.7% older adult women were found to have anorexia. No significant difference ($p \geq 0.05$) was found between free living and old-age home residents in terms of anorexia. Protein and energy scores were found significantly ($p < 0.05$) correlated with appetite scores of both free living and old-age home groups. Significant ($p< 0.05$) negative correlation was also observed between depression and appetite scores for both the groups and this was supported by significant negative beta coefficient ($p<0.05$) between depression and appetite scores from binary logistic regression model. **Conclusion:** Older women participants for the study, both free living and residents of old-age homes, were suffering from anorexia that was associated with food intake and depression. **Keywords:** Older adult women, Appetite, Food intake, Depression.

PPCN-04 DEVELOPMENT OF PRODUCTS FOR PROMOTION OF BREASTFEEDING AND COMPLIMENTARY FEEDING. ***Sunidhi Mishra,*** Dr. Sarla Lakhawat, Kusum Sharma. 1=Department of FSN, College of Community and Applied Sciences, MPUAT, Udaipur, Email:- sunidhi.mishra69@gmail.com

Background & Objectives: Breastfeeding and complimentary feeding is the way to provide the nutrient to the infant for the growth and development.
The objective of the study was to develop the products and calculate the nutritive value of the product for the breastfeeding and complimentary feeding. **Materials & Methods:** In this study the ingredients for the development of products were collected from the local market of Udaipur city. Acceptability of the products will be assessed on 9-point Hedonic scale with the help of selected panel of judges. **Result:** The two products were developed; one for the breastfeeding and one were for the complimentary feeding. The selected panel of judges accepted the products. The products were rich in nutrients such as energy, protein, fat, B-carotene, iron and calcium. **Conclusion:** This work has provided information about products for promotion the breastfeeding and complimentary feeding and also the nutrients content of the products. These products were nutrients rich such as protein, B- carotene, iron & calcium are essential for the promotion of breastfeeding and complimentary feeding. **Keywords:** Breastfeeding, complimentary feeding, nutrients.

PPCN-05 EFFECT OF MID DAY MEAL PROGRAMME ON THE NUTRITIONAL STATUS OF SCHOOL CHILDREN. ***Archana Prabhat,*** Alva's Centre for Post graduate studies and Research, Moodbidri, Mangalore University, Karnataka. Email:- drarchanaprabhat@gmail.com

Background & Objectives: Mid-day meal scheme is one of the important policies and the main purpose of it is to lower the cost of schooling and also to improve the nutritional level of children. School going children are vulnerable to malnutrition and nutritional deficiencies having a negative effects on the growth and development of children. Objective: To assess the effect of Mid-day meal on the nutritional status of school going children (6-12 years). **Materials & Methods:** It was a cross sectional study done on sixty children of the age 6-12 years, having regular Mid-day meal. Anthropometric assessment i.e., Height, Weight, Mid Upper arm circumference (MUAC) were done and compared with ICMR standard values. Daily dietary intake and food consumption pattern were studied for three consecutive days.**Result:** The study showed that the mean height and weight of school children (from 6 to 12 years) were considerably lower than the ICMR standards but mid upper circumference value found to be similar to that of standards irrespective of consuming regularly the mid-day meal provided at their institutions. From the diet recall method, it was understood that mean micronutrient intake was unsoundly lower than the standard recommendations. **Conclusion:** Mid-day meal programme has a very low effect on the nutritional status of the subjects and requires a better modulation in providing the variety of the foods with required nutrient proportion for the sustainability of health during the growth period of the school going children. **Keywords:** Mid-day meal, school children, malnutrition, nutritional status, deficiencies.

PPCN-06 ANTHROPOMETRIC MEASUREMENTS OF SELECTED INSTITUTIONALIZED ELDERLY RESIDING IN MAHARASHTRA STATE OF INDIA. ***Bharati Bhosale*[1],** Rohini Devi Pingali[2]. 1= Department of Food Science & Nutrition S.R.M.P. College of Home Science for Women, Akluj 2= ex Dean & Head Department of Food Science & Nutrition, College of Community Science, VNMKV, Parbhani. Email:-bharati_1003@rediffmail.com

Background & Objectives: Anthropometric measurements are more useful in assessing the nutritional status of elderly as they provide non invasive and easy information on nutritional status of elderly and quite inexpensive to operate. The present investigation was carried out to assess nutritional status of selected institutionalized elderly residing in Maharashtra state of India. **Materials & Methods:** Investigation comprised of 500 institutionalized elderly, covering eight districts of Marathwada region. Anthropometric measurements of elderly subjects were recorded by using standard procedures. Statistical analysis of collected data was carried out after consolidation and consumption to interpret the results.**Result:** The anthropometric measurements of selected elderly subjects reported average body weight and height of 50.19 ±10.49 kg and 150.8±9.91 cm respectively. The mean values of mid arm circumference, waist circumference, hip circumference and triceps skin fold were 23.76±2.81 cm, 77.69 ±10.13 cm, 89.35 ± 8.75 cm and 12.58 ± 6.14 mm respectively. Sexwise comparison indicated that except for mid arm circumference the other entire circumferences and triceps skin fold exhibited significant difference between men and women. All anthropometric measurements decreased with increase in age. The majority of studied elderly were found to have normal BMI which decreased with advancement of age. **Conclusion:** All anthropometric measurements decreased with increase in age. The majority of studied elderly were found to have normal BMI. **Keywords:** Anthropometric measurements institutionalized, elderly, BMI, nutritional status.

PPCN-07 STUDY OF HEMOGLOBIN LEVEL AND BODY MASS INDEX AMONG FEMALE COLLEGE STUDENTS AT COIMBATORE CITY. ***Dr.K.Anusuya Devi,*** Dr.V.Sathiya. Email:- anusuyadevi@psgcas.ac.in.

Background & Objectives: Nutritional anemia and malnutrition (Overweight and Obesity) exists globally and exists across all the sections of the population. Notable changes in growth pattern, lifestyle, dietary habits and behavior are likely to influence the hemoglobin levels and weight among adolescents of various income groups. Study was done to examine the level of anemia among college students and Body Mass Index (BMI) among female college students at Coimbatore city. **Materials & Methods:** A cross sectional study was performed for 88 respondents selected from the a government aided private college comprising majority of females between the ages 18-20 as we assume that anemia and overweight/obesity will be more prevalent among the adolescent age group. The data was collected using a questionnaire to illicit socio-demographic details, biochemical assessment and food pattern by assessing their food frequency, 72 hour recall and questionnaire along with their processed food consumption. Body Mass Index of ≥23 kg/m2 is used to define malnutrition verweight/Obesity). Hemoglobin was estimated in gram %. Statistical analyses were done using mean and standard deviation.**Result:** 44% the students were found to be anemic (Hb <12 g%). Overweight was noted 12.5%, whereas obesity was 11% among selected female students having a BMI of ≥ 23 kg/m2. Mean BMI of 23.6+0.43 was noted in over weight and 27.5+2.78 in obese female students.
Conclusion: Thus, reflected a change on the trend of obesity among this group of young college students that could be related to the increased awareness by the ideal physical appearance and health benefits of weight control. **Keywords:** Haemoglobin, college students, BMI.

PPCN-08 ASSOCIATON OF NUTRITIONAL STATUS AND DIET QUALITY IN 7-10 YEARS OLD SCHOOL GOING CHLDREN. ***Vandana Saini,*** Deeksha Yadav, Monika Jain. Email:- vandana16saini@gmail.com.

Background & Objectives: Background: Diet quality index is a measure of the quality of diet using a composite of recommendation regarding the consumption of foods and nutrients Objective: To assess the nutritional status and observe the diet quality of 7-9 years old school going children and study the association between the two. **Materials & Methods:** The sample comprised 120 boys and girls who were randomly selected from three schools. Background information was collected using self-designed questionnaire; socio economic status was assessed using Kuppuswamy's socioeconomic status scale. Anthropometric measurements included height and weight. Weight for age and height for age Z scores were calculated using WHO references. Twenty four hour dietary recall was used to collect information regarding diet and nutrient intake; nutrient adequacy ratio and mean adequacy ratio of nutrient intake were calculated. Healthy Eating Index-Canadian (HEI-C) was used to assess diet quality of the subjects

Result: On the basis of height for age Z score, all subjects were normal and according to weight for age Z score, 93.33% were normal, 5.8% were underweight and 0.83% were severely underweight. Nutrient adequacy was found adequate for protein, calcium and vitamin C, inadequate for energy and iron, and was nearly 75% higher than normal for fat. Mean adequacy ratio reflected overall adequacy of nutrients in their diet. As per HEI-C diet quality of all the subjects was poor. No significant association was found between nutritional status and diet quality ($p>0.05$) and socio economic status and diet quality ($p>0.0.5$) of children. **Conclusion:** In spite of being normal with respect to WHO criteria the diet quality of the subjects was unsatisfactory which suggests that HEI-C is not an appropriate tool to observe diet quality of Indian children. Diet quality index based on the national dietary guidelines need to be standardized to get the true picture of the quality of diet of Indian children. **Keywords:** Anthropometry, Diet quality, Healthy eating index, Nutritional status.

PPCN-09 ACCEPTABLE ENTITY OF BLACK SOYBEAN GENOTYPES (GLYCINE MAX). ***Sumangala S,*** Physico-chemical characteristics and cooking quality of black soybean, Email:-ssbasapur555@gmail.com.

Background & Objectives: To know the acceptability of black soybean genotypes **Materials & Methods:** A total of three soybean genotypes including two black soybeans- kalitur and DSM (Dharwad Soybean Mutant) with one yellow soybean - DSb 21 were procured from Department of Crop Physiology, University of Agriculture Sciences, Dharwad during kharif - 2017. The cooking quality of grains was evaluated in terms of soaked weight and volume, cooked weight and volume, cooking time, per cent increase in weight and volume and per cent solids leached during boiling and pressure cooking methods. The acceptability of cooked seeds was evaluated for organoleptic profile by using 9 point hedonic scale.**Result:** Among the cooking quality parameters, per cent increase in weight and cooking time differed significantly ($p \geq 0.01$) among boiled yellow and black soybean genotypes. Significant ($p \geq 0.01$) difference was noted in pressure cooking time of yellow and black soybean genotypes. Boiling of white or black resulted in increased weight (30 - 32.88 g%), increased volume(24 - 28 ml%) and time took 1- 11/2 hrs for cooking was with acceptable index of 83.88. However pressure cooking of black soybeans resulted in higher increase in weight (32 - 39.77 g %), volume (27- 29.50 ml %) and took less time for cooking of seeds (20 - 31 min). The acceptable index of pressure cooked seeds was 83 - 84.51.**Conclusion:** Among the different cooking methods, pressure cooking increased cooked weight, volume and per cent solids leached with minimum time for cooking for black soybean genotypes. Keywords: black soybean, DSM, Kalitur, DSb 21.

PPCN-10 Withdraw.

PPCN-11 IMPACT OF FARM AND FOOD BASED APPROACH ALONG WITH HEALTH AND NUTRITION EDUCATION ON: FARMING PRACTICES, MOTHERS' AWARENESS OF HEALTH AND NUTRITION, HOUSEHOLD FOOD CONSUMPTION AND NUTRITION STATUS OF CHILDREN 6-24 MONTHS OLD. ***PVVS Murty,*** Dangoria Charitable Trust, Hyderabad, Email:-dangoriatrust@yahoo.com.

Background & Objectives: Back ground and objectives: Indian diets are qualitatively deficient in micronutrients (vitamins and minerals), due to low intake of micronutrient-dense foods like vegetables and, fruits besides pulses and animal products. Objectives included promotion of micronutrient –dense vegetables and fruits in homestead gardens along with health, and nutrition education in a rural community. **Materials & Methods:** Methods: Location was 10 villages (approx population 25000) of Medak district in the South Indian state of Telangana. Target population was families with pregnant and or woman with 6-24 months old children. Families were motivated to raise micronutrient-dense vegetables and fruits (latter some families only) in homestead gardens (near the house or in their fields). Planting material –seeds and saplings were supplied. Impact was assessed through: acceptance of homestead gardens; increase in the intake of vegetables by the family and change in Knowledge attitude and practice of mothers with 6-24 months old children over four years' project period. Some women raised nurseries in their backyard and sold them for the project as planting material, earning some income. Green methods of farming like vermcomposting and use of botanical pesticides were also taught. One self-help group produced and marketed neem seed powder as fertiliser and pesticide. **Result:** Results: Acceptance of homestead vegetable gardens was good. 776 vegetable gardens were raised diverting 116 acres of land from traditional water guzzling crops. 102 Vermi compost beds were established. There was a quantum increase in the frequency (about 30%) and per capita consumption of green leafy (GLV) (179%) and other vegetables (52%). Base-line and end-line KAP surveys showed remarkable improvement in mothers' understanding of health, food and nutrition including child feeding practices. **Conclusion:** Conclusion: Farm and food based approach along with behavioural change communication can make an impact on bridging the gap

in dietary intake of vegetables and mothers' knowledge of health and nutrition. ICDS data showed reduction in moderate and severe malnutrition among 6-24 months old children. **Keywords:** Key words: Homestead vegetable gardens, Family food consumption, Health and nutrition education, Mothers' knowledge (KAP) of health and nutrition, Malnutrition in children.

PPCN-12 ANTHROPOMETRIC AND NUTRITIONAL STATUS OF ADOLESCENT STUDENTS IN BIHAR. ***Swiny Sandhvi,*** Mukul Sinha,
Email:- swinysandhvi@gmail.com.

Background & Objectives: Anthropometrics can be a sensitive indicator of health, growth and development in infants and children. Measurement of height, weight and nutrient intake are the reliable means to evaluate the nutritional status and it is very much in need.Poor nutrition can lead to eating disorders, obesity, delayed sexual maturation and delay in reaching your full height potential. Hence the present study was undertaken to conduct the anthropometric assessment and to know the nutrient intake among adolescent school students in Pusa block of Samastipur district.objectives :1.To study the socio-economic status.2.To do their anthropometric and dietary assessment.3.To correlate their anthropometric and dietary pattern with nutitional status of adolescents students.**Materials & Methods:** Nutritional status of a sample of 120 adolescent respondents (60 each from private and government schools) aged between 13 to16 years were selected by purposive sampling method, from Samastipur, district of Bihar were evaluated by anthropometric measurement & nutrient intake. For anthropometric assessment & nutrient intake questionnaire was developed. Direct interview method was adopted to collect relevant information from the respondent. The data have been presented in mean, SD and Correlation Coefficient.**Result:** The correlation coefficient between protein and government school adolescent weight (r=0.280) was significantly positive but height and BMI was not significant. The correlation coefficient between protein and private school adolescent weight (r=0.542) and BMI (r=0.500) was positively correlated and highly significant while height was not significant. The correlation coefficient of iron with height, weight and BMI of government school adolescent was not significant. But in private school correlation coefficient of iron with weight (r=0.448) and BMI(r=0.421) was positive and highly significant. **Conclusion:** Therefore this study suggests that the Anthropometric assessment and nutritional intake of adolescent students in Bihar should further be done for coming to a conclusion. **Keywords:** Anthropometry, Nutrient intake, Adolescent, School students.

PPCN-13 NUTRITIONAL STATUS OF RURAL ORPHANS. ***Daneshwari Onkari,*** Sunanda Itagi,
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Background & Objectives: The research on nutritional status of rural orphans was conducted in the year 2016-2018 in Dharwad taluka of Karnataka state with objective to know the nutritional status of rural orphans. Nutritional status was assessed using nutritional anthropometry, the BMI of the school age boys and girls were compared with the WHO standards (2007) and self structured questionnaire was used to collect auxiliary information about orphans. **Materials & Methods:** Prevalence of orphans in the age range of 6-18 years was carried out in Dharwad taluk of Karnataka state. From the prevalence, about 124 orphans were randomly selected in the age range of 6 to 18 years to know their nutritional status. **Result:** Results revealed that almost equal percentages of the orphans were in under weight (51.6 %) and normal category (48.4 %). None of the orphan children were in over weight and obese category of BMI. There was significant association between gender and nutritional status. There was significant difference found between age groups with respect to nutritional status, mean scores indicated that 10-15 years and 16-17 years old children had better nutritional status compared to 6-9 years old children. There was significant difference between type of orphans and nutritional status. According to mean scores maternal orphans and double had better nutritional status than paternal orphans. Age and birth order were found to be the significant predictor of nutritional status and explained about 26.0 per cent of variation in the nutritional status of rural orphans. There was negative and significant relationship found between rule-breaking behaviour, aggressive behaviour and other behaviour problems with nutritional status indicating lower the nutritional status higher will be behaviour problems. **Conclusion:** Majority of the orphan children were in underweight category and their nutritional level was influencing their behaviour problems. The orphan children are in need of immediate health and nutrition intervention for the better health status and upliftment of nutritional level. **Keywords:** Orphans, Children, Nutritional status, BMI, Height, Weight.

PPCN-14 NUTRITION STATUS AND MENOPAUSAL PROBLEMS AMONG RURAL AND URBAN MIDDLE AGED WOMEN. ***DeepaKannur,*** SunandaItagi, Email:- deepakannur0472@gmail.com.

Background & Objectives: According to Indian Statistical Report (ISR, 2014) the average age of menopause in India is 47.5 years, just slightly lower than the average age of 51 for North American and European women. Premature menopause is on the rise in India due to a combination of environmental and genetic reasons. Indian women living in rural areas (72 per cent of the population) and urban areas both cite having urogenital symptoms and general body aches and pains. Interestingly, women in urban area complain more about having hotflushes, mood swings, psychological problems, and intercourse challenges. The present study was conducted with an following objectives,1. To assess the nutrition status and significant predictors and 2.To know the menopausal problems among rural and urban middle aged women and its find out the influencing factors. **Materials & Methods:** The nutrition status and menopausal problems among 160 rural and urban middle aged women was studied during 2016. The women who attained menopause and belonging to 40-55 years age range were selected from 8 villages of 4 talukas of Dharwad and Bagalkot Districts. The postmenopausal symptoms were measured by using Menopause Rating Scale (MRS) and categorized as somatic, psychological and urinary symptoms. The structured interview schedule was used to collect personal information like number of the family members with their age, relationship with respondent. BMI was classified by using WHO classification (2007).The Socio Economic Status (SES) of family was assessed by using Socio Economic Status scale. **Result:** The results revealed that 46.25% of them belonged to overweight category and 33.13% had ideal body weight. Age was significantly associated with BMI. It indicated that women aged between 51-55 years belonged to overweight and obese category followed by 46-50 and 40-45 years. The mean age at menarche was 12.70 years and mean age at menopause was 42.25 years. Around 90% of the respondent's perceived menopause as natural phenomena and 60% of respondents experienced 3-5 days of bleeding during menopause. Though started to experience menopausal symptoms between the age of 35-40 years, majority of women (63%) experienced somatic problems, while 26% of them showed psychological problems and only 10% had urinary problems after menopause. BMI was significantly associated with menopausal problems in rural women of both the districts and non-significant association was found between BMI and menopausal symptoms in urban women of both the districts. **Conclusion:** The study concluded that weight status was significantly influencing on health problems among menopausal symptoms. Hence there is a need of educational empowerment of women with regard to weight control, healthy, nutritious diet and personal hygiene during menopausal period. **Keywords:** Menopause, Weight-status, Problems.

PPCN-15 HEALTH EDUCATION AND KNOWLEDGE ON MENSTRUAL HYGIENE AMONG RURAL ADOLESCENTS OF NORTH KARNATAKA. ***Dr. Sunanda Itagi,*** Deepa Kannur, Rekha Sangal,Professor, HDF Dept, UAS Dharwad, Email:- itagi.sk@gmail.com.

Background & Objectives: Knowledge on menstrual hygiene, problems faced during menstruation and effect of health education was assessed among rural adolescents of North Karnataka. **Materials & Methods:** Adolescent girls with the age ranging from 13-18 years were selected from 28 villages of North Karnataka. The mean age at menarche was 13.33 years. The self-structured questionnaire was used to measure knowledge on menstrual hygiene. The Socio Economic Status (SES) of family was assessed by using Socio Economic Status scale. **Result:** Findings revealed that majority (76.42%) of adolescent girls were having low knowledge on menstrual hygiene and 23.58 per cent of them reported high knowledge on menstrual hygiene. There was a positive significant association between SES and age with menstrual hygiene. It indicated that higher the SES, better the knowledge on menstrual hygiene and as the age increases, the knowledge on menstrual hygiene also increases. Health problems faced by adolescents were stomachache (48%), Backache (18.21%), pimple (14%) and headache (12.14%). There was a significant difference between pretest and posttest in experimental and non-significant differences found between pretest and posttest in control group with regard to knowledge on menstrual hygiene of the rural adolescent girls. It indicated that 60% of girls gained knowledge in experimental group. **Conclusion:** Health educational intervention not only helps in increasing knowledge on menstrual hygiene but also enhances personal hygiene practices during menstruation. **Keywords:** Knowledge, Menstrual Hygiene, Health.

PPCN-16 THE PREVALENCE AND FACTORS ASSOCIATED WITH OVERWEIGHT AND OBESITY AMONG COLLEGE GOING STUDENTS OF WEST BENGAL, INDIA: CROSS-SECTIONAL STUDY. ***Sunanda Biswas,*** Arabinda Das, Department of Food & Nutrition, Acharya Prafulla Chandra College, New Barrackpore, Kolkata.
Email:- sunanda_titu@yahoo.co.in.

Background & Objectives: A steady trend of obesity in young adults is recently revealed as public health crisis in India. Young adulthood is a vulnerable period for weight gain and the health consequences of becoming obese during this life-stage of serious concern. Less physical activity, poor nutritional knowledge in young adults may develop obesity among them. The aim of this study was to determine the prevalence and factors associated with overweight/obese among college going students of West Bengal. **Materials & Methods:** A descriptive cross sectional study was conducted among college students using convenient sampling to recruit participants. A total of 100 students (50 male and 50 female) in the age range of 19–21 (Mean 20.48 ± SD 0.85) completed the study procedures. Body Mass Index (BMI) was used to determine whether they fall under the category of being overweight/obese. To assess nutritional knowledge and other information questionnaires were used and diet survey (24 hour recall method) was conducted to collect dietary information. **Result:** The prevalence of overweight/obese among students was associated with gender (OR: 1.55, 95% CI: (0.679, 3.561)), age (OR: 1.67, 95% CI: (0.89, 1.85)) and nutritional knowledge (OR: 1.73, 95% CI: 1.36, 3.14). The findings also revealed that income, family history, carbohydrate intake, protein intake, fat intake and energy intake were not associated with prevalence of overweight/obese. **Conclusion:** Students with unhealthy dietary practice and lifestyle behavior should be taken care of. Promoting healthy dietary and weight management practices might be of great importance when developing health education programs. **Keywords:** College students, Overweight, Obesity, Questionnaire, Nutritional Knowledge

PPCN-17 CONSUMPTION OF VEGETABLES AND FRUITS AND ITS ASSOCIATION WITH ADIPOSITY AND BLOOD PRESSURE IN URBAN WOMEN BELONGING TO LOW AND LOWER MIDDLE INCOME GROUP. ***Monica Gajanan Oak,*** Padmini S. Ghugre, Department of Food Science and Nutrition, SNDT Women's University,Juhu,Email:- monicaoak@gmail.com.

Background & Objectives: Vegetables and fruits are known for their micronutrient and phytochemical content. Their association with various health conditions has been well documented. **Materials & Methods:** In the present study, fruits and vegetable intakes of urban women aged 20-45 years belonging to low and lower middle income group (N= 1500) were calculated using Food Frequency Questionnaire (FFQ) . Vegetables were categorised as leafy vegetables, roots and tubers and other vegetables. Height, weight, waist circumference (WC), hip circumference (HC), skinfolds, systolic blood pressure (SBP) and diastolic blood pressure (DBP) were measured. Body Mass Index (BMI), Waist to Hip Ratio (WHR) and Body fat percentage (BF%) were calculated. **Result:** Only 41.27%, 3.27% and 17.93% women had leafy vegetable, other vegetable and fruit intake respectively as per recommendation given in Dietary Guidelines for Indians. On the contrary, 71.7% women had roots and tubers intake higher than the recommendation. Intake of green leafy vegetables was significantly and inversely associated with BF% and DBP. Significant inverse association was observed between fruit intake and WHR. Increasing fruit intake was found to be associated with decrease in WC and WHR. **Conclusion:** In view of increasing incidence of chronic degenerative diseases, there is need to increase intakes of vegetables including leafy vegetables and fruits. However, the intake of roots and tubers should be reduced. Keywords: fruits, vegetables, blood pressure, adiposity, women.

PPCN-18 EFFECTIVENESS OF MILLET INCLUSION ON THE ANTHROPOMETRIC MEASUREMENTS OF CHILDREN (11-14 YEARS) CONSUMING MID DAY MEAL. ***Aishwarya S,*** Sangeeta Pandey, Mount Carmel College,
Email:- ashwaryaganjigunte@gmail.com

Background & Objectives: Mid-Day Meal program is one of the largest programs helping in the eradication of hunger in children going to Government schools .Over the years Mid-day Meal program has been serving the same menu, this has lead to development of taste fatigue in children. With millets one could combat taste fatigue, reduce malnutrition and much more as millets are known to be nutri-dense packages .The overall aim of the study was to compare the anthropometric changes in the children (9-14 years) consuming Mid-Day Meals with and without millets. **Materials & Methods:** Study sample consists of 100 children each for control and experimental groups from the two schools located in the South Bengaluru. Anthropometric measurements were assessed using

weighing scales, stadiometers and Mid Upper Arm Circumference tapes to record weight, height and mid upper arm circumference respectively. Pre designed questionnaires was developed to gain in-depth knowledge of socio-economic status and nutritional status. Various recipes were designed with millets using pearl, foxtail and barnyard to prevent taste fatigue and provide a combination of nutrients. Data was collected periodically for 3 months at 30 day interval. **Result:** The present study consists of two schools from south Bengaluru. The study found that majority of the study subjects receiving Mid day meal with inclusion of millet shows significant increase in their weight, height, Mid Upper Arm Circumference and Basal Metabolic Index when compared to control. **Conclusion:** Effectiveness of the intervention program was found in experimental group when compared to control with respect to the anthropometric measurements with significant values. **Keywords:** Mid-Day Meal, Millet, Nutri-dense, Anthropometric data, MUAC.

PPCN-19 PERFORMANCE ASSESSMENT OF SERVICES REGARDING SUPPLEMENTARY NUTRITION UNDER ICDS IN A RURAL BLOCK OF HARYANA. ***Neelam Kumar,*** Jyoti Kaushik***,*** P.G.I.M.S.ROHTAK, Email:neelamkumar62@yahoo.com.

Background & Objectives: The integrated Child Development Services (ICDS) scheme was started with the aim of promoting child welfare in respect of children in age group 0-6 years by providing a package of services to children between 0-6years, expectant and nursing mothers and women 15-44 years of age.Worldwide 95 million children under age 5 werefound to be underweight in 2014. Nearly half of deaths in children under five are attributed due to undernutrition.This study aims to assess supplementary nutrition services under ICDS in rural area of Rohtak.**Materials & Methods:** Study area. The present study was carried out in rural block LakhanMajra, (district Rohtak, Haryana).**Study design:**The study was anganwadi based observational study with cross-sectional design. **Method:** Total 80 of anganwadi centers are present in block LakhanMajra. Out of these 80 anganwadi centers, 20 anganwadi centers were selected by adopting simple random sampling (without replacement) procedure.**Data collection:**On the day of visit to the selected AWC, the AWW was interviewed using a pre-designed and pre-tested proforma as provided by NIPCCD.. Interview was conducted for AWWs at their respective AWCs. **Result:** 23.09% of children between 6 months-3 yrs received morning snacks,34.82% received hot cooked meal and remaining 42.09% received take home ration.14.93% of children between 3-6yrs received morning snacks,10.15% received hot cooked meal and 74.92% received take home ration. Among pregnant women 48.97% received hot cooked meal and 51.03% received take home ration.35.38% lactating women received hot cooked meal.31.67% adolescent girls received hot cooked meal and 68.33% received take home ration. **Conclusion:** Quality of supplementary nutrition was satisfactory in 80% of anganwadicentre. 20% of AWC had interruption in supplementary nutrition since last 6 month. Keywords: ICDS, NIPCCD, AWC, SN.

PPCN-20 Pooja Patil - withdraw.

PPCN-21 Vinutha U. Muktamath - withdraw.

PPCN-22 VALUE ADDITION OF CONVENTIONAL FOOD PREPARATIONS WITH DISCARDED GREENS. ***Tarvinderjeet Kaur,*** Suman Bala, Department of Home Science, Kurukshetra University, Kurukshetra, Haryana,
Email:- tarvin_khushi@rediffmail.com

Background & Objectives: The wide prevalence of micronutrient malnutrition is an indicator of the poor nutritional status of the masses in India. With no cost availability of discarded greens of cauliflower which are rich source of nutrients especially β carotene, ascorbic acid, riboflavin, folic acid, calcium and iron can be used to meet dietary micronutrient requirements. Keeping in view the nutritional significance of cauliflower greens, the present study was undertaken to enrich conventional food preparations with discarded cauliflower greens. **Materials & Methods:** METHODOLOGY: Commonly consumed conventional food preparations namely chutney, pakora, chilla, saag, soup, parantha, puri, kadhi, burji, laddoo, mathri and matrey were enriched by incorporating cauliflower greens at different levels. Developed value added food preparations were organoleptically evaluated by a panel of ten judges using nine point hedonic scale. **Result:** RESULT: All the conventional food preparations developed with incorporation of cauliflower greens at different levels were organoleptically acceptable. Vitamin C, beta carotene, folic acid, riboflavin as well as iron and calcium content in all cauliflower greens incorporated food preparations increased significantly ($p<0.01$). **Conclusion:** Commonly consumed food preparations can be successfully prepared by incorporating discarded cauliflower greens and these preparations if consumed on a daily basis can take care of the micronutrient deficiencies of the population. Keywords: **KEYWORDS:** Conventional food preparations, under-exploited greens, enrich, nutritional status, incorporation.

PPCN-23 Assessment of Nutritional Status and Physical Fitness of Selected Adolescent Girls (16-18 Years). ***Rasikha,*** Thirumani Devi, India, Email:- rasikhashankaran96@gmail.com

Background & Objectives: To assess the nutritional status and physical fitness of adolescent girls and improved that the nutritional status of the adolescent girls strongly associated with physical fitness. **Objectives:** 1. To assess the nutritional status of the selected adolescent girls. 2. To Find out the physical fitness of the selected adolescent girls. **Materials & Methods:** The study was conducted for selected adolescent girls (16-18Years) in the selected residential area of Coimbatore city. Fifty adolescent girls were selected for the present study and socio economic and dietary data was collected using specially structured questionnaire. Anthropometric measurements (weight, standing height and skin fold thickness) were recorded. Socio economic variables included were age, education and economic status and anthropometric measurements were considered to create an awareness of the nutritional status and its effect on physical fitness of the selected subjects. Nutritional status of study subjects was assessed by using various parameters viz., weight, height, Waist Hip Ratio and body mass index at different age points were compared with the corresponding reference value. The physical fitness was assessed through sprint test, flexibility test, agility test and endurance tests. The collected data were considered and inter related these two parameters. **Result:** The nutritional status of the adolescent girls was not correlated with the nutrients in standard norms. The dietary pattern of the selected subjects revealed that their nutrients in diet were not adequate to ICMR-RDA (2016). These two were associated with the nutritionally related deficiency diseases. The physical fitness proved the impotency because of the improper nutritional intake. **Conclusion:**The Consumption of balanced diet with all the adequate nutrients will help to maintain the good nutritional status. The change in life style pattern influences the nutritional status of an individual. The physical fitness can be improved by the consumption of adequate balanced diet. It will help to improve the physical fitness of an individual. The study proves the positive correlation of nutritional status with physical fitness of the selected subjects. **Keywords:** Nutritional Status, Physical Fitness, Adolescent Girls.

PPCN-24 IMPACT OF VILLAGE CHILD HEALTH AND NUTRITION PROJECT INTERVENTIONS ON NUTRITIONAL STATUS OF SEVERELY ACUTE MALNOURISHED (SAM) CHILDREN IN DISTRICT FATEHGARH SAHIB. ***Poonam Khanna[1],*** Jill Miller[1], Tejinder Singh[1], Thakur Mejjie[2], Rajbir Kaur[3], Jyoti[3], Sonia Minhas[3]. 1=University of Utah, Salt Lake City, US, 2= Director Mehar Baba Charitable Trust, 3= Post Graduate Institute of Medical Education & Research, Email:- poonamkhanna05@gmail.com

Background & Objectives: Globally, 17 million children under 5 years old are estimated to be severely wasted annually. Severe wasting is a key contributor (12.6%) to child deaths due to nutritional deficiencies and children suffering from severe acute malnutrition face a higher risk of deaths when compare with healthy children. Keeping in view, above study was planned to assess the impact of nutrition interventions on the nutritional status of SAM children. **Materials & Methods:** Under Village Child Health and Nutrition Project 9 villages were selected using purposive sampling technique and using census-based sampling technique nutritional assessment of 573 children was done using WHO growth standards. In present paper, from baseline data all severely acute malnourished were selected and nutrition interventions like home visits, one to one counseling of mothers and practical demonstration were done at group and individual levels. Apart from this child health cards and cyclic menus were distributed. Anthropometric measurements were recorded after one month and post intervention changes were recorded at an interval of 6 months. **Result:** Post intervention results revealed that nutrition interventions given under Village Child Health and Nutrition Project had a positive impact on food consumption patterns and nutrition knowledge. In addition, a positive change in food behavior of children was also seen. Significant changes were observed in mean Z scores before and after nutrition counseling that declined from -3.05 to -1.81 and -3.16 to -2.25 for weight for height (WHZ) and weight for age (WAZ), respectively. **Conclusion:** Village Child Health and Nutrition Project nutrition interventions were effective in community-based management of SAM children. **Keywords:** SAM, Anthropometric measurement, Nutritional counselling, under five year's children, malnutrition.

PPCN-25 A STUDY ON THE CORRELATION BETWEEN LIFESTYLE DISEASES AND FOOD HABITS OF REGULAR EATERY CONSUMERS IN MALAPPURAM DISTRICT. ***Anitha Begum[1],*** Dr Anooja Thomas[2], 1=St Therasas college ,Ernakulam, 2=CMS College, kottayam . Email:- anithaahemed@gmail.com

Background & Objectives: A well-balanced diet goes hand in hand with a healthy lifestyle. The right diet can help to fight conditions and illnesses like heart disease, diabetes, osteoporosis, cancer and obesity among many

others. Diet and life styles are in our hand. In modern life style eatery consumers are fastly growing. **Materials & Methods:** 200 subjects who consume regularly from food outlets were selected randomly from Manjeri municipality (Malappuram district) for the study. From these subject incidence of lifestyle diseases, eating habit from outlets and details regarding the socio-economic background including age, religion, types of family, occupation, education, family income, etc. were collected using structured interview schedule. **Result:** Among the regular eatery consumers (64% are visiting various food outlets regularly, $p<0.05$) 69% of Subjects had the incidence of lifestyle diseases (cumulative frequency). Diabetes was the most prevalent lifestyle disease. 49%of the samples were affected with diabetes.39% had hypertension and 22.5% had cancer. Among the selected sample 74.5% of diabetic patients had a family history of diabetes. 20.6% of sample below 30 years consume hotel food regularly.16.2% of the sample below 30 years consume bakery food stuffs regularly. 24.6% of the sample below 30-39 years consumes hotel food regularly. 41% of subjects selected vegetarian food items ($p<0.05$). 81% of the people selected non vegetarian foods. **Conclusion:** The results of the study have well proved that regular consumption from outlets is a major factor for the development of lifestyle diseases. Keywords: Eatery consumers, life style diseases.

PPCN-26 NUTRITIONAL STATUS AND PREVALANCE OF NUTRITIONAL DISEASES AMONG 6 – 8 YEARS OLD CHILDREN OF FISHERMEN COMMUNITY OF EAST GODAVARI DISTRICT, ANDHRAPRADESH. ***Rajya Lakshmi Devi Yenumula***, Avinashilingam Institute for Home Science and Higher Education for Women, Email:- yenumula.rajee@gmail.com

Background & Objectives: In India, 60.57% of the fishermen families were under below poverty line (BPL) category as per CMFRI (2010) reports. In Andhra Pradesh, 97.3% of marine families were under BPL category. This study analyses the Nutritional Status of children aged 6 – 8 years(boys and girls) belonging to fishing communities in coastal Andhra Pradesh who are under BPL in the coastal regions in and around Rural Kakinada of East Godavari District. **Materials & Methods:** The study examines the socio-economic background, nutritional status and health analysis of school children aged between 6-8 years belonging to the fishermen community of East Godavari District, Andhra Pradesh. A sample size of 1000 children from various schools was selected for this study with the aid of District Medical and Health Department and various school authorities. Data was collected through a nutritional survey by using pre-designed questionnaire. Anthropometrical, clinical and Nutritional assessment was done, analyzed and calculated. **Result:** The major findings of the study were that 63.4% of the boys and 79.3% of girls that were examined are underweight, 64.1% of boys and 98.7% of girls are below the standard height determined by World Health Organization.15% of the subjects suffer from vitamin A deficiency, 12% were suffering from anemia and 19% from various vitamin B deficiencies. **Conclusion:** Malnutrition seen in the children of the fishermen community results from the interaction of poor-quality diets and poor-quality health which are shaped by a host of underlying factors, such as, poor economic development, conflict, inequality, and illiteracy. **Keywords:** Fishermen community, Below poverty line, Deficiencies, Malnutrition, Vitamin A deficiency, Anemia.

PPCN-27 ADDRESSING HOUSEHOLD MICRO-NUTRIENT INTAKE THROUGH NUTRITION GARDEN INTERVENTION IN RURAL INDIA*.* ***S Raju,*** D.J.Nithya, R.V. Bhavani, M S Swaminathan Research Foundation,
Email:- raju@mssrf.res.in

Background & Objectives: Farming system for Nutrition (FSN) is an intervention study conducted in two agro-ecologically different locations under the research programme on “Leveraging Agriculture for Nutrition in South Asia” in India. This paper examines whether nutrition garden intervention along with nutritional awareness addresses household micro-nutrient intake. **Materials & Methods:** 5 villages in Wardha district in Maharashtra state and 7 villages in Koraput district in Odisha state were taken for the study. A baseline survey was conducted in 2013-14 and nutrition garden intervention along with nutrition awareness was provided. An endline survey was conducted in late 2017-18 with a sample of 190 households from each study area. Semi quantitative food frequency questionnaire was used to understand the household food consumption pattern. **Result**: The average consumption of fruits, green leafy vegetables, roots & tubers and other vegetables increased in the households who participated in the intervention, when compared with before and after intervention in both study areas. In Wardha, recommended dietary intake (RDI) of fruits and other vegetables was almost met and in Koraput fruits, green leafy vegetables and other vegetable consumed was more than RDI after intervention. In both study areas, number of food items increased significantly excluding roots & tubers in Koraput. The average intake of micro-nutrients – vitamin C, vitamin A, dietary folate, calcium and iron were significantly high in participating households

when compared with non intervention households. **Conclusion:** Although the intake of micro-nutrients had increased, it was still less than the recommended dietary allowances, indicating the need for continued effort. Nutrition garden increases the availability and accessibility of fruits and vegetables at household level. It can play a very important role in improving household micro nutrient intake, thereby addressing the problem of hidden hunger at low cost. **Keywords:** Nutrition Garden, Micro-Nutrient Intake.

PPCN-28 NEED FOR CUSTOMIZED CUTOFFs FOR ANTHROPOMETRIC INDICATORS IN CASE OF RURAL INDIAN MEN. ***Sayali Deshpande Joshi*[1],** Shobha Rao[2], 1= School of health Sciences (SHS), Savitribai Phule Pune University, Pune, 2= Society for Initiatives in Nutrition and Development, Pune, Email:- nutrisayali@gmail.com

Background & Objectives: Background: Association of adiposity and blood pressure is explored widely among urban than rural population. **Materials & Methods:** Methods: Rural men (n=142) were measured for blood pressure and anthropometry [Body mass Index (BMI), body fat (BF), waist circumference (WC) and Visceral fat (VF)]. Dietary consumption was assessed using FFQ and physical activity pattern using questionnaire. **Result:** Results: Prevalence of obesity (BMI ≥25 kg/m2), central obesity [WC ≥90 cm/ WHR ≥0.9/ Waist-to-Height ratio (WHtR) ≥0.5/ VF ≥9%] and hypertension (HTN- SBP ≥140/ DBP ≥90 mmHg) was high (36.6, 9.9, 23.9, 40.1, 45.7% and 26.8% respectively). Risk for HTN was significant for those in higher (compared to lower) tertiles of BMI (OR 40.48; CI: 2.6-166.2), BF (OR 19.36; CI: 4.2- 89.2), WC (OR 27.23; CI: 5.9-125.7), WHR (OR 11.85; CI: 3.2-43.6), WHtR (OR 18.17; CI: 3.9-83.3) and VF (OR 34.80; CI: 4.5-268.5). ORs remained significant after adjusting for diet and physical activity. Importantly, significant risk was seen even in second tertiles, i.e. below conventional cutoffs defining obesity. ROC cutoffs obtained for predicting HTN risk were lower than conventional cut offs defined for Asian populations for BMI (23.6kg/m2), BF (23.7%), WC (80.5 cm) and WHR (0.87). These cutoffs were even lower than those reported among urban Indians. The implication is that, using conventional cutoffs for BMI, WC and WHR, we would miss 15.5, 42.9 and 25.4% subjects while screening for risk of HTN. As rural–urban differences are striking in India, it indicates need for customized cutoffs for rural population for defining obesity. **Conclusion:** Conclusions: As increased adiposity in disadvantaged settings where under nutrition is prevalent is known to be a risk factor for hypertension, our observation highlights need for customized cut offs and underscores need of interventions for prevention of obesity in rural populations. **Keywords:** hypertension; obesity; ROC, cut-off; rural; men.

PPCN-29 DIET RELATED NEEDS ASSESSMENT OF OBESE WORKING ADULTS. ***Chetna Singh,*** Monika Jain, Department of Food Science and Nutrition, Banasthali Vidyapith, Rajasthan. Email:- chetnasingh2057@gmail.com

Background & Objectives: Lifestyle changes specifically in working obese adults have led to higher obesity prevalence along with various interrelated comorbidities including hypertension, type 2 diabetes and cardiovascular diseases. Dietary modifications with functional foods incorporation can help in combating obesity and comorbidities but their easy availability becomes a problem. The objective of the present study was to identify the food related unmet needs of obese adults by conducting needs assessment survey. **Materials & Methods:** Subjects belonging to 30-59 years of age (n=400) working in identified offices of Delhi and diagnosed with obesity based on their BMI (≥25kg/m2) were included in the study. Anthropometric measurements included weight, height and waist circumference (WC). A self administered questionnaire was standardized to conduct needs assessment survey. Data related to associated comorbidities and diet including food habits, fruits and vegetables consumption, and intake of unhealthy foods were collected. **Result:** Mean BMI of men and women were 28.02±2.24 kg/m2 and 28.03±2.00 kg/m2 respectively. WC was higher than the cut offs in 98% subjects. Commonly reported comorbidities by 56.7% subjects were diabetes, hypertension and dyslipidemia. More than half of the subjects (55.0%) were vegetarian. One third subjects consumed 3-4 servings of fruits and vegetables daily whereas two thirds consumed 1-2 servings/day. Burgers, fries, chips were the most popularly consumed unhealthy snacks. Highest need was reported for nutraceuticals rich health food by 81.2% subjects. Further, high needs were reported for fruit and vegetable based snacks, fibre rich snacks and multigrain snacks by 65.7%, 61.7% and 59.2% subjects respectively. **Conclusion:** Obese subjects munch on unhealthy snacks as their need for nutraceutical rich, fibre rich, fruits and vegetables rich easily available foods remains unmet. **Keywords:** Needs assessment, BMI, Nutraceuticals, Obesity.

PPCN-30 INFLUENCE OF DEMOGRAPHIC VARIABLES ON PREMENSTRUAL SYNDROME (PMS) AMONG REPRODUCTIVE AGE WOMEN*. **Suba G,*** thirumainarasu@gmail.com, Thirumani Devi A,
Email:- subag74qmc@gmail.com

Background & Objectives: Premenstrual syndrome (PMS) refers to a group of menstrually related disorders, characterized by physical and mental symptoms that vary with different phases of the menstrual cycle and the reproductive age generally ranges from 15 to 45 years (Department of Health and Human Services, 2013). Environmental conditions and personal conditions play a role in the incidence of PMS. Hence the present study was conducted to determine the relationship between the demographic characteristics and the prevalence of PMS among the reproductive age women. **Materials & Methods:** In the present study, totally 541 participants were selected by purposive random sampling technique. An interview schedule method was framed to collect the data related to the demographic profile of the participants. PMS symptoms were recorded on the basis of the standard tool known as Premenstrual Daily Diary. The average score for PMS symptom of each individual was noted. The data was statistically analyzed using descriptive and inferential statistics. **Result:** From the study, it was evident that the demographic variables like marital, occupational and educational status of the selected participants, location of house and parents' occupation showed that there was a significant association with PMS scores, at ($p<0.05$) level. Occupation of the mothers of the selected participants was an important predicator of PMS symptom and revealed that there was an association between the location of selected participants and PMS symptom score with higher statistical significance ($p<0.05$). this may be due to the fact that the participants in rural areas hae less interaction and knowledge regarding PMS compared to their urban counterparts. Mean score of age indicated that the PMS was high among the participants aged between 41-45 years. Mean PMS score was higher among the participants in the nuclear family system compared to joint/extended family system. The highest score of PMS was noted among the selected participants whose mothers had lower education than college education. **Conclusion:** From the study it was clear that PMS though occurred in all age and all sectors of reproductive age women, the prevalence was influenced by demographic characteristics like location, occupation, education, parents' education and occupation and marital status. With proper counseling and health education at the schools, work places the needed improvement in the view of PMS among women and there by proper management by themselves can be achieved which can nullify the demographic factors influencing PMS. **Keywords:** premenstrual syndrome-the symptoms occurring in the luteal phase of menstrual cycle.

PPCN-31 Knowledge About Traditional Nutritional Practices And Cooking Related Beliefs Of Adolescent Girls*. **Neelam Kumari[1],*** Ritika Srivastava[2], 1=Isabella Thoburn College,2= IGNOU. Email:- neelamkumari0809@gmail.com

Background & Objectives: Adolescents are future parents. If adolescent girls have better nutritional knowledge and awareness on nutrition they may help improve the nutritional status of children and family members and a sustainable solution towards optimum health can be targeted through empowering adolescent girls in terms of beneficial nutritional practices.
Materials & Methods: The study was conducted to explore the traditional nutritional knowledge and cooking related beliefs of adolescent girls. The adolescent girls (13-18years) were part of the cross sectional study. The subjects belonged to urban area. The data was collected using pretested questionnaire. **Result:** Result and Discussion- The result revealed that 30% respondents were vegetarians, 32% respondents were non-vegetarians and 38% respondents were ovo vegetarians. 14.0% respondents said that fermented food increase digestibility, 24% reported for decrease cooking timing, 40% responded for increase taste and 22% for all the above option. 8.0% respondents reported that mixing of food items increase the nutritive quality of food, 20% said cooking food items increase the nutritive quality of food and 40% preserving the food items increase the nutritive quality of food and 32% opted for none of these. The finding revealed that that the majority 75% girls were found having poor nutritional knowledge and the finding about their cooking habits revealed that 22% girls cook occasionally, 30% sometimes and 48% never. Result showed that there was statistical association between traditional nutritional practices, knowledge and statement of nutrition related belief. As a whole, the traditional nutritional knowledge of adolescent girl was inadequate before intervention which showed improvement after intervention. **Conclusion:** There is an urgent need to educate the adolescent girls regarding beneficial nutritional practices and increase their interest in cooking and knowledge. **Keywords:** adolescent girls, traditional, nutrition education.

PPCN-32 COMPARATIVE STUDY OF HEALTH, NUTRITION & PSYCHOLOGICAL CONDITIONS BETWEEN SEXUALLY VICTIMIZED GIRLS AND NORMAL ADOLESCENT GIRLS – A SOCIAL REPORT*.* ***Koyel Pal Chowdhury,*** Abbott Nutrition International, Email:- palchowdhurykoyel@gmail.com

Background & Objectives: Society has a stereotype belief that sexually victimized girls may not be so well nourished, their life style, hygiene, clinical symptoms, psychological stability are demeaned in compare to normal adolescent girls. To break old notion, this study has been conducted to observe the present conditions of victimized adolescents. The hypothesis is all girls are same. **Materials & Methods:** The study has been preceded among the girls between 12-18 years age. Total 60 subjects (30 each in control & affected group) were randomly selected from a Home where victimized girls are rehabilitee and same aged girls from Government school. Anthropometric, dietary recall with self-made pretested questionnaire on hygiene, overall development and life style assessments are performed. **Result:** Anthropometric measurement differs but negligible(sd-18.7,18.9). Both are almost same except victimized girls' appearance being a little bit shallow. Many girls of both groups are in periodical cycle (73.3%, 66.6%) as excepted. In case of sense of hygiene and utilization of it, the victimized girlshas scored higher. They have better dietary intake, food planning, and frequency of time and amount of intake all are optimum as because they are looked after in Home with discipline, although school girls' habits are unhealthy. Social desirability of all girls are very high but the psychological irrelevancy exists (mean-28,29) because of transitional phase. Victimized girls are leading more discipline life in all aspects in the Home. School girls' are concerned the requirement of nutrition but practical implementation is not done. So, null hypothesis is not accepted (t score-0.9) in Nutrition but accepted (t score-0.02) in psychological status. **Conclusion:** Both types of girls are ambitious and looking for a better healthy life although victimized girls want more socially sound life and harmonious family. So, the responsibility of society is to treat all the girls equally. **Keywords:** Sexually Victimized, Adolescent Girls, School Girls, Nutritional Status, Socio Economic Status, Comparison.

PPCN-33 CHILD HEALTH STATUS AND CLIMATE RELATED AGRICULTURAL VARIABILITY: CASE STUDY INDIA. ***Vidhu Gupta[1],*** Meena Sehgal[1], Sujit Kumar Ghosh[2], Kanwal Nayan Singh[1], Ajay Mathur[1]. 1= The Energy and Resources Institute (TERI), New Delhi, 2= North Carolina State University, Raleigh, USA,
Email:- vidhu.gupta@teri.res.in.

Background & Objectives: A high prevalence of underweight in children poses a serious challenge in India. The National average of underweight prevalence according to NFHS-4 study is at 36%. Every second (58%) child (aged 6- 59 months) is anaemic (haemoglobin <11.0g/dl) in India. Thus, we propose here a methodology to identify populations/ areas for targeted interventions for adaptation measures to build resilience from climate variability and extreme weather. **Materials & Methods:** To identify districts at high vulnerability of agriculture, we used ranking based on the vulnerability index of agriculture to climate change, developed by the Government of Indiaâ€™s National Initiative on Climate Resilient Agriculture (NICRA) and an index based on childhood health outcomes, such as stunting, wasting, underweight, anaemia in population based on district level survey data from National Family Health Survey (NFHS-4) 2015/16 (based on district boundaries of 2011 National census). The districts or small administrative areas within a developing country were considered. This index has been created to rank districts based on nutritional and health status of children who are under five years old- one of the most vulnerable populations at small area (district) level in India. **Result:** Our study identified districts presenting both poor (less than median) child health index rank and very high to high agricultural vulnerability rank to climate change. Around 230 districts from different states reported very high to high agricultural vulnerability. 135 agricultural vulnerable districts rate worse than median of child health index; in the need of varying level of attention. The districts were largely clustered in Maharashtra, Gujarat, Karnataka, Rajasthan, Madhya Pradesh, Uttar Pradesh and Bihar. **Conclusion:** This approach assists in prioritization of population and adaptation of targeted approach to progress on population health and build resilience to climate variability and extreme weather events. This could be achieved through interventions like food fortification, crop diversification and many more. Keywords: Child Health, Nutrition, Climate Change, Vulnerability of agriculture, Resilience

PPCN-34 NUTRITIONAL PARADOX PERSISTS: STUDIES IN BENGALEE FEMALE ADOLESCENTS. ***Neepa Banerjee,*** Surjani Chatterjee, Satabdi Bhattacharjee, Ayan Chatterjee, Sandipan Chatterjee, Shankarashis Mukherjee. Hpafu, Department Of Physiology, University Of Calcutta, Email: - bneepa.15@gmail.com.

Background & Objectives: Nutrition, being the foundation of human development, is a prerequisite for achieving optimal quality of life. Therefore, any threat against it can become the bottleneck in the country's overall progression. Moreover, nutritional threats in children, one of the most vulnerable sections of the society, have direct impacts on the growth and development of the nation. The rapid socio-economic transition and unplanned urbanization in developing countries have resulted into select pockets of affluence, which may have a potential to alter energy balance unfavorably. An attempt, in this context, has been made to assess the nutritional status of the Bengalee female adolescents (age range 12-17 years) belonging from upper-middle socio-economic group and residing in the Kolkata Metropolitan area. **Materials & Methods:** Nutritional status in terms of anthropometric indicators including MUAC, WC, BMI, TMI, WHR and WHtR was assessed; PAL was calculated, energy consumption was evaluated and knowledge, attitude and behavior regarding healthy dietary habit was assessed. **Results:** A significantly high prevalence of physical inactivity, prolonged sedentarism and consequently high level of overweightness, a form of malnutrition, has been observed among the school going Bengalee adolescent girls. Further, it has been observed that knowledge and behaviors related to healthy eating habit among the study participants were poor and the frequency of eating out and skipping breakfast were found to be high. **Result:** A significantly high prevalence of physical inactivity, prolonged sedentarism and consequently high level of overweightness, a form of malnutrition, has been observed among the school going Bengalee adolescent girls. Further, it has been observed that knowledge and behaviors related to healthy eating habit among the study participants were poor and the frequency of eating out and skipping breakfast were found to be high. **Conclusion:** It may be concluded form the present study that a high prevalence of overweightness persists among Bengalee adolescent girls. In spite of still prevailing nation-wide undernutrition, there exists nutritional paradox where over-nutrition related issues are becoming burning concerns. Interventions like involvement in enjoyable leisure-time physical activity with improvement of knowledge regarding healthy nutrition in an integrated manner may be of use to address this public health challenge. Keywords: childhood obesity, double burden, eating-out, nutritional status, West Bengal.

PPCN-35 DOES PHYSICAL ACTIVITY IMPROVE AGING AND/OR EXCESS CALORIE- INDUCED COGNITIVE IMPAIRMENT OF MALE HUMANS? ***Aindrila Das,*** Dr Samir Kumar Ghosh, Kalyani University. Email:-aindrila_11@yahoo.co.in.

Background & Objectives: Eating behavior, unlike many other biological functions, is often subject to sophisticated cognitive regulation. Overeating may greatly increase the risk of memory loss for elderly people. Researchers concluded the odds of having MCI more than doubled for those in the highest calorie-consuming group compared with those in the lowest calorie group. To study the influence of excessive calorie intake and/or physical activity level on cognitive performance of a micronutrient deficient randomized human male population in urbanized West Bengal, India. **Materials & Methods:** A cohort study has been carried out with 357 young (30.13± 0.24 yr) and 287 aged (58.62 ± 0.29 yr) subjects. Participants' socio-economic status (Kuppuswamy's socio-economic scale), health status (health assessment questionnaire; HAQ) calorie and micronutrient consumption (Diet Survey - Three 24h Recall), cognitive function (Mini-Cog, 6-Item cognitive impairment test; 6-CIT) and physical activity level (PAL) (questionnaire) have been assessed. **Result:** Analysis of data reveals declining Cognitive function ($p<0.05$) in aged subjects with At Par (AP) (Required amount) calorie diet compared to young AP calorie group. CE (Excess calorie) consumption (> 30% of requirement) does not affect ($p>0.05$) cognition of young subjects compared to their AP calorie consuming counterparts. But the aged subjects consuming CE diet shows significant ($p< 0.05$) cognitive decline compared to AP calorie diet consuming subjects of the same age group. While low PAL adversely affects cognition in both young and aged population, high PAL displays strong positive influence on cognitive function which is independent of age or calorie intake. **Conclusion:** Observations suggest that aging-induced cognitive loss and excess calorie-induced cognitive impairment among subjects with micronutrient deficiency, markedly surface with low PAL and high PAL masks the influence of aging and excess calorie-induced cognitive deterioration. Thus choice of appropriate diet along with maintenance of an active lifestyle with optimum calorie consumption may help to prevent/compensate aging- and excess calorie-induced cognitive loss and/or impairment. Keywords: Aging, cognition, excess calorie, physical activity level.

PPCN-36 Netravati M. Ulavannavar - withdraw

PPCN-37 Madhumati K Mantur - withdraw

PPCN-38 A STUDY ON NUTRITIONAL STATUS, PREVALENCE OF ANAEMIA AMONG EARLY AND MIDDLE STAGES OF ADOLESCENT GIRLS IN NAGAPATTINAM DISTRICT'. ***Ms. R. Kaviyarasi,*** Dr. M. Sylvia Subapriya,
Email:- kavimanistet@gmail.com.

Background & Objectives: Adolescence is the period that extends from the onset of puberty until full growth is reached for most individuals, adolescence occurs between of ages of 12 and 20.adolescence is second only to infancy in the nutritional requirements necessary for normal growth and development.The prevalence of anaemia is disproportionately high in India due to poverty, inadequate diet, worm infestation. India has ths the world highest prevalence of iron deficiency anaemia among 60 to 70 percentage of the anaemic adolescent considered as a nutritionally critical period of life. The pre pregnancy nutritional statusin young girls are important for the health of adolescent girls. The world's adolescent population is facing a serious of nutritional changes which are not only affecting their growth and development but also their livelihood as adult. Nutrition of the adolescent girl is particularly important but under nutrition in adolescents frequently goes unnoticed by their families or the young people themselves. Adolescence is a time to prepare for the nutritional demands of pregnancy and lactation that girls may experience in later life. Under nutrition negatively affects adolescent girls by affecting their ability to learn and work maximum productivity, increasing the risk of poor obstetric outcomes for teen mothers, arresting the healthy development of future children, and affecting sexual maturation and growth and preventing the attainment of normal bone strength and the development of healthy teeth if a youth doesn't get enough calcium Anemia in adolescence has serious implication for a wide range of outcomes and nearly all of the functional consequences of iron deficiency are strongly related to the severity of anaemia. It causes reduced resistance to infection, impaired physical growth, mental development, reduced physical fitness, work capacity and school performance. The study was carried out with the following objectives: To select a 200 adolescent girls, **Materials & Methods:** The present study was carried at Nagapattinam district early and middle stages of adolescent girls (12 to 14 years and 15 to 16 years). 200 subjects of early and middle stages of adolescent girls were selected for this study. Anthropometric Assessment Biochemical Assessment, clinical Assessment, Dietary pattern and nutritional assessment were identified to the nutritional and health status of adolescent girls. Questionnaire method was used to collect data regarding general information, life style pattern, health status, assessment of nutritional status of the subjects etc. **Result:** The study considered the life style pattern, health status, clinical assessment, bio chemical estimation of haemoglobin , serum protein, serum albumin level and dietary pattern in both early and middle stages of adolescent girls. Low level of haemoglobin, serum albumin, serum protein are observed in middle stages of adolescent girls indicates the high risk of anaemia. **Conclusion:** The study was concluded that most of the respondents in middle stages of adolescent girls (15 to 16) were suffered by anaemia than compared to early stages of adolescent girls (12 to 14 years), So nutritional education as well as better dietary habit with intake of iron rich foods supplementation which helps to alleviate the anaemia among the middle stages of adolescent girls. **Keywords**: Nutritional status, early and middle stages of adolescent girls, Haemoglobin anaemia.

PPCN-39 Effect of Anthropometry on Body Fat, Lipid Profile & Blood Pressure of Young Muslim Girls from Mumbai City. ***Anuradha Mitra,*** College of Home Science Nirmala Niketan,
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Background & Objectives: Background: Community specific dietary patterns are likely to impact body composition and lead to early incidence of Life Style Diseases among the youth.. Objective: To assess the correlation of anthropometry with body fat %, lipid profile and blood pressure in young Muslim girls. **Materials & Methods:** Methods: Cross sectional study on 210 Muslim girls aged 18.8±1.0 years. Anthropometry, body-fat % and blood pressure (BP) were assessed. Lipid profile was assessed of 68 girls. **Result:** Among the 210 girls, 30% were underweight, 17% were overweight, 14% were obese. 51.7% had high body fat % (>30%), 13.8% had high waist circumference (>80cm) and 14.8% had high waist to hip ratio (>0.81). Hypertension noticed, with 24% having high systolic-BP (>110mmHg), 48.3% high diastolic-BP (>70mmHg). Body-fat positively correlated with weight (r=0.831), body mass index (r=0.935), waist circumference (r=0.762), waist to hip ratio (r=0.428), systolic-BP (r=0.207), diastolic-BP (r=0.165) ($p<0.05$), 68 girls showed proneness to metabolic syndrome, with high serum triglyceride levels (110±52 mg/dl) which positively correlated with body mass index (r=0.278) and waist circumference (r=0.265) and low high density lipoprotein 47±9 mg/dl that was negatively correlated with body mass index (r=0.314) ($p<0.05$). **Conclusion:** Conclusion: Increased anthropometry and BP was adversely associated with high body fat and triglycerides, thereby increasing risk of metabolic syndrome. Nutrition education

and lifestyle modification needs to be emphasised to create awareness about the importance of a proper diet and health. **Keywords:** Community specific dietary patterns,Effect of Anthropometry on body composition.

PPCN-40 FARMING SYSTEM FOR NUTRITION: IMPACT ON FOOD CONSUMPTION PATTERN AND DIETARY DIVERSITY ACROSS DIFFERENT AGE GROUPS. ***D.J. Nithya,*** S. Raju, R.V. Bhavani. M.S.Swaminathan Research Foundation, Email:- djnithya@mssrf.res.in.

Background & Objectives: Farming system for Nutrition (FSN) study was conducted under the research consortium "Leveraging Agriculture for Nutrition in South Asia", to explore the feasibility of an FSN approach, to improve dietary diversity. The present paper demonstrates the impact of an FSN approach on food consumption and dietary diversity across different age groups. **Materials & Methods:** Five villages in Wardha district, Maharashtra and seven villages, Koraput district in Odisha were taken for the study. A baseline survey was conducted in 2013-14 and FSN interventions were promoted along with nutrition awareness. An endline survey was conducted in late 2017-18. 24-hour diet recall method was used to measure food and nutrient intake. Dietary diversity was calculated by simple counting of food groups. **Result:** The study revealed that the mean dietary diversity had increased from 6.02 to 6.10 in Wardha and 4.92 to 5.31 in Koraput following 3 years of intervention. In Wardha, mean consumption of vegetables, animal foods, fruits and fats increased across all age groups; pulses and legumes increased in ≥10 years population and in Koraput, vegetable and animal foods increased across all age groups. Mean intake of nutrients like protein, fat, energy, calcium, iron, vitamin A and C increased across all age groups in Wardha, except for protein, energy and iron in 1 to <5 years children and iron in adolescents group. In Koraput, calcium intake increased across all age groups while protein intake increased in 5 to 17 years children and adolescents; fat in 10 to 14 years children; iron and vitamin-A in 5 to 9 years children; vitamin-C in 1 to 9 years children and adolescents groups. **Conclusion:** Overall, a farming systems approach to increase availability of nutrient dense food coupled with nutrition awareness, can improve dietary diversity and nutrient intake in undernourished populations dependent on agriculture. In the long run, this can alleviate the problem of under-nutrition. **Keywords:** FSN approach, dietary diversity, nutrient intake.

PPCN-41 A Comparative Study on Physiochemical Properties of Various Milk Samples Commercially Available In Kendrapara District, Odisha, India. ***Shuchismita Behera,*** Sunil Kumar Rout, Arabinda Ranasingh, Pratikshya Patra[2],1= Lecturer, Department of Zoology, Kendrapara Autonomous College, Kendrapara Odisha, Email:- Shuchi.rmrc@gmail.com.

Background & Objectives: Dairy products are frequently included as important elements in a healthy and balanced diet. Cow and buffalo milk are generally used for marketing purpose. The adulteration of milk with various substances for economic gain is reported to be a prevalent practice in India. Although milk production density of Kendrapara district has increased from 2009-2014, the per capita availability of milk has decreased indicating a greater demand. Thus it is necessary to ensure by the companies for both quality maintenance and to fulfill the increasing demands. So the present study aims at verifying the purity of different brands of milk available in Kendrapara and to estimate their biochemical parameters. **Materials & Methods:** The study area comprises a coastal district Kendrapara of Odisha state, India. It included four commercial milk brands available at Kendrapara market. Density and pH were estimated using standard lactometer and pH meter. Milk samples were tested for the presence of urea, hypochlorites and chloramines. Casein, soluble protein and glucose were estimated using standard procedures. Statistical analyses were performed using Graph pad prism. **Result:** Both urea and hypochlorite level was found to be negative for all the milk samples. Lactometer readings showed no dilution with water for 'Omfed' and 'Go' milk while 'Milkymoo' showed 25% dilution. 'Pragati' milk was denser than the normal milk point indicating presence of some additive substance. Mean casein content was found to be significantly high in 'Omfed' samples. No significant difference was found in reducing sugar level. All the milk samples showed a significant decrease in pH point at high temperature (100 degree Celsius) except 'Omfed' sample indicating lesser bacterial lactic acid formation. **Conclusion:** 'Omfed' milk was found to be fresher in terms of lower bacterial population and purity. It is most suitable for cheese production due to high casein content while restoring its nutrient value. **Keywords:** milk, Kendrapara, pH, casein, Omfed, adulteration.

PPCN-42 NOVEL OBESE INDICATORS FOR THE MANAGEMENT OF OBESITY AND DIABETES. ***Thamilovia.Sa,*** Uma Mageshwari.S, Department Of Food Service Management And Dietetics, Avinashilingam Institute For Home Science And Higher Education For Women, Coimbatore. Email:- ovia2611@gmail.com.

Background & Objectives: Visceral adiposity, has been found to be associated with an increased risk of a cluster of diabetogenic factor.Obesity is recognized as the main cause of a great number of chronic diseases, and also is an established risk factor for development of diabetes.Visceral Adiposity Index (VAI) and Lipid Accumulation Product (LAP) are novel indicators to measure pre diabetes through insulin resistance. There is need for evidence based studies to find out the association of adiposity and insulin resistance so that intervention can be directed towards decreasing visceral adiposity rather than total weight management. The primary objectives of the study is to • Assess the VAI and LAP among adult women • Associate VAI and LAP as novel obese indicators for Insulin Resistance. **Materials & Methods:** 52 adult women of age 18-30 years were screened for anthropometric measurements like height (cm), weight (kg), waist circumference (WC), hip circumference (HC) and biochemical parameters like lipid profile, fasting glucose and insulin using standard procedures. BMI, waist-hip ratio (WHR), waist-height ratio (WHtR), VAI, LAP and Homeostasis Model Assessment of Insulin Resistance (HOMA-IR) was calculated. VAI and LAP are gender-specific, based on simple anthropometric and functional parameters and was calculated using standard formulas. **Result:** Sixty three percent of the selected women were obese. WHR and WHtR were 0.92±0.07 and 0.45±0.06 respectively. The VAI (2.25±1.39) and LAP (40.11±24.32) points for obese women were found to be high compared to normal and overweight category. The result signifies that VAI and LAP are found to be increased as BMI increases, and the HOMA-IR of obese women was also found high. **Conclusion:** VAI and LAP are less invasive, cost effective methods and can be used as a novel indicator to detect insulin resistance and enable primary prevention of diabetes. **Keywords:** VAI, LAP, insulin resistance, novel indicators.

PPCN-43 TO ASSESS THE NUTRITIONAL KNOWLEDGE, ATTITUDE AND PRACTICE LEVEL OF CARE-GIVERS & FOOD HANDLERS IN SCHOOLS AND ORPHANAGES THROUGH PRE AND POST INTERVENTION DESIGN IN WEST BENGAL. ***Ms. Damanjeet Kaur,*** Deptt. Of Food Science & Nutrition Management, J.D.Birla Institute (affiliated to the Jadavpur University). 11, Lower Rawdon Street, Kolkata
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Background & Objectives: Childhood malnutrition is a grave public health concern worldwide that is associated with adverse health and socio-economic consequences. Schools and orphanages play an integral role in shaping dietary practices of children under their care and ensuring optimal nutritional status. Owing to this, acquirement of nutritional knowledge by caregivers and food handlers is of prime importance. The aim of the study was to determine the changes in the nutritional knowledge, attitude and practice of care-givers and food handlers in schools and orphanages, through nutrition education program. **Materials & Methods:** A Knowledge Attitude Practice (KAP) questionnaire was prepared for a pre and post intervention study. A total of 159 caregivers and food handlers from various schools and orphanages in West Bengal, primarily from Kolkata, Howrah and Anandapur districts participated in the study. A nutrition education program was conducted for two weeks, which included powerpoint presentations, videos and nutrition based activities. A comparative analysis of pre and post intervention data using statistical tests like student's t-test, descriptive statistical tests and analysis of variance were performed, using "Eviews". **Result:** The results depicted that there was a significant change in the knowledge level (p-value < 0.01) of the subjects post intervention. Descriptive statistical analysis showed that the mean of correct responses increased by 67.15. There was a significant improvement in the attitude of the respondents (p-value < 0.01). An increase was seen in the mean of acceptable responses by 60.33. However, the change in practices (p-value > 0.01) followed by the respondents was not significant **Conclusion:** Detailed analysis of the data showed that the nutrition education program had a significant improvement on the nutritional knowledge and attitude of the respondents. However, very little or insignificant change was seen in the practices followed by the respondents between the pre and post intervention phases. **Keywords:** Caregivers, malnutrition, Nutrition Education.

PPCN-44 Anamika Singh – withdraw

PPCN-45 PREVALENCE AND PATTERN OF POLYCYSTIC OVARIAN SYNDROME AMONG OBESE CLIENTS: A PROSPECTIVE OBSERVATIONAL STUDY FROM TRUWEIGHT. ***Zakera,*** Suhasini Mudraganam, Shunmukha Priya, G. Jyothsna, Truweight Wellness Pvt. Ltd, Email:- zakera_m@truweight.in.

Background & Objectives: Polycystic Ovarian Syndrome (PCOS) occurs among females of reproductive age and the prevalence ranges from 3.7 to 22 per cent in Indian women. Weight management is recommended as one of the first line of treatment for PCOS, the present study was conducted to assess the impact of weight loss on improvement of selected symptoms of PCOS subjects and to determine the correlation between the macro nutrient (carbohydrates, protein, fat and fibre) intake with weight loss among PCOS subjects enrolled in Truweight program. **Materials & Methods:** The study was a prospective observational study undertaken for a period of 6 months among obese females enrolled in the Truweight program. Inclusion criteria: females between age of 17 to 40 years who were known cases of PCOS, BMI > 30kg/m2. The subjects were selected using purposive sampling technique. Data collected includes, Weight, BMI, Diet recall, medical reports, menstrual cycle details and selected symptoms. Initial and final readings were recorded and the data was analysed using statistical procedures like Paired t-test, correlation coefficient, model F-test and regression methods. **Result:** In the present study, there was significant reduction in BMI (35.28± 5.79 to 30.65 ±5.56) among subjects following the Truweight program. The per cent weight loss among the subjects was between 8 to 20 percent of their initial body weight. During the course of the program, major symptoms associated with PCOS like irregular cycles (84 per cent), Facial hair (54 per cent) and Acne (32 per cent) have improvement among the study subjects. Macro nutrient intake were positively correlated with weight loss. The mean intake of carbohydrates (154.38g), protein (46.22g) and fat (25g) were associated with significant weight loss among subjects. The mean intake of fibre (34.34g) was also associated with weight loss. **Conclusion:** Obesity is common findings in PCOS subjects. The present study concludes that Truweight Dietary Management approach contributes to significant reduction in BMI and help improving the PCOS condition and the symptoms associated. **Keywords:** Polycystic Ovarian Syndrome, Weight loss, Body Mass Index, Truweight

PPCN-46 NUTRITIONAL STATUS AND DIETARY INTAKE AMONG UNMARRIED ADOLESCENT GIRLS IN RURAL AREA OF CHITTOOR DISTRICT- A COMMUNITY-BASED SURVEY. ***Sirshendu Chaudhuri,*** Uday Kumar Reddy, Syeda Fathima Amrin, Assistant Professor, Department of Community Medicine, Apollo Institute of Medical Sciences and research, Chittoor, Email:- sirshendusisu@gmail.com.

Background & Objectives: Objectives of the present study were to estimate the prevalence of thinness, low energy and protein intake among unmarried adolescent girls in the rural area of Chittoor district; and household level determinants for under-nutrition and decreased intake of nutrients. **Materials & Methods:** Study settings- The study was done in five villages under 'Aragonda' sub-center in Chittoor district in Andhra Pradesh. **Study design-** Community-based cross-sectional survey. Study population- Adolescents unmarried girls between 10-19 years from the villages. **Data collection-** Data was collected electronically by interviewing the subjects and their mothers in the local language. Dietary intake was assessed by 24-hours dietary recall with help of standard bowls. **Data analysis-** Data was analyzed by SPSS version 21. Univariate followed by multivariate modeling was done for assessing predictors. **Result:** Finding was based on 102 subjects. Prevalence of thinness, low energy intake, and low protein intake was 29.4% (20.4, 38.4), 79.4% (71.3, 87.5%) and 60.8% (51.0, 70.6%) and respectively. Distribution of thinness was related to 'presence of a male child in the family' (2.2; 0.8, 5.9); 'presence of at least one alcohol user in the family' (1.5; 0.6,3.8); families not using PDS (5.9; 0.8, 42.7). Median energy intake [Kilojoules (KJ)] across various age groups was lower than recommended for Indian standard (10-12 years: 4140 KJ; 13-15 years: 5517 KJ; 16-17 years: 6987KJ; 18 years and above: 7079KJ). Low energy intake was associated with 'presence of a male child in family' (1.5; 0.6, 3.7); 'overcrowding' (2.7; 1.1, 6.7); 'presence of at least one alcohol user in family' (2.0; 0.8, 5.0); families not using PDS (10.0; 0.9, 108.3). **Conclusion:** A good proportion of adolescent girls in the study area are thin and consuming low energy and protein. Role of economic condition and social factors like gender bias and alcohol use should be carefully investigated further. **Keywords**: Thinness; Dietary intake; Energy intake; Protein intake; Adolescent girls

PPCN-47 IMPACT OF TRUWEIGHT DIET PROGRAM IN DELIVERING WEIGHT LOSS AND RELIEVING SYMPTOMS AMONG HYPOTHYROID SUBJECTS. ***Shareefa Salma,*** Suhasini Mudraganam, Shunmukha Priya, Jyothsna, Thyroid Manager, Truweight Wellness Pvt.Ltd, Email:- shareefa@truweight.in.

Background & Objectives: In India, one in ten adults suffers from Hypothyroidism which is related to overweight. The broad objective of the study was to evaluate the impact of dietary changes on improvement of body mass index, weight loss and symptoms in hypothyroid subjects and correlate the macro nutrient intake with weight loss among the subjects enrolled for Truweight program. **Materials & Methods:** This study was carried out among hypothyroid clients enrolled in Truweight program for a period of 10 months. Forty two clients, comprised of 7 males and 35 females aged between 30 to 60 years, >25 kg/m2 who were following the Truweight program were selected using purposive sampling technique. Initial weight, BMI, dietary recall, medication details and the symptoms related to hypothyroidism were collected using structured questionnaire. Statistical analysis was done using paired t-test, model F-test, correlation coefficient and Regression methods. **Result:** The results revealed that there was significant reduction in weight and BMI among the subjects in 10 months Truweight program. The mean weight loss were 10.67 + 2.78 and BMI difference were 4.18 + 1.60 and these were positively correlated with the macro nutrient intake. The weight loss per cent was 7 to 15. Among the selected clients, there was significant relief from the symptoms associated with hypothyroidism like fatigue (62 per cent), muscle/joint pain (29 per cent), hair fall (24 per cent) and water retention (21 per cent). Around 66.67 per cent of the clients had a vitamin D level <30 initially. With the Truweight program there was an improvement in biochemical parameters as well. **Conclusion:** Obesity is observed among hypothyroid subjects, and Truweight program has a vital role in weight reduction, bringing the BMI down and managing the symptoms of hypothyroidism.The present study points that a well balanced diet including the principles of nutrition related to hypothyroid should be initiated early will help in controlling hypothyroidism and reducing the associated symptoms. **Keywords:** Hypothyroidism, Thyroid Stimulating Hormone, Body mass index, Weight loss.

PPCN-48 NUTRITIVE VALUE STUDIES IN DOLICHOS BEAN (DOLICHOS LABLAB L.VAR. TYPICUS PRAIN) GERMPLASM. ***K.Jyothi Reddy,*** B.Neeraja Prabhakar, P. Saidaiah, S. R. Pandravada, College of Horticulture, SKLTSHU, Rajendranagar, Hyderabad, Email:- jyothi.reddy934@gmail.com.

Background & Objectives: To estimate protein content in pods of Dolichos bean (Dolichos lablab L.var. typicus Prain) germplasm **Materials & Methods:** Thirty five dolichos bean germplasm lines along with the three checks were grown in Randomized Block Design with two replications were evaluated.The crude protein content of the sample was estimated according to the micro Kjeldhal method AOAC. (2005) calculated as protein nitrogen product and multiplied with 6.25 to obtain the protein content. **Result:** PSRJ-13039 (25.09%) showing maximum protein content in pods (25.09%), while the lowest protein content in pods was recorded in IC-546388 (15.41 %) among 35 genotypes. **Conclusion:** Considering protein content in pods the selected germplasm may be used as parental source for the development of superior dolichos bean varieties for commercial cultivation and may be released as a variety. That released varietal pods are incorporated in daily diet which is one of the best way to overcome malnutrition problems in community. **Keywords:** Dolichos bean, nutritive value,pods and Protein content.

PPCN-49 MAINTAINING DOLICHOS BEAN (Dolichos lablab L. var. typicus Prain) SEEDS NUTRITION AFTER HARVEST IN PURDUE IMPROVED CROP STORAGE BAG AGAINST PEST ATTACK. ***K. Vanitha[1],*** P. Saidaiah[1], Harikishan Sudini[2], A. Geetha[3], K. Ravinder Reddy[1], 1=College of Horticulture, Rajendranagar, Sri Konda Laxman Telangana State Horticultural University, Hyderabad, 2=International Crops Research Institute For the Semi-Arid Tropics, Patancheru, Hyderabad, 3= Regional Agricultural Research Station, State Agricultural University, Palem, Nagarkurnool district,
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Background & Objectives: Dolichos bean is an important legume crop and best grown for fresh green pods used as vegetable and dry seeds for preparations of various dishes. The green pods contain vitamin A (864 IU), vitamin C (12.6 mg), protein (31.58%), iron (8.89 mg) and rich in calcium (78 mg). The dried seeds contain protein (40%), carbohydrates (20.04%) and fat (1%). The ripe seed contains high protein. The crop suffers losses in the field as well as in the storage. The bruchid or infested pulses are rendered unfit for consumption because of the presence of excreta and metabolic waste products like uric acid which leads to fungal infection of the grains and

loss of protein and carbohydrate content. The triple layer Purdue Improved Crop Storage (PICS) bags provide excellent protection. **Materials & Methods:** Two Factorial Completely Randomized design with three replications for 6 months. Factor 1 - Types of storage bags (jute bag, polythene bag, PICS (Purdue Improved Crop Storage) bags, jute bag treated with insecticide. **Factor 2 -**Three storage durations 2,4 and 6 months. **Result:** After every 2, 4 and 6 months interval of storage period, in triple layer PICS bag the protein content (%) (38.917, 38.50 and 37.76) and carbohydrate content (%) (19.37, 19.26 and 19.24) respectively were high and less loss in nutrition content was observed in triple layer PICS bag compared with initial nutrition content and other traditional storage practices like jute bag, polythene bag, jute bag treated with insecticide. **Conclusion:** Insufficient intake of proteins and carbohydrates in our diet may leads to malnutrition. Dolichos bean crop is best grown for fresh green pods used as vegetable and dry seeds for preparations of various dishes and the other plant parts as fodder for livestock. It is one of the most popular perennial vegetable crop in India. Ripe dried seed is rich in protein content. Intake of Dolichos bean as a pulse can solve insufficient protein and carbohydrate intake problem. Bruchid attack which once attack cause 100% loss cause loss of valuable nutrition in the seeds. PICS bag is a chemical free hermetic storage practice to store the highly nutritious dolichos bean seed and protect the seed from bruchid infestation which on attack cause unfit for consumption and loss of nutrition in the seed. PICS bag causes airtight condition in the bag and stops the activity of biotic organisms that cause damage to produce and maintain the quality of the dolichos bean seeds. **Keywords:** Dolichos bean, PICS (Purdue Improve Crop Storage), Bruchid.

PPCN-50 EFFECTIVENESS OF NUTRITION EDUCATION ON KNOWLEDGE, ATTITUDE AND PRACTICES OF MOTHERS OF ACUTE MALNOURISHED CHILDREN (6-24 MONTHS) IN ANGANWADI CENTERS OF DELHI, INDIA. ***Yamini gusain,*** Dr. Lalita Verma, Dr. Mansi Chopra, Lady Irwin College, University of Delhi, Email:- yaminigusain95@gmail.com.

Background & Objectives: Appropriate infant and young child feeding practices (IYCF) are pre-requisite for optimal growth and development of children. This study aims to assess the IYCF practices of mothers' and administer IYCF counselling on mothers' of acute malnourished children (6-24 months) in Anganwadi Centres (AWCs) as an intervention. **Materials & Methods:** A community-based cross sectional study was conducted in 5 zones of Delhi; North (Madipur), South (Badarpur), West (Hastsal), East (Shakarpur) and Centre (Nabi Kareem) from October 2017 to March 2018. Weight, length and Mid Upper Arm Circumference (MUAC) of children (n=250) were measured and weight for height Z scores (WHZ) were computed with the help of WHO Anthro Plus software. Children were categorized as acute malnourished if WHZ<-2SD and/or MUAC <125mm. Knowledge, attitude and practices (KAP) of mothers on IYCF were assessed using a pre-tested interview schedule. Nutrition education with the help of flipbook providing information on early initiation of breastfeeding, importance of breast feeding, when to initiate complementary feeds, types of complementary foods to be given for the management of acute malnutrition (developed by Government of India) and recipe book which included low cost and easy to prepare recipes like poshtik khichdi, poshtik cheela, nut laddoo etc. (developed during the course of the study) was used to deliver counselling to mothers of acute malnourished children (n=50). **Result:** The prevalence of acute malnutrition among 250 children aged 6-24 months (250) in Delhi was reported as 44.4% from the present study. On assessing pre and post KAP of mothers and applying McNemar test, the results revealed that the gain in KAP among mothers were statistically significant ($p<0.05$). Significant improvement was seen in the KAP of the mothers regarding all the important aspects of IYCF like exclusive breastfeeding till 6 months (52 vs. 96; $p<0.001$), importance of breastfeeding till 6 months(10 vs. 92; $p<0.05$), reason to start complementary food (30 vs. 94; $p<0.001$), appropriate consistency of complementary food (42 vs 88; $p<0.001$), knowledge about increasing dietary diversity of meal (84 vs. 100; $p<0.001$) and how to encourage child to eat food (52 vs. 100; $p<0.001$). Mothers also remembered the recipes demonstrated and practice them at home for their infants. **Conclusion:** The study demonstrated that appropriate intervention in the form of nutrition counselling prove out to be instrumental in improving mother's KAP related to infant feeding. **Keywords:** Acute malnutrition, Infant and Young feeding practices, Knowledge Attitude Practices.

PPCN-51 ARRIVING AT MID UPPER ARM CIRCUMFERENCE CUT-OFFS FOR SCREENING OF ACUTE MALNUTRITION AMONG CHILDREN 6-24 MONTHS OF AGE. ***Yamini gusain,*** Dr. Lalita Verma, Dr. Mansi Chopra, Lady Irwin College, University of Delhi, Email:- yaminigusain95@gmail.com.

Background & Objectives: Mid upper arm circumference (MUAC) is popularly used as an alternate method of screening under 5 children with acute malnutrition. The present study aims to compare WHZ score and MUAC as screening criteria for acute malnutrition among children (6-24 months) in Anganwadi Centres (AWCs) of Delhi. **Materials & Methods:** The data of the present study was collected from 5 zones of Delhi; North (Madipur), South

(Badarpur), West (Hastsal), East (Shakarpur) and Centre (Nabi Kareem) from October 2017 to March 2018. 250 children aged 6-24 months were screened for acute malnutrition using WHZ score and MUAC. With the help of Anthro Plus software WHZ scores were computed. Cutoff of WHZ<-2SD and/or MUAC <125mm was used to screen acute malnourished among children. To determine the power of MUAC to predict acute malnutrition, ROC curves were drawn against WHZ scores. Sensitivity and specificity of various MUAC cutoffs was calculated and the cutoff with highest Youden Index was derived. **Result:** From the total of 250 children for whom data was available, 48.4% were male. Mean MUAC was 133.9 mm (range: 110 mm-159.5 mm). The prevalence of acute malnutrition as indicated by MUAC (<125mm) was 14.8%. In comparison the prevalence of acute malnutrition as indicated by WHZ score (<-2SD) was higher (41.2%). The current cutoff of MUAC for diagnosing acute malnutrition compared poorly to the same category as defined by WHZ score with Kappa 25% (p value = 0.053). Area under the curves (AUC) were calculated and showed an optimal MUAC cutoff to detect acute malnutrition (WHZ<-2SD) at 130.3mm (AUC= 0.993) with a sensitivity and specificity of 70.9% and 89.1% respectively. **Conclusion:** The present study showed that on applying ROC curves, the MUAC cutoff to detect to detect acute malnutrition came out to be higher than the cutoff which is in use currently (125mm). Hence, we must reconsider this cutoff so that children requiring medical attention and nutrition care support are not missed. **Keywords:** Acute malnutrition, WHZ score, MUAC, ROC curves.

PPCN-52 IMPACT OF NUTRITIONAL EDUCATION PROGRAM ON PREGNANT WOMEN IN MUMBAI SLUMS. ***Nandita Sanat Dhanaki[1],*** Shivshankar Timmanpyati[2], 1=BJ Wadia Hospital for Children, Mumbai, Cuddles Foundation, 2=Food Service and Clinical Nutrition, Tata Memorial Hospital, Mumbai, Email:- nandita@cuddlesfoundation.com.

Background & Objectives: Malnutrition in pregnancy not only affects the expecting mother but intensely affects her fetus; as insufficient nutrient supply and reserve from womb itself, may lead to fetal growth retardation. On birth, infant's growth and development will be hampered due to pre-existing malnutrition, a most prevalent phenomenon in our country. By educating importance of maternal nutrition and spreading awareness through Nutritional Education Program (NEP) to the target group, high prevalence of infant malnutrition can be prevented. **Materials & Methods:** NEP was conducted for enlisted pregnant women at Integrated Child Development Service Program (ICDS) Anganwadi centers. 70 subjects were selected out of which group 1 (n= 35) were uneducated and group 2 (n=35) were educated, (ranging from 5th to 12th standard). A pre-questionnaire and post questionnaire was used to collect data about nutritional awareness and food habits; by interviewing subjects individually before and after NEP, to analyze the impact of NEP. **Result:** Mean age of the pregnant women were 25.81±4.3 years. For 71.4% of women, it was 2nd and 3rd pregnancy. 51.4 % women didn't have any source of nutritional advice; remaining 48.6% women didn't have authentic source of nutritional advice. 60% women didn't consume breakfast daily. 57.1% of women consumed junk food more than twice a week; out of which 77.5% belonged to group 1. Only 34.3% women consumed milk and milk products more than twice a week. Awareness on household dietary sources of protein, calcium and iron were nil or incorrect, which after NEP improved in both the groups by significant difference ($p < 0.05$). In group 1, 22.8% were still not convinced that breakfast is important post NEP; in group 2, 100% agreed that breakfast is important post NEP ($p=0.0009$). **Conclusion:** NEP can significantly improve nutritional awareness among pregnant women and play an crucial role to hamper the vicious cycle of malnutrition. **Keywords:** Nutritional Education Program, Malnutrition, Pregnancy

PPCN-53 ASSESSMENT OF NUTRITIONAL STATUS OF 1-3 YEAR OLD CHILDREN IN ASSOCIATION TO FEEDING AND WEANING PRACTICES. ***Charu Maheshwari,*** Email:- charumaheshwari09@gmail.com

Background & Objectives: Globally it is estimated that malnutrition is an underlying cause for infant's death. Inappropriate feeding practices are major contributory factors for malnutrition in young children, especially among the under fives. The anthropometric measurement is a powerful tool that provides assessment of nutritional status. The study was undertaken with a major objective to study the nutritional status of infants in relation to feeding practices. **Materials & Methods:** The present study was a cross-sectional descriptive study, comprising 821 mothers and 868 children. The feeding practices were assessed by administering the self structured questionnaire. The anthropometric nutritional status was assessed by the indices height-for-age (HFA), weight-for-age (WFA), weight-for-height (WFH), according to WHO standards. **Result:** In present study, about 21.8% of children in 1-3 years of age group were severely underweight and 18.09% were moderately underweight. Similarly, 42.86% and 21.31% children were found severely and moderately stunted (low height for age) respectively. The present study revealed that about 26.96% and 17.82% of boys from our study population were severely and moderately underweight respectively. In girls, we found 14.46% and 18.38% were severely and

moderately underweight respectively. In present study, we also found age group and gender differences between no anthropometric failure and CIAF. There were significant relationships between under-nutrition (underweight, stunting and wasting) with reasons for prolonged breastfeeding and information about breastfeeding. No significant association among under-nutrition and reasons for cessation of breastfeeding, initiation of breastfeeding, discarding colostrum and type of first feed practices was found. Frequency of baby feed per day (in 12 – 24 months babies) was significantly associated with malnutrition In underweight children of 12 – 24 and 24 – 36 months age group, frequencies of three time baby feed per day were very low (1.12% and 3.13% respectively). Similarly, frequency of baby feed per day (in 24–36 months children) was significantly associated with under-nutrition. **Conclusion:** The findings from the study revealed that inappropriate feeding practices were the major cause of under nutrition in poor rural settings **Keywords:** Breastfeeding, , weaning, under-nutrition, anthropometric, CIAF.

PPCN-54 Ashwini H- withdraw

PPCN-55 HEAVY METAL CONCENTRATION IN COMMONLY CONSUMED FOOD ITEMS IN BAREILLY CITY, UTTAR PRADESH. ***Deepali Sharma,*** Aditi Rikhari, Gita Bisla, Department of Food Science and Nutrition, Banasthali Vidyapith, Rajasthan, Email:- jgdsharmad13792@gmail.com

Background & Objectives: Heavy metals are important environmental pollutants and their presence in atmosphere, soil, water and in food chain can cause a number of diseases to living beings; especially renal, cardiovascular, neurological and bone diseases. Generally food stuffs are contaminated with nickel (Ni), cadmium (Cd), arsenic (As), mercury (Hg), aluminium (Al), lead (Pb). The objective of the research was to determine the concentration of heavy metals in selected food items, commonly consumed foods by the population of Bareilly city. **Materials & Methods:** A dietary survey was conducted in selected 50 households to list out the most commonly consumed food items. Food samples were analyzed for five different heavy metals viz. As, Al, Cd, Pb, Hg. Two samples from each five food groups were taken from the local shops of four different areas in 2017-2018 (November-February). Atomic Absorption Spectrophotometer methods were used for the estimation of heavy metals. The concentrations were compared with those of safe limits of various legislations. **Result:** The results showed that the concentration of Al, As, Cd, Pb and Hg were higher in spinach, whereas Cd, Pb and Hg levels found to be higher in tomatoes. The concentration of Hg was also found above the safe limit in cabbage. Further dairy milk sample was found contaminated by As, Pb and Cd; and concentration of Hg and Pb was recorded exceeding the permissible limit in drinking water. While concentration in other food samples were found lower than the recommended safe limits. **Conclusion:** The samples containing higher amounts of metals should be avoided in diet and regularly monitored to avoid the health risk among human. The study concludes that atmospheric depositions and selling systems of crops play a significant role in elevating the levels of heavy metals in food stuffs causing possible health hazards to consumers of locally produced foodstuffs **Keywords:** heavy metals. Contamination

PPCN-56 SENSITIVITY AND SPECIFICITY OF MID UPPER ARM CIRCUMFERENCE IN THE IDENTIFICATION OF SEVERE ACUTE MALNUTRITION IN CHILDREN OF RAICHUR. ***Madhu Mitha M,*** Shaheena S, Franciosalgeo G, Tinku Thomas, Anura V Kurpad, Sumathi Swaminathan, St. John's Research Institute, St John's Medical College, Koramangala, Bangalore ,Email:- madhumitha.m@sjri.res.in

Background & Objectives: In India, both weight-for-height/length Z (WHZ) scores and mid-upper arm circumference (MUAC) are used for screening of severe acute malnutrition (SAM) in the community. We aimed to evaluate MUAC against the WHZ (as a gold standard) cut-offs for identification of SAM. **Materials & Methods:** Children from urban and rural areas in Raichur taluk were screened for presence of SAM. To identify children with SAM, height in centimeters, weight in kilograms and MUAC in centimeters were measured. A cut-off of WHZ below - 3 SD and a MUAC of below 11.5 cm was used to define SAM. Sensitivity and specificity of MUAC was tested against the WHZ score. **Result:** In total, 179 children were screened in the community mainly through the anganwadis out of which 79.9% and 21.8% were identified as SAM with MUAC and WHZ scores respectively. About 82% of the children identified as SAM were also stunted. Sensitivity of MUAC was at 100% indicating that all children with SAM identified using WHZ were correctly identified although the specificity was low at 25.7 % indicating that lesser number of healthy children were correctly identified. The positive predictive value was 27.3% indicating that fewer children identified as SAM using MUAC were true positives and the negative predictive value was 100% indicating that the children being screened negative for SAM using MUAC truly were not

identified as SAM using the WHZ score. **Conclusion:** A larger number of children are likely to be identified as SAM using MUAC as a screening tool for SAM compared to WHZ score. This could lead to a higher burden on resources in treatment of SAM at the community level. However, further studies on using the two measurements simultaneously should be conducted across districts and states of India to understand whether the same findings are observed. **Keywords:** Severe acute malnutrition, Mid-upper arm circumference, Sensitivity.

PPCN-57 ASSESSMENT OF DIET QUALITY AND NUTRITIONAL STATUS OF PRESCHOOLERS BELONGING TO LOW AND MIDDLE INCOME GROUPS RESIDING IN DELHI. ***Chhavi Rohilla,*** Lady Irwin College Email:- chhavi170@gmail.com

Background & Objectives: Preschool age is a period of rapid growth with changing nutritional needs. The main objective of the present study was to assess and compare the diet quality and nutritional status of 3-5-year-old children belonging to low and middle-income groups. **Materials & Methods:** This was achieved using a pretested questionnaire on food habits, 24- hour recall repeated on 2 days for food and nutrient intake, dietary diversity questionnaire and anthropometric measurements of height and weight. The weights and heights of middle income group children were significantly better compared to low income group children ($p<0.01$). **Result:** According to BMI for age 79.6 and 72% children were normal from middle and low-income group respectively. There was a dual burden of malnutrition with 77% low income group children stunted and, 25% and 20% of low and middle-income children being at risk of overweight/obesity respectively. Children from middle income group had significantly higher dietary diversity scores as compared to low income group children ($p<0.01$). Dietary diversity score of children was significantly associated with their nutritional status ($p<0.001$). Nutritional knowledge was significantly high in middle income group mothers than in low income groups ($p<0.05$).The mean adequacy percent of food group intake were significantly higher for all food groups in middle income group as compared to low income group ($p<0.01$).Further, the mean percent nutrient adequacy for all nutrients was inadequate (<75% of RDA) in children from low income group whereas for middle income group children mean energy, protein, calcium and Vitamin C intake was adequate. However, vitamin A and iron intake in both the income groups was grossly inadequate. **Conclusion:** There is a need for appropriate behavior change communication strategy, involving all stakeholders, to improve dietary diversity especially intake of protective foods like vegetables and fruits to improve intake of micronutrients. **Keywords:** preschoolers, nutritional status, low income group, middle income group

PPCN-58 Factors Influencing Physical Growth and Attainment of Menarche among School Girls. ***Dr. Saraswati Hunshal,*** Krishnapriya Sahoo, HDFS, AICRP, University of Agricultural Sciences Dharwad, Email:- hunshal2@gmail.com

Background & Objectives: Adolescence is one of the most challenging periods in human development because of the hormonal, psychological, cognitive and physical changes that occur simultaneously with emotional, social dimensions. As is it true at all ages, there are individual differences in physical changes. This period is characterized by physical growth spurt and attainment of menarche which has greater influence on the behavoiur and attitude of girls. In spite of influence of heredity and environmental factors on physical changes during adolescence among girls due to secular trend in the attainment of menarche all over the world, there is a need to understand the current status of physical growth among urban and rural adolescent girls. The present study aimed to understand the nutritional status, physical growth and attainment of menarche and factors influencing among school girls. **Materials & Methods:** The sample for the study comprised of girls in the age group of 9-15 years, studying in urban and rural schools of Dharwad district of Karnataka and Khurda district of Orissa State. Totally 384 girls studying in 5th - 10th Std were selected from two urban and two rural schools from each district. Age specific nutritional assessment of girls was calculated using weight for age and weight for height as per Waterlow classification (Bamji et. al., 2003). **Result:** The study found that more number 68 per cent of girls from both regions were malnourished. Among different categories of malnutrition, more number (29.43%) of girls were found in short duration malnutrition category closely followed by long duration malnutrition (26.82%). Further, more number of girls from Dharwd were noticed in long duration malnutrition while more number of Khurda girls were found under normal nutritional status. Further, urban girls from both areas had better nutritional status compared to rural girls. **Conclusion:** Nutritional status, food habits and participation in sports activities of the respondents had significant influence on their physical growth status. Further, girls with normal nutritional status and non-vegetarian food habits attained menarche at earlier age. **Keywords:** Physical growth, Nutritional Status, Menarche.

PPCN-59 JUNK FOOD AND NUTRITION INSECURITY AMONG CHILDREN AND ADOLESCENCTS IN KOLKATA. ***Binata Nayak,*** Dept of Home Science (Food & Nutrition Division) University of Calcutta 20 B Judges Court Road Kolkata-700 027,Email:- binata_nayak@yahoo.com

Background & Objectives: Rapid population growth and urbanization is increasing challenges to maintain food security. In this context, large multinational companies are coming forward to supply food to the whole world. They are supplying junk food items that have attractive packaging and good taste with very low nutritive value. These foods are getting popular due to time factor, taste factor and appealing advertisements. Specially, school aged children are getting addicted to these foods which is hampering their growth and development and are being vulnerable to non-communicable diseases. In developing countries, this has added double burden of disease creating new challenge to the health system. This increasing popularity is due to globalization and market liberalization in food marketing. The aim of study was assess the prevalence of junk food consumption and knowledge of adolescents regarding its ill effects and also factors contributing towards this public health concern. **Materials & Methods:** 100 boys and 100 girls from two schools in Kolkata, West Bengal (India) were selected by purposive sampling and students from class twelve were selected by disproportionate random sampling for the study. Data was collected using structured questionnaire. **Result:** Out of 100 boys 70% are consumed junk food 3-4 times per week. Fast food are the favorite junk food of them, where as candies are favorite for girls. Enjoying the taste is the main reason for choosing it and 78.5% adolescent had average knowledge about ill effects of junk food. But problem lies in the fact that they do not translate this knowledge in to good food behavior. **Conclusion:** To control the junk food consumption, huge capital expenditure in food marketing and false advertisement should be restricted. Meanwhile, effective health promotion activities will help to create awareness about dietary needs among general population. **Keywords:** junk food, health hazards, nutrition insecurity.

PPCN-60 INTAKE OF RESISTANT STARCH BY ADULTS RESIDING IN MUMBAI AND ITS ASSOCIATION WITH ANTHROPOMETRIC MEASUREMENTS. ***Madhuri R Nigudkar,*** Jagmeet Madan, Department of Food, Nutrition and Dietetics, Sir Vithaldas Thackersey College of Home Science SNDT Women's University, Santacruz, Mumbai, Email:- rvnigud@gmail.com

Background & Objectives: To estimate daily resistant starch (RS) intakes and to correlate resistant starch intake with anthropometric parameters in adults residing in Mumbai **Materials & Methods:** Cross sectional study design. Food intake data was collected from 220 working adults from Mumbai using '7 day food diary' method. Resistant Starch data base was created by analysing starchy food preparations that were frequently consumed by the participants. Height, weight, waist circumference and hip circumference of the participants were recorded **Result:** Wheat flour based ethnic preparations were found to be lowest in RS content. Millet bhakri, pressure cooked brown rice, pohe, semolina preparations, red gram, bengal gram and lentil preparations were relatively higher in RS content. Green plantain preparations showed the highest RS content. The daily RS intake by the study population was found to be 4.73 ± 1.22 g/d with men consuming 5.33 ± 1.32 g RS / d and women consuming 4.37 ± 0.98 g RS/d. Cereals and millets as a food group was the major source of RS in the diets of the study participants which contributed to 57% of the daily RS intake. Pulses and legumes were the second most important food group which contributed to 26% of daily RS intake, followed by tuber preparations. Daily RS intake did not show any correlation with any of the anthropometric parameters of the participants. However, the daily RS intake was positively correlated with energy and macronutrient intake suggesting that increased RS intake is associated with increased food intake **Conclusion:** The study highlights the significance of maximizing the intake of coarse millets, variety of pulses and plantain which are a part of inherent Indian diet to increase daily RS intake. The beneficial effects of resistant starch intake were however not evident in anthropometric measurements considering the limited intake of RS by the population **Keywords:** Resistant Starch, 7 day food diary, anthropometric parameters.

PPCN-61 Pragnya Priyadarshini Panda - withdraw

PPCN-62 FOOD AND NUTRITION SECURITY AMONG PRESCHOOL CHILDREN: AN ASSESSMENT OF OF RURAL ANGANWADI CENTRE OF ICDS. ***Manoj Kumar,*** Kusum Bharti, Dr. Pramila Prasad, Dept. of Home Science-Food & Nutrition,T.M. Bhagalpur .University, Bihar Email:- kumarmanoj9234@rediffmail.com

Background & Objectives: Food and nutrition security exists when all people at all times have physical, social and economic access to food, which is consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life. Millions of children suffer from food and nutrition insecurity resulting in undernutrition. Nutrition Security implies physical, economic & social assess to balanced diet, clean drinking water, safe environment & health care for every individual. Several programmes, missions and acts including a National Nutrition Policy (1993), National Nutrition Plan of Action (1995), and National Nutrition Mission (2018) have been launched with the time bond framing to achieve a goal for reducing malnutrition in India. Integrated Child Development Services (ICDS) is one of the most important scheme for the improvement of nutritional status of preschool children.The present study was aimed to assess to adequacy of Diet & Nutrition & its impact on the Nutritional Status of preschool children of rural AWCs of Bhagalpur & Banka Districts of Bihar. **Materials & Methods:** For this purpose 600 preschool children were randomly selected from AWCs to assess the diet intake and adequacy by 24 hours recall method, and calorie and micronutrient were calculated and compared to RDA. For the nutritional assessment anthropometry tools & WHO growths Standards (2006) were used. **Result:** Out of 600 children only 16% of the children were getting full diet, while 84 % were not getting full diet, of which 20% children were gating ½ diet compared to RDA, Protein Intake was only 16% compared to daily requirement. Minerals & Vitamins intake including Calcium, Iron, Iodine, Zinc, and Vitamin 'A' were less than 25% compared to daily requirement. Environment & Sanitation was poor in common. No single child was getting pure drinking water. Due to low intake of food & nutritional diet resulting 52% children undernourished in which 22% severely undernourished, and 48% were normal. **Conclusion:** It may be concluded that Food & Nutrition Insecurity leads to undernurtion in children. Food & Nutrition Security must be ensured through the ICDS and other National Nutritional Programmes for combating malnutrition in India. **Keywords:** Nutrition, under nutrition, Food Security, Micronutrient.

PPCN-63 CHARACTERIZATION OF DIETARY CALCIUM AMONG PREGNANT WOMEN AT BRUHAT BANGALORE MAHANAGARA PALIKE HOSPITAL, BANGALORE. ***Monisha S,*** Division of Nutrition, St. John's Research Institute, Bangalore Email:- monisha.s@sjri.res.in

Background & Objectives: Growing evidence suggests that calcium has a pivotal role in reducing pregnancy-induced-hypertension, pre-eclampsia and preterm-births. Indian National guidelines suggest a daily consumption of 1000mg during pregnancy. However, there is a dearth of data on the compliance to calcium supplements, as well as on habitual dietary calcium intakes. While the World Health Organization recommends a daily calcium intake of 1500-2000mg in populations with low-calcium intakes, the intakes in a low-middle-income-country like India, with diverse dietary intakes, range from 150-750mg/d (tatanin.org). There is a need for comprehensive characterization of diet intake especially during pregnancy, to guide provision of optimal counseling regarding supplementation and dietary sources of calcium. Therefore, this study aimed at measuring dietary calcium intake and its food sources among urban pregnant women at Bruhat-Bangalore-Mahanagara-Palike (BBMP) hospitals, Bangalore. **Materials & Methods:** A cross-sectional pilot-study was conducted in apparently-healthy pregnant women (n=259) attending routine antenatal-care at BBMP hospitals, within 20-weeks of gestation to assess their dietary patterns. At baseline; socio-economic status, obstetrics history, anthropometry and anemia were assessed. Dietary intake of various nutrients and food-groups were assessed using two-consecutive 24-hour diet recalls within the interval of 1-month.**Result:** The mean age of the study participants was 25 years, 61% had education upto high-school and 49.3% were anemic at recruitment. The median dietary calcium intake was 510.9mg/d. The dietary calcium sources were milk and milk products contributing to 45.5% followed by cereals and millets with 23.6%. Fruits, green-leafy vegetables, vegetables, meat and meat-products and others contributed to 8.2%, 8.0%, 5.4%, 1.9%, 7.4% respectively. Almost 50% consumed non-vegetarian diet in the form of eggs, fish, or meat and meat-products. **Conclusion:** Our data suggest that calcium intake is low during pregnancy, and that milk and milk products, cereal and millet were the major calcium-contributing foods. Dietary assessment during pregnancy is important and would help in planning supplementation guidelines during pregnancy. **Keywords:** Dietary calcium intake, food-groups, National guidelines.

PPCN-64 Sehar Siddiqui - Withdraw

PPCN-65 PREVALENCE OF ANEMIA IN PREGNANT LADIES IN RURAL AREAS THEMATIC AREA: COMMUNITY NUTRITION. ***Punita,*** Manav rachna international institute of research and studies, Faridabad,
Email:- punitagrak98@gmail.com

Background & Objectives: Background: Anemia in pregnancy is associated with increased rates of preterm delivery, maternal morbidity and mortality etc. **Objective:** 1. To estimate the prevalence of iron deficiency anemia among pregnant women. 2. To explore their knowledge, attitudes and practices about anemia. **Materials & Methods:** Two tools were designed for identifying anemia in pregnant ladies. **Questionnaire** - A specially designed questionnaire was prepared .It was divided into 3 main areas covering knowledge, attitudes and practices of pregnant women towards anemia. **Blood test**- Hemoglobin was assessed for all pregnant women using sahli haemometer. **Result:** A total of 32 participants completed the study. Out of 32,12 pregnant females were illiterate , while 14 and 6 had education up to class 10th and class 12th. All of them had visited public health center but only 19 of them were taking folic acid tablets regularly. Only 4 of the total pregnant females had hemoglobin above 11mg/dl. So, prevalence of anemia was 87.5% among the pregnant females of this region of rural Haryana. Out of these 6 women had mild anemia , 7 had moderate anemia , 11 had severe anemia and 4 had vere severe anemia according to WHO (2017). **Conclusion:** There is a significantly high prevalence of anemia among pregnant women in rural areas of Haryana. The study has also enlisted a few socio demographic factors that contribute to such high prevalence of this disease. Hence, it was concluded that a change of dietary pattern and supplements of iron is required to cure the deficiency of anemia. Thus, programmes focussed on target population need to be planned and implemented with active participation of locals. **Keywords:** Anemia, Prevalence, Pregnancy, Hemoglobin, Iron, Risk factors.

PPCN-66 A COMPARISON OF MACRO AND MICRO NUTRIENT INTAKE OF ADULT MEN WITH DIFFERENT DEGREES OF ABDOMINAL OBESITY. ***Archana Tewari,*** Kiran Bains, Dayadeep Kaur Grewal, Punjab Agricultural University, Ludhiana Email:- tiwariarchana587@gmail.com

Background & Objectives: Abdominal or visceral fat in comparison to subcutaneous fat is a matter of concern because it is a major determining factor in many health problems. The comparison of quantitative as well as qualitative intake of macronutrients of adult men with or without abdominal obesity might give insight into the role of each macronutrient in the development of abdominal obesity. **Materials & Methods:** One hundred and two volunteer male subjects (40-60 years) were divided on the basis of abdominal obesity (AO) into three groups - No abdominal obesity i.e. Grade 0 with waist circumference <94 cm; Abdominal obesity i.e. Grade I with waist circumference: 94.1 to 101.9 cm and Grade II with waist circumference: >102 cm. The nutrient intake was assessed by DietCal software from food intake recorded for three consecutive days. **Result:** The daily consumption of protein by the subjects with Grade II AO was significantly ($p \leq 0.001$) lower than the subjects with either no AO or Grade I AO. The carbohydrate: protein ratio varied between a narrow range of 3.48 to 3.69 among the three groups indicating high carbohydrate diets of all the subjects. Energy and fat intake of the subjects in all the groups was much higher than the recommended dietary allowances. The micronutrient intake of the studied group was fairly adequate, out of eight major vitamins, six were more than adequate or marginally adequate while the intake of calcium, iron, and zinc was adequate. **Conclusion:** The adult males in all the three groups had higher intake of protein, fats and energy. The protein intake per kg body weight was significantly lower in the subjects with grade II abdominal obesity, thus shows that higher protein intake is inversely related to abdominal obesity. The diets high in macronutrients may contribute to a good the of vitamins and minerals as well. **Keywords:** Macro nutrients, Micro nutrients, visceral fat, subcutaneous fat, Diet Cal.

PPCN-67 FOOD AND NUTRIENT INTAKE PATTERN OF 4-6 YEARS CHILDREN OF JORHAT, ASSAM. ***Urmimala Baruah,*** Email:- urmibaruah17@gmail.com

Background & Objectives: The present investigation was undertaken to study the food and nutrient intake pattern of 4-6 years children of Jorhat, Assam. **Materials & Methods:** 200 pre-school children in the age range of 4-6 years were selected randomly from four schools of Jorhat district of Assam. The food intake pattern of the respondents were assessed by using 24 hour recall method and food models by interviewing the mothers. **Result:** The results of the study revealed that the mean daily intake of cereals, fats and oils, sugar and jaggery, pulses, roots and tubers and fruits by the 4-6 years children were (91.58-95.41%), (89-90.8%), (79.25-89.15 %),

(79.83-83.33%), (79.45-74.45%) and (61.75-62.20 %) of the Balanced Diet Recommended (BDR) respectively. Nutrient intake pattern of the target children revealed that the mean daily intake of energy was (81.57-84.03%) of the Recommended Dietary Allowances (RDA), followed by protein (141.14-146.86%), fat (150.76-155.32%), ascorbic acid (63.8-67.47%), calcium (57.67-61.5%), iron (36.07-37.30%) and beta-carotene (32.74-34.49 %) of the RDA. **Conclusion:** The findings of the present study showed inadequate consumption of the green leafy vegetables, other vegetables and dairy food group by the target children, which is a matter of concern because poor intake of these food groups leads to shortfalls in the consumption of key vitamins and minerals which in turn may affect the growth and development during this period. **Keywords:** Food, Nutrient, Children, Growth, Development.

PPCN-68 CORRELATION OF ECONOMIC STATUS AND LEVEL OF NUTRITION KNOWLEDGE APTITUDE PRACTICES WITH NUTRITIONAL ADEQUACY AMONG ADOLESCENTS FROM PRIVATE AND GOVERNMENT COLLEGE STUDYING DIFFERENT STREAMS. ***Anupama J B[1],*** Anitha.C[2], Sushma B.V[3], 1= Bharthiar University, Coimbatore, 2=Department of Studies in Food Science and Nutrition, Karnataka State Open University, Muktagangothri, Mysuru, 3= Department of Water and Health â€“ Faculty of Life Science, JSS Academic of Higher Education and Research, Mysuru, Email:- anupama_suresh2000@yahoo.com

Background & Objectives: Adolescence is a transitional period which often begins with earliest signs of secondary sexual characteristics development due to the hormonal changes and ends when a person has achieved adult status. During this period the changes in lifestyles and food habit indeed occurs resulting in additional chances to expand healthy food choices options. In this back drop it was very interesting to understand the association of dietary habits, stream of subject opted and the nutritional status. Hence the present study was taken up with the objective to evaluate nutritional adequacy among adolescents from private and Government College studying different streams with respect to economic status and nutrition KAP **Materials & Methods:** 400 students studying in preuniversity colleges with Science (42%), Arts (15%) and Commerce (43%) stream aged between 17 to 19 years formed as study participants. Investigation was carried out with obtaining consent from subject using purposive random sampling technique. Required information was elicited using prestandardized checklists. **Result:** Findings reveal that a greater extent of students belonged to upper middle economic status. Higher proportion of students studying in Arts stream had less satisfactory food practices and nutritional knowledge compared to the students studying commerce and science streams (P <0.001). Majority of studentâ€™s BMI was below the normal range. Markedly the nutritional Knowledge, Attitude and Practice in relation to nutrient intake was significant (P= 0.001) among adolescents from private than government college adolescents studying different streams. Noticeably there was significant association of nutritional adequacy with family infrastructure. Evidently participants with better economic status had satisfactory KAP which reflected on their good nutritional adequacy. **Conclusion:** Hence forth to conclude, the data proves beyond doubt that nutrition interventions and education strategies to be necessary for promotion of nutrition adequacy among adolescents. Thereby appropriate nutritional support substantially could promote scholastic achievements among adolescents. **Keywords:** Adolescence, Dietary practices and nutritional knowledge, Nutrition interventions and education, Nutritional assessment.

PPCN-69 ELUCIDATING SENIOR CITIZENS' HEALTH THROUGH NUTRITIONAL PARADIGMS STUDIED AT TWO DIFFERENT TIME PERIODS. ***Vaibhav Rai,*** Deepali Dande, Rutwik R M Thengodkar, Cyanofarm Research Centre, Uttan Vanaushadhi Sanshodhan Sanstha, Keshav Srushti, Uttan, Thane, Email:- cyanofarm@gmail.com

Background & Objectives: This is a comparative nutritional study of two time periods (1960s & 2018) examining changes in food intake pattern and its effects on current health to identify factors responsible for it. Limited data is available in India particularly regarding senior citizen's nutrition. By 2050, elderly population of India is expected to rise up to 300 million. Nutrition and physical activities are two important factors constituting health and wellbeing of people. Since physical activities of senior citizens are generally limited, nutrition becomes the major parameter determining health. **Materials & Methods:** 53 elderly people residing in suburban Mumbai were identified by simple random sampling method with inclusion / exclusion criteria; for two time periods involving interview schedule / questionnaire in the form of Food Frequency Quantity along with Body Mass Index [BMI] computation. Database of 97 food items was compiled in form of calories and macro-nutrients. Recommended Dietary Allowances were computed based on age, lifestyle of individuals and were compared with actual consumption. The data was analyzed using Microsoft spread-sheet. **Result:** The results exhibits BMI of participants in 1960s were majority (59%) normal; 25% underweight while rest were overweight. Half of the participants were

consuming unchanged or more food quantity resulting in reduction from normal BMI 59% to 42% and underweight from 24% to 19% causing shift towards overweight domain that was earlier 17% to 40%. 43% of preobese people were diagnosed with diabetes while 57% of them were also hypertensive. **Conclusion:** This study indicates clear transition of participants from normal to overweight domain. Thus balancing diet according to their age is of prime significance. It is required to create awareness regarding this issue as it affects more than 10% of Indian population whose life expectancy will be increasing from 67 to 74 years. **Keywords:** changes in nutritional pattern, senior citizen nutrition, overweight, nutritional study.

PPCN-70 CONSUMPTION PATTERN OF FAST FOOD BY UNDERGRADUATE STUDENTS OF DAYALBAGH EDUCATIONAL INSTITUTE. ***Suman Madan,*** Dr. Richa Verma, Prof. Gul Mathur, Dayalbagh Educational Institute, Dayalbagh, Agra 282005, Email:- dr.sumanm@gmail.com

Background & Objectives: Fast food which is also termed as junk food is the food that is quickly prepared and served. These foods are high in calories but lacks in nutrients. Mostly college going students are involved in fast food eating due to increment in globalization, urbanization and commercial advertisement of fast food which are responsible for changing eating habits. Junk food are the cause of many metabolic disorders like obesity, cardiovascular disease and diabetes etc. thus it is essential to stick on balanced diet with variety of ingredients. Balanced diet provides all nutrients that help in maintaining proper intellectual development, good health and reducing the risk of development of systemic diseases. Thus, present study is planned to assess the consumption pattern of fast food by the university students. **Materials & Methods:** Simple random sampling method was used and 198 undergraduate students (68 boys and 130 girls) from Dayalbagh educational institute, Deemed to be university, Agra was included in the study. A structured questionnaire was self-administered to the university students. **Result:** Result of the study revealed that 25% students were not physically active, 53% students were having family history of systemic disease. 51% students regularly consume fried/high fat food in the form of kachori, samosa, pizza, chole bhture etc. whereas 48% occasionally consume fried or high fat food. 31% students regularly consume high sugar-based food like cold drinks, ice-cream, donuts, pastries and cakes etc. whereas 60% students occasionally consume high sugar-based food. 80% students revealed that taste of fast food is the sole reason for consumption of junk food. About 23% students was having adequate knowledge about effect of fast food consumption on health whereas 35% students have moderate knowledge and 42% students was having inadequate knowledge about effect of fast food consumption on health. **Conclusion:** Present study concluded that young adults are frequently indulging in consumption of fast food. Thus, it is necessary to create awareness about ill effects of fast food and benefits of balanced diet to the college going students. Balanced diet is essential for maintaining good health as well as prevention from developing non-communicable diseases. **Keywords:** Fast food, Junk food, nutrition knowledge, nutritional awareness.

PPCN-71 Jaya Krishna - withdraw

PPCN-72 NUTRITIONAL AND HEALTH STATUS OF HOUSEHOLD MEMBERS IN THE RURAL-URBAN INTERFACE OF BANGALORE. ***Vijayalakshmi D,*** Shilpa Yatnatti,(HAG),Department of Food Science and Nutrition, UAS, GKVK, Bengaluru, Email:- shilpayatnatti@gmail.com

Background & Objectives: Changes in the health and nutritional status results from fundamental changes in food consumption patterns and life style. Nutrition transition is causing increase in overweight and obesity and diet-related diseases. Bangalore is the capital city of Karnataka state, which is often referred to as “Silicon City” and has its growing urbanization influence on surrounding rural localities. Research team funded with DBT (Department of Bio-Technology) conducted study to evaluate nutrition and health status of household members in the rural-urban interface of Bangalore. **Materials & Methods:** From the Geo-coded identified areas, both from north (N=150 households) and south (N=150 households) Bangalore, 300 households comprising of rural, transition and urban area were selected. Standardized questionnaire was applied to elicit data on socio-demographic profile, morbidity status and prevalence of non-communicable diseases. Anthropometric measurements viz. height, weight, waist and hip circumference were taken to assess nutritional status of household members. **Result:** Maximum per cent of household’s members (39-43%) belonged to 20-40 years age group and studied up to secondary school (23-28%) across the gradient. Gender-wise distribution was observed to be same between male and female. Percentage of female household members with back ache, body ache and joint pain (over past 3 months at the time of data collection) was significantly more in rural whereas it was gastritis among urban. Prevalence of underweight was 17 per cent in rural north, which was observed to be high when

compared to rural south (11.3%). Among urban south residents, 29.2 and 8 per cent of them belonged to overweight and obese group respectively; however it was 19.8 and 6.3 per cent in urban north.There was non-significant difference in the prevalence of commonly observed non-communicable diseases (Diabetes =14-25% and Hypertension=17-22%)in the rural-urban interface of Bangalore. **Conclusion:** These findings indicate magnitude of prevalence of malnutrition and related non-communicable diseases prevalence across rural-urban gradient of Bangalore **Keywords:** Rural-Urban gradient, Socio-demographic, Nutritional status, Health status.

PPCN-73 NUTRIENT PROFILING OF ULTRA PROCESSED PACKET FOODS PREFERRED BY CHILDREN AND ADOLESCENTS IN THE INDIAN MARKET. ***Laishram Tombisana,*** Richa Pande, Dr. Bharati Kulkarni, National Institute of Nutrition (ICMR), Hyderabad. Email:-tombisanalaishram1994@gmail.com

Background & Objectives: Consumption of less-healthy ultra-processed packet foods and beverages by the children and adolescents is one of the major public health concerns. This study was done to conduct nutrient profiling of the ultra-processed packet foods (UPFs) preferred by the children and adolescents. **Materials & Methods:** This cross-sectional situational analysis included nutrient profiling of the ultra-processed packet food items preferred by children and adolescents using two nutrient profiling models: WHO SEARO nutrient profiling model and UK Ofcom nutrient profiling model. In all, 695 food packets were photographed and profiled by analyzing their nutrient labels. The food label data was collected from the supermarkets in Hyderabad and the online grocery stores. **Result:** Out of 695 products, only 70 (10.1%) products were found suitable to be marketed to the children and adolescents as per the WHO/SEARO cut-off nutrient profiling model and 150(22%) products were found to be healthy as per the UK/OFCOM nutrient profiling model. **Conclusion:** The study shows that most of the currently available UPFs that are preferred by children & adolescents are unhealthy and are not suitable to be marketed to the children and adolescents. The study indicates a strong need for nutrient profiling and regulations related to production and marketing of the UPFs in the country. **Keywords:** Nutrient profiling, ultra-processed foods, packet foods, HFSS foods.

PPCN-74 EXPLORING THE IMPACT OF SANITATION PRACTICES ON HEALTH ATTAINMENT: A STUDY AMONG SCHOOL KIDS IN 24 PARGANAS NORTH, WEST BENGAL. ***Avijna Ray,*** Purba Chaatyopadhyay, University of Calcutta , Department of Home Science, Food & Nutrition, Email:- avijnaroy@gmail.com

Background & Objectives: The increased burden of communicable diseases among school children duo to poor personal hygiene and inadequate sanitation conditions remains a concern on the public health agenda in developing countries. Given this background, in the present study the objective was to look into the demographic and sanitation profile and basic health parameters of these children and to see the impact of demographic variables and sanitation habit on the health parameters of the study population. **Materials & Methods:** A cross-sectional study was conducted in 2017 from randomly selected eight schools of four villages from the district of North 24 Parganas in West Bengal. The target study population includes student of both sexes of the age group of 9 to 11 years. Data regarding anthropometric measurements were taken as per guidelines of World Health Organization, socio demographic details and personal hygiene related data were collected using pretested standard questionnaire. **Result:** The result of the multivariate logistic regression analysis revealed that the boys had more probability of having morbidities (OR = 2.71, CI 2.15- 3.69 at 0.10 significance level) or being wasted (OR = 2.01 CI .15-3.69 at 0.10 significance level) and stunted (OR = 1.9 CI 1.36-3.18 at 0.10 significance level) than girls . As expected variables like open defecation a, washing hands with soap after toilet and using public toilets were correlated health outcomes. Children who had the habit of defecating openly had the highest probability of being stunted (OR= 2.57 CI 1.33-2.63 at 0.05 significance level). **Conclusion:** Future of the society depends on the health of its children. Considering the poor nutritional status and personal hygiene and sanitation practice related morbidities an intervention focusing on sustained personal hygiene education with greater involvement of parents will be more beneficial to the children. **Keywords:** Health, Hygiene, Morbidities, Sanitation.

PPCN-75 ROLE OF FOOD ENVIRONMENT ON FOOD AND NUTRITION SECURITY IN SCHOOL GOING CHILDREN (10-15 YEARS OF AGE) FROM SLUM HOUSEHOLDS OF VADODARA. ***Ankita Sharma,*** Department of Foods and Nutrition, Faculty of Family and Community Sciences, The Maharaja SayajiRao University of Baroda Vadodara. Email:-suneeta.chandorkar-fn@msubaroda.ac.in

Background & Objectives: The food environment is a major determinant of food choices and food and nutrition security among the population. The present investigation aimed at studying the role of food Environment on food and nutrition security in school going children (10-15 years of age) from slum households of Vadodara. **Materials & Methods:** From five zones of Vadodara city two were selected at random and 245 school going children 10-15 years of age from the slum households were enrolled for the study. A pretested questionnaire was used to assess the Food Environment (in and around the homes and at school) and Food and Nutrition Security. Dietary pattern and dietary intake data (24 hour recall method) were collected. Nutritional status was assessed through anthropometry. **Result:** Majority of the children (58-70%) were in the moderate and secure food and nutrition security category based on Individual Dietary Diversity Score. The prevalence of stunting was higher (77%) than thinness (54%) in the study population. Majority of the children (93%) received pocket money INR 5- 10) that they used for purchasing food from the street vendors. One third of the total calories were contributed by street food or food purchased from canteen. The food items sold near the residential area and in and around the school were bakery products, packaged foods and unpackaged processed foods, ready to eat foods and confectionery that were high in trans fat and calories from fat and sugar. However the mean percent RDA met for proteins, fat, β carotene, calcium, energy and iron was 88%, 84%, 20%, 29%, 63% and 69% respectively **Conclusion:** Attempts need to be made to promote healthy food environment and healthy food choices for improved food and nutrition security. **Keywords:** Food and nutrition security, Food Environment, Dietary diversity.

PPCN-76 ROLE OF SAFETY NET PROGRAMME (TARGETED PUBLIC DISTRIBUTION SYSTEM) ON FOOD AND NUTRITIONAL SECURITY IN ADULTS OF SLUM HOUSEHOLDS OF VADODARA. ***Ria Ahuja,*** Department of Foods and Nutrition, Faculty of Family and Community Sciences, The Maharaja SayajiRao University of Baroda Vadodara. Email:- suneeta.chandorkar-fn@msubaroda.ac.in

Background & Objectives: The Targeted Public Distribution System (TPDS) is the largest and longest running food safety net program in India. The present study aimed at evaluating the modified TPDS and examining its association if any with the food and nutrition security in the selected study population. **Materials & Methods:** Sixteen Fair Price Shops catering to the study population were selected and adult males (212) and females (245) from 245 households from slums of Vadodara using stratified random sampling. Data on Socio-Demographic profile, Individual Dietary Diversity, Anthropometric measures (weight, height, BMI), food and nutrition security (FNS) (availability, accessibility and utilization) and functioning of TPDS (functionary and beneficiary perspective) were collected. **Result:** Seventy five percent of the card holders had stamped ration cards of which 92% were utilizing TPDS. The TPDS were working during stipulated working hours indicating satisfactory availability dimension of FNS. Majority (94%) of the households walked to the TPDS indicating easy accessibility. The utilization of TPDS was highest by the subjects from second lowest income quartile thus providing food and nutrition security to the poorest of the poor. The mean IDD score were similar for well nourished and undernourished subjects indicating poor dietary diversity irrespective of nutritional status. TPDS users were more nutritionally secure than non TPDS users indicating that the money saved from buying subsidized grains was being utilized for purchasing foods from other food groups. The major barriers to utilization of TPDS were misclassification of cards (59% BPL households classified as APL) and poor quality grains due to poor storage facility thus jeopardising food and nutrition security. Under-weighment and over pricing were the common malpractices observed among the fair price shop owners. **Conclusion:** Rigorous implementation and monitoring of TPDS can go a long way in promoting food and nutrition security among vulnerable population. **Keywords:** Targeted Public Distribution System, Food and Nutrition Security, Dietary Diversity.

PPCN-77 INFLUENCE OF WOMEN'S STATUS IN THEIR FAMILY ON THEIR HEALTH AND NUTRITIONAL STATUS- CONSIDERING EMPLOYMENT AS A RIDER. ***Anees Fathima Thabassum .Z,*** Khyrunnisa Bagum, University of Mysore. Email:- aneesshazi@gmail.com

Background & Objectives: Background: Indian societies are principally male dominated, who have greater control over family decisions, and this causes subordination of women and their roles and status in the family and society. This restrains women in decision making in every sphere of life including those related to their health and mental well-being. Objective: This study aims to explore association between women's status in the family and its influence on their overall health and nutrition. **Materials & Methods:** Methodology: Educated women, 400 employed (EW) and 272 unemployed women (UEW); aged 25 to 40 years participated. Self-reporting standardized questionnaires were used to elicit information regarding their Degree of involvement in decision making and preference given in family to evaluate their status. Information on General health distress (GHD), Menstrual and Mental health, General health quality (GHQ) were also obtained. Height and weight were

measured. **Result:** Results: Significantly higher percentage (33%) of EW were involved in complete decision making (P<0.0001) and enjoyed good family status (P=0.036). Majority of women irrespective of employment and family status experienced mild GHD. EW with poor family status experienced significantly higher GHD (P=0.021). Severity of Pre-menstrual symptoms (PMS) significantly increased with decrease in family status (EW and UEW, p=0.0148 and p=0.0050). Family status also influenced mental health, significant differences were noted among EW (Depression-P=0.0007, Anxiety-P=0.0408, Stress-P<0.0001) and UEW (Depression- P<0.0001, Anxiety P=0.0018, Stress P=0.0308.Among EW family status exhibited significant association with GHQ, GHD, depression, Anxiety and stress. However among UEW significant association of family status with GHD, PMS, depression, Anxiety, Stress and BMI was evident. **Conclusion:** Conclusion: It is obvious that employment acts as a catalyst in enhancing women's status in the family, it can be considered as a prime factor determining their health status; overall wellbeing, unemployment and poor status in the family may have serious effect on the general and mental health of women. **Keywords:** women's status, Employment, decision making, general health, mental health.

PPCN-78 STUDY OF PATTERN AND PERCEPTION OF EXCLUSIVE BREASTFEEDING AMONG THE MOTHERS AND FACTORS AFFECTING BREASTDING IN POPULATION OF JABALPUR DISTRICT (M.P). ***Richa Singh,*** Rani Dugavati University, Jabalpur, Madhya Pradesh. Email:- richa609@gmail.com

Background & Objectives: Exclusive breastfeeding means that an infant receives only breast milk from his or her mother or a wet nurse, or expressed breast milk, and no other liquids or solids, not even water, with the exception of oral rehydration solution, drops or syrups consisting of vitamins, minerals supplements or medicines. But it has been observed that the practice of breastfeeding was not properly followed by mothers. Many children in developing countries like India die of nutrition related causes due to lack of nutrition education and poor feeding practices. The present study was conducted to assess the perception and evaluate the breast feeding practices followed by the mothers. **Materials & Methods:** Data was collected from 500 respondents who visited OPD of Pediatrics department in NSBC Medical College, Jabalpur, Madhya Pradesh. A pretested questionnaire was administered to collect data from the respondents. **Result:** Approximately 49.6% of mothers initiated breast feeding within the first hour after delivery and 28.4% of respondents gave pre-lacteal feed to infants in whom the most common feed was honey (52.11%). The majority of respondents (78.4%) were aware of exclusive breastfeeding. 79.6% of the respondents know the importance of breast feeding. Among participants who did not gave exclusive breastfeed after delivery, the most common milk preparation given other than breast milk was infant formula milk (49.07%) and cow milk (35.18%). Infant formula and cow milk were the most common products given other than breast milk. **Conclusion:** The study findings indicates that mother's educational status and type of family were significantly associated with exclusive breastfeeding. There is still lack of awareness regarding breast feeding among population of Mahakaushal region of Madhya Pradesh which can be improved by more intensive work by health care providers. **Keywords:** exclusive breastfeeding, pre-lacteal feed, early initiation of breast feeding, infant formula.

PPCN-79 A STUDY OF INFANT FEEDING PRACTICES AMONG MOTHERS IN URBAN LUDHIANA, PUNJAB. ***Jaspreet Kaur,*** Govt. College for Girls, Ludhiana, Rani Dugavati University, Jabalpur, Email:- jaspreet71k@gmail.com

Background & Objectives: INTRODUCTION: Infant feeding practices are important determinants of infant mortality and morbidity. Inadequate practices result in a significant nutritional decline and lead to infant and child malnutrition. **OBJECTIVES:** To investigate the infant feeding practices prevalent among mothers of infants a community-based, cross-sectional descriptive study was conducted in urban Ludhiana, Punjab. **Materials & Methods:** METHODS: A total of 320 mothers, with infants aged 6–24 months residing in urban Ludhiana were randomly selected and interviewed. The self developed, pre tested questionnaire was used for data collection **Result:** RESULTS: Out of 320 mothers interviewed, only 28% initiated breast feeding within one hour of birth. 27% of the infants received colostrums as their first feed whereas 70% of infants had honey as first feed. The infants receiving exclusive breastfeed under six months was 43% whereas 57% infants received complementary feeding at the age of 6–8 months 45.7% followed demand feeding pattern. 97% of the mothers were primary care givers. Fresh home cooked food was preferred by most mothers (96%). The complementary feed contained food items broadly prepared from cereals, pulses and milk. Very few mothers were giving green leafy vegetables (22%) whereas 56% mothers chose other vegetables to feed the children. 23.7% infants were given nutritional supplements. **Conclusion:** CONCLUSIONS: There is an urgent need to educate mothers regarding early initiation of breast feed, importance of colostrums and exclusive breast feed to improve the nutritional status of

infants and young children and reducing malnutrition. **Keywords:** infants, feeding practices, breast feed, colostrums.

PPCN-80 CONSUMPTION PATTERN AND INDIGENOUS TRADITIONAL KNOWLEDGE ON MEDICINAL PLANTS IN UPPER ASSAM. ***Sushmita Khatoniar,*** Mridula Saikia Barooah, Department of Food Science & Nutrition, Assam Agricultural University, Jorhat, Assam. Email:- sushmitakhatoniar@gmail.com

Background & Objectives: Assam is endowed in flora and fauna and a homeland of different medicinal plant species. Plants are being used as a mainstay of Indian medicines since time immemorial. These plants are very important sources of the diet in the rural areas of India, as they play significant role in food security, health and nutritional status of the rural population. Hence, the present study was undertaken to study the consumption pattern and traditional knowledge of medicinal plants in Upper Assam. **Materials & Methods:** The study was conducted in 120 households from 3 districts (40 households from each district) namely Jorhat, Golaghat and Lakhimpur. A pretested questionnaire was used to observe the parameters such as consumption pattern, traditional use of locally available greens. The amount of greens consumed was estimated using weighment method. **Result:** The consumption pattern of greens revealed that about 14.50 % of total households consume greens regularly, 48.20 % consume thrice a week and 23.70 % households consume once a week. The greens are mostly consumed as curry, sabji or as chutney. The average daily intake of greens was 26.46 g which is much below than the recommended intake. While assessing the traditional knowledge and practice of these greens as medicinal plants for treating various ailments, it was found that 42 different greens were being used for treating various diseases like gastro-intestinal diseases, hypertension, infections, fever, cough, diabetes, urinary disorders etc. **Conclusion:** Green leafy vegetables are treasure trove of micronutrients and also posses medicinal properties. Inventory and documentation of these traditional knowledge and practice is a pre-requisite for the development of Indian Ayurvedic medicine and also other pharmaceuticals. Awareness about these underutilized greens will help to combat micronutrient deficiencies along with its other health protective factors at community level. **Keywords:** medicinal plants, consumption pattern, ethno medicine

PPCN-81 THREAT OF DIABETES AMONG FARM WOMEN OF UTTARAKHAND TARAI. ***NaliniTrivedi***, Anuradha Dutta, Pushpa Shukla, Soni Tilara, Nivedita Prasad. Department of Foods and Nutrition, GB Pant University of Agriculture and Technology, Pantnagar, Uttarakhand-263145.Email:-n4nalinitrivedi@gmail.com

Background & Objectives: The global problem of diabetes has translated to 8.8% of the Indian population being diabetic. 7.1% of the Uttarakhand population is severely diabetic and 14.9% of the population moderately diabetic as per NFHS4 (National Family Health Survey). These values may not appear alarming but this is fast becoming a reason for concern. Women face more health problems than men. It was with this perceptive that the present study was undertaken to assess the prevalence of diabetes among the rural women in Udham Singh District of Uttarakhand. **Materials & Methods**: 105 respondents out of 428 women (aged 20 and above) selected through convenience sampling participated in the study in 2017-18. The study area was farm colonies of G.B. Pant University of Agriculture and Technology; Uttarakhand were studied in 2017-18. Background data was collected through a pretested questionnaire. Anthropometric measurements and fasting blood sugar was collected using standard tools. The collected information was statistically analyzed. **Result**: The results show that 41.90% of the respondents fell in the 36-59, late adulthood age group. 45.71% of the respondents were found to be obese (≥ 25) followed by 7.61% overweight (23-24.9), 33.33% who were normal (18-22.9), and 13.33% underweight (<18) respondents. The prevalence of diabetes was 8.57%, followed by 20.95% who were prediabetes. Chi square and correlation analysis showed positive significant association between age and diabetes whereas weak positive association was found between BMI and diabetes at <0.05 significance level. **Conclusion**: The study revealed prevalence of diabetes among rural agriculture women to be higher than NFHS data at state as well as national level. Age was found to be major significant risk factor for diabetes as compared to BMI (Body Mass Index). Thus the high prevalence of diabetes mellitus in rural agriculture areas of Uttarakhand needs community outreach interventions regularly for their early detection and proper health education to combat the increasing burden of diabetes. **Keywords**: Diabetes, Rural Women, Lifestyle.

PPCN-82 Samina Vora - withdraw

PPCN-83 NUTRITIONAL STATUS OF POSTMENOPAUSAL WOMEN OF JORHAT DISTRICT, ASSAM. ***Mansi Tiwari,*** Ruma Bhattacharyya, MridulaS.Barooah, Moloya Gogoi, PremilaL Bordoloi. Department of Food Science and Nutrition, College of Community Science, Assam Agricultural University, Jorhat, Assam.Email:- mansi4148@gmail.com

Background & Objectives: With advancement in medical science and other health care facilities, life expectancy has increased which resulted major part of life in menopause by women. The overall health and nutritional status of postmenopausal women is greatly influenced by their food intake and hormonal changes that occur during menopausal period. The present study aimed at assessing the nutritional status and health related problems of postmenopausal women of Jorhat, Assam. **Materials & Methods**: A total of 100 postmenopausal women were assessed for nutritional status taking height and weight of the individual and comparing calculated BMI with standard BMI classification. The information on socio-economic status, food consumption pattern, age at menopause and medical condition were assessed with the help of a pre-tested interview schedule. **Result**: The study revealed that 12.00, 46.00, 36.00 and 6.00 per cent of the population were underweight, normal, overweight and obese respectively. Majority of women of study area (54.00%) attained menopause at early age i.e. between 40-45 years. 78.00 per cent population were non-vegetarian while only 22.00 per cent were vegetarian. It was also observed that 32.00 per cent population skips breakfast regularly. The mean nutrient intake/day of energy, protein, fat, carbohydrate, calcium, magnesium, phosphorus and iron were found to be 1718.79±491.00 Cal, 47.15±22.76 g, 42.67±12.11 g, 286.54±82 g, 479.36±358.08 mg, 116.25±68.7 mg, 519.68±239.72 mg and 13.02±6.87 mg respectively. Information on medical condition revealed that 48.00 per cent of population had bone disease (out of which 54.16 % had joint pain, 20.83% arthritis, 12.50 % osteopenia, 8.33 % osteoporosis and 33.33% had experienced fracture), 32.00 per cent had diabetes, 18.00 per cent had hypertension, 36.00 per cent had migraine, 45.00 per cent had gastric ulcer, 9.00 per cent had asthma and 4.00 per cent had liver disease. **Conclusion**: The study concludes that the postmenopausal women were nutritionally vulnerable with various health related problems and this calls for special attention to initiate measures for improvement of health and nutritional status of this age group.**Keywords**: Menopause, postmenopausal women, nutritional status, food intake, mean nutrient intake, health

PPCN-84 Development of low cost weaning food to combat malnutrition at individual level.***D.Pushplata,*** PG Deptt. Of Home Science, Kolhan University, Chaibasa, Jharkhand. Email:- lata123sai@gmail.com

Background & Objectives: Infancy is the most important stage of human childhood.There are several types of supplementary foods which are being marketed in India but they are quite expensive and are beyond the purchasing power of the parents belonging to lower middle and lower income groups. Hence there is need to develop the supplementary foods which can be prepared at home at low cost. The present study was undertaken with the objective of developing low cost weaning food for infants. The hypothetical assumptions say that it is possible to create a new product at household level which will be equal or more nutritious and cheaper than readymade weaning foods.**Materials & Methods**: The present research work was carried out in PG Department of Home Science, Kolhan University, Chaibasa, Jharkhand..A low cost weaning food "Dalia" was devised which was prepared with Ragi. Parboiled rice, Mung dal, Wheat, Ground nut and White Til.After roasting, three types of products that is Halwa, Porridge and Khichdi were prepared. These foods were subjected to sensory and nutritional evaluation. The proximate composition was determined and sensory evaluation was done by a panel using nine point hedonic scale system. The product was compared nutritionally and cost wise with readymade weaning foods**Result** : The results revealed that the Calorie and Protein content of "Dalia" Is very high in comparison with readymade foods "Cerelac"and "Nestum" .Sensory evaluation showed a very good acceptability levels and the cost of "Dalia" calculated was found to be much lower than the readymade foods.**Conclusion** : On the basis of all findings it was concluded that "Dalia" could be considered as the best weaning food from nutritional, sensory and cost point of view which could be easily prepared at household level.**Keywords**: Infancy,Weaning,Childhood,Proximate Composition.

PPCN-85 ELUCIDATING HEALTH PERCEPTION: THE SOCIO-ECONOMIC AND ECOLOGICAL INTERPRETATION.***Rama Das[1],*** Prof. Sankar kumar Acharya[2]. 1=Barrackpore Rastraguru Surendranath College, 2=Bidhan Chandra Krishi Viswavidyalaya.Email:- ramadasbpd@gmail.com

Background & Objectives: In a conventional way, we consider health and nutrition as consequent to the process in which food is consumed and calorie is entering the metabolic function. The general health and hygiene are

suffering from stereotypes. Very few can understand or do realize the process of managing health and nutrition is basically a function of perception and product of active learning. **Materials & Methods**: The study was conducted in some semi-urban area of West Bengal and comprised of 194 respondents, i.e., school going teenage girls in age category of 10-19 years. 28 Independent variables have been selected for this study. **Result**: The following variables i.e. age, education, parent education, total monthly family income, distance from home to school, BMI, total calorie and protein from diet have been found significantly correlated with a hygiene perception. From stepwise Regression Analysis it has been found that better health perception has built up by mother's education. Family income has also been a good indicator for health perception. **Conclusion**: The present study has considered the school going teenage girls, the most crucial psychosomatic status of life to elucidate their general health, perception. In a unique socio-ecological context and dynamics. The social ecology of instrumental network, physical distance of school, the demographic psychic, socio-economic character like education, income etc. are relegated to its interpretation of health perception. **Keywords**: Health perception,Teenage Girls, Socio-economic character, Body weight, BMI, Calorie in diet.

PPCN-86 PREVALENCE OF MENOPAUSAL SYMPTOMS AMONG POST-MENOPAUSAL WOMEN IN KOLHAPUR CITY, MAHARASHTRA.***Shukrani Chetan Shinde***.CNCVCW, CSIBER, Kolhapur-416004, India.Email:- shuks_6584@yahoo.co.in

Background & Objectives: To assess prevalence of menopausal symptoms among post-menopausal women in Kolhapur city of Maharashtra. **Materials & Methods**: purposive sampling method. Setting: 300 post-menopausal women between the age group of 50-59 yrs. were selected from Kolhapur city. Tool: Self-structured questionnaire comprising socioeconomic status, anthropometric, body composition, and clinical assessment was devised. **Result** : The mean age of the participants was 54.51 ± 4.90. The majority of the post-menopausal women in all the categories were married and housewives having natural menopause. The mean age (yrs.) of menopause of was 44.24 ± 5.71. 1/3rd of study population were hypertensive with mean systolic blood pressure (mm of hg) of subjects was 132.6 ± 23.29 and mean diastolic blood pressure (mm of hg) was 83.76 ± 11.18, which are considered as Stage I Hypertension (AHA, 2017). Mean weight (kg), body mass index (kg/m2) and mean WHR of study population was 63.97 ± 13.01, 27.64 ± 4.43 and 0.90 ± 0.15, respectively. Body composition of selected post-menopausal women shows that mean total body fat (%) was 41.52 ± 9.27 and mean visceral fat was 8.67 ± 2.3. Most of the post-menopausal women suffered from hot flushes, night sweats, palpitation, insomnia, loss of memory, poor concentration, tiredness, anxiety, depression, irritability, mood swings, frequent headaches, frequent urination, constipation, joint pain and weight gain after menopause.**Conclusion** : Anthropometric measurements shows that selected post-menopausal women were obese. 1/3rd of study population was hypertensive with BP at Stage I Hypertension. The severity of symptoms of menopause was distressing in these selected postmenopausal women. **Keywords**: Menopausal symptoms, Post-menopausal women, Body Composition.

PPCN-87 PREVALENCE OF MENOPAUSAL SYMPTOMS AMONG POST-MENOPAUSAL WOMEN IN KOLHAPUR CITY, MAHARASHTRA.***Priyanka Bhattacharyya***, Mamoni Das,RumaBhattacharyya.Food Science and Nutrition.
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Background & Objectives: Prevalence of hypertension is rising at an alarming rate among the tea plantation workers of Assam. Increased prevalence of hypertension among the tea community is attributed to faulty eating and lifestyle patterns. Lack of proper education and awareness among the community triggers the prevalence of hypertension and other cardio-vascular diseases. The study was designed to assess the dietary risk factors of hypertensive tea plantation workers. **Materials** & Methods: Hundred hypertensive tea garden workers were selected randomly, using the hospital records of the tea garden. Survey was conducted using a pre-tested questionnaire consisting of information on their socio-demographic, medical, lifestyle and dietary patterns. Body Mass Index (BMI) was calculated using Garrow's Classification. **Result**: Results revealed that cent percent of the population belonged to low income group, 46% were illiterates, 30% attended primary school, 16% attended school to 10th standard and only 8% were HSLC pass. BMI indicated 26% of the respondents were underweight, 12 % were overweight and 2% were obese. Eighteen per cent of the hypertensive respondents were diabetic, 21 % with CVD, 13% liver cirrhosis and 8% with gastro-intestinal disorders. Eighty seven per cent of the respondents had lifestyle habit of consuming alcohol,63% of the respondents used chewed tobacco, 62 % practiced smoking and 54 % practiced both chewing and smoking. Dietary practices that 88 % were non-vegetarian, 55% had 3 meals per day, 34 % had 4 meals per day that and 11 % had 2 meals per day. Ninety one per cent showed a high

consumption of salt of more than 5 g per day.**Conclusion**: It was observed from the study that the lifestyle patterns like consumption of alcohol, tobacco, smoking and high intake of salt and processed food were the risk factors associated with the onset of hypertension. Lack of proper education and awareness regarding hypertensive elevates the prevalence of the disease.**Keywords**: Hypertension, dietary, lifestyle, alcohol, tobacco, salt, risk factors, prevalence, education, awareness.

PPCN-88 A COMPARATIVE STUDY OF HEALTH STATUS AMONG STUDENTS AND SERVICE HOLDERS.***Shuchismita Behera*[1],** Smruti Prajna Panda[1] ,Jasaswini Tripathy[1],Subhalaxmi Mohanty[1] ,Sushree Lipsa Lopamudra Dwibedy[1] ,Dev Kumar Tripathy[1], Satyanarayan Parida[2], Gandham Bulliyya[2]. 1= Department of Zoology, Kendrapara Autonomous College, Kendrapara, Odisha.2= Regional Medical Research Centre, Indian Council of Medical Research, Bhubaneswar.
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Background & Objectives: The level of adult mortality risks is highest in east India. These deaths are due to improper dietary intake, sedentary life styles and occupational stress which are the causative factors for non-communicable diseases. Service holders and students constitute a major proportion of adult population. Medical research is one of the stressful occupations worldwide and students at their young adult stage experience more academic stress. The present pilot study aims at assessing nutritional status and disease risk of service holders in medical research and students pursuing graduation. **Materials & Methods**: It included 9 students age ranging from 19-23years and 16 service holders age ranging from 24-59 years. Socioeconomic and clinical data were collected by pretested questionnaires along with examination for clinical signs. Anthropometric data were collected according to WHO procedure. Estimation of haemoglobin, blood group, blood glucose and blood pressure were done using standard procedures. **Result** : The mean body-mass- index (BMI) and waist-hip ratio was found to be high among service holders (p=0.06 and 0.02 respectively). Mean postprandial blood glucose and mean energy, protein and carbohydrate intake were also high in this group although not significant. The underweight subjects were found marginally high where as abdominal obese subjects were found significantly higher among students (p= 0.01). The percentage of impaired glucose tolerance was found to be more among service holders both in terms of after and before blood glucose level with borderline significance (p =0.08 and 0.09 respectively). Persons having stage 1 hypertension were found only among service holders according to high diastolic blood pressure. According to clinical data chronic respiratory disorder was found to be more among students (p = 0.04). **Conclusion** : Present study reveals that service holders are at higher risk to obesity, hypertension, diabetes and anemia where as health status of students cannot also be ignored due existence of abdominal obesity, underweight and chronic respiratory disorder at significant higher level. **Keywords**: Students, Service-holders, BMI, waist-hip ratio, blood glucose, blood pressure, haemoglobin

PPCN-89 Archana P - withdraw

PPCN-90 Prevalence of hypertension among adults working in higher education. ***Sruthi Sreedhar*[1]**, Dr.A.Swarnalatha[2], D.Diji[3], Anitha rose[4].Dept. of Food Science and Nutrition, Nehru arts and Science College, Coimbatore Email:- sruthysreedhar5@gmail.com.

Background & Objectives: Hypertension, also known as high or raised blood pressure, is a global public health issue. The number of people with hypertension who are undiagnosed, untreated and uncontrolled are also higher in low- and middle income countries compared to high-income countries. Hence the study was taken to anlayse the blood pressure of the adults working in higher education and to study the prevalence of blood pressure among them. **Materials & Methods**: Arts and science college in Coimbatore district was selected for the study. Blood pressure assessment camp was organized in the selected college for the students. Blood pressure was measured using digital spigmonometer by the well trained health professional. Three readings were taken with 5 minutes interval and the average of three was noted as the individual blood pressure level. The blood pressure level was classified based on JNC VIII classification on hypertension. **Result**: Among 250 participants, majority (43.2 per cent) were in the age group of 31-40 years followed by 41-50 years (29.7 per cent) and 21-30 years (18.9 percent). It was observed that 27 per cent of female and 5.4 per cent of male were having normal blood pressure and 42 per cent of female and 24 per cent male recorded high blood pressure. Even 5.4 per cent of 21-30 years were having prehypertension. **Conclusion**: Hypertension is prevalent among adults working in higher education and it was found to be maximum during middle age group. **Keywords**: Hypertension, adults in higher education.

PPCN-91 Okram Abemsana Devi - Withdraw

PPCN-92 BEHAVIOUR CHANGE COMMUNICATION FOR NUTRITION SECURITY TO RURAL WOMEN OF BIHAR. ***PRIYANKA KUMARI***[1], Sarita Srivastava2. 1=Department of Home Science, G.B.M. College, Magadh University, Gaya, Bihar.2= Department of Home Science, B.R.A. Bihar University, Muzaffarpur, Bihar, India. Email:- kumari.priyanka.2004@gmail.com

Background & Objectives: Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food. Nutrition security means access by all people at all times to the adequate utilization and absorption of nutrients in food, in order to be able to live a healthy and active life. In Bihar 60.3 percent (NFHS-IV) women were anaemic and 30.4 percent women have BMI less than 18.5 (BMI>18.5) The aim of the study to improve the nutrition status of women by behaviour change communication towards dietary diversity **Materials & Methods**: A cross-sectional study was conducted on 400 women in the age group of 18-35 years) from Purnea district of Bihar. Participants were selected by incidental-cum purposive sampling. Anthropometric measurements(BMI was calculated using the formula: Weight (kg)/Height2(m)), Food frequency questionaire,24 hr diet recall and bio-chemically measurement were conducted by using standardized methodology as recommended by World Health Organization. Data were analyzed using computer software Microsoft Excel for windows and all results were evaluated statistically by applying the SPSSPC package (version 9.0, SPSS, Chicago, Illinois, USA.). **Result**: There was significantly increase in BMI from 18.05±.215 to 19.88±0.494 after 1 year of treatment (p≥.001). Majority of women (70%) had MUAC less than 21 cm ie19.92±1.394 and after treatment 21.6±1.174. There was significant improvement in level of haemoglobin from 8.77±0.824 to10.53±0.8354 (p≥ 0.001).There was great improvement in nutrition status of women. **Conclusion**: This study reflects there is great impact of BCC on consumption of locally and seasonal available food material focussed on diet diversity. Food production primarily for household consumption by various methods with minimum input and maximum output eg: Kitchen gardening, sack farming, Change in life style, focused on hygiene and sanitation. **Keywords**: Behaviour change communication, women, nutrition security, dietary diversity.

PPCN-93 PREVALENCE OF OBESITY AMONG HIGHER EDUCATION STUDENTS. ***K.Vignesh***,Dr.A.Swarnalatha,P.Gowsalya,P.M.Irshana.Dept.of Food Science and Nutrition, Nehru arts and Science College, Coimbatore
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Background & Objectives: Obesity is emerging as a serious problem throughout the world, not only among adults but also children, teenagers and young adults. Generally irregularity in diet, lack of exercise and addiction which is common among the college students were observed to be the independent factor leading to obesity. Hence the study was taken with the objective to study the anthropometric measurements of college students and to analyze the prevalence of obesity among the students.**Materials & Methods**: About 131 under graduate students including boys and girls in an arts and science college were selected for the study. Their anthropometric namely height, weight, Waist Hip ratio were measured and BMI was calculated using standard procedures. They were classified based on BMI classification and analysed. **Result** : Among the selected subjects, 39 per cent were boys and 61 per cent were girls in the age group 18 to 20 years. Compared to girls (39 per cent) majority of the boys (45 per cent) were having normal weight. But majority of the boys (47 per cent) were having underweight when compared to their counterpart. The prevalence of obesity was more in girls (21 per cent) in comparison with boys (6 per cent). 6 per cent of the girls were preobese where only 2 per cent of the boys were in the pre obese stage. **Conclusion** : The study revealed that obesity was more common among college going girls but under weight was more common among boys when compared to their counter parts. Both might be due to improper food habits. **Keywords**: Obesity, Higher education students.

PPCN-94 IMPACT OF NUTRITIONAL SUPPLEMENTATION ON THE NUTRITIONAL STATUS OF ADOLESCENT GIRLS. ***Sarita Srivastava***[1], Priyanka Kumari[2]. 1=Department Of Home Science, B.R.A.Bihar University, Muzaffarpur, Bihar, 2=Department of Home Science, G.B.M. College, Magadh University, Gaya. Email:- kumari.priyanka.2004@gmail.com

Background & Objectives: Adolescent girls are the most vulnerable section of population that constitute about one-tenth total population .Under-nutrition among adolescents is a serious public health problem , especially in India. In this context, the present study was taken up among early adolescent girls residing in the urban area of Muzaffarpur District, Bihar, India. The objective of the study is to assess the Nutritional status of the early adolescent and to study the Morbidity pattern among these adolescent girls in Muzaffarpur District of Bihar.

Materials & Methods: Cross-sectional study was carried out over a period of four months. 600 girls of age 13-17 years were examined during that period. Data was collected by interviewing the girls using predesigned, pre tested, semi-structured schedule. Anthropometric measurements were recorded using standardized methodology as recommended by World Health Organization (WHO). Body Mass Index (BMI) – BMI was calculated using the formula Weight in kg/height in m². The subjects were categorized into various grade based on BMI according to WHO International Standard. Data were analyzed by using SPSS 16.0 version. **Result**: A total 600 girls were studied. 37.4% were in the age group 13 years. According to WHO reference standards 56.4 % girls were under-nourished (BMI 23.5 kg/m2). 32.4% were showed clinical anaemia, 27.1% were having dental caries, 18.8 were having reproductive problem (Dysmenorrhoea), 16% were skin problem, 4 % Eye problem (defective vision).**Conclusion**: It is concluded that there is a high prevalence of under nutrition, dental caries and clinical anaemia among adolescent girls in Muzaffarpur District of Bihar. The present study calls for Health education and nutrition interventions to reduce the serious health problem on priority basis. **Keywords**: BMI, Thinness, undernutrition, Adolescent girls, Morbidity Pattern, dental caries, anaemia.

PPCN-95 DECLINING ENERGY EXPENDITURE AMONG MILLENNIALS: REVISITING THE DAILY ENERGY REQUIREMENT. ***Srishti Sinha***, Sarita Devi, Anura V Kurpad, Rebecca Kuriyan. Division of Nutrition, St. John's Research Institute, St. John's National Academy of Health Sciences, Bangalore, India. Email:- srishti.s@sjri.res.in

Background & Objectives: The daily energy requirement is based on the daily energy expenditure. Millennials are the next generation of adults in India, and their risk for chronic disease depends on their energy balance. It is thought that the Schofield equation overestimates the basal metabolic rate (BMR) in Indian adults by 5-12%; combining this with decreased physical activity energy expenditure (PAEE) among millennials leads to considerable error in estimating total energy expenditure (TEE). The present study aimed to measure BMR, PAEE and TEE in young adults (millennials) and to compare these with predictions based on weight and activity counters.**Materials & Methods**: A total of 20 male subjects (10 normal weight and 10 overweight), 18-20 years old, were recruited from student population of St. John's Medical College, Bangalore. The TEE of subjects was measured using doubly labelled water (2H2O-0.07 g/kg body weight and 18O-1.25 g/kg body weight) and urine samples were collected at baseline and post dose days-0, 7 and 10. The physical activity of the subjects was measured using tri-axial accelerometer (Actigraph, GT3X+) for 7 days. BMR was measured using indirect calorimetry.**Result**: From the preliminary results, the TEE of subjects (n=5) with average BMI of 19.28 kg/m2 was 1916±456 kcal/d (8.01±1.9 MJ/d) with BMR of 1524±105 kcal/d (6.37±0.43 MJ/d) and physical activity level (PAL) of 1.25±0.2. The physical activity energy expenditure as assessed by accelerometer was 284±108 kcal/d (1.18±0.45 MJ/d) with average step counts of 6672±1853 steps/d. The Schofield equations over-estimated the BMR of the subjects by 3.9%. When compared with RDA for Indian adults, the measured TEE was lower by 400 kcal/d. The data collection is ongoing and the results will be presented during conference. **Conclusion**: The data suggest that TEE among millennials is very low. Therefore, it is critical to revisit the daily energy requirement and physical activity recommendations for Indian adults to avoid positive energy balance and its consequences. **Keywords**: Total Energy Expenditure, Basal Metabolic Rate, Physical Activity Level, Daily energy requirement.

PPCN-96 APPLICATION OF HEALTH BELIEF MODEL TO ASSESS THE NUTRIENT INTAKE IN CHILDREN OF RURAL AREAS IN FARIDABAD. ***Pratima Singh1,*** Varsha Srivastava.Department of Nutrition and Dietetics, Faculty of Applied Sciences, Manav Rachna International Institute of Research and Studies, Faridabad, Haryana.
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Background & Objectives: Child malnutrition is a widespread public health problem in India as 35.7% children, under the age of 5years, are underweight (NFHS-4, 2017). In this purview, this study was conducted with the objective to assess and predict the health beliefs of parents, regarding the nutrient intake of their children in the age group of 1 to 5 years living in rural areas of Faridabad, Haryana. **Materials & Methods**: The aforementioned study was conducted among 100 parents, using a self-structured questionnaire, on a 5-point scale, which was based on health belief model[HBM]. It consisted of four constructs: perceived susceptibility (4questions); perceived severity (4questions); perceived benefits (5questions); perceived barriers (5questions). The anthropometric data and food consumption (using food frequency table) was also collected. Mean, standard deviation and percentage were calculated. **Result** : The mean age(in years) and the mean weight(in kg) were 3.18±1.21 and 14.41±3.67, respectively. The response under perceived susceptibility, showed that the parents believed that their children are mostly susceptible to the nutrient deficiencies (3.47±1.30) and under perceived severity, they believed that nutrient deficiency can lead to severe complications to their children (2.84±1.33). 61%

of the children were vegetarian although the parents were aware of the health benefits of the non-vegetarian foods (3±1.37). The availability of the nutrient rich food (2.9±1.59) and the cultural beliefs (2.9±1.59) were the main barriers to the lack of nutrient intake among the children. The food frequency table reflected that parents believed that feeding the children with certain foods like jaggery, ghee etc is sufficient enough to provide all the nutrients, irrespective of the quantity.**Conclusion** : The study concludes that in spite of the awareness of susceptibility and severity of nutrient deficiency the parents were unable to feed their children in prescribed amounts due to non-availability of food sources, cultural beliefs and misbeliefs regarding certain foods.**Keywords**: Health Belief Model, child malnutrition, nutrient deficiency

PPCN-97 Dr Pratibha Singh - Withdraw

PPCN-98 INCIDENCE OF METABOLIC SYNDROME IN URBAN ADULTS OF BANGALORE.
***Reddy Jyothsna Challagundla*[1]**, S. Kowsalya[2]. 1=Sakra World Hospital, Bangalore.2=Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore. Email:- jyothsnard@gmail.com

Background & Objectives: To estimate the incidence of metabolic syndrome in urban adults of Bangalore. **Materials & Methods**: Urban adults of Bangalore were included in the study group using random sampling method. A total of 390– Females187&Males203 were assessed. Age 20-60years were included. Physically disabled, pregnant, lactating subjects were excluded. The Anthropometric Measures of Height, Weight& Waist Circumference (WC) were measured. Body Mass Index(BMI) was calculated. Fasting Blood Sugar (FBS), Lipid Profile, Blood Pressure(BP) were noted. Diet Recall was captured & calories consumed per day was estimated. The Physical Activity(PA), Alcohol consumption were also noted. National Cholesterol Education Program Adult Treatment Panel III(NCEP-ATP III) criteria was used to categorise under Metabolic Syndrome(MS). The data was analysed by using standard statistical techniques. **Result** : A total of 390 subjects- females187& males203 were assessed. Overweight was observed in 45% & Obesity in 18%. Borderline rise of FBS in 20%& High FBS in 38%. High Total cholesterol& Triglycerides with low HDL in 30-33%. High LDL in 63%. High BP was noted in 32%. Lack of PA in 53%. Calories consumption per day >2000 kcal was 73%. Alcohol habit was observed in 38%. Three criteria of MS was observed in 24% & two criteria of MS in 60%. The lack of PA& high calorie consumption had a significant correlation with altered Lipid values& high BMI. HighWC had significant relation to HighBMI. Women had significantly highWC compared to Males. The alcohol habit had a significant correlation with elevated triglycerides& lowLDL. Increased calorie consumption had a moderate correlation with raised blood sugars& highBMI. Metabolic Syndrome was significantly observed in the people who had lack of physical activity; high calorie consumption and alcohol habit. **Conclusion** : Findings suggest that metabolic syndrome is in raise in the present population at 31-50 year age group. Overweight/ obesity, Dyslipedemia& high blood sugar levels were predominant in 31-40 year age group. High blood pressure was observed in 45-55 age group. Identifying Life style& interventions/ education to correct Life style of the young adults is the need of the hour to reduce the raising Metabolic Syndrome in community. **Keywords**: Metabolic syndrome in urban adults of Bangalore - Community Nutrition.

PPCN-99 Priyanshu Tripathi - withdraw

PPCN-100 UBIQUITY OF OVERWEIGHT AND OBESITY AMONG SELECTED ADULTS IN A PRIVATE COLLEGE IN COIMBATORE: A PILOT STUDY. ***Aiswarya Ashok,*** Shamlin Saleem, Shifana A***,*** Anitha. M.C. NEHRU ARTS AND SCIENCE COLLEGE. Email:- aishuaishukarchi@gmail.com.

Background & Objectives: Obesity is an important modifiable risk factor for most chronic non-communicable diseases. The objective of the study was to find out the prevalence of overweight/ obesity among adults in Coimbatore. **Materials & Methods**: This was a cross sectional study conducted among randomly selected 59 adults of both males and females in working in a private college in Coimbatore. Adults ranging ≥18 years to 50 years are interviewed with the help of a pre-tested structured questionnaire. Height, weight, waist circumference and hip circumference were measured using standard anthropometric methodology. Body Mass Index and Waist Hip Ratio (WHR) were calculated with the formulas. **Result**: Mean age of the study population was 37.13±8.8 years. Mean BMI among men was significantly higher (26.39), compared to women (25.72) with p = 0.0124. The prevalence of overweight and obesity in the selected population was 15 % and 51% respectively, as per WHO BMI guidelines for Asians. Higher proportion of men (59%) had high waist-hip-ratio when compared to women (57%). **Conclusion**: The prevalence of overweight and obesity is high among selected adults in Coimbatore.

Preventive programs for weight control and a healthy lifestyle should be emphasized for the adults in their work place.**Keywords**: Obesity; overweight; prevalence; Body Mass Index

PPCN-101 ***Haritha.U,*** Silpa.S[1], Anitha. M.C[2]. NEHRU ARTS AND SCIENC COLLEGE. Email:itsmeharitha069@gmail.com

Background & Objectives: Overweight and underweight are major health problems among young adolescents worldwide. The present cross-sectional study was carried out to determine the nutritional scenario among selected female students of a private college in Coimbatore.**Materials & Methods**: College going female students aged 17-20 years with the total of 57 females participated in the study. The period of study was from august 1st week to September 1st week 2018. The data was collected using a pre-tested questionnaire. Height and weight of the participants was collected. One commonly used indicator i.e., body mass index (BMI; kg/m2), was derived to evaluate the nutritional status of the subjects. Based on Body Mass Index categories, the selected participants were grouped into various categories Underweight (severe thinness, moderate thinness and mild thinness), Normal, Overweight/Obesity into (obese I, obese II and obese III)**Result** : The mean age group for the group selected was 19±0.84. The mean BMI of the subjects was 20.0±2.63. We could note a majority (46%) of selected students belong to normal category. Underweight which was further classified into severe thinness had (7.5%), moderate thinness (14%), and mild thinness (16%). Among selected population, Overweight and Obese female students constitute 16% respectively.**Conclusion** : The results obtained through the study revealed that due to BMI categories, some cases of malnutrition including both underweight and overweight were observed among the selected female students.**Keywords**: Body Mass Index, Thinness, Overweight, Obese, Scenario

PPCN-102 FAST FOOD CONSUMPTION PATTERN AND AWARENESS AMONG COLLEGE STUDENTS OF JORHAT DISTRICT. ***Senorita Gogoi***, Pranati Das, Ruma Bhattacharyya. Food Science and Nutrition. Email:- mariajorhat@gmail.com

Background & Objectives: With change in lifestyle practices of people and rapid growing of fast food outlets the consumption of fast food among the youth especially the adolescents and young adults is a common practice. Study of the fast food consumption pattern, contributing factors and awareness among the students. **Materials** & Methods: Hundred students were randomly selected from ten different colleges of Jorhat district. Survey was conducted by using a standardized questionnaire consisting information on their socio- demographic, consumption pattern, influencing factors, preferences and awareness. **Result**: Results revealed that majority of both male as well as female participants tend to eat out at fast food outlets everyday in a week and prefer both western and traditional fast food. The major influencing factors for the male participants were taste, easy access, college/ hostel life and for female participants it were taste, friends/ acquaintance, college/ hostel life. The preference for coffee and fizzy drinks of male participants was more. Taste and product variety were the major factor of importance for both the groups. The majority of male and female participants spent 200-300 rupees and 300-400 rupees per week respectively. Hundred percent of the population agreed that fast food consumption is unhealthy. However, majority of the male population were satisfied with their consumption pattern and the female participants have not thought of changing their consumption in the future yet. **Conclusion** : It was observed from the study that majority of the students prefer consumption of fast food daily. Easy accessibility, friends/acquaintance, and college life are the major influencing factor in fast food consumption. The students were aware that fast food consumption has negative effect on health but they were satisfied with their consumption pattern. **Keywords**: Fast food, fast food consumption pattern, questionnaire.

PPCN-103 MAPPING FOOD AND NUTRITION SECURITY AMONG THE VULNERABLE GROUPS IN VADU VILLAGE IN RURAL VADODARA. ***Suneeta Chandorkar***
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Background & Objectives: Rural landless or small scale farmers are at a higher risk of being Food and Nutrition Insecure due to limited resources, lack of awareness about nutrition, poor sanitation conditions, gender inequality etc. Of these, women and children form the most vulnerable groups. Therefore, the present study assessed Food and Nutrition Security (FNS) status of households and women and children (7 – 59 months) in a rural setting.**Materials & Methods**: Vadu village was purposively selected and 285 households [200 agrarian (AHH) and 85 non-agrarian households (NAHH)] having mother and child (7 – 59 months) were surveyed. FNS was assessed using Food Consumption Score (FCS), Individual Dietary Diversity Score (IDDS), Household Dietary Diversity Score (HDDS) and nutritional status. **Result**: All the households had acceptable FCS indicating good availability. Though households were Food and Nutrition Secure as per HDDS, 89.9% of children and 89.1% of

mothers were moderately Food and Nutrition secure as per IDDS. Average energy intake of mothers from AHH was 1699 kcal/day whereas that of NAHH was 1721 kcal/day. Prevalence of underweight among mothers of AHH (56%) was higher than those from NAHH (34%). The access to anganwadis for mothers from AHH was hampered as they were located away from the farms and mothers were busy with farming activities during the day. Utilization of food safety net programmes was suboptimal as only 70% possessed ration card. THR packets were available however only 62% children and 68% mothers utilized them. Prevalence of exclusively breastfed children among NAHH (81%) was higher as compared to AHH (32%). Fifty percent of the children from AHH were underweight whereas 38% of children from NAHH were underweight. Twenty one percent households practiced open defecation. **Conclusion**: FNS of rural setting was not satisfactory. NAHH were more Food and Nutrition Secure than AHH. **Keywords**: Food and Nutrition Security, Individual Dietary Diversity Score, Household Dietary Diversity Score, Food safety net programmes.

PPCN-104 COMPARISON BETWEEN BODY COMPOSITION OF BASKETBALL PLAYERS AND BADMINTON PLAYERS FOLLOWING SAME CALORIC INTAKE.***Sheena Arora***, Meenakshi,Mansi Bhardwaj. Department of physiotherapy, Manav Rachna International Institute for Research and Studies.
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Background & Objectives: Now a days many studies are acclaiming that to alter body composition different kinds of physical activity is required. Some other studies show that dietary intake plays a major role. So this study evaluated the effect of suggested same caloric intake on the Body composition of the Basketball players and Badminton players. The purpose of this study was to find out the effect of different physical activities on Body composition if the diet remains the same. **Materials & Methods**: Study was conducted at Manav Rachna International Institute for Research and studies, Fridabad, Comparative Study design was used. A total of 50 players participated in this study of which 25 were basketball players and 25 were Badminton players. All subjects were randomly selected on the basis of inclusion and exclusion criteria. All players aged between 18 to 26 years and were from Delhi and NCR region. Data collection for body composition that included Body mass index (BMI) and Skeletal Muscle Mass (SMM) was done with help of Bioelectrical Impedance Analysis. T test was used for data analysis. **Result**: The t value for BMI after comparing both the groups was 0.4344 showing a little difference with different physical activity with p value of 0.666. Also t value after comparing SMM for both the groups was 0.0024 again showing not much of difference with p value of 0.998. **Conclusion**: There were no significant difference in the body composition of Basketball and Badminton players on following same diet regime. That concludes that diet has a major role in altering the body composition. **Keywords**: body composition, physical activity, caloric intake

PPCN-105 DIETARY HABITS AND PHYSICAL ACTIVITY AMONG THE SELECTED HYPERTENSIVES. ***Dr.A.Swarnalatha*[1]**, Dr.Amirthaveni[2].1=Nehru arts and science college, Coimbatore.2=Dept.of Food Science and Nutrition, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore.Author Email:- swarna.latha041@gmail.com

Background & Objectives: Hyper tension is a silent, invisible killer that rarely causes symptoms. Hypertension already affected one billion people worldwide leading to heart attacks and strokes. Apart from the genes and environmental factors, obesity, sedentary lifestyle and dietary habits are the important contributors of increasing prevalence of hypertension. Hence the study was undertaken with the objectives to study the dietary and physical activity pattern of the hypertensives. **Materials & Methods**: Health camps were conducted at selected rural and urban areas of Coimbatore district, Tamil Nadu and hypertensives patients were identified with the help of medical practitioner and a group of medical assistants. About 256 hypertensives from rural and 257 hypertensives from urban identified in the age group of 25-55 years were selected for the study. The dietary habits and physical activity pattern were collected from 513 selected and tabulated. **Result**: Among the 513 selected hypertensives, most (42 per cent) of the selected hypertensive men and women in both rural and urban areas were in the age group of 40-49 years. About three fourth of rural and urban hypertensives followed non vegetarian diet. Only less than one quarter of rural and urban were consuming less than 10 g/day of salt where as the rest three fourth consumed more than twice the recommended amount given by WHO. The saturated fat, bakery product, fried snacks and fast foods intake were found to be more common in both rural and urban areas. It was adverse to note most of the hypertensives were not doing any physical exercises. Women were generally physically inactivity than their counter parts. **Conclusion**: Most of the hypertensives food habits were rich in fat and salt and poor in

other essential nutrients. About three fourth were physically inactive due to one or other reasons. **Keywords**: hypertension, dietary pattern, physical activity

PPCN-106 MICROBIAL FOOD SAFETY OF MID DAY MEAL PREPARED AT THE CENTRALISED KITCHEN AND SERVED IN GOVERNMENT PRIMARY SCHOOLS IN RURAL PETROCHEMICALS AREA OF VADODARA. ***Shweta Patel***, Uma Iyer, Swati Dhruv. Department of Foods and Nutrition, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda. Email:- patelshweta8625@gmail.com

Background & Objectives: Mid Day Meal (MDM) Programme of India aims at providing hot cooked meals to all the children studying in Government and Government aided primary schools on all working days. Non-Government Organisations (NGOs) are involved in running centralised kitchens for supplying MDM to schools at many places in India. Maintaining food safety in such large food production establishments is crucial. Microbial profile is an important food safety aspect which needs to be studied. Objective: To study the microbial profile of MDM prepared at the centralised kitchen and served in the schools of rural industrial areas of Vadodara.
Materials & Methods: Rural petrochemicals area of Vadodara was selected for the study. It was divided into three geographical regions. One Government primary school was selected from each region. Microbial analysis of all the food items served throughout the week was carried out on samples collected from the centralised kitchen at the time of production and from the schools at the time of serving. Samples were analysed using standard methods for total plate count (TPC) (ISO 4833-1:2013), coliforms (ISO 4832:2006), E.coli (ISO 7251:2005), yeast and mold (ISO 21527 (Part-1):2008). **Result** : The results indicate that all the foods prepared at the centralised kitchen at Vadodara had microbial counts within safe limits. The time gap between production and serving was more than that suggested in the guidelines (4 hours). Coliforms (<10 cfu/gm), E.coli (0 cfu/gm), yeast (<10 cfu/gm) and mold (10 cfu/gm) remained to be the same at the time of serving. TPC was found to be lower in most rice based preparations than curry based preparations and rotis. Though TPC was higher at the time of serving than production, it was within the safe limits (<105 cfu/gm).**Conclusion** : Microbial quality was maintained in the Mid Day Meals prepared at centralised kitchen and served in schools of ruralVadodara. **Keywords**: Mid Day Meal, Microbial Food Safety, Centralised kitchen.

PPCN-107 MICRONUTRIENT LEVELS IN WOMEN WITH PREECLAMPSIA AND THEIR ASSOCIATION WITH BIRTH OUTCOME. ***Amrita Khaire***, Hemlata Pisal, Kamini Dangat, Karuna Randhir, Savita Mehendale, Sadhana Joshi. Bharati Vidyapeeth Deemed University, Pune Satara Road, Pune India. Email:- bvduirsha@gmail.com

Background & Objectives: Micronutrients like vitamin B12 and folate play an important role in nucleic acid metabolism, cell growth and are important determinants of fetal growth. The present study examined the levels of maternal and cord plasma folate, vitamin B12, homocysteine and their association with birth outcome in women with preeclampsia (PE).**Materials & Methods**: This study includes 450 normotensive control (NC) and 350 women with PE. PE women were further classified into women delivering at term (n=224) and preterm (n=126). Maternal and cord blood was collected at delivery. Folate, vitamin B12 and homocysteine levels were estimated by chemiluminescent microparticle immunoassay method.**Result** : The levels of maternal vitamin B12 ($p<0.05$), folate ($p<0.01$) and homocysteine ($p<0.01$) were higher in the PE group as compared to the NC group. Maternal folate levels were higher in both term and preterm groups, while vitamin B12 levels were higher only in the preterm group as compared to NC group. In contrast, homocysteine was higher only in the term PE group. Similar changes were also observed in the cord plasma. There was a positive association of maternal homocysteine with systolic ($r = 0.151$, $p = 0.000$, $n = 578$) and diastolic blood pressure ($r = 0.213$, $p = 0.000$, $n = 578$) in the whole cohort. A negative association of maternal folate with systolic blood pressure ($r = -0.105$, $p = 0.048$, $n = 352$) while a positive association with baby weight in NC group ($r = 0.116$, $p = 0.029$, $n = 352$). There was a positive association of maternal vitamin B12, folate and homocysteine with cord vitamin B12, folate and homocysteine resp. in the whole cohort. **Conclusion** : These findings on a large cohort of preeclampsia suggest that one carbon metabolites (folate, vitamin B12 and homocysteine) are altered in women with preeclampsia, which influence the birth outcome. **Keywords**: birth outcome, micronutrients, preeclampsia

PPCN-108 PREVALENCE OF OVERALL OBESITY AND CENTRAL OBESITY AMONG SELECTED ADULTS. ***Megha Rose***, R.Subhikshna, Ashmiya. A, Dept. of Food Science and Nutrition, Nehru arts and Science College, Coimbatore
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Background & Objectives: Obesity is a complex, multi-factorial chronic disease. Overweight and obesity are the fifth leading risk for global deaths. Obesity is strongly associated with other metabolic disorders including diabetes, hypertension, dyslipidaemia, cardiovascular disease and even some cancers. This study was aimed at determining the prevalence of over all and central obesity among adults. **Materials & Methods:** Hundred adults including male and female in the age group of 21 to 55 years were selected from urban areas of Coimbatore for the study. For all the hundred adults, anthropometric measurements namely weight, height, waist and hip ratio were collected and BMI and WHR were calculated. The prevalence of overall obesity and central obesity was studies based on the BMI classification and WHR classifications. **Result:** Among the 100 selected adults, 80 per cent were female and 20 per cent were male in the age group of 21 to 55 years. Among them 65 per cent of female and 45 per cent of male were in the age group of 21 to 30 years and 12 per cent of female and 45 per cent of female were in the age group of 31 to 40 years. The average BMI of female was found to be 23.05 and for male, it was 26.79. The prevalence of overall obesity was found to be 61 per cent among females and it was found to be more when compared to male. The central obesity was prevalent among 40 per cent of male and 15 per cent of female. **Conclusion:** The study says that the prevalence of central obesity was more among male and overall obesity was more among female when compared to their counter parts. **Keywords:** overall obesity, central obesity.

PPCN-109 A STUDY TO EVALUATE THE ANTHROPOMETRIC PROFILE AMONG HOSTELS BORDERS OF ASSAM AGRICULTURAL UNIVERSITY (AAU), ASSAM. ***Laishram Maria Devi,*** Pranati Das***,*** Ruma Bhattacharyya ***,*** Food Science and Nutrition, Email: - marialaishram3@gmail.com

Background & Objectives: Nutritional anthropometry is the measurement of the variations of the physical dimensions and the gross composition of the human body at different age levels and degrees of nutrition. Anthropometric values are closely related to nutrition, environmental characteristics, genetic makeup, social and cultural conditions, lifestyle, functional status and health. Anthropometric evaluation is an essential feature of geriatric nutritional evaluation for determining malnutrition, being overweight, obesity, muscular mass loss, fat mass gain and adipose tissue redistribution. Additionally, anthropometric measurements assist providers in selecting appropriate treatment options for children, adolescents and adults. The purpose of the study is to evaluate the important anthropometric measures among hostels border of AAU, Assam. **Materials & Methods:** A total of 100 borders i.e. 55 girls and 45 boys were randomly selected for the study. The anthropometric measurements taken for the assessment of subjects are height and weight from that body mass index (BMI) was calculated further waist circumference, hip circumference were measured and waist hip ratio (WHR) was calculated. **Result:** The study revealed that the mean height, weight and BMI of girls and boys were 158, 52.24, 20.93 and 167, 56.05, 21.85 respectively. The mean waist, hip circumference, waist hip ratio of girls and boys were 30.38, 34.73, 0.87 and 32.8, 34.2, 0.96 respectively, indicating normal BMI and waist hip ratios for girls, whereas in case of boys through BMI was normal, waist hip ratio values exceeds the normal range which means that excess weight was distributed around their waist. **Conclusion:** The study concluded that the boys borders of AAU has moderate risk of being affected by weight related health conditions given by WHO as the anthropometric measurement in terms of waist to hip ratio is higher than the standard normal value of healthy people. **Keywords:** Anthropometric measurement, waist circumference, hip circumference Body Mass Index (BMI), Waist Hip Ratio (WHR).

PPCN-110 ASSOCIATION BETWEEN BREAKFAST CONSUMPTION PATTERN AND COGNITIVE PERFORMANCE AMONG SCHOOL GOING CHILDREN. ***Nataraj A Durgannavar***[1], Vijayalakshmi D2**,** 1=Assistant Professor, Department of Food Processing and Nutrition, Akkamahadevi Women's University, Vijayapura, Karnataka, 2=Professor, Department of Food Science and Nutrition, University of Agricultural Sciences, GKVK, Bengaluru, Karnataka
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Background & Objectives: Breakfast has been labeled the most important meal of the day. Studies have documented a positive relationship between regular breakfast consumption and cognitive outcomes in youth. However, most of these studies have focused on specific measures of cognition rather than cognitive

performance as a whole (e.g., IQ test scores) and have been limited to Western samples of school-age children and adolescents. This study aims at providing the evidence and extending the literature on linkage between breakfast consumption and cognitive performance in a sample of school going children selected from North Bengaluru city of Karnataka. **Materials & Methods:** A total of 200 school children in the age group of 10 to 12 years (5th – 7th standard) were selected randomly from two schools (100 from Government School and 100 from Private School). Breakfast consumption pattern of children was assessed using questionnaire for the past one week. Based on the frequency of breakfast consumption, the children were classified into two groups i.e., breakfast consumers and breakfast skippers. Cognitive abilities of school children were assessed through the Malin's Intelligence Scale for Indian Children (MISIC) which is an Indian adaptation of W.I.S.C.(Wechsler's Intelligence Scale for Children). The child was categorized into different intelligence levels based on the IQ (Intelligence Quotient) obtained through test. **Result:** Findings showed that children who regularly have breakfast had significant higher verbal, performance and full scale IQ test scores (all $p<0.01$) compared to breakfast skippers in both the type of schools. Majority of the breakfast skippers had average level IQ (64.5%) whereas higher percentages of breakfast consumers found to have high average IQ level (54.4%).**Conclusion:** Findings may reflect the benefits of regular breakfast consumption on cognition and regular breakfast consumption should be encouraged among school children. **Keywords:** Breakfast, cognition, School children.

PPCN-111 SOCIETAL STIGMA: OBESITY TRANSITION FROM CHILDHOOD TO PRE ADOLESCENT IN REFLECTION OF LIFESTYLE. ***Priyanka Yadav,*** Gargi Hira***,*** Email:-priyankathegoodsoul@gmail.com

Background & Objectives: Childhood is a period of rapid physical and mental growth and development. Children are building up new tissues constantly and replacing the old ones. Their nutritional requirements are higher per unit of body weight than those of adults. Overweight and Obesity are form of malnutrition arising due to excess fat deposition.Today these are increasing as public health problem of global significance. Children who are overweight or obese are at higher risk of developing serious health problems, including various NCDs. In addition overweight children suffers psychological problems as depression, social isolation etc. One of the key causes of increase in prevalence of overweight worldwide children is change in eating habbit, due to altered availability of foods and increasingly sedentary lifestyle. **Objectives:** 1- To study eating habbit of overweight and obese children; 2- To study different physical activities perform by obese children; 3- To find out the effects of obesity on children. **Materials & Methods:** Study area: The study was conducted in Sigra urban region of district Varanasi (UP. **Study subject:** 100 overweight and obese children (random selection) of age group between 8 yrs to 15 yrs. **Tools used:** Semi structured open-ended questionnaire cum interview schedule **Method:** BMI was calculated and on basis of anthropometric measurements, result was drawn by simple percentage analysis. **Result:** Among 100 samples the highest percentage was found to be 33 between 65-70 kg in 13-15 yrs of age and lowest percentage was found to be 8 between 45-50 kg in 8-10 yrs of age. **Conclusion:** Overweight and obesity in children and pre-adolescent requires a multi disciplinary, multi-phase approach which include dietary management, physical activity enhancement, restriction of sedentary behaviour. **Keywords:** Obesity, sedentary lifestyle, NCDs, anthropometry measurements

PPCN-112 Akanksha Arora - withdraw

PPCN-113 MICRONUTRIENTS ADEQUACY AMONG SELECTED SCHOOL CHILDREN BASED ON THE DIETARY HISTORY. ***Shekhara Naik R,*** Jamuna Prakash****,*** Department of Food Science and Nutrition, Yuvaraja'as College, University of Mysore,Email:-rsnaik1967@gmail.com

Background & Objectives: School age is an active stage of growth in children who require adequate amount of micronutrients to meet the physical, mental and physiological demand. objective of the study to assess the micronutrients adequcy among school children from Mysore. **Materials & Methods:** The study was designed to reveal the micronutrients intake from the diet history of the selected school children from Mysuru. A total of 850 children from urban and rural area were enrolled for the study based on randomised experimental design. Diet history was recorded by adopting 24hrs recall method from children and their parents. The nutrients intake was computed from the diet and adequacy was determined using recommended intakes. **Result:** The percent adequacy of iron intake ranged from 58.5-73.7%; calcium intake was much below desirable level at 45%; zinc intake was inadequate with 51-59%. Adequacy of vitamin C intake ranged between 41-103%. β-carotene intake was highly inadequate among all groups. Thiamine intake was adequate among children, however riboflavin and

niacin intakes were less than 50% of recommendation. An average adequacy of 23.5% was seen for folic acid among entire group. **Conclusion:** Diets were deficient in most of the micronutrients which reflects the inadequate intake of healthier foods such as fruits and vegetables, pulses, and milk and milk products and poor diversity of diets. **Keywords:** Dietary intake, nutrient adequacy, protective foods, recommendations.

PPCN-114 PROOF OF CONCEPT OF A CULTURALLY APPROPRIATE IRON FORTIFIED BISCUITS TO REDUCE MATERNAL AND PERINATAL ANAEMIA. ***Pratibha Dwarkanath*[1]*,*** Tinku Thomas[1]*,* Annamma Thomas[2], Shobha N Gudi[3]*,* Shaylaja AS[3]*,* Sheela CN[2]*,* Shirley George[2], Arnab Mukherji[4]*,* Anura V Kurpad[1]*,* 1=Division of Nutrition, St. John's Research Institute, Bangalore, 2=Department of Obstetrics and Gynaecology, St. John's Medical College Hospital, 3=St. Philomena's Hospital, Bangalore, 4=Indian Institute of Management, Bangalore

Background & Objectives: Iron deficiency anaemia (IDA), a silent epidemic, affects maternal and infant morbidity and mortality risks, including haemorrhage and low-birth-weight. Although routine antenatal care includes iron supplementation during pregnancy, low-adherence (under 40%) from the oral iron supplement side effects is a major reason for ineffective supplementation. We aimed to provide iron in a more acceptable food-based form, an iron-folate fortified biscuit, and to test its iron bioavailability and non-inferiority to the standard iron-folate capsule during pregnancy. **Materials & Methods:** First, 17 apparent-healthy non-pregnant non-lactating (NPNL), non-anaemic women were recruited and randomised to receive the supplements (iron-folic biscuits or iron-capsule) in a crossover design. The baseline increase in serum iron over an 8h protocol was estimated as a measure of bioavailability. Second, a double-blind randomized controlled trial among pregnant women (n=121) attending routine antenatal care was conducted. The intervention-group received iron-folate biscuits + placebo capsule, while the control-group received placebo biscuits + iron-folate capsules for 3 months. Compliance was recorded, along with baseline information, diet, anthropometry, and 5ml venous blood (before and after) to measure iron biomarker changes. **Result:** In the first study, the overall iron absorption from the iron-folate biscuit was comparable with the capsule (Mean:604 vs. 409 µg/dl, p=0.08). In the second study, the mean baseline hemoglobin (Hb) was 11.3 and 11.2g/dl in the intervention and control groups respectively. The difference in Hb change between the groups was 0.10g/dl (95%CI: -0.37 to 0.57), within the predefined non-inferiority limit of 1g/dl. Multiple linear regression of Hb change showed the groups were comparable (regression coefficient = -0.03, p=0.9) after adjusting for potential confounders.**Conclusion:** Our findings suggest that the iron-folic biscuits were equally efficacious in delivering iron as capsules in the 2nd trimester and could be an alternative-method of iron supplement during pregnancy. Pilots to test the effectiveness of the food-prototype on pregnancy are recommended. **Keywords:** Iron deficiency anaemia (IDA), Iron-bioavailability, efficacy, pregnancy, haemoglobin.

PPCN-115 EATING DISORDERS INFLUENCE THE HEALTH STATUS OF YOUNG ADULT WOMEN (20-25 YEARS). ***M. S. Sindusha,*** A. Thirumani Devi*,*
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Background & Objectives: Eating disorders are psychological disorders which lead to improper eating pattern. These eating patterns negatively influence the person's physical and psychological health. These eating disorders are mostly seen in adolescents and some times in young adults. Girls and women are more prone to have eating disorders than men of same age. The eating disorders are mainly three, namely, Anorexia nervosa, Bulimia nervosa and Binge-eating disorder. With this background, a study was conducted among young female adults (N=50) in the age of 20-25 years to find the influence of eating disorders on health status of the selected young adult women. **Materials & Methods:** A study was conducted among young female adults (20-25 years of age). The BMI of 50 participants was computed and they were interviewed using a specially designed questionnaire which concentrated on their eating patterns. The results were analysed statistically. **Result:** The findings of the study revealed that the BMI of majority of the participants surveyed were in normal (48%) weight category, 30% were in over-weight category and 22% were under-weight. It was found that 16% of the selected subjects had eating disorders. Six participants suffered from Anorexia Nervosa and Binge-eating disorder was observed only in two participants. No participant suffered from Bulimia Nervosa. Participants suffering from Anorexia Nervosa were mostly under-weight or normal while participants suffering from Binge Eating Disorder were over-weight. The consumption of junk food was persistent in all the participants, thus showing how the western diet has become a part of our eating pattern. When the nutritional knowledge of the participants was evaluated, it was found that lack of proper nutritional knowledge of the selected participants had a great impact on their eating patterns. This type of eating disorders affected their meal pattern, food servings and food preferences. Inclusion of westernized foods and stress eating was also found to be the major cause for the prevalence of eating disorders. **Conclusion:** The

occurrence of eating disorders was observed in the selected participants. These disorders were not existing until the past few decades. The westernization and modernization has started to affect the eating pattern. The lack of proper nutritional knowledge was also found to be the major cause for eating disorders which influenced the health status. Health education and nutritional intervention should be started to improve their nutritional status for their optimal health and well-being. **Keywords:** Eating disorders, lack of knowledge, westernization.

PPCN-116 DIETARY PATTERN AND NUTRITIONAL STATUS OF TRANSGENDER AGED BETWEEN 20-40 YEARS. ***Deepika Palanivel,*** Thirumani Devi.A**,** Email: - dpka374@gmail.com

Background & Objectives: A transgender is biologically a boy but there is transformation in their physical and psychological characters as for a girl (preferred to be addressed as a woman). In the world, the transgenders are estimated to be 600 crores, there are roughly one million Hijra in India, representing approximately one in every four hundred post pubertal persons born male. The present study flashes light upon the dietary and nutritional status of the transgenders aged between 20-40 years. **Materials & Methods:** The sample size was 30 for the present research and the subjects were selected by convenient sampling method. Questionnaire was used to gather data from the selected subjects. Coimbatore(Sai baba colony and Thudiyalur) was the area to conduct the present study. The picked out samples were assessed for their nutritional status, dietary habits, physical and mental health. **Result:** The dietary habits were found out on enquiry about their general dietary pattern including food allergies, likes and dislikes on food. It was revealed that cent percent of them consumed non vegetarian food and road side foods, junk food(75%) and an average of two meals,one snack and one beverage in a day. The dietary intake was assessed by three day dietary recall method. 53.4% of the subjects were obese, 16.6% over weight, 10% under weight and 20% normal by Body Mass Index. They had very poor physical health due to their sedentary life style and neglection of exercise and yogic practices in their day to day life. By results they dint show mental fitness also due to equal percent of sexual and verbal harassment and earned a maximum of rupees 15,000 per month. Based on HUDCO income classification (2007) thirty per cent of the subjects belonged to low income level they were earned up to 5000 to 7000 rupees. **Conclusion:** Even on consumption on balanced meal they show low nutritional status due to stress, poor hygiene and sanitation, lack of medical facilities and nutritional intervention programs for them. **Keywords:** Transgender, Nutritional status, Dietary habits, mental health

PPCN-117 INFLUENCE OF BODY COMPOSITION AND SARCOPENIC OBESITY ON AGE AND BLOOD PRESSURE OF URBAN ALLAHABAD WOMEN. ***Zoomi Singh*****,** Neelam Yadav**,** Research Scholar, Centre of Food Technology, University of Allahabad**,** Email:- zoomisingh@gmail.com

Background & Objectives: Obesity has been recognized as a critical global health issue. It is a medical disorder in which excess body fat has accumulated to the extent that it may have an adverse effect on health. The study aimed to determine the influence of body composition indices on blood pressure of urban female residents of Allahabad district and to evaluate these indices for better health risk predictor. **Materials & Methods:** The cross-sectional study was carried out among 250 adults (20-49 years) women of urban Allahabad. Blood pressure (B.P.), BMI (Body Mass Index), waist-hip ratio (W: H), body fat % (by caliper and analyzer) and muscle mass were measured using standardized procedures. Relative risk (RR) and linear regression between adiposity (W: H), obesity (BMI), body fat %, and blood pressure were examined. **Result:** Results of the study showed that obese women with higher WHR >0.85 were at higher risk of becoming hypertensive (systolic 1.22 & diastolic 3.13). According to sarcopenic obesity, the highest prevalence was observed in hypertensive women and in the age of 40-49 years by both caliper and analyzer body fat % measurement. The strong relationship was observed between W: H ratio with systolic B.P. (R= 0.383) & diastolic B.P. (R= 0.397) while body fat % showed a strong relationship with systolic B.P. by both, caliper (R= 0.330) and analyzer (R= 0.361). **Conclusion:** Adiposity (W: H) and body fat % showed strong association with blood pressure than BMI while age has the positive association with body fat %. **Keywords:** Hypertension, obesity, waist hip ratio, body fat %, body mass index.

PPCN-118 CHANGES IN DIETARY FAT INTAKE OVER 25 YEARS. ***Vishnu G P,*** Tinku Thomas, Anura V Kurpad, Sumathi Swaminathan, St. John's Research Institute***,*** Email:- vishnu.gp@sjri.res.in

Background & Objectives: Over the past two decades, although mean fat intake in Indian diets has increased, these changes in intake have not been further fragmented and studied. **Materials & Methods:** Six thick rounds of the National Sample Survey's Household Consumer Expenditure data covering a period of 25 years (1987-2012) were used (NSS 43, NSS 50, NSS 55, NSS 61, NSS 66, NSS 68). The data on diet intake was converted into per capita daily nutrient intake using Indian food composition tables (2017). **Result:** The contribution of energy from total fat increased (12.7% to 19.7%; $p<0.001$), while that from carbohydrate decreased (74.8% to 67.9%, $p<0.001$) and that from protein remained constant (at 10.8%). Per capita fat intakes are below the acceptable macronutrient distribution range (AMDR) of between 20-35% of total energy. The increase in the consumption of monounsaturated fatty acids and polyunsaturated fatty acids (50% increase from 10.3 (+/-6.9)g to 15.8 (+/-7.6)g and a 133% increase from 6 (+/-3.6)g to 14 (+/-7.8)g respectively) was much higher when compared to the increase in consumption of saturated fatty acids (26% increase from 11 (+/-10.4) g to 13.9 (+/-10.1) g. Across all time periods, fat consumption in rural India was lower than urban India with the gap remaining the same (about 11g)). Wide variation in fat intake between wealth quintiles was seen across the years. According to the latest NSS 68 data, added oils (vegetable oils, trans fat, butter/ghee) contributes to 53.3% of total fat intake followed by milk and milk products (20%). Over 25 years, although consumption of trans-fat intake declined (1.53 (+/-4.7)g to 0.62 (+/-2.6)g), butter/ghee consumption increased (0.78 (+/-2.9)g to 1.18(+/-3.1)g), and mean vegetable oil consumption increased (11 (+/-8.8)g to 23 (+/-11.1)g, $p<0.001$). Rise in vegetable oil consumption was largely through the increased use of mustard oil and edible oil (refined, palm, sunflower oil, others). **Conclusion:** Though dietary fat consumption has increased over time, intakes remains below the AMDR. This increase has largely been contributed by vegetable oils. **Keywords:** Fats, Fatty acids, Acceptable Macronutrient Distribution Range.

PPCN-119 ASSESSMENT OF NUTRITIONAL STATUS OF STUDENTS OF KENDRAPARA AUTONOMOUS COLLEGE USING ANTHROPOMETRIC INDICATORS. ***Prasant KumarSahoo***, Aparna Rath, Subasis Satapathy, Shuchismita Behera,Department of Zoology, Kendrapara Autonomous College, Kendrapara Odisha.Email:- biju9439@gmail.com

Background & Objectives: The prevalence of obesity has been increasing progressively in the past two decades across most of the world. Obesity is the condition of excess body fat, which can lead to various health problems. Although accurate methods to assess body fat exist, the measurement of body fat by these techniques is expensive and is often not readily available. The purpose of this investigation is to assess nutritional status of students in the college using anthropometric indicators. **Materials & Methods:** Data were collected using simple random sampling among students studying in Kendrapara Autonomous College. A total of 295 students with the age range of 18-22 years were included in the study of which 205 were females and 90 were males. Two surrogate measures are important to assess body fat: Body Mass Index (BMI) and Waist Circumference. Two other anthropometric data, i.e. hip to waist ratio and hip circumference were also collected and analyzed. All anthropometric measurements were taken using WHO guidelines. Data were entered in Microsoft Office Excel 2007. All statistical analyses were performed using Graph pad prism version 4.0. **Result:** The surveillance indicated that 48.48 % of students do not have a healthy weight and half of the total female students sampled (i.e. 47% of 205 females) are underweight which is a matter of serious concern. About one fourth of the total male students sampled, have a hip-waist ratio above cut-off value recommended by WHO and thus have an increased risk of metabolic complications. **Conclusion:** It is highly recommended that measures should be initiated to aware the college students of their nutritional status which might be helpful in safeguarding the health of students of Kendrapara Autonomous College. **Keywords:** Anthropometric data, Body-mass index, waist circumference, hip to waist ratio, hip circumference, Student.

PPCN-120 FOOD INSECURITY AND FOOD CONSUMPTION PATTERN BY SEASON IN HOUSEHOLD LEVEL WITH CHILDREN IN BEED DISTRICT. ***Nuzhat sultana M.B.[1],*** Mubina Abdul Aziz Shaikh[2], 1= Home Science Mrs. K.S.K. College, Beed (M.S.), 2= SRT University, Nanded (M.S.), Email: - nuzhatsultanamb@gmail.

Background & Objectives: Food insecurity is often associated with inadequate nutrient intakes and low quality of diet, which can compromise adult's and children's health and well-being. food insecurity can have detrimental long-term effects on child physical, mental, cognitive, and psychosocial health and development. High rates of food insecurity are documented among rural households in Marathwada, in Beed district. 1. To compare food consumption patterns for households with and without children, 2.To compare the prevalence of food insecurity for households with and without children, 3. To identified factors associated with food insecurity in households with children in Beed district. **Materials & Methods:** Randomly 200 selected households were surveyed in the month May2017 September2017.Household food insecurity status was determined using an adapted NMMB survey method. The above study examine unconditional associations between food security status and demographics. socioeconomics, frequency of food consumption, in households with pre- school and without pre - school children by season. **Result:** Households with children (n = 100) and without children (n = 100) participated in the survey. Food insecurity was identified in 48.8% of households with children; this was significantly higher than in households without children (34.5%,)The study revealed that intake of cereals and pulses were quite satisfactory. Intake of green vegetables and fruits respectively. There is lacking of intake of green vegetables and fruits respectively. But intake of milk and milk and meat & fish was very deficient. Food insecurity is high among households with children in Beed district. The prevalence of household food insecurity did not significantly differ by season and Demographic and socioeconomic characteristics of the person responsible for food preparation. **Conclusion:** Food insecurity is high among households with children in Beed district. we found no seasonal differences in food security and food consumption for households with children. **Keywords:** Food security, Food Preparation, Food consumption, Season, Socioeconomic Status.

PPCN-121 TWIGGING ADOLESCENT WELLBEING THROUGH DEVELOPMENT AND VALIDATION OF COMPREHENSIVE HEALTHY EATING AND LIVING INDEX FOR ADOLESCENTS (CHELI). ***Radhika Hedaoo[1],*** SubbaRao M Gavaravarapu[2], Vishnuvardhana Rao[3]***,*** 1=Department of Nutrition and Dietetics, Symbiosis School of Biological Sciences, Symbiosis International University, Pune, 2=Department of Extension and Training division, National Institute of Nutrition, Hyderabad, 3=National Institute of Medical Statistics, New Delhi, Email: - radhika.hedaoo@ssbs.edu.in

Background & Objectives: Considering that diet and nutrition cannot be looked in isolation without considering lifestyle determinants which have a bearing on the adolescent well being; one of the pertinent methods is to develop an 'easy-to-use' integrated scale which measures the lifestyle behaviors among adolescents. **Materials & Methods:** The comprehensive index was formulated after reviewing a range of validated indices by measuring diet, stress, physical activity, screen time and sleep components using a scoring matrix and converting it to an index. The developed index was checked for its face, content and construct validity. Cut offs for individual components were calculated based on optimal recommendations and guidelines given in validated indices by allotting 'Good', 'Need improvement' and 'Poor' scores suggestive of maximum, intermediate and minimum bidirectional scores respectively. The developed index was administered on randomly selected 219 adolescents (girls and boys) of urban coeducational schools. Paired sample T test was used for validating diet scores with food frequency, stress scores with Cohen's stress scale, physical activity score with WHO IPAQ, sleep and screen time with referenced standards suggested. **Result:** The mean age of adolescents was 13.7±.70 and the mean CHELI score was 10.25 ±6.8 respectively. The categorized comprehensive scores suggested 25 % adolescents had good scores followed by 59% needed improvement and 0.4 % had a poor score respectively. 67% adolescents needed improvement in diet and eating behavior, 69% reduction of screen time, 68% stress management, 86% an improvement in physical activity and 26% needed an adequate sleep. Paired sample t-test applied suggested insignificant difference between the individual component scores of CHELI and validated indices ($p > 0.05$).The Pearson correlation revealed a significant correlation between sleep scores and BMI of adolescents ($p<0.05$). **Conclusion:** "CHELI" as an innovative ready reckoner can be used effectively for targeted lifestyle behavior change interventions among adolescents. **Keywords:** Adolescent nutrition, lifestyle indicators, Screentime,Stress

PPCN-122 STUDY ON FOOD HABITS, PHYSICAL ACTIVITY & NUTRITIONAL STATUS OF YOUNG ADULTS RESIDING IN HOSTEL, PG (PAYING GUEST) AND PERSONAL ROOM WITH SELF-COOKING. ***Asma Banu***, Dr Vanitha Reddy. P, Department of Water and Health - Faculty of Life Sciences, Division of Nutrition & Dietetics, JSS Academy of Higher Education & Research, Mysore-15, Karnataka,Email:- ashuasma678@gmail.com

Background & Objectives: Life away from home for upgrading the professional status is self challenged and difficult to manage. Students stay in Hostel, PG & some prefer staying in personal room (who demands for privacy), where they learn to adjust and manage without family members and prone to malnutrition due to poor eating & living habits. **Objective:** To study the food habits, physical fitness and nutritional status of young adults residing in Hostel, PG & Personal Room. **Materials & Methods:** The study was carried out in 150 young adults of both genders who stay away from home reside in Hostel, PG & Personal Rooms. Demographic data, Anthropometric measurement, Hemoglobin status, Dietary history by 24-recall method, lifestyle habits & health problems were collected by questionnaire and assessment **Result:** Among all 45-54% of the subjects residing in Hostel & PG were underweight and due to unhealthy dietary practices such as (skipping meals, consuming less amount of food or prefer consuming from outside which contain unhealthy fats and carbohydrates and also lack in nutrients). Whereas Personal room students were observed to be with normal weight and few were overweight due to the consumption of their own choice of food prepared. Study has also revealed that students residing in Hostel & PG suffering with health issues like - dizziness, allergy, constipation, blurred vision, poor appetite, acidity, bleeding gums, flatulence, dysmenorrhea, white dot on nails, weakness, etc. Irrespective of type of residence, around 50% were anemic & 60% of the subjects lost weight after residing in hostel and PG. **Conclusion:** The study reveals that nutritional status of students residing in personnel room was better than the hostel and PG students. This may be due to liberty of choosing the food what they wanted to eat in personal room. By improving the food quality at hostels and PG the condition can be improved. **Keywords:** Nutritional status, Anemia, hostel, paying guest.

PPCN-123 TO STUDY DIETARY PATTERN AND ANTHROPOMETRY OF PRESCHOOL CHILDREN BETWEEN 3-6 YEARS OF AGE IN MUMBAI. ***Nandita S Dhanaki*[1]*,*** Rupali Sengupta[2]***,*** 1=Bai Jerbai Wadia Hospital for Children, Mumbai, Cuddles Foundation***,*** 2=DR. BMN College, Mumbai, Affiliated with SNDT Women's University***,*** Email: - nandita@cuddlesfoundation.com

Background & Objectives: The paper aims to study anthropometric pattern and dietary pattern of preschool children in comparison with ICMR (Indian Council of Medical Research) standards-2010 with respective age group. As at preschool, children are at growing age, optimal nutrition is of prime importance. Hence, their current dietary pattern and anthropometric pattern should be analyzed to implement better nutritional programs for the purpose of achieving optimal nutrition. **Materials & Methods:** 502 preschool children with age group of 3-6 years belonging to middle income group were included. 255 were males, 247 were females. Children with infection, diarrhea, and any medical comorbidity were excluded. Dietary pattern was recorded using 3 day home recall. Their body weights, heights, MUAC (Mid Upper Arm Circumference) were recorded. **Result:** Overall MUAC classification of all subjects showed, 85.7% were in normal category, 13.1% were moderately malnourished and only 1.2% were severely malnourished. Even though majority were in normal category; when energy, carbohydrate, protein and fat intake of subjects were calculated by 3 day recall and was compared with ICMR RDA, it was found that macro-nutrient composition of the subject's food intake were lower than ICMR RDA with statistical significance (p=0.00). The subjects were divided into 3 groups: group 1 (3-3.9 years), group 2 (4-4.9 years) and group 3 (5-6 years) to compare their height and weight with the ICMR standards. Mean heights of all the subjects were higher than ICMR standards. In case of weight, group 2 and group 3 had lower mean weight than ICMR standards. **Conclusion:** Though MUAC classification showed positive results, other anthropometric pattern such as weight were found to be lower than the standards indicating mild wasting. Hence nutritional programs focusing on this age group is required to facilitate growth and development. Nutritional Education should be imparted involving children, parents and teachers to facilitate the child to make healthier choices. **Keywords:** Anthropometry, Dietary pattern, Weight, Height

PPCN-124 CONSUMPTION PATTERN OF JUNK FOOD AND KNOWLEDGE ABOUT ITS ILL EFFECTS AMONG THE SCHOOL GOING CHILDREN OF RURAL AREAS OF GOALPARA DISTRICT, ASSAM. ***Barnali Deori***[1], Prarthana Sonowal[2], 1=Lecturer, Arya Nursing College, Changsari, Kamrup(R), Assam, 2=Dietician, CHC, Moran, Email:- barnalideori@gmail.com

Background & Objectives: Junk food is a term for food that is of little nutritional value and often high in fat, sugar, salt and calories. Junk food consumption and obesity in childhood has been described as a global epidemic not only in developed but also in developing countries. The aim of the study was to assess the consumption pattern of junk food and knowledge of its ill effects among the children of rural areas of Goalpara district, Assam. **Materials & Methods:** The study was carried out in four government schools present in rural areas of Goalpara district of Assam. The target population identified were school going children between the age group of 10-13 years studying in Class V to Class VIII. Data was collected from a total of 100 numbers of children by using a self- structured questionnaire and interview method. Information regarding types of junk food consumed, frequency and time of consumption, reason for selection, knowledge on ill effects of consuming junk food, etc, were taken. **Result:** The study revealed that 76% of school going children consumed junk foods. Daily consumption of junk foods was higher among boys (57%) as compare to girls (43%). 38% of children consumed junk foods on a daily basis, 43% consumed 3-5 times a week and 19% consumed once or twice a week.Most popular junk food item was chips, followed by chocolates, sugary drinks, etc. Almost all the school going children like junk foods for their taste as well as their easy availability. Most of the junk foods consumed was during break period from the shops outside the school premises. 63% of children have a minimum knowledge about the ill effects of junk foods while the remaining 37% were unaware of its ill effects. Despite this fact, there is high prevalence of junk food consumption among the school going children. This was due to the selection of foods being driven primarily by taste instead of nutritional content. **Conclusion:** The influence of junk foods among the school going children is high and increasing day by day due to many of its characteristics such as taste, appearance, easy availability, etc. Awareness needs to be created among the school aged children and teachers regarding the adverse health effects of these foods. This will minimize the lifestyle disorder among children and adolescents to a greater extent. Steps may be taken with the help of government for banning junk food nearby school premises to minimize the effect of junk foods on human health. **Keywords:** junk food, school going children, ill effects

PPCN-125 USE OF COMPOSITE INDEX OF ANTHROPOMETRIC FAILURE INDEX (CIAF) TO ASSESS THE BURDEN OF UNDERNUTRITION AMONG PRIMARY SCHOOL CHILDREN (10-19 YEARS OF AGE) FROM MUNICIPAL SCHOOLS OF URBAN VADODARA. ***Shruti Kantawala,*** Uma Iyer, Swati Dhruv, Department of Foods and Nutrition, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara, Email:- shruti_kg@yahoo.co.in

Background & Objectives: Composite Index of Anthropometric Failure (CIAF), which is an aggregated single anthropometric measure was proposed originally by Svedberg, comprised of 6 sub-groups of anthropometric failure (Groups A-F) to which Nandy et al. supplemented one more sub-group (Group Y) which provides information on relative significance and severity of conventional indicators of under-nutrition with respect to the total prevalence of under-nutrition. The present study was planned to assess the nutritional status of school children of urban vadodara using CIAF. **Materials & Methods:** The present study was conducted in 4 representative municipal schools randomly selected from each zone of urban Vadodara (N=16 schools). All the children from 1st to 7th standard of the school were enrolled for the study. The total number of registered children was 6574 out of which data was collected on 4905 children. **Result:** In the present study, about 2/3rd of the children were in a state of anthropometric failure and 15% of children had all the three forms of under-nutrition i.e. underweight, stunting, and thinness. Overall Anthropometric failure was more in boys and age wise highest prevalence was seen at 10 years of age. **Conclusion:** Using CIAF, high prevalence of under-nutrition in the form of underweight, stunting and thinness was found to be prevailing among school children of urban Vadodara indicating that school health should be an important aspect of essential public health program but has received little attention, as most of the focus is on under-five children. **Keywords:** School children, stunting, thinness, anthropometric failure, urban

PPCN-126 EFFECT OF FLAXSEED ON POSTMENOPAUSAL WOMEN. ***Jennifer Saulam[1],*** Pushpa Bharati[2]***,*** 1=Assistant Professor, Dept. of Food Processing and Nutrition, Akkamahadevi Women's University, Vijayapura***,*** 2=Professor, Dept. of Food Science and Nutrition, College of Community Science, UAS, Dharwad, Email:- jennifersaulam27@gmail.com

Background & Objectives: Postmenopausal women are at increased risk for a number of health conditions. During this period, they experience many of the bothersome symptoms like hot flashes, night sweats, mood swings, dry vagina, etc. These may be due to the lowered estrogen levels in the body. Hence, the diet rich in estrogens can reduce these symptoms. Flaxseed is richest food source of lignans (phytoestrogens). Lignans as isoflavones are non-steroidal polyphenolic compounds structurally related to estrogens. Hence, they may be useful for reducing post-menopausal symptoms. However, there are insufficient data on the efficacy of flaxseed diets on post-menopausal symptoms. With this background, this study was taken up to investigate the effects of dietary intervention with flaxseed for 30 days on post-menopausal women. **Materials & Methods:** Thirty post-menopausal women aged 47 to 58 years were selected for the study. A self-structured questionnaire was framed for data generation regarding their personal history, medications, medical history, gynecologic history and severity of 17 post-menopausal symptoms before and after the intervention. Subjects were given flaxseed diet of 30g per day for 30 days. After 30 days, subjects were interviewed only about the severity of post-menopausal symptoms. Pre and post intervention menopause symptoms were compared using paired Student's t test. **Result:** Results of this dietary intervention study indicated that supplementation of post-menopausal women with flaxseed chutney for 30 days significantly reduced the severity of all the post-menopausal symptoms. Anxiousness was reduced in 88 per cent women followed by sleeping problems (82 %), hot flashes and night sweats (77 %).
Conclusion: Hence, it can be concluded that flaxseed diet of 30g consumed for 30 days to post-menopausal women is effective in reducing the post-menopausal symptoms. Further studies have to be carried out on larger sample size. **Keywords:** Flaxseed, Postmenopausal women

PPCN-127 THE VOICE OF HUNGER AND POVERTY: THE NEXUS AND NEMESIS***.*** ***Anannya Chakraborty,*** S K Acharya***,***
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Background & Objectives: To organize selected baseline survey for delineating the present scenario of hunger poverty and silence.2. To analyse and estimate the intra and inter level of relation and interaction by taking poverty, hunger and silence as dependent variables to be predicted and elucidated from a score of socio-ecological and techno-economic variables selected for study.3. To generate a micro level policy based on empirical study and thereafter to create an experimental paradigm for it's further replication. **Materials & Methods:** a) Mean. b) Standard deviation. c) Coefficient of Variance. d) Correlation of coefficient. e) Step down regression analysis. f) Canonical covariate analysis. **Result:** there is a correlation between 21 selected independent variables and one dependent variable i.e. hunger. **Conclusion:** hunger is not only a nutritional phenomenon, but also it is a social phenomenon.The hunger, poverty and silence or voiceless are the inseparable parts of each other. People are hungry because they are poor and people are both hungry and poor because of their voicelessness.If hunger is to be removed we have to drive out poverty and to get rid of both hunger and poverty, people has to be out spoken about their problems and needs, because the world would be deaf till you are mute. **Keywords:** Agriculture, Calorie, Hunger, Socio- ecological parameters.

PPCN-128 DIETARY ADEQUACY AND CONSUMPTION PATTERN OF MICRONUTRIENT RICH FOODS AMONG ADOLESCENT GIRLS. ***Jyoti Tak,*** Nikita Wadhawan, Department of Food Science and Nutrition, College of Community and applied science, MPUAT, Udaipur, Email:- jyotistak@gmail.com

Background & Objectives: Adolescence is a stage of phenomenal growth and development between the onset of puberty and full maturity. Unfortunately adolescent girls are a neglected sector of the population of our country. The main nutritional problems of adolescents are associated with micronutrient deficiencies. Inadequate micronutrient status increases susceptibility to diseases, affects cognitive capacity and decreases physical performance. Therefore the study aimed to assess the micronutrient dietary adequacy and consumption pattern adolescent girls. **Materials & Methods:** 120 adolescent girls from government school of Udaipur city were

selected by purposive sampling method. After an extensive study of relevant review of literature, an interview schedule was developed to collect the data. Micronutrient adequacy in diet was assessed by calculating their dietary intake of micronutrients by 24-hour recall method and their frequency of consuming micronutrient rich foods. The data thus collected were transferred on excel sheets and processed, tabulated and analyzed. **Result:** Results revealed that the calcium, iron, zinc, β carotene, riboflavin was less than 50 per cent to RDA and intake of dietary folate was negligible by the subjects (0.48% of RDA). Further, the intake of thiamine and ascorbic acid was also found to be lower than RDA but intake of these micronutrients was quite better than the other micronutrients. Overall consumption of micronutrient rich foods among adolescents was found very less specially foods like; amranthus, drumstick, garden cress, beet root, karonda, piyal seeds. Daily consumption of micronutrient rich foods was observed all most nil in subjects except rice flakes, cow pea, green gram and coriander leaves. **Conclusion:** The study illustrates that most adolescent girls were having poor consumption of important micronutrients rich foods and their dietary intake of micronutrients was inadequate as compare to daily recommended intake. **Keywords:** dolscent gilrs, Micronutrient, Consumption pattern, Nutrient intake

PPCN-129 A REFLECTION OF NUTRITION INSECURITY: NUTRITIONAL DEFICIENCY MANIFESTATION AND MORBIDITY STATUS AMONG SELCTED SCHOOL CHILDREN FROM MYSORE. ***Shekhara Naik R,*** Jamuna Prakash****,*** Department of Food Science and Nutrition, University of Mysore, Mysuru, India, Email: - rsnaik1967@gmail.com

Background & Objectives: Nutritionally insecure children suffer with various kind of nutritional deprivations which manifest into visible signs and symptoms of deficiencies. They may also suffer with frequent infections on account of compromised immunity status. **Materials & Methods:** The study was planned to target schoolchildren from urban (n=434) and rural (n=416) area of Mysore. All children were physically examined for different nutritional deficiency manifestation and presence of morbidities. **Result:** The results of the study revealed that 76% of children exhibited one or other form of nutritional deficiencies and around 24% were found normal. Discoloration of hair (40%), vitamin A deficiency (52%), reddening of tongue (39%) and phrynoderma (49%) were observed. The morbidity status of children recorded during the time of study showed prevalence of various kinds of infections in children. The largest occurrence was that of cold with an incidence of 34.2% followed with cough at 26.0%. There were few children with fever (4.2%) and skin infections were with 9.6% among children. Around 52.1% of children did not report any kind of sickness. A small number were also seen with diarrhoea and vomiting. **Conclusion:** The extent of nutritional deficiencies was higher than incidence of infections indicating a need to improve the dietary intake of children. **Keywords:** Nutritional deficiency, vitamin A deficiency, morbidity status, infections.

PPCN-130 THE RELATIONSHIP BETWEEN SLEEP DURATION AND OBESITY AMONG ADOLESCENTS. ***Komala M***., Sridhara A.S, Santosh C.D, Senior Assistant Professor of Human Development, Department of Studies in Food Science and Nutrition, University of Mysore, Manasagangotri, Mysuru , Email:- komalagangadhar71@gmail.com

Background & Objectives: The sleep is important for health of entire body and mind. The decrease in sleep duration or increase in sleep complaints in today's world has raised the concern for its negative impact on health. The inadequate sleep duration is now been recognized as a potential risk factor for obesity. In both developed and developing countries, the prevalence of obesity especially during childhood and adolescence has reached to epidemic proportion in the past few decades. As per the research evidences, obesity is a multi-factorial condition influenced by various demographic and life style factors. There is a dearth of published research on sleep pattern and its association with obesity among adolescents with reference to Karnataka state. Hence an attempt was made to assess the prevalence of short sleep duration and Overweight/obesity among high school students. **Materials & Methods:** A total 300 students studying in 6th to 10th standard were drawn from the Hassan town of Karnataka state. A cross-sectional school based study was carried out during March and April 2018. Self framed questionnaire was used to collect the data on socio-demographic conditions and sleep pattern. Anthropometric measurements included weight, height, waist and hip circumference were recorded using standard procedure. Further Body Mass Index for age (BMI-for-age) and Waist-Hip Ratio (WHR) were calculated to find the prevalence of overweight and obesity in the study sample. Data were analyzed using SPSS package for windows version 16. Descriptive statistics, correlation and one-way ANCOVA were computed. **Result:** As per the findings, about 45% of the adolescents obtain less than 8 hours of sleep per day. Chi-square test showed no significant result for genders but showed a highly significant result for age groups. As per BMI-for-age, the prevalence of overweight

(+1SD) or obesity (+2SD) was higher in males (26%) and in adolescents of 10 to 12 years of age (25.9%). The inverse linear correlation was found between sleep duration and body mass index. One-way ANCOVA results indicated that while confounding the age factor, a significant relationship was found between sleep duration and body mass index. **Conclusion:** This study concludes that inadequate sleep duration is an important risk factor for adolescent obesity and there is a need for conducting the intervention studies focusing on other life style factors to improve the sleeping habits and to reduce the overweight and obesity among adolescents. **Keywords:** Adolescents, Sleep duration, Obesity, overweight

PPCN-131 NUTRITION KNOWLEDGE, ATTITUDE AND PRACTICES (KAP) AMONG SCHOOL GOING CHILDREN IN GUWAHATI, ASSAM. ***Chandrama Baruah,*** Asst. Professor, Dept of Food, Nutrition & Dietetics, Assam down town University, Email:- chandramabaruah11@gmail.com

Background & Objectives: The development of a nation greatly depends upon the nutritional status of its population.Proper nutrition is the root of healthy life. Good eating habits are the key for maintaining and/or improving health no matter what one's age, gender, occupation or location.The early age period of an individual (7-12 year) has been called the latest time of growth. During this age maintaining a balanced diet and regular physical activeness is very important for overall development.The food choices of children were greatly influenced by their surroundings like family, friends, media (especially TV) etc. The dietary habits learnt in early life are likely to be carried to adulthood. Nutrition knowledge and positive attitude are known to influence dietary practices. There is paucity of information on nutrition knowledge, attitude and practices among school-children as well as society, which is one of the main obstacles to planning measures for the proper improvement of the nutrition status of the population. The present study was conducted among school going children in Guwahati, Assam with the following **objectives**: 1. To assess the nutritional status of the school going children; 2. to assess the nutrition Knowledge, Attitude and Practices (KAP) of school going children. **Materials & Methods:** A cross-sectional study was conducted among 100 school going children aged 7–12 years. The three point scale Knowledge, Attitude and Practice (KAP) was applied and nutrition knowledge score was determined based on the response (correct response: 1, incorrect: 0, do not know: 0).A pre structured questionnaire was used to collect these demographic and nutrition status data. **Result:** The number of male and female children surveyed, were 52% and 48% respectively. The analysis of nutritional status data revealed that male students were carrying normal height and weight compared to the female students (carrying less values than standard WHO values).The dietary practices were determined from frequency of food consumption, which divulges that the daily intake of fruits and milk and milk products (6% and 16% respectively) is very low. The overall nutrition knowledge, practice and attitude of the students were found 51.6 %, 48.2% and 45.9% respectively. **Conclusion:** The triple burden of malnutrition is a burning topic among school going children.The healthy food choices will help a child to become healthy. The nutrition knowledge alone may not be sufficient to change dietary habits hence in addition there is need to inculcate positive attitude and practices towards healthy eating in early childhood. **Keywords:** KAP, nutrition, School going children

PPCN-132 PREVALENCE AND DETERMINANTS OF PICKY EATING BEHAVIOUR AMONG INDIAN PRESCHOOLERS. ***Kejal Joshi Reddy***[1,] Amita Manjure[2,] 1= Kamalnayan Bajaj Diabetes Unit, KEM Hospital and Research Centre, Rasta Peth, Pune, 2=Symbiosis School of Biological Sciences, Symbiosis International, Pune, Email:- kejaljoshi@gmail.com

Background & Objectives: Picky eating is a common disorder during childhood often causing considerable parental anxiety. Previous studies have demonstrated the importance of eating behaviour regarding dietary variety and nutrient intake of children. However, association between picky eating and factors influencing during first 1000 days of life demands research attention. **AIM** - To study the prevalence and associated factors of Picky eating in young children. **Materials & Methods:** A cross sectional study among young children (3-6 years, n=200) from Urabn Mahrashtra (Pune and Mumbai city) was carried out. Data on anthropometry, birth order, IYCF practices, dietary intake and eating behaviour, milestone achievement and parents' perception of picky eating was collected. Ethical permission and informed written consents were availed. **Result:** The prevalence of Picky eating reported by parents was 52.5%. Compared with non-picky eaters, picky eaters had a lower dietary intake of energy ($p<0.01$), protein ($p<0.05$) and carbohydrates. Picky eaters also had a 0.325 lower Z score for Weight for age (95% CI: -0.600, -0.050, $p<0.02$). Prevalence of morbidities was significantly ($p<0.005$) higher among picky eaters. Picky eating behaviour significantly associated positively ($p<0.05$) with age of weaning, catering of child,

professional engagement of both the parents and negatively ($p<0.01$) with WAZ and WHZ scores, breast feeding immediately after birth, independency of the children while eating meals and milestones achievement. **Conclusion:** Feeding practices and parental time have significant impact on developing Picky eating behaviour among children, which may have negative impact on the growth of their children. Further, longitudinal studies towards picky eating behaviour and it's impact on growth and development of the children shall be carried out. **Keywords:** Picky eating behaviour, nutritional status of young children, eating habits, child feeding practices.

PPCN-133 COMPARATIVE ANALYSIS OF A GLOBAL PERSPECTIVE RELATED TO MYTHS DURING PREGNANCY IN ORIENTAL AND OCCIDENTAL SOCIETIES. **Preeti Singh,** Dr.Avantina Sharma Bhandari
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Background & Objectives: The range of opinion can be bewildering. Fish is essential for the development of the baby's brain, but can't it also contain dangerous levels of mercury. The science is not just badly reported. It usually gets stirred into a stew of superstition and folklore that varies from country to country. Some of these taboos are myths and some of them have a modicum of grounding in science. Plenty of common sense gets handed down too, of course. Eating green leafy vegetables are recommended by traditional culture in the world. But sound advice often gets packaged together with ideas that are closer to magic than to medicine. **Objective** To know the prevalence of myths during pregnancy in occidental and oriental societies. To determine the causes of myths during pregnancy. To know the reality behind the myths followed during pregnancy.**Materials & Methods:** The study on comparative analysis of a global perspective related to myths during pregnancy in oriental and occidental societies was done in various sectors of lucknow and the data of oriental societies and occidental societies was collected from America, Canada, Australia and gulf countries. While executing this project an extensive review was done of various researches which had been performed before on similar topic. The questionnaire was made to know the myths followed in the different societies. The sample size was of 60 and the results were designed in a graphical manner. As per the results, we got to know the various variations between the oriental and occidental societies some were following those myths while the rest ones were clueless and on top of that some people told us about the history of following those myths. We had also found some similarities which were common in both the oriental and occidental societies. Hence, basically all were following the chain of history which had been directed to them before. **Result:** Now a days, women are aware about what to eat during pregnancy and these fascinating myths like white food can make their baby‘s skin will be fairer. What women choose to eat is also influenced by their own experiences, their access to particular foods, their socioeconomic status, family context, and so on. Thus, it is important to not assume that all people of a particular cultural group share the same dietary notions and food practices. **Conclusion:** By conducting this survey on comparative analysis of a global perspective related to myths during pregnancy in oriental and occidental societies" among women we came on the conclusion that some women still believes in myths during pregnancy but the percentages are lower than what we are expecting. With increase in the literacy status such taboos andmisconceptions have been reduced. **Keywords:** pregnancy, global perspective.

PPCN-134 NUTRITIONAL AND QUALITY CHARACTERISTICS OF PASTA INCORPORATED WITH FINGER MILLET (ELEUSINE CORACANA). ***ALOMIB AUSTINA RIBANAR,*** Usha Malagi***,*** *D*epartment of Food Science and Nutrition, College of Community Science University of Agriculture Science, Dharwad-580005-India***,***
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Background & Objectives: The present study was undertaken to develop finger millet (ragi) incorporated pasta for osteoporotic patients. **Materials & Methods:** Ragi and other ingredients required for preparation of pasta were procured from local market. The ragi flour and rava flour were mixed to develop pasta through permutation and combination method in the proportion of 0:100, 30:70, 40:60 and 50:50 respectively, similarly for the malted ragi flour and rava flour (0:100, 10:90, 20:80, 30:70 and 40:60 respectively). 100% rava flour is considered to be controlled. The pasta was prepared through the extrusion method. The cooking quality such as cooking time (mins), cooked weight (g), cooked volume (mL), solid loss (g) and water uptake (g) of the pasta were analyzed and sensory evaluation was carried out by 9-point hedonic scale conducted by 10 semi-trained panel members of FSN department of UAS, Dharwad. Nutrient composition analysis was carried out based on the best cooking quality and sensory evaluation. **Result:** The cooking time was significantly high for ragi flour incorporated pasta which was ranged from 12 mins to 19 mins followed by the malted ragi flour incorporated pasta ranging from 3 mins to 10 mins compared to the control (5 mins). Cooked weight and cooked volumes were decreases as

incorporation level of the ragi flour and the malted ragi flour increases. The solid loss was highest in 40% level of the malted ragi flour incorporation. The 40% ragi flour incorporated pasta were selected best on the basis of cooking quality and sensory score. Nutrient composition of the ragi flour incorporated pasta contain moisture (12.11%), fat (0.18%), total ash (1.73%), crude fiber (0.36%), protein (8.16%), carbohydrate (84.10%), physiological energy (371 kcal), and calcium (183 mg), respectively. **Conclusion:** In conclusion, it was found that ragi flour can be incorporated to prepare pasta as supplementation food for osteoporotic patients. **Keywords:** Cooking quality, Pasta, Ragi flour and Sensory evaluation.

PPCN-135 TRADITIONAL THERAPEUTIC FOOD HABITS FOR CHILD-BIRTH RELATED PHYSICAL CONDITIONS OF TWO INDIGENOUS TRIBES OF ASSAM: SEMA AND LAMA. ***Monisha Choudhury,*** Dr. Basanti Baroova. Indian Institute of Food Processing Technology**,** Email:- urjhaa@gmail.com

Background & Objectives: Indigenous tribes inherit aged know-how of disease remedial recipes consisting of locally grown agricultural and horticultural produces. Two tribe of very less population in Assam are Sema and Lama tribes have some basic food combinations as the planned diets during different physical conditions. **Materials & Methods:** In the present study, the specific child-birth related physical conditions viz. infancy, pregnancy and lactation, were studied for both the tribes through consensus. **Result :** As per the collected documentations, Sema tribe infants are fed with mashed banana and milk, khichdi, rice flour, soft rice and starch of rice along with breastfeeding, while the for the same condition, Lama tribe feeds infants with rice starch, sugar, banana-rice flour and milk combination, soft rice, sago and rice with mashed potato. For pregnancy, Sema tribe goes for boiled taro, boiled mustard greens, and boiled ferns to provide iron supplementation and conventional food of the tribe tortoise meat was avoided to avoid abortions. The Lama pregnant women are fed with mustard leaves fry, bottle gourd fry, fern fry, banana leaves fry and cooked banana inflorescence for iron supplementation along with chicken, pork and fish curries and dry fish chutney for protein supplement. In lactation, Sema tribe feeds its women with boiled papaya, boiled chicken, pigeon curry, boiled dry fish; while Lama tribe feeds papya curry, chicken boil, taro stem boil, pumpkin leaf curry and lentil boil for quicker recovery. The various percent of the aforementioned food uses along with percent of type of preparation were also calculated out condition-wise for both the tribes. **Conclusion:** The effectiveness of such food habits can be theoretically explained and gives scope for scientific validation studies. **Keywords:** Sema, Lama, Therapeutic Food Habit, Infancy, Pregnancy, Lactation

PPCN-136 GENDER DIFFERENCES IN EATING HABITS AND NUTRITIONAL STATUS AMONG ADOLESCENTS, AGES 13-17 YEARS IN MUMBAI. ***Panchali Moitra[1],*** Jagmeet Madan[1], Nida I Shaikh[2]. Sir Vithaldas Thackersey College of Home Science (Autonomous), SNDT Women University, Juhu, Mumbai, India.2= Rollins School of Public Health, Emory University, Atlanta, Georgia, USA. Email:- urjhaa@gmail.com

Background & Objectives: During a period of their life that is characterized by important psychological and physiological changes, adolescents are frequently attracted to unhealthy lifestyles 3-4, that may lend to inadequate nutrition (deficits or excess) and long -term health, growth, and development consequences tracking into adulthood.Given the importance of establishing healthy eating habits and the necessity of monitoring the nutritional status of the adolescent population to evaluate and refocus interventions, the present cross sectional study was carried out with an aim to assess the eating habits, nutrient intakes and nutritional status of adolescents, ages 13-17 years, in Mumbai. Comparison of the reported intakes with the recommended values and an investigation of any gender differences in nutrient intakes were also evaluated. **Materials & Methods:** A cross sectional study of 214 boys and girls from grades 8, 9 and 11 who were randomly selected from grade rosters of a government aided school, a private school and a junior college in Mumbai. Participants completed three non -consecutive, interviewer administered 24-hour dietary recalls and a 27-item eating habits assessment questionnaire over a three month period and provided anthropometry measurements. Eating habits such as meal pattern, food preferences, frequency of eating out and the habit of watching television or computer while eating at home were assessed. A perception survey including 9 items and 4 perceptions from 'traditional to totally modern' was also conducted. Data were analyzed using SPSS version 22. Mean nutrient intakes, percent recommended dietary allowance adequacy and macronutrient distribution of the diets were calculated. **Result :** The mean age of adolescents was 14.7±1.5 years, 43.1% were girls and had a BMI of 21.7± 5.3 kg/m2. Among girls, the overall prevalence of overweight and obesity was 15.5 % and 9.3% respectively. The prevalence of overweight and obesity was 10.7% and 7.8% among boys. Overall, 24.2 % reported eating outside with friends at least 2-3 times

a week; 23.3% had sweets and 29.9% had fried foods at least once a week. Samosa (33.3%), pav bhaji (54.6%), chaats (57.9%) and pakoda (50.5%) were consumed on weekly basis. More than half reported watching television regularly with their meals and less than two-thirds had breakfast on a daily basis. 43.9 % of energy consumed was provided by fats in their diets. The boys reported higher consumption of proteins ($p<0.01$) and energy, carotene and calcium ($p<0.05$) than the girls; though the mean intakes were still much lower than the respective recommended dietary allowances. The percent RDA adequacy of iron, zinc and B vitamins was calculated to be meager 30-40%. **Conclusion :** The study findings indicate the dual predicament of deranged macronutrient distribution and sheer micronutrient inadequacy in the diets of urban adolescents.Unhealthy eating habits such as skipping breakfast, frequent eating outs, watching TV while eating and increased indulgence in fried foods were observed. This calls for an urgent intervention to sensitize the adolescents and their families about ways to adopt healthy eating habits. **Keywords:** Eating habits, Adolescents, Nutritional status, nutrient intake, unhealthy habits

PPCN-137 NUTRITIONAL ASSESSMENT OF POST MENOPAUSAL WOMEN IN KOLLI HILL, TAMILNADU. ***Dr.S.Parameshwari,*** C.Rosalin. Periyar University, Salem, Tamilnadu. Email:-sparameshwari2009@gmail.com

Background & Objectives: Study objective was to assess the anthropometric measurement, biochemical, clinical and dietary assessment from the selected tribal postmenopausal women in Kolli hill, Namakkal District, Tamilnadu. **Materials & Methods:** Study was conducted in Kolli hills of Namakkal district, Tamil Nadu. Sample of 100 tribal postmenopausal women belonging to the age group of 40 to 55 years were selected for the collection of data regarding Anthropometric measurements like height and weight were measured. Body mass index was calculated for the selected subjects. 24 hour dietary recall method was used to assess the dietary intake of the subjects. **Result :** Mean height and weight were compared with standard values and found that height was below the standard values of NCHS (2010) and weight was normal. BMI of the subjects found that, 15 per cent of the subjects had normal BMI and 66 per cent of the subjects had BMI of < 16 and it categorized as underweight and severely malnourished, 11 per cent of the subjects had BMI in the range of 25-29.9 and it was categorized as overweight.8 per cent was indicated obesity. The respondents mean height was 155 cm and the mean weight was 53 kg. Cereals and pulses were consumed weekly thrice and green leafy vegetables consumed irregularly. Consumption of fruits and milk were poor. Food intake was less than the ICMR suggested RDA except green leafy vegetables and nutrient intake was found to be in adequate except vitamin, iron and calcium. **Conclusion :** Majority of the tribal postmenopausal women are severely malnourished and had very poor nutritional knowledge. **Keywords:** Tribal Women, Body Mass Index, Food Consumption.

PPCN-138 UNEXPLAINED ETIOLOGY OF ANEMIA IN JHARKHAND. ***Franciosalgeo,*** Santu Ghosh, Prashanth Thankachan, Beena Bose, Tinku Thomas, Anura V Kurpad, Sumathi Swaminathan. St. John's Research Institute & St John’s Medical College. Email:-franciosalgeo.g@sjri.res.in

Background & Objectives: Public health policies to combat anemia in India have largely focused on reducing iron deficiency through supplementation. The association of dietary micro-nutrient intake and anemia was examined in non-pregnant women of reproductive age (WRA) in Jharkhand, a state with high anemia burden. **Materials & Methods:** Data was collected from WRA aged 18-45 years availing rations from the Public Distribution System from 3 districts of Jharkhand, as part of a quasi-randomized control trial to evaluate impact of double fortified salt. Hemoglobin (Hb), Serum Ferritin (SF) and C-Reactive protein (CRP) were estimated. Women were classified as iron deficient anemic (Hb < 12 g/dL, SF < 15 µg/L, CRP <10 µg/L), anemic (Hb < 12 g/dL, SF > 15 µg/L, CRP <10 µg/L) and iron deficient (Hb > 12 g/dL, SF < 15 µg/L, CRP <10 µg/L). Intake of macro and micro-nutrients were computed from 24-hr diet recalls with multiple recalls in a subset of 120 women. The proportion at risk of inadequate intake of iron, folate and vitamin B12 was calculated using the probability approach. **Result :** A total of 478 women were recruited and blood collected from 405 women. Prevalence of anemia, iron deficiency and iron deficiency anemia were 72%, 37%, 32% respectively. Only one person reported thalassemia. Unexplained anemia was about 41%. The median dietary iron intake was 10.8 (9.0, 12.4) mg/day, while folate and B12 intakes were at 128.6 (105.3, 160.3) µg/day and 0 (0, 0.3) µg/day respectively. Risk of deficient intake for iron was 95.5% and folate 88.5%. Intakes of iron, B12, folate and various food groups were not associated with hemoglobin or ferritin levels. **Conclusion** : Although high prevalence of anemia was recorded, dietary intake was not associated with anemia. The effect of environmental factors and heavy metal

contamination may need to be explored to understand anemia in this region. **Keywords:** Anemia, risk of deficient intake

PPCN-139 Sripriya Dubey, - Withdraw

PPCN-140 CHOCOLATY KERNELS. ***NAZIYA FATHIMA,*** Smt. VHD central institute of home science .Email:- naziyafathima96@gmail.com

Background & Objectives: Value addition of food is of current interest because of increased awareness among consumers. Children and adolescent iron and protein requirement are high and hence value addition using millets and garden cress seeds is one way to meet iron and protein requirement. **Materials & Methods:** Standardization trials indicated that incorporation of 52% dark chocolate, 16% jaggery, 14% garden cress seeds, 7% little millet, 5% almonds, 4% coconut and 2% ghee was highly accepted. The present study aimed at sensory evaluation, proximate analysis and shelf life study of iron rich chocolaty kernels (value added chocolates). The product were subjected to sensory evaluation by 25 semi trained panellists. Sensory qualities included appearance, colour, texture, taste, odour and overall acceptability. A 9-point hedonic rating scale was used. **Result:** There was statistical significant ($p>0.02$) difference with respect to texture and overall acceptability. The developed product contained 23.66% moisture, 6.17g protein, 1.83g fat, 0.63g total fiber, 1.19g ash, 66.52g carbohydrate, 269.97kcal energy and iron 4.66 per 100g with a shelf life of 10-15 days.**Conclusion:** In lactating woman, children and all age group people this chocolaty kernels can be consumed as a good source of iron and protein, and helps in maintaining good health. **Keywords:** 9 point hedonic rating scale, proximate analysis

PPCN-141 UNDERSTANDING THE DRIVERS OF FOODS AND NUTRITION SECURITY AMONG TRIBAL MOTHER CHILD PAIRS IN KAWANT BLOCK OF CHHOTA UDEPUR DISTRICT. ***Qudshiya I. Motiwala ,*** Vanisha S. Nambiar. Department of Foods and Nutrition, Faculty of Family and Community Sciences, The M.S University of Baroda, Vadodara, Gujarat .Email:- qudshiya.motiwala@gmail.com

Background & Objectives: Food and Nutrition Security (FNS) of tribal women and children and health issues of tribal women may be different from urban areas and need to be studied in depth.**Aim:** To understand the drivers of Foods and Nutrition Security among tribal mother-child pairs in Kawant block of Chhota Udepur district, Gujarat. **Materials & Methods:** A cross-sectional study wherein 30 mother-child pairs from 4 villages from a tribal district of Kawant from Chota Udepur district of Gujarat were purposively if they were involved in farming, registered with the self-help group (SHG), and had child < 5 years. IFRPI indicators were used to assess the FNS among the mother-child pairs which included both direct and indirect parameters, data were analysed using WHO Anthro software, M S Excel and SPSS software. **Result :** All subjects belonged to poor families, lived in kutcha households and had extended family with 72% who were literate, 83% practiced open defecation, 54% had a low mean calorie (1180 Kcal) and protein intake (37 g) with poor dietary diversity and meal patterns. Based on anthro software, 86% children were moderately undernourished (WZA< -2SD), and 75% were moderately stunted (HZA) with mean calorie and protein intake of 950 kcal and 14g resp. Correlation results revealed that mothers with low BMI had wasted, stunted and underweight children. Mother BMI had sig. positive relations with number of family members, source of drinking water and timely introduction of complimentary feeding to children. The education status of mothers and source of drinking water had positive significance on morbidity of mothers. Institutional remedy during illness and timely introduction of complimentary feeding to child was found to be effective on normal MUAC of children (0-5y). **Conclusion :** Poor food availability and utilization were the main drivers of FNS in tribal areas and awareness regarding sustainable diets and food systems need to be created in such areas of the country, especially among populations which are involved in agricultural activities and yet food insecure. **Acknowledgements:** The authors are grateful to Deepak Foundation, Vadodara, for the necessary support and logistics. **Keywords:** Food and Nutrition security, Mother â€“ child Undernutrition, Drivers of food and nutrition security, tribal, agriculture.

PPCN-142 ETHNO-NUTRITIONAL STUDY OF SPICES USED FOR THE PREPARATION OF NKWI, A TRADITIONAL FOOD OF WESTERN CAMEROON: INFLUENCE ON FOOD SECURITY. ***Djiazet Steve*[1]*,*** Mezajoug Kenfack Laurette Blandine[1], Tchiégang Clergé[2], Prathapkumar Halady Shetty[2].1= Department of Food Science and Technology, Pondicherry University, Pondicherry India.2= National School of Agro-Industrial Science University of Ngaoundere Cameroon.Email:- qudshiya.motiwala@gmail.com

Background & Objectives: Food habits in Western Cameroon are characterised by highly spiced meals, including nkwi. Preliminary investigations revealed the existence of some spices specific to the western part of Cameroon. The spices are known to have health benefit properties and the meal plays an important role in the nutrition of the population. The aim of the present sturdy was to evaluate the types and quantities of spices for this soup in Western Cameroon in view of the development of a spice mix, and to determine its influence on food security. **Materials & Methods:** A survey was carried out; a total of 517 women were questioned individually on local spice samples that were presented to them. **Result :** The common most essential spices of the soup were F. xanthozyloïdes, S. melongena, M. whitei, and S. zenkeri fruit. Their quantities for a litre of nkwi varied between 0.79g for S. melongena to 18.27g for M. whitei. This variability was elucidated with the differences in the mean weights of spices from a division to the other. This study revealed that the spices were well known and there were differences, regarding the spice composition of nkwi with respect to the different divisions. The variability was mostly at the level of the choice of the spices utilised for the odour. **Conclusion :** The type and quantity of spices used for the preparation of nkwi varied in the different localities of the Western Cameroon, depending on the food habits of the different population groups. The variability in the spice composition of nkwi was based on the sensorial properties that are taken into consideration during the preparation. This study contributed to set the bases of the development of a ready to use spice mix for nkwi. **Keywords:** Local spices, Western Cameroon, nkwi, food security

PPCN-143 SOCIETAL TRANSITION AND EMERGING DOUBLE MALNUTRITION BURDEN IN URBAN POOR SETTINGS IN INDIA: A CROSS-SECTIONAL STUDY. ***Richa Malik,*** Seema Puri**.**Institute of Home Economics, F-4, Hauz Khas, University of Delhi, India.Email:- richamalik@hotmail.com

Background: Co-existence of under-and over-nutrition or Double Burden of Malnutrition (DBM), is emerging as a challenge in transitional countries like India especially among urban poor; reflecting multitude of underlying reasons; that need to be studied. **Objectives**: The study aims to determine the prevalence of different forms of malnutrition existing within the same community and to identify possible determinants. **Material and Methods**: This data was a part of a cross-sectional study of 400 children (3-5 years) from urban poor settings of Delhi, India.Anthropometric measurements (weight, height, waist-circumference, hip circumference in mothers and weight, height in children) were taken from a stratified random sample of mothers aged >18 years with children aged 3-5 years. Households were categorised into different forms of malnutrition existing within the same households; comparing different forms of malnutrition. **Results**: Based on BMI-for-age (BAZ) and Height-for-age (HAZ) scores of the child and BMI of the mothers, the prevalence for Double Burden (DB) was 41.3%; Single burden (SB) was 44.3% and No Burden (NB) was 14 %.Maternal and child anthropometric profile revealed significant differences among all three in the categorized households ($p<0.05$). The predictors associated with DBM existence included mothers' weight, height, age at marriage; child's height-for-age&weight-for-age z-scores($p=0.00$). The other predictors were day time sleep among children, spending more time in eating & leisure activities by mothers showing greater sedentary profile ($p=0.00$) and initiation of complementary feeding before 6 months by mothers in the case of the index child enrolled for the study**Conclusion**: Programs need to be redirected to help understand the pathways and to tackle this challenge of DBM.

POSTER PRESENTATIONS – FOOD SCIENCE NUTRITION

17th November 2018 **09:30 AM – 11:30AM**

Code No.	Name and Address	Title of Presentation
PPFSN-01	Archana Prabhat, Alva's Centre for Post graduate studies and Research, Moodbidri, Mangalore University, Email: drarchanaprabhat@gmail.com	Isolation, production and application of bacterial pectinase for industrial use.
PPFSN-02	Barbhai Mrunal D, Dept. FSN, UAS, GKVK, Bangalore, Email:mmrunal93@gmail.com	Formulation and evaluation of nutri-dense products for pre-schoolers.
PPFSN-03	Safira Banu.M, Email:- afiramohammud2018@gmail.com	Nutritional status and dietary habits of vegetarian tribal adolescent girls.
PPFSN-04	Sumangala S, Email:- ssbasapur555@gmail.com	Acceptable entity of black soybean genotypes (glycine max).
PPFSN-05	Misal Anuja Anil, Pariskar Vaibhav Sakharam, Gulve Maroti Shivaji. Email:anujamisal08@gmail.com	Enrichment of nutrient in biscuit by using of pomegranate waste.
PPFSN-06	Ganesh pariskar	Withdraw
PPFSN-07	Indu Bhargavi. K, Department of Food Science and Nutrition, Manasagangorti University of Mysore, Email:- indubhargavi.95@gmail.com	Impact of popping on the nutritional value of macro and micro nutrients in millets.
PPFSN-08	Shaikh Firdos Akbar, Email:- shaikhfirdos19597@gmail.com	Standardization and development of coconut burfi fortified with beetroot.
PPFSN-09	Gulafshan Perween, Univ. Dept. of H.Sc. -Food & Nutrition, TMBU, Bhagalpur. Email:- gulafshanperween4@gmail.com	Salt iodinization improvement in nutrition security.
PPFSN-10	S. Thirukkumar, Email:- psthirukumar@gmail.com	Effect of primary processing on the anti-nutritional factors in selected pulses.
PPFSN-11	Pratibha Basvanta Thombare, Food Science and Nutrition, College of Community Science, VNMKV Parbhani, Email:- pratibhathombare93@gmail.com.	Development of savoury snacks with incorporation of Colocasia leaves.
PPFSN-12	G. Narsing Rao, Email:- narsingg72@gmail.com	Preparation, standardization, physico-chemical characteristics, antioxidant activity, sorption isotherm of instant tomato spice mix for snacks.
PPFSN-13	Rekha Sinha, Birsa Agricultural University, Ranchi, Email:sinharekha_05@yahoo.co.in	Development of nutri cookies and their nutritional assessment.

FOOD SCIENCE NUTRITION (Contd..)

Code No.	Name and Address	Title of Presentation
PPFSN-14	Aishwarya V Patil Department of Food Science and Nutrition, College of Community Science, University of Agricultural Sciences, Dharwad, Email:- aishwaryavpatil550@gmail.com	Effect of incorporation of ragi flour to chakali.
PPFSN-15	Anit James, Email:- angeljames.james@gmail.com	Role of soy protein isolate in lowering blood pressure levels.
PPFSN-16	Sivasankari.R Dept. of Human Development and Family studies, CSC&RI, Madurai, Email:- sivasankarifsn@gmail.com.	Flavoured pineapple – Anutritious snack.
PPFSN-17	Mariammal.A, Email:- maribanurose@gmail.com	Value addition of baby corn.
PPFSN-18	Vinuta R Yadagouda, Department of Food Science and Nutrition, MHSc, College of Community Sciences, UAS, Dharwad, Email:- vinu.y06@gmail.com	Effect of pre-treatment on palak incorporated chapati.
PPFSN-19	Ashwini Bidwe, college of community science,VNMKV, Parbhani, Email:- prashu.vnmkv@gmail.com	Formulation and quality evaluation of weaning food.
PPFSN-20	Asha Arya, Jaishree Bhalerao,Department of Food Science & Nutrition, College of Community Science, VNMKV, Parbhani, Email:- asha_222902@rediffmail.com	Development of value added bakery products.
PPFSN-21	P.D. Shere, MIT College of Food Technology, MIT Art, Design and Technology University, Pune, Email:- sherepd@gmail.com	Nutritional enhancement of instant noodles by incorporating vegetable puree.
PPFSN-22	Rinju R, University of Calicut, Email:- rinju.64@gmail.com	Proximate and anti-nutrients analysis of pineapple plant (Ananas Comosus) stem and leaves.
PPFSN-23	Mariammal. A, Email:- maribanurose@gmail.com	Studies on storage stability of grape pomace powder incorporated functional health mix.
PPFSN-24	Aparna Nagendra, NU Hospitals, Bangalore, Email:- appu31@gmail.com	Proximate analysis and sensory characteristics of soya dates sandesh.
PPFSN-25	T G Thippeswamy, Department of Studies and Research in Biochemistry, Tumkur University, Tumakuru, Karnataka. Email:- thippeswamytg@gmail.com	Effect of germination on ascorbic acid and antioxidant activity in horse gram (Macrotyoma Uniflorum) seeds.

FOOD SCIENCE NUTRITION (Contd..)

Code No.	Name and Address	Title of Presentation
PPFSN-26	B.Kavitha, Dept of Horticulture, Nammalvar Agricultural College, TNAU, Email:- kavitharamesh82@gmail.com.	Preparation of nutraceutical rich 'steamed Indian rice cake'mix using different varieties of black gram and its physico-chemical characteristics.
PPFSN-27	Shweta Singh, Email:- shweta.9jdb@gmail.com	A study on the acceptability of plant-based milk and curd among the lactose intolerant people.
PPFSN-28	Najma Chokli, St. Teresa's Autonomous College, Ernamkulam, Email:- najmachokli@gmail.com	Development and evaluation of nutricookies designed for Type 2 diabetes.
PPFSN-29	Anithasri. M. J, Email:- anithasri1964@gmail.com	Development of sorghum health mix from popped sorghum.
PPFSN-30	Sonal Aigal, University of Agricultural Sciences, Dharwad, Email:- sonalaigal@gmail.com	Starch digestibility and glycemic index of ready to cook foxtail millet flakes.
PPFSN-31	Kalpana Lahadee, Email:- lahadekalpana15@gmai.com	Development of low glycaemic index food products.
PPFSN-32	Sonal Aigal, University of Agricultural Sciences, Dharwad, Email:- sonalaigal@gmail.com	Ready to cook foxtail millet flakes: Extended uses and organoleptic evaluation.
PPFSN-33	N. S. Rajendran, Dept. Of Life Sciences, University Of Calicut, Email:- Pectin2018@gmail.com	Extraction and characterization of pectin from underground stem of banana.
PPFSN-34	Dr. Shagufta Yasmin, Email:- drshagufta13@gmail.com	India's transition from food security to nutrition security.
PPFSN-35	K.Geethanjali, Avinashilingam Institute of Home Science and Higher Education for Women, Coimbatore, Email:- geethanjalikamaraj15@gmail.com	Formulation and standardization of iron and vitamin C enriched dark chocolate.
PPFSN-36	Srividhya Raghunathan (Kayastha), Email:- srividhyar1911@gmail.com	Gundruk a traditional fermented food of himalayan region with potential probiotic and health benefits.
PPFSN-37	Samreen K Kittur, College of Community Science, University of Agricultural Sciences, Krishi Nagar, Dharwad, Email:- samreenk06@gmail.com	Quality evaluation of sweet potato genotypes of different flesh colours.
PPFSN-38	Wandhekar Sangram Sanjay,	Withdraw
PPFSN-39	Dr. Merrylin. J, Department of Food Science and Nutrition, Sarah Tucker College, Tirunelveli, Email:- merrylin_86@yahoo.co.in	Development of value added product from tomatoes (squash, halwa and toffee) and their nutritional composition.

FOOD SCIENCE NUTRITION (Contd..)

Code No.	Name and Address	Title of Presentation
PPFSN-40	P. G. Prabhakara Rao, CSIR-Central Food Technological Research Institute, Resource Centre, Habsiguda, Hyderabad, Email:- rao.pamidighantam@gmail.com	Development and quality evaluation of ridge gourd peel dietary fibre fortified extruded snack.
PPFSN-41	Rajesh Devisetti, Department of Food Science and Nutrition, University of Mysore, Mysuru, Email:- rajeshjrg@gmail.com	Effect of hydrothermal processing on antioxidant properties of cowpea from organic and conventional sources.
PPFSN-42	G. Sulochanamma, CSIR-Central Food Technological Research Institute, Resource Centre, Habsiguda, Hyderabad, Email:- sulochanapraveen98@gmail.com	Nutritional assessment, antioxidant and antimicrobial activity of Nigella sativa seeds.
PPFSN-43	Sridhar Rachakonda, CSIR-Central Food Technological Research Institute, Resource Centre, Habsiguda, Hyderabad, Email:- sreedharr@cftri.res.in	Preparation of protein concentrate from Nigella sativa seeds and evaluation of functional properties.
PPFSN-44	Srinivasulu K, CSIR-CFTRI, Resource Centre, Habsiguda, Hyderabad, Email:- srinivasuluk@cftri.res.in	Moisture adsorption isotherms of pre-treated amaranth flour fitted at gab model.
PPFSN-45	Alisha P, Department of Food and Nutritional Sciences, Sri Sathya Sai Institute of Higher Learning, Anantapur, Email:- meeram@sssihl.edu.in	Standardization and quality evaluation of millet cookies.
PPFSN-46	Bushra Shaida, Email:- gulbushra@gmail.com	Evaluation of functional properties of Cydonia oblonga seed extract.
PPFSN-47	Mohana Rubini.G.S, Avinashilingam Institute for Home Science and Higher Education for Women, Email:- mohanarubini1996@gmail.com	Product development and nutritional value of chikki with underutilized pumpkin seeds.
PFSN-48	K Avanthika, Department of Food and Nutritional Sciences, Sri Sathya Sai Institute of Higher Learning, Anantapur, Email:- meeram@sssihl.edu.in	Development and quality evaluation of pea flour incorporated millet cookies.
PPFSN-49	Harshitha.B.K, British Biologicals, Email:- harshitha632@gmail.com	Organoleptic and proximate analysis of developed health mix enriched with omega-3 fatty acids.
PPFSN-50	Neelavathani M, Email:- neelavathani@gmail.com	Process standardization for β carotene enrichment of coconut burfi with papaya.
PPFSN-51	Ruchita Agarwal, Assam Agricultural University, Email:- ruchhere@gmail.com	Value - addition of horticultural crops of north-east India for ensuring food and nutrition security.

FOOD SCIENCE NUTRITION (Contd..)

Code No.	Name and Address	Title of Presentation
PPFSN-52	M Yogitha Chowdary, Vignan's (Deemed To Be) University, Email:- yogithachowdary@hotmail.com	Development and standardization of sorghum based edible cutlery.
PPFSN-53	Appani Laxman Kumar, Sri Konda Laxman Telangana State Horticultural University, Email:- appanilaxman123@gmail.com	Effect of fortification on nutritional and sensory quality of papaya and guava fruit bar.
PPFSN-54	V.Sathiya, Department of Nutrition and Dietetics, PSG College of Arts and Science, Coimbatore, Email:- sathiya2022@gmail.com	Formulation, standardisation, proximate composition and popularization of chia seeds (Salvia hispanica l.) based recipes.
PPFSN-55	Kushwaha Pratibha,	Withdraw
PPFSN-56	Kavita B. Patil, All India Coordinated Wheat and Barley Improvement Project, University of Agricultural Sciences, Dharwad, Email:- kavita.kotagi@gmail.com	Biochemical characterization of Dicoccum wheat genotypes of peninsular zone.
PPFSN-57	Christina George, College Of Community And Applied Sciences, Mpuat, Email:- christinageorge666@gmail.com	Nutrient analysis of ready-to-eat product by incorporation of raw jackfruit pulp powder.
PPFSN-58	G. Karishma Yadav, Avinashilingam Institute of Home Science and Higher Education for Women, Email:- gkarishma94@gmail.com	Sterling impact of maltodextrin on textural properties of jackfruit (Artocarpus heterophyllus) bar using a solar cabinet dryer.
PPFSN-59	Abhirami Sivaprasad, Avinashilingam Institute for Home Science and Higher Education for Women, Email:- abhiramisiv@gmail.com	Development and nutritional evaluation of value added chicken meat sausages.
PPFSN-60	Bhavesh Baria, ICAR-National Dairy Research Institute, Karnal, Haryana, Email:- bariabhavesh2@gmail.com	Black carrot concentrate as natural colourant for yoghurt.
PPFSN-61	Anamika Singh, ICAR- National Dairy Research Institute, Karnal, Haryana, Email:- anamikanshu@gmail.com	Development of a nutrient rich weaning food composite of yellow peas/ bengal gram with maize, rice and skimmed milk powder by extrusion cooking process.
PPFSN-62	Ms. Kankana Das, Department of Chemical Technology, University of Calcutta, Email:- daskank2013@gmail.com	Engineering diacylglycerol oil production from medium chain fatty acids, catalysed by both enzymatic and chemical processes for juxtaposed comparative analysis of esterification reaction: A pilot study.
PPFSN-63	Madhushrita Das, Department of Chemical Technology, University of Calcutta, 92, A.P.C Road, Kolkata, Email:- dasmadhushrita@yahoo.com	In vitro study of antioxidant and antihypertensive activity of protein hydrolysates from freshwater mussel lamellidens marginalis.

FOOD SCIENCE NUTRITION (Contd..)

Code No.	Name and Address	Title of Presentation
PPFSN-64	Sriparna Chkraborty, Department of Chemical Technology, University of Calcutta, Email: sriparnachakraborty16@gmail.com	Preparation of amino acyl glycerides as novel food formulation.
PPFSN-65	Asima Saqib,	Withdraw
PPFSN-66	Archana Tewari, Punjab Agricultural University, Ludhiana, Email:- tiwariarchana587@gmail.com	A comparative study of total phenols, anthocyanins, ascorbic acid and antioxidant activity of wild mulberry species.
PPFSN-67	Priyanka Tangariya, Department of Foods and Nutrition, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Udham Singh Nagar, Uttarakhand, Email:- priyanka.tangariya@gmail.com	Optimization, sensory and nutritional evaluation of beetroot enriched nutritious snack bar.
PPFSN-68	S.Udhaya Geetha, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Email:- udhayageetha92@gmail.com	Development and standardization of beta carotene rich squash.
PPFSN-69	Akriti Jaiswal, Department of Food and Nutrition,College of Home Science, Punjab Agricultural University, Ludhiana, Email:- jaiswalakriticsa@gmail.com	Effect of processing treatments on antioxidant potential of Indian sesame seeds.
PPFSN-70	Jyothi.H,	Withdraw
PPFSN-71	N. Kapaini Basena, Dept. of Food Science and Nutrition, Assam Agricultural University, Jorhat, Email:- kapainibasete@gmail.com	Processing for value addition of starfruit.
PPFSN-72	V Geetha Balasubramaniam, Centre for Food Technology, Department of Biotechnology, Anna University, Email:- geethavbala@gmail.com	Prebiotic potential of finger millet seed coat polyphenols.
PPFSN-73	G.Kaviya, Email:- kaviya.gk6@gmail.com	Effect of fruits consumption on blood glucose level of diabetics.
PPFSN-74	Kimeera Ambati, Sri Venkateswara University, Email:- kimeeraa@gmail.com	Millet milk- A potential source of calcium for infants.
PPFSN-75	Arnab Chatterjee, Department Of Nutrition, Asansol Girls' College, Asansol, West Bengal, Email:- arnabchatterjeenin@gmail.com	Comparative analyses of calcium content of various sources of milk; commonly consumed by the people of Asansol.
PPFSN-76	Sarah Jane Monica, Department of Home Science, Women's Christian College, Chennai, Email:- sarahjane.monica@gmail.com	In vitro antioxidant and antidiabetic potential of pumpkin seed protein (Cucurbita maxima L.).

FOOD SCIENCE NUTRITION (Contd..)

Code No.	Name and Address	Title of Presentation
PPFSN-77	Prabhavathi S.N, University of Mysore , Email:- pprabhavathisn@gmail.com	Formulation and evaluation of low sugar nutribars.
PPFSN-78	Ranjitha N.L, University of Mysore, Email:- ranjitha.nl81194@gmail.com	Nutritional properties of groundnut seed cake and their utilization in the formulation of baked products.
PPFSN-79	Keerthi Kiran D M,	Withdraw
PPFSN-80	Chingakham Sima Chanu,	Withdraw
PPFSN-81	Yashmin Nongrum, Email:- yeshminnongrum@gmail.com	Development of value added extruded food product with the incorporation of Centella asiatica.
PPFSN-82	Premila L. Bordoloi, Department of Food Science and Nutrition, College of Community Science, Assam Agricultural University, Jorhat, Assam, Email:- premilajmch13@gmail.com	Fformulation and nutritional analysis of low cost enteral formulae for nutrition therapy.
PPFSN-83	Irshad Ahmad Shah, Department of Food Science & Technology, University of Kashmir, Hazratbal, Srinagar, Email:- irshadshah401@gmail.com	Antioxidant and antibacterial activity of wild rose hips of Kashmir valley.
PPFSN-84	Chandrima Mandal,	Withdraw
PPFSN-85	Swetha .S, College of community Science, UAS Dharwad, Email:- shwetaswetus2599@gmail.com	Value Addition to Nippat Through Incorporation of Little millet.
PPFSN-86	Shuchita Anand, Manav Rachna International Institute of Research and Studies, Email:- shuchita.anand96@gmail.com	Cashew apple- A lesser known fruit with high functional benefits.
PPFSN-87	Roopa U., University of Agricultural Sciences, Dharwad, Email:- roopsu.08@gmail.com	Oil quality of high oleic groundnut variety DH 245.
PPFSN-88	Vishakha Singh, Deptt. of Food Science and Nutrition, Assam Agricultural University, Email:- duttaankita2017@gmail.com	Value addition of indigenous fruits and vegetables of north-east region for ensuring food and nutrition security.
PPFSN-89	Latha Rani R, College of Community Science, UAS Dharwad, Email:- latharanjurani@gmail.com	Physicochemical properties of buckwheat.
PPFSN-90	Roopa U., University of Agricultural Sciences, Dharwad, Email:- roopsu.08@gmail.com	Performance of high oleic advanced breeding lines of groundnut (Arachis hypogaea L.) Under natural drought conditions.

FOOD SCIENCE NUTRITION (Contd..)

Code No.	Name and Address	Title of Presentation
PPFSN-91	Goudar I. V. University of Agricultural Sciences, Dharwad, Email:- ivgaicrp@gmail.com	Identification of potential confectionery groundnut genotypes for cultivation in Karnataka.
PPFSN-92	Goudar I. V., University of Agricultural Sciences, Dharwad, Email:- ivgaicrp@gmail.com	Early generation selection for drought tolerance in groundnut (Arachis hypogaea L.).
PPFSN-93	Vishakha Singh, Deptt. of Food Science and Nutrition, Assam Agricultural University, Email:- duttaankita2017@gmail.com	Effect of multi-nutrient supplementation on the health status of malnourished school age children.
PPFSN-94	Nisha Jha, Department of Food Science and Technology, Pondicherry University, Email:- nishajha.22121995@gmail.com	Screening of generally recognized as safe phytochemicals and evaluating their anti-virulent potential against Versinia. enterocolitica.
PPFSN-95	Nimitha Suresh,	Withdraw
PPFSN-96	Anand Zanwar, Centre for Innovation in Nutrition Health Disease, Interactive Research School for Health Affairs, Bharati Vidyapeeth (Deemed to be University), Pune, Email:- anandzanwar10@gmail.com	Development of micronutrient rich, stabilized vegetarian omega-3-fatty acid formulation for food fortification.
PPFSN-97	K. Balaswamy, CSIR-Central Food Technological Research Institute, Resource Centre, Hyderabad, Email:- kbswamy@cftri.res.in	Development of protein rich with good antioxidant potential extruded ready-to-eat snack using kidney beans and Boerhavia diffusa.
PPFSN-98	Baskar M, Email:- baskar.fsn@gmail.com	Standartization of clarified sapota RTS beverage from sapota fruit.
PPFSN-99	Pameu Khenmungan,	Withdraw
PPFSN-100	Bhavesh Baria, ICAR-National Dairy Research Institute, Karnal, Haryana, Email:- bariabhavesh2@gmail.com	Extraction of carotenoids using green biorefinary concept.
PPFSN-101	Laxmi Pandey,	Withdraw
PPFSN-102	Priyadarshini S, Department of Home Science, Women's Christian College, Chennai, Email:- priyadarshinis02@gmail.com	In vitro antioxidant and antidiabetic activity of protein extracted from wood apple (Limonia acidissima L.) Seed.
PPFSN-103	Poonam Jethwani, Department of food and nutrition, College of Home Science, Punjab Agricultural University, Ludhiana, Email:- poonam.jthi@gmail.com	Formulation and evaluation of nutrient and antioxidant rich bar with the incorporation of chiaseed and mango.
PPFSN-104	Poonam Jethwani, Department of food and nutrition, College of Home Science, Punjab Agricultural University, Ludhiana, Email:- poonam.jthi@gmail.com	Development and evaluation of nutrient and antioxidant rich bar with the incorporation of flaxseed and guava.

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Code No.	Name and Address	Title of Presentation
PPFSN-105	Khushboo Singh, Department of Food and Nutrition Punjab Agricultural University, Ludhiana, Punjab, Email: khush16.1990@gmail.com	Efficacy of pomegranate peel extract in suppressing the rancidity of *Mathri.*
PPFSN-106	Shrutika Umralkar, Department of Studies in Food Science and Nutrition, University of Mysore, Manasagangotri, Mysuru, Email:- shrutika.umralkar@gmail.com	Sensory analysis, granule morphology and estimated glycemic index of selected Stevia based Indian desserts.
PPFSN-107	Sanjana Agarwal,	Withdraw
PPFSN-108	Sindhu. S, Smt. VHD Central Institute of Home Science, Bangalore, Email:- sindhuyogitha19@gmail.com	Standardization and development of millet nippattu with natural ingredients.
PPFSN-109	Yashmin Nongrum, Department of Food Science And Nutrition, College of Community Science, Assam Agricultural University, Email:- yeshminnongrum@gmail.com	Nutritional and organoleptic evaluation of fruit based complementary food mix for pregnant and lactating mother.
PPFSN-110	Sushma.S, Smt.VHD Central Institute of Home Science, Email:- sushma1sushmas@gmail.com	Development and standardisation of nutritos (millet nachos).
PPFSN-111	Senjuti Saha,	Withdraw
PPFSN-112	Dr S Thilagavathi, Periyar university , Salem, Email:- thilakachandru@gmail.com	Nutrient and phytochemical composition of developed fruit bars (kiwi and pomegranate).
PPFSN-113	Meera M, Department of Food and Nutritional Sciences, Sri Sathya Sai Institute of Higher Learning, Anantapur, Email:- meeram@sssihl.edu.in	Development and shelf stability of flax seed and garden cress seed incorporated health cookies.
PPFSN-114	Lakshmi Jithendran, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Email:- lakshmi_jithendran@yahoo.com	Nutrient content of Solanum nigrum berries cultivated in kitchen garden.
PPFSN-115	Prakruthi M, Department of Food Science and Nutrition, Yuvaraja's College Mysore, Email:- prakruthi.s.lakshmi@gmail.com	Development of traditional low glycaemic index snack product from barnyard millet flakes and evaluation of its nutritional quality.
PPFSN-116	Mounika Patiballa, Department of Food Science and Nutrition , College of community science, UAS Dharwad, Email:- monicamonu819@gmail.com	Formulation and acceptability of foxtail millet incorporated cake.
PPFSN-117	Shonima Venugopal, The Maharaja Sayajirao University of Baroda, Vadodara, Email:- shonima118@yahoo.co.in	Product development, sensory evaluation, glycemic index and lipemic response of amla (Emblica officinalis) powder incorporated recipes.

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Code No.	Name and Address	Title of Presentation
PPFSN-118	Rajeshwari F Kurbett, Email:- raj10681995@gmail.com	Studies on preparation and sensory quality of soybean incorporated vada.
PPFSN-119	Tokpam Reshma Chanu, Department of Water and Health - Faculty of Life Sciences, Division of Nutrition & Dietetics, JSS Academy of Higher Education & Research, Mysore, Email:- misnahenbi123@gmail.com	Black rice- proximate and mineral composition, phytochemical screening, polyphenol content, functional properties and product development.
PPFSN-120	Seetharamu JJ, Division of Nutrition & Dietetics, Department of Water & Health-Faculty of Life Sciences, , JSS Academy Of Higher Education and Research (JSSAHER), Mysuru, Email:- seetharamujj@gmail.com	Dehydrated green leafy vegetables as functional ingredients in traditional indian recipe -chutney powder.
PPFSN-121	Anupriya Mamgain,	Withdraw
PPFSN-122	Senjuti Saha,	Withdraw
PPFSN-123	Bhavya Pande,	Withdraw
PPFSN-124	Sivananth.C, Department of Food Science and Nutrition, Home Science College & Research Institute, Tamil Nadu Agricultural University, Madurai, Email:- sivananth.c@gmail.com	Physicochemical and amino acid profile of groundnut (Arachis hypogaea L.) germ and its substituted cookies.
PPFSN-125	Kavitha Ravichandran, Centre for Food Technology, Department of Biotechnology, A. C. Tech. Campus, Anna University, Chennai, Email:- kavisri9@gmail.com	Physicochemical properties of indigeneous red rice varieties of Tamil Nadu.
PPFSN-126	Akshatha, Yuvaraja college, University of Mysuru, Mysuru, Email:- akshatha95sai@gmail.com	Sensory evaluation of therapeutic soup developed with basil seeds.
PPFSN-127	Sandeep Jaiswal, Centre for Food Technology, Department of Biotechnology, Anna University, Email:- jaiswalsandeep2025@gmail.com	Immunomodulation of monocytes through probiotic isolates in THP-1/ HT-29 double layered co-culture model.
PPFSN-128	Nithyakalyani Doraiswamy, Centre for Biotechnology, Anna University, Chennai, Email:- nithyakalyani.dr@gmail.com	Co-immobilized hydrolases on nanoparticles: Application in food industry.
PPFSN-129	Ratika Oberoi,	Withdraw
PPFSN-130	Deepika D, Smt, VHD Central Institution of Home Science And Research Centre (Autonomous), Bangalore, Email:- deepikagowdaraj@gmail.com	Development and evaluation of millet based – dry fruits ice cream.
PPFSN-131	Daisy Sharma,	Withdraw
PPFSN-132	N Ilakya, Email:- ilakya16@gmail.com	Process standardization for foxtail methi khakhra.

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Code No.	Name and Address	Title of Presentation
PPFSN-133	Amrit Lal Singh, ICAR-Directorate of Groundnut Research, PB 5, Gir Natl Park Road, Junagadh, Email:- alsingh16@gmail.com	Peanut a nature's nutritious food and good source of iron and zinc.
PPFSN-134	Swati Parnami, The M.S.University of Baroda, Email:- swatiaap@gmail.com	Feasibility and acceptability of guava leaf powder (glp) incorporated traditional indian recipes and determination of shelf life and phytochemical estimation ofGLP incorporated IndianS crispy bites (ICB).
PPCN-135	Pavitra.K, Email:- Pavitrapaviaug@gmail.com	Development of millet ladoo mix.
PPCN-136	Sudha kumbar, Department of Food and Nutrition and Research Centre, Smt. V.H.D Central Institute of Home Science (Autonomous), Seshadri Road, Bengaluru Email:- sudhakumbar.sudhi@gmail.com	Development of value added multi millets namkeens.
PPCN-137	Tousif pasha, Department of food science and nutrition (yuvaraja's), Email:- sudhakumbar.sudhi@gmail.com	Development of traditional breakfast food from white ragi.
PPCN-138	Sushmitha LJ, Department of food science and nutrition (yuvaraja's) , Email:- sudhakumbar. kslj771995@gmail.com	Comparative evaluation of sensory and nutritional quality of dumplings from brown and white ragi.
PPCN-139	Syeda Sara Huma, Smt. VHD Central Institute of Home Science, Email:- syedsarahuma@gmail.com	Development and standardization of wat-tea.
PPCN-140	Yashwanth Kumar LS, Department of food science and nutrition (Yuvaraja's college), Email:- yashunayak82@gmail.com	Development of breakfast product from barnyard millet - shiavalaki (Urochola ramosa).
PPFSN-141	Bhramarambha MS, Department of food science and nutrition (Yuvaraja's college), Email:- bhramarambhamsbhramarambhams@gmail.com	Development of breakfast product from barnyard millet - Gojjuavalaki (Urochola ramosa).
PPFSN-142	Aruna P, Department of food science and nutrition (Yuvaraja's college), Email:- arunaaru30101996@gmail.com	Development of healthy snack product (laddu) by brown top millet.
PPFSN-143	Basirath Afreen I ,	Withdraw
PPFSN-144	Nethra vathi G, Smt. VHD. Central Institute of Home Science, Email:- nethrav14@gmail.com	Finger millet sandige.

FOOD SCIENCE NUTRITION (Contd..)

Code No.	Name and Address	Title of Presentation
PPFSN-145	Mehanaz Fathima,	Withdraw
PPFSN-146	Mahesh Shivananjappa, Department of Food Science and Nutrition, Yuvaraja's College (Autonomous), University of Mysore, Email:- mayavishiva@gmail.com	Using pranic-energy to increase yield of knol-khol (Brassica oleracea) and thus ensuring nutrition security.
PPFSN-147	Prajna B, Department of food science and nutrition (Yuvaraja's college), Email:- prajnad24@gmail.com	Effect of different processing method on nutritional quality of browntop millet (Urocholoa ramosa).
PPFSN-148	Hifza khan, Smt VHD Central Institute of Home Science, Email:- hifzakhan76@gmail.com	Development and evaluation of nutri-fruity jam for all age groups.
PPFSN-149	Kavita Amol Mane, MIT College of Food Technology, MIT ADT University, Rajbaug, Pune, Email:- kavita83.more@rediffmail.com	Development and quality evaluation of lycopene enriched whey base functional beverage.
PPFSN-150	Mamtha Chandra singh, School of Medicine (University of Wollongong, Australia) and Illawarra Health and Medical Research Institute (Australia), Email:- mcs931@uowmail.edu.au	Potential of high-pressure processing preservation as a sustainable solution to malnutrition.

PPFSN-01 ISOLATION, PRODUCTION AND APPLICATION OF BACTERIAL PECTINASE FOR INDUSTRIAL USE. ***Archana Prabhat***, Nayana, Alva's Centre for Post graduate studies and Research, Moodbidri, Mangalore University, Email: drarchanaprabhat@gmail.com

Background & Objectives: Production of microbial enzymes at the industrial scale and their commercialisation has gained a lot of focus and importance. Some of the industrially important enzymes from microbial origin include lipases, amylases, proteases, xylynases, pectinases etc. Objective: This study was undertaken to determine the production and application of bacterial pectinase for industrial use (clarification of fruit juices). **Materials & Methods:** Here the isolation of microorganism and characterization was done, then pectinase assay was performed and finally fruit juice was clarified using this enzyme. Here decayed orange peel was used as the sample and it was collected from a local market, South Kalamsseri- Cochin. The collected decayed orange part was used for the serial dilution in order to isolate the organism. The dilutions were then plated on appropriate media (pectin agar media) and spread plate was performed. After the incubation time colonies with zone were obtained which shows the production of pectinase enzyme. These isolated colonies were then inoculated to the petri plate containing pectin agar media and streak plate was performed. After 24 hours incubation, the isolated colonies were subjected to Gram's staining. **Result:** It was a Gram-negative bacillus. The biochemical characterization (IMViC test) was done and VP Citrate tests were positive. Then the colonies were inoculated in Pectinase Production Broth. After 24 hours incubation, the media was centrifuged for the isolation of enzymes. The enzyme assay also done by titration technique and the enzyme activity was found to be 0.78 U. This isolated enzyme was used for the clarification of apple juice and lime juice. **Conclusion:** According to the findings obtained from the study the clarification of fruit juice by the use of bacterial pectinase is most cost effective and yield good results for industrial use. **Keywords:** Clarification, fruit juice, enzyme, microbe, pectinase, xylynases.

PPFSN-02 FORMULATION AND EVALUATION OF NUTRI-DENSE PRODUCTS FOR PRE-SCHOOLERS. ***Barbhai Mrunal D***, Vijayalakshmi D, Dept. FSN, UAS, GKVK, Bangalore, Email:mmrunal93@gmail.com

Background & Objectives: Pre-schoolers within the age group of 1-6 years are picky eaters, rejecting full meals, preferring snacks thus, making it one of the important meals contributing to daily nutrient intake. They are vulnerable, falling prey to the vicious cycle of malnutrition if diet lacks in quality and quantity. Thus, present study was conducted with objective to formulate nutrient dense snack product for pre-schoolers. **Materials & Methods:** Three variations of Veggi sticks were developed by replacing refined wheat flour with wheat: soy flour (9:1) and incorporation of spinach leaves at 5 (VS1), 10 (VS2) and 15 (VS3) per cent level. Sticks prepared from refined wheat flour without addition of spinach served as control. Prepared product was evaluated by 21 semi trained panel members for organoleptic parameters with 9-point hedonic scale and nutrients were analysed for best accepted products using AOAC methods. Statistical analysis was done using one-way analysis of the variance and significance was noted at 5 per cent level. **Result:** Sensory evaluation revealed that veggi sticks with 15 per cent spinach was best accepted with 8.42 overall acceptability and control with 7.80 overall acceptability. Due to addition of spinach higher scores were obtained for VS3 compared to control for colour (8.57, 7.95) and appearance (8.42, 7.66) respectively. The nutrient analysis showed 100 gm of Veggi sticks (VS3) had 409 Kcal of energy, 15.18 gm of protein, 14.60 gm of fat, 95.10 mg of calcium and 7.00 mg of iron. The amount of protein, calcium and iron was increased in VS3 than control as refined wheat flour was replaced by wheat: soy flour (9:1) and incorporation of spinach. **Conclusion:** Value addition of the snacks preferred by pre-schoolers can make them more nutri-dense and can act as substitute for the commercially available snacks. **Keywords:** pre-schoolers, picky eaters, organoleptic evaluation, nutri-dense.

PPFSN - 03 NUTRITIONAL STATUS AND DIETARY HABITS OF VEGETARIAN TRIBAL ADOLESCENT GIRLS. ***Safira Banu.M***, Thirumani Devi.A,
Email:- safiramohammud2018@gmail.com

Background & Objectives: Adolescence is the transition period between childhood and adulthood where rapid physical, mental, emotional and social development takes place. Adolescent girls are at greatest risk for nutrient deficiency and it affects their overall development. With this background this study was conducted to find out the aspects related to socioeconomic profile and to assess the nutritional status of the selected adolescent girls (N=30) by anthropometric measurements in a tribal area of the Nilgiri District. **Materials & Methods:** It was a community based cross sectional study conducted in the tribal area of Nilgiri District. Thirty selected adolescent

girls were interviewed using questionnaire and anthropometric measurements was carried out. Results were analyzed statistically. **Result:** In socioeconomic status 70 percent of the selected subjects belonged to nuclear family and 30 percent were in joint families. The findings of study revealed that 43 percent of them had normal BMI and only three percent were underweight. Seventy six percent of them had normal waist hip ratio and 23 percent of them had high waist hip ratio. Majority of selected subjects missed their lunch and less than 27 percent missed breakfast and dinner. Nutrient intake of the selected subject revealed that intake of protein, fiber, energy, calcium, iron, carotene, thiamine, niacin and vitamin c was deficit when compared to ICMR-RDA (2016). The type of the food intake is major consideration for the nutritional status of the selected subjects. The clinical symptoms of the selected subjects highlighted were general weakness, poor appetite and mouth ulcer and were considered as the common deficiency signs experience by majority of the selected subjects. **Conclusion:** Since the prevalence of under nutrition was high among selected tribal adolescent girls, appropriate health education and nutrition intervention should be directed to improve their nutritional status and promote their optimum health status. **Keywords:** Adolescents, Girls, Nutritional status, Anthropometry and clinical examination.

PPFSN -04 ACCEPTABLE ENTITY OF BLACK SOYBEAN GENOTYPES (GLYCINE MAX). ***Sumangala S,*** Email:- ssbasapur555@gmail.com

Background & Objectives: To know the acceptability of black soybean genotypes. **Materials & Methods:** A total of three soybean genotypes including two black soybeans- kalitur and DSM (Dharwad Soybean Mutant) with one yellow soybean - DSb 21 were procured from Department of Crop Physiology, University of Agriculture Sciences, Dharwad during kharif - 2017. The cooking quality of grains was evaluated in terms of soaked weight and volume, cooked weight and volume, cooking time, per cent increase in weight and volume and per cent solids leached during boiling and pressure cooking methods. The acceptability of cooked seeds was evaluated for organoleptic profile by using 9 point hedonic scale. **Result :** Among the cooking quality parameters, per cent increase in weight and cooking time differed significantly (p ΓëÑ 0.01) among boiled yellow and black soybean genotypes. Significant (p ΓëÑ 0.01) difference was noted in pressure cooking time of yellow and black soybean genotypes. Boiling of white or black resulted in increased weight (30 - 32.88 g%), increased volume(24 - 28 ml%) and time took 1- 11/2 hrs for cooking was with acceptable index of 83.88. However pressure cooking of black soybeans resulted in higher increase in weight (32 - 39.77 g %), volume (27- 29.50 ml %) and took less time for cooking of seeds (20 - 31 min). The acceptable index of pressure cooked seeds was 83 - 84.51. **Conclusion:** Among the different cooking methods, pressure cooking increased cooked weight, volume and per cent solids leached with minimum time for cooking for black soybean genotypes. **Keywords:** black soybean, DSM, Kalitur, DSb 21.

PPFSN-05 ENRICHMENT OF NUTRIENT IN BISCUIT BY USING OF POMEGRANATE WASTE. ***Misal Anuja Anil***, Pariskar Vaibhav Sakharam, Gulve Maroti Shivaji, Email:anujamisal08@gmail.com

Background & Objectives: To utilise pomegranate waste and enrichment of fiber in biscuits. **Materials & Methods:** Analysis of raw material and pomegranate peel biscuits were carried out by AOAC moisture was determined by oven drying method. Ash content was done by wet ashing method crude fiber was estimated by weendes method. Protein and fat estimated by micro-kjeldhal and soxhlet method. Calcium is calculated by AOAC shelflife of biscuits was carried out. **Result:** Biscuits made up with 10% pomegranate peel powder contains 3.21% moisture, ash contains 1.61%, fat contain 20.30%, protein 7.8%, crude fiber 5.42%. **Conclusion:** It was found from our work that about 50% of total pomegranate fruit weight correspond to peel hence utilization of peel is very important pomegranate peel is good source of protein and fiber hence with incorporation of biscuits gives nutritive products. **Keywords:** waste utilization, pomegranate peel, Biscuits, protein enrichment.

PPFSN-06 Ganesh pariskar - Withdraw

PPFSN-07 IMPACT OF POPPING ON THE NUTRITIONAL VALUE OF MACRO AND MICRO NUTRIENTS IN MILLETS. ***Indu Bhargavi. K***, Department of Food Science and Nutrition Manasagangorti University of Mysore, Email:- indubhargavi.95@gmail.com.

Background & Objectives: Introduction: In India, malnutrition is widely prevalent among both rural and urban population. Millets being nutritionally superior are an economically viable resource. However, the consumption of millets is very limited due to their underutilization in ready-to-eat and ready-to-use foods. Therefore, an attempt

was made in the present study to subject the millets to thermal processing to improve the bioavailability of nutrients and prevents the growth of microorganisms by lowering the water activity. **Materials & Methods:** In the present study three millets viz,. Finger millet Eleusine coracana, Pearl millet Pennisetum, Little millet Panicum sumatrense, were popped by subjecting them to heat at 250┬ºc in a traditional popping setup the popped millets were analyzed for major nutrients (fat, protein, carbohydrate, fiber) and minor nutrients (calcium, phosphorous, iron) using standard AOAC method at the department of Food Science and Nutrition lab Mansagangotri university of mysore. **Result:** It is observed that there is a significant increase in the protein (9.7, 9.02, 9.42), carbohydrate (83.97, 83.25, 82.31), total starch (75.96, 69.15, 50.03) and iron content (9.97, 8.00, 10.03) and decrease in fat (2.26, 1.01, 3.40), dietary fibre (2.26, 1.01, 3.40), calcium (187.00, 126.67, 8.75) and phosphorous (186.57, 129.67,143.67) content in popped finger millet, pearl millet and little millet respectively. **Conclusion:** The changes in the nutritional content may be due to the rupturing of the cell walls of the grains which in turn influence the release of the nutrients from the matrix of the grains in the popped millets compared to native millets. The reason for the improvement of nutritional value owing to popping are discussed in the present paper. **Keywords:** popping, macro and micronutrients.

PPFSN-08 STANDARDIZATION AND DEVELOPMENT OF COCONUT BURFI FORTIFIED WITH BEETROOT. ***Shaikh Firdos Akbar***, Patil Rohini Hindurao,
Email:- shaikhfirdos19597@gmail.com

Background & Objectives: To standardize and development of coconut burfi fortified with beetroot. **Materials & Methods:** We prepared burfi with own standardized recipe with the ratio 3:2.5 of coconut and beetroot respectively.first heat a pan with vegetable fat add grated dried coconut and grated beetroot, sugar to the pan. pour milk powder dissolved in water. Mix and cook together on a medium flame. Mixture turns gooey and bubbly. Continue to cook until the mixture comes together and begins to leaves the sides of pan. pour it immidiately to a greased tray. level it well and make a square. Allow to cool down for about 15 minutes. Cut them to desired sizes while it is still warm. the cool and packed it.**Result :** (Analysis of burfi) Burfi made up with beetroot and coconut contains 2.01% protein , 6.9% moisture, 1..6% fat, 1.5% ash, 4.26% fiber.**Conclusion :** This gives high calcium and fiber rich product.**Keywords:** Beetroot, coconut, burfi, calcium rich.

PPFSN-09 SALT IODINIZATION IMPROVEMENT IN NUTRITION SECURITY . ***Gulafshan Perween***[1], Dr. Faruque Ali[2],1= Univ. Dept. of H.Sc. -Food & Nutrition, TMBU, Bhagalpur, 2= PVC of BNMU, Madhepura(Bihar), Email:- gulafshanperween4@gmail.com

Background & Objectives: Iodine is a trace element that is essential for the synthesis of thyroid hormones by the thyroid gland. These hormones are involved in growth, development and control of metabolic processes in the body. Not only does iodine deficiency cause goitre, but it may also result in irreversible brain damage in the foetus and infant and retard psychomotor development in children. Iodine deficiency disorders are usually the most common cause of preventable impaired cognitive development. They also affect reproductive functions and impede childrenΓÇÖs learning ability. It is estimated that about 1.88 billion people worldwide remain at risk of insufficient iodine intake, if iodine interventions are not kept in place. Approximately one third of the worldΓÇÖs population lives in areas where natural sources of iodine are low, and therefore they require the permanent presence of iodine-supplying interventions. This population at risk of iodine deficiency is unevenly distributed across the world and within countries. Salt iodization is the preferred strategy for control of iodine deficiency disorders and is implemented in more than 120 countries around the world. **Materials & Methods:** 23 salts samples were collected from Bhagalpur at different areas with the prepared questionnaire 50 users were asked various questions related to their physical, physiological, mental development, use of iodized salt any physical disorder if found were also asked. The data were compiled and analysed.**Result :** This study is based on ΓÇ£Estimation of iodine content in various salt samples being utilized in different locality of Bhagalpur and its impact reflecting IDD of 10 salt brands and fifty users. The result of the survey will be used to create awareness and improve nutrition and health program being enforced in our area. **Conclusion :** In the present study no obvious symptoms were found compared to few little symptoms were found but prolong use of non-iodized salt may aggravate the problem in future. There should be strict enforcement of iodisation of salt. The salt Commissioner Health Authority and others should come up to protect the future generation from stunting.**Keywords:** IDD, thyroxine, aggravate, iodization.

PPFSN-10 EFFECT OF PRIMARY PROCESSING ON THE ANTI-NUTRITIONAL FACTORS IN SELECTED PULSES. ***S. Thirukkumar***, G. Hemalatha, L. Senthamaraiselvi,Email:-psthirukumar@gmail.com

Background & Objectives: Grain legumes are important sources of proteins, minerals and vitamins for millions of people in the world, particularly in the developing countries. Presence of various anti-nutritional factors may account partly for the low digestibility of proteins and minerals. Hence, the present research aimed to reduce the anti-nutritional factors such as tannin, trypsin inhibitor and phytic acid by different processing/cooking methods with optimum conditions in selected pulses for maintaining the beneficial value of nutrition. **Materials & Methods:** The selected pulses for green gram, chickpea, pigeon pea, lentil, green peas and faba bean, were procured from local market at Madurai and subjected to different processing treatments viz., raw, dehulled, roasting (5, 10, 15 mins), germination (8, 16, 24 hours), soaking (8, 16, 24 hours), boiling (15, 30, 45, 60 mins), pressure cooking (10, 20 mins) and blanching (10, 20, 30 mins). The anti-nutritional factors for tannin, trypsin inhibitor and phytate were determined as per the procedure of Schanderl (1970), Wheeler (1971) and AOCS (2017) in raw and processed pulses. **Result:** The tannin content of 354±10.12, 507±5.52, 249±6.61, 947±3.22, 113±0.69 and 111±0.08 mg/100g, trypsin inhibitor activity on 4.45±1.47, 6.75±2.49, 4.70±1.58, 7.20±2.78, 7.15±2.94, 7.40±2.69 and 4.05±1.29 TIU/ml and phytic acid content on 902±24.55, 441±6.30, 673±21.98, 949±27.77, 462±0.94 and 135±0.83 mg/100 g were presented in raw whole pulses of green gram, chickpea, pigeon pea, lentil, peas and faba bean respectively. Among the selected raw whole pulses, tannin, trypsin inhibitor and phytic acid content were highest in lentil and lowest in faba bean. **Conclusion:** All the processing methods have effectively reduced anti-nutrient content and the reduction percent proportionally increased with time of processing in selected pulses. Also, the data indicated that twenty minutes of pressure cooking was more effective than other cooking in decreasing tannin, trypsin inhibitor and phytic acid levels. **Keywords**: Pulses, Anti-nutrition, Processing, Tannin, Phytate, Trypsin inhibitor

PPFSN-11 DEVELOPMENT OF SAVOURY SNACKS WITH INCORPORATION OF COLOCASIA LEAVES. ***Pratibha Basvanta Thombare***, Farzana H. Farooqui,Food Science and Nutrition, College of Community Science, VNMKV Parbhani, Email:-pratibhathombare93@gmail.com.

Background & Objectives: Colocasia is an important food crop of West Africa and Oceania. It is easily available, low cost vegetable but underutilized. Colocasia leaves have been reported to be rich in nutrients, including minerals such as calcium, phosphorus, iron, vitamins and fibres. Colocasia leaves need to be utilized, hence attempt was made to develop value added products with incorporation of cococasia leaves powder. **Materials & Methods:** Savoury snacks such as puri and kharapara were prepared with and without incorporation of dry colocasia leaves powder. The prepared products were evaluated organoleptically to find out the most suitable and highly accepted level of incorporation. The most accepted variation was assessed for its nutrient content and was stored in zip lock bag and aluminum foil pouch to evaluate the shelf life. StudentΓÇÖsΓÇÖtΓÇÖ test were implied for analysis of data.**Result:** The organoleptic evaluation indicated that value added puri at 6 per cent and Kharapara at 7 per cent prepared with incorporation of colocasia leaves powder were highly accepted. Due to value addition there was increase in calcium protein, fiber, total minerals, and iron content of puri and kharapara. There was no difference between the scores allotted for both products packed in two packaging materials.**Conclusion :** Colocasia leaves are rich in calcium so the calcium content of the products will be increased and will be useful to combat calcium deficiency. Colocasia leaves are also rich in minerals like iron, copper, zinc and manganese so the addition of colocasia leaves will be helpful to cure micronutrient deficiencies. **Keywords:** Colocasia leaves powder, Product development, Shelf life study.

PPFSN-12 PREPARATION, STANDARDIZATION, PHYSICO-CHEMICAL CHARACTERISTICS, ANTIOXIDANT ACTIVITY, SORPTION ISOTHERM OF INSTANT TOMATO SPICE MIX FOR SNACKS. ***G. Narsing Rao***, P. G. Prabhakara Rao, A. Nagender, R. G. Math,Email:-narsingg72@gmail.com

Background & Objectives: Tomato (Solanum lycopersicum L.) is a good source of active components such as polyphenols, β-carotene, lycopene and fibre. Tomatoes are used in culinary, pickle, sauce preparations and dehydrated for longer shelf life. Instant spice mixes are popular in India as they are used as food adjuncts and sprinkling on fried and extruded snacks. The present study was taken up to develop a stable instant tomato spice mix (ITSM) for application on snack foods. **Materials & Methods:** Fresh ripe tomatoes were pre-treated with

sodium hypochlorite, cutting, tray drying, grinding and sieving to yield tomato powder. The ITSM was standardised by mixing tomato powder (46%). spice (42%) and salt (12%) and packed in metalized polyester polyethylene pouches. The ITSM was evaluated for physico-chemical characteristics, lycopene, polyphenols, antioxidant activity and sorption isotherm using standard methods. **Result:** The ITSM was found to be rich in fibre (5.03%), iron (10.33mg/100g), calcium (134mg/100g), phosphorous (168mg/100g) polyphenols (1155mg/100g), β-carotene (42.85mg/100g) and lycopene (26.34mg/100g). Inhibition of 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical by 50% was observed at a concentration of 3.2 µg/ml and for ABTS radical at 0.54 µg/ml. Moisture sorption isotherm of ITSM with an initial moisture content of 14.97% and critical moisture content of 21.87%, equilibrated at 34 and 27% relative humidity (RH), respectively. ITSM is highly hygroscopic in nature, hence protection from moisture and immediate packaging is required. The overall sensory quality of the ITSM on extruded snacks showed a score of 7.0 and ITSM 15-20 g was optimized for 100g snack. **Conclusion:** The study shows that tomatoes, which are highly perishable and source of active compounds of can be conveniently converted into ITSM for application on extruded and deep fried different snacks. Study also helps reduce the post harvest losses, which in turn helps both the farmer and consumer.**Keywords:** Instant tomato spice mix, active compounds, antioxidant activity, snacks, sensory quality.

PPFSN-13 DEVELOPMENT OF NUTRI COOKIES AND THEIR NUTRITIONAL ASSESSMENT. ***Rekha Sinha***, Bindu Sharma, Nilika Chandra, Birsa Agricultural University, Ranchi, Email:sinharekha_05@yahoo.co.in

Background & Objectives: Bakery products are important ready-to-eat processed foods. The nutritional quality of these products is low because of the use of refined flours in their preparations and replacement of refined flour with finger millet and soy flour will upgrade the nutritional quality of such products. Therefore, an attempt was made to develop nutri cookies and their sensory and nutritional evaluation was carried out. **Materials & Methods:** Two types of cookies were developed by incorporating the finger millet flour in refined flour at 30 percent level (Type I) and finger millet flour and soy flour at 50 percent level (Type II). Developed cookies were subjected to sensory evaluation on 9 – point hedonic scale and analyzed for proximate composition, Ca, Iron, Phosphorous, Cu, Zn and β - carotene by standard methods. **Result:** Both types of cookies were found acceptable. Addition of finger millet flour in Type I cookies increased the total mineral, fiber, calcium, iron, phosphorus, copper and zinc content, which increased further in Type II due to supplementation of soy flour along with finger millet flour. **Conclusion:** Finger millet and soy flour can be successfully substituted for nutritional enrichment of cookies. **Keywords:** cookies, finger millet, soy flour, enrichment

PPFSN-14 EFFECT OF INCORPORATION OF RAGI FLOUR TO CHAKALI. ***Aishwarya V Patil***, Dr. Kasturiba B,Department of Food Science and Nutrition, College of Community Science, University of Agricultural Sciences, Dharwad, Email:- aishwaryavpatil550@gmail.com

Background & Objectives: People nowadays love to consume snack foods because of the light and quick meal that can be consumed anywhere and anytime. Chakali is one of the Indian traditional savory snacks produced from rice flour with combination of chickpea flour, natural flavoring and spices. So, with the addition of ragi flour to chakali, makes the chakali more nutritious than the traditional chakali. Hence, the present study was undertaken with the objective to study the effect of incorporation of ragi flour in chakali. **Materials & Methods:** The chakali were prepared with 25, 50 and 75 per cent incorporation of ragi flour. The nutritive value was computed using the "nutritive value of Indian foods" by NIN (C. Gopalan et al., 1971). The chakali were evaluated for appearance, color, flavor, taste, texture and overall acceptability by using nine point hedonic scale by semi-trained panel members. **Result:** The results revealed that the sensory quality of chakali decreased with increase incorporation of ragi flour. The overall acceptability score of control was 8.10 and the scores for 25, 50 and 75 per cent incorporation was 7.75, 6.25 and 5.50 respectively. There was increase in calcium content with addition of ragi flour. The increment in calcium content of 25, 50 and 75 per cent incorporated ragi chakali was 32.96%, 49.83 % and 59.95 % respectively. **Conclusion:** The chakali prepared with 25 per cent incorporation of ragi flour was found acceptable without affecting sensory attributes. **Keywords:** Ragi, Chakali, Calcium, Sensory attributes.

PPFSN-15 ROLE OF SOY PROTEIN ISOLATE IN LOWERING BLOOD PRESSURE LEVELS. ***ANIT JAMES***, Email:- angeljames.james@gmail.com

Background & Objectives: Soy protein Isolate are basically the proteins that are derived from the soy bean cakes after the extraction of the oil.Soy protein isolate has many health benefits like reducing cholesterol -Heart Disease , Hypertension , Certain Cancer , Diabetes, Menopause , Osteoporosis etc. b To identify high blood

pressure patients among population group To develop a food product incorporating Soy Protein Isolate .To assess the acceptability of the developed product.To assess the nutritional quality of the developed product.To see the role of Soy Protein Isolate in lowering blood pressure levels. **Materials & Methods:** The study was conducted in Gomtinagar area of Lucknow City. The present study was carried out to study the impact of Soy Protein on high blood pressure. The study was carried out in three phases : Phase I : Identification of individuals with high blood pressure.Phase II : Organoleptic Evaluation of Soy protein Isolate CookiesPhase III : Intervention using a Case -Control Design.In this study 60 subjects were selected and were divided into control and experimental group. A proforma was used to record the pre and post reading of the pressure levels in hypertensive patients which consisted of details of patients like name , age , sex , height ,weight , BMI , marital status , occupation and the name of the doctor who was examining them . A similar proforma was also filled by the control group which included the complete health status.The study was conducted for a period of 1 month .Sphygmomanometer was used for measuring the blood pressure of the subjects under the supervision of a doctor.Soy Protein Isolate was procured and it was incorporated in form of cookies and intervened to the patients for a month.Composite Scoring Test was used for the sensory evaluation. After 1 month the blood pressure were recorded again. There was a lowering effect after consumption. **Plan Of Work** Phase I - Indentification of Individuals with High Blood Pressure, Procurement of Soy Protein Isolate Powder, Preparation Of Cookies
Phase II -Organoleptic Evaluation of Soy Protein Isolate Cookies, Phase III - Intervention using a case control design for 1 month Result Analysis. **Result:** A significant change in blood pressure was observed following one month of intervention in the study group ($p<0.001$) . It was observed that pre -intervention interval, maximum subjects had Grade I hypertension whereas after intervention maximum subjects had high normal category of blood pressure. A decrease in both systolic and diastolic blood. Lifestyle modification with change in diet along with soy protein Isolate showed drastic change in their blood pressure levels .
Conclusion: It was observed that 37% of the people in the age group of 51-60 years had high blood pressure . 67% males were prone to hypertension because of peer pressure, demands , nature of work ,insecurity of jobs , unemployment , instability of the job , family responsibilities, demands of the society , hassles of day to day life all these accumulate and cause stress. Hence consumption of Soy Protein Isolate in the diet had great influence in lowering the blood pressure levels .It can be incorporated in any food product to improve the protein quality.**Keywords:** Soy Protein Isolate , Isoflavones, Hypertension , systolic and diastolic blood , Sphygmomanometer.

PPFSN-16 FLAVOURED PINEAPPLE – A NUTRITIOUS SNACK. ***Sivasankari.R***, Kanchana. S, Dept. of Human Development and Family studies, CSC&RI, Madurai, Email:- sivasankarifsn@gmail.com.

Background & Objectives: In India the production of pineapple is high in West Bengal and Assam (Indian Horticultural database, 2014). Though we are produce adequate quantities of fruits and vegetables, the losses in the field as well as storage is more. Inorder to minimize wastage processing can be done. One way to increase the value of the fruits is by drying it. Osmotic dehydration is one of the novel drying technique. Based on the significance of pineapple, value added osmotically dehydrated pineapple was processed with the following objectives. 1. To standardize osmotically dehydrated pineapple (sweet and spiced). 2. To study the storage stability of the products. Materials & Methods: A fresh, disease free pineapple was selected. The pineapple was peeled and cut into slices. The core was removed from the slices. Some slices were kept as such and made other slices into pieces. The sugar syrup was prepared with the Total Soluble Solids (TSS) of 30°Bx, 40°Bx and 50°Bx. The citric acid (0.5%) was added in the syrup to get clarified sugar syrup. The fruit slices/pieces were added in the prepared sugar syrup (30°Bx/40°Bx/50°Bx) and boiled for 30 minutes separately. In spiced pineapple slices / pieces add 1% salt with 1% chilli powder or 3% ginger extract. Then the slices/pieces were drained from the syrup and kept in cabinet tray drier at 60°C for 8 hours. Then the dehydrated slices/ pieces were packed in Poly Ethylene (PE) bags and allowed to store the bags for storage study and organoleptically evaluated. Result: The initial moisture content of pineapple was 89.50% and the moisture content drastically reduced upto 3 hours, after 3 hours gradual reduction in moisture content was observed. The moisture content after 6 hours of drying was 9.85% for slices and in pieces the moisture content was 8.73%. The total sugar was increased 43.51 g% in dehydrated slices and in dehydrated pieces it was 45.26 g% and reducing sugars was increased 11.85 g% in dehydrated slices and in dehydrated pieces it was 13.26 g%. The fibre content also increased from 1.3% to 4% in dehydrated pineapple slices and pieces. Vitamin C content was reduced into 23 and 25.26m g (%) in dehydrated pineapple slices and pieces. Flavours like chilli powder and ginger is added at 50°Bx sugar concentration and organoleptically evaluated. Among two flavours ginger had better quality characteristics than chilli powder. The organoleptic characteristics of the osmotically dehydrated (flavoured) pineapple slices/pieces during 90 days of storage were in the acceptable level (7-8). Conclusion: Pineapple could be processed into osmotically dehydrated

pineapple a delicious snack. The ginger extract flavoured pineapple had better taste than chilli powder flavoured pineapple. The dehydrated pineapple slices and pieces had good storage ability during the entire period of storage study (90 days). The cost of production of 1Kg osmotically dehydrated pineapple was Rs.160.
Keywords: Osmotic, dehydration, flavoured pineapple

PPFSN-17 VALUE ADDITION OF BABY CORN. ***Mariammal.A***, Vijayalakshmi.R, Email:- maribanurose@gmail.com

Background & Objectives: Baby corn is medium plant type and provides green ears within 65-75days of the sowing. Baby corn is almost sweet corn and harvested just as it has begun to develop. It is a small young corn ear harvested at the stage of silk emergence. Its miniature size is appealing, as is the taste, color and crunch. Baby corn adds a special gourmet touch to many dishes and salads. The de-husked ears can be eaten as a vegetable, whose delicate flavour and crispiness are much in demand. It is popular in India as a non-traditional thrust vegetable for export and value addition. The present study was undertaken with an objective to extend its shelf life and add value through brining. **Materials & Methods:** The purchased baby corns were dehusked, cleaned and graded. Ear heads of equal length and width were selected. They were steam blanched for 3 minutes. One batch of graded baby corn were dipped in 2%, 4%, 6%, & 8% of salt and another batch were brined in 0.5%, 1.0%, 1.5%, and 2.0% acetic acid. The most acceptable concentrations of 4% and 6% of salt and 1% and 2% of acetic acid were selected for storage studies. **Result:** Organoleptic changes of brined baby corn during storage. The organoleptic characteristic of the fresh baby corn was found to be higher than the brined sample during the initial day of storage. On the 45th day all there was an increase in scores of the all the sensory characteristics than their initial day of storage. Among the brined samples, T1 and T3 samples scored higher values than the other two samples. On 45th day T1 scored higher values of color and T3 scored maximum values for taste among the brined samples. T2 has less score for taste and texture. T4 had the minimum scores for taste. **Conclusion:** Shelf life of the baby corn can be increased by using simple brining techniques. The control baby corn sample scored the highest scores for all the sensory attributes when compared to all the treatments throughout storage. Among the treatments, organoleptic scores revealed that T1 (1% salt) scored higher in terms of color, texture and overall acceptability. T3 (1% acetic acid) had higher scores for taste and flavor. T4 (2% acetic acid) had less sensory scores when compared to other treatments. It could be concluded that this simple technique may be popularized among the farmers and entrepreneurs to extend the shelf life and add value of baby corns. **Keywords:** Baby corn - brine solution.

PPFSN-18 EFFECT OF PRE-TREATMENT ON PALAK INCORPORATED CHAPATI. ***Vinuta R Yadagouda***, Department of Food Science and Nutrition, MHSc, College of Community Sciences, UAS, Dharwad,
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Background & Objectives: Spinach is well known for its anti carcinogenic, antimicrobial and antioxidant activity. It is preferably utilized in food as unblanched, blanched, dehydrated, pureed form into cooked or baked dishes. As the wheat flour chapatti is staple breakfast food so incorporation of spinach increases its nutritive value. Hence the present study was taken up with the objective to know the effect of pre-treatment on palak incorporated chapati. **Materials & Methods:** The wheat flour chapati was taken as control. Then the wheat flour with 25 g of pre-treated palak as unblanched, blanched and dehydrated powder was taken as test samples for the value addition. The chapatis were evaluated for water absorption, thickness, diameter and weight by measuring before and after treatment. The appearance, colour, texture, flavour, taste and overall acceptability were evaluated by using nine point hedonic scale score card by semi trained panels. **Result:** The results of the study revealed that chapati with pre-treated blanched sample were smooth in texture; the water absorption was less and weight of the chapati after preparation was less. The chapati with pre-treated unblanched dough was bit harder and bit rough while making chapatis and the water absorption was more. The weight of the chapati was less when compared to blanched sample. The sample pre-treated with dehydrated palak powder was laborious and cannot be used for large preparation as the yield of palak after dehydration is very less viz., 100g of palak yields 5g after dehydration. When the incorporation was done the water absorption was high and after shallow fat frying chapati weight was more when compared to other pre-treated samples. **Conclusion:** The pre-treated blanched sample is better and more accepted when compared to other pre-treated samples. So blanching is the better pre-treatment for the incorporation into the chapati for value addition. **Keywords:** Palak, dehydration, pre-tretment.

PPFSN-19 FORMULATION AND QUALITY EVALUATION OF WEANING FOOD. ***Ashwini Bidwe***, Vijaya Nalawade, college of community science,VNMKV, Parbhani, Email:- prashu.vnmkv@gmail.com

Background & Objectives: Breast milk satisfies the nutrient and energy requirements of the infant up to six months of age; but thereafter an infant needs additional food for proper growth and development. A variety of weaning foods are commercially available but these products are beyond the economic means of most families. Therefore present study was carried out to formulate weaning food using locally available low cost food stuffs.**Materials & Methods:** The Weaning food (RMS) was formulated using ragi (malted) , rajkheers (malted) , whole green gram (malted) , soy bean , sapota powder , sugar powder , skim milk powder and cardamom powder. Four variations of weaning food were prepared using different proportion of ingredients. The acceptability of developed RMS weaning foods was studied by nine point hedonic scale. Nutrient content of highly accepted RMS weaning food was analysed using standard methods. The acceptability of formulated weaning food by the infant and their mothers was also studied. The keeping quality of weaning food was studied by storing the weaning food at room temperature and at refrigerator temperature for 90 days. Simultaneously microbiological examination was carried out. **Result:** Results of organoleptic evaluation inferred that variation II of developed RMS weaning food consider to be highly accepted weaning food as it obtained highest score (8.4) for overall acceptability. Nutrient analysis of developed RMS weaning food showed that it contain 20.33 g protein, 9.5 mg iron and 448.6 mg calcium. RMS weaning food stored at refrigerator temperature was well accepted as compared to store at room temperature for period of 90 days. Further weaning food stored at both the conditions found to have low microbial population therefor they can be considered as safe for consumption. It was also very well accepted by infants and their mothers. Beside this no digestive disorder were noticed after feeding RMS mix to the infants. Cost of RMS weaning food was Rs. 90 per kg. **Conclusion:** Developed nutritious RMS weaning food will prove to be a beneficial in rapid growth and achieve nutrition security among infants in developing countries, because it is prepared from locally available low cost food stuffs and also easy for preparation. **Keywords:** Weaning food, Sensory evaluation, Nutrition analysis, Microbial Evaluation.

PPFSN-20 DEVELOPMENT OF VALUE ADDED BAKERY PRODUCTS. ***Asha Arya***, Sujata Jondhale, Jaishree Bhalerao,Department of Food Science & Nutrition, College of Community Science, VNMKV, Parbhani, Email:- asha_222902@rediffmail.com

Background & Objectives: Bakery products are eaten at the time of breakfast or with a tea. They are palatable and liked by all age groups. Young generation mostly prefer the bakery products. The demand for bakery products is continuously increasing irrespective of their poor nutritional value. Hence, there is need to enhance the nutritional value of bakery products both quantitatively and qualitative using nutrient rich food ingredients. **Materials & Methods:** Bakery products such as cookies and nankatai were prepared with and without incorporation of nutritious ingredients viz. ragi, rajgeera, garden cress seed and soyabean flour. The prepared products were evaluated organoleptically to find out the most suitable and highly accepted level of incorporation. The most accepted products were assessed for their nutrient content and were stored at room temperature to evaluate the shelf life for 60 days. Student's 't' test and ANOVA were implied for analysis of data. **Result:** The organoleptic evaluation indicated that value added cookies and nankatai prepared with incorporation of ragi, rajgeera, garden cress seed and soyabean flour at the levels of 5, 10, 5 ,10 per cent respectively scored significantly higher over the other variations. Due to value addition there was increase in content of protein (7.5 g & 6.6 g /100g), fiber (0.7 g & 0.9 g/100g), total minerals (1.4 mg & 0.95 mg /100g), calcium (69.35 mg & 38.8 mg /100g) and iron (6.1 mg & 3.1 mg / 100g) of cookies and nankatai respectively. There was no significant difference between the scores allotted for both products in the beginning and at the end of the storage period.**Conclusion :** It is concluded that nutrient content can be increased significantly by incorporating nutritious ingredients viz. ragi, rajgira, garden cress seed flour and soya flour in bakery products viz. cookies and nankatai.**Keywords:** Sensory evaluation, Nutrition analysis, Shelf life.

PPFSN-21 NUTRITIONAL ENHANCEMENT OF INSTANT NOODLES BY INCORPORATING VEGETABLE PUREE. ***P.D. Shere***, MIT College of Food Technology, MIT Art, Design and Technology University, Pune,
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Background & Objectives: The objective of present investigation was to explore the possibility of nutritionally enhancing instant noodles by incorporating vegetable puree. Instant noodles are energy dense foods and

vegetable incorporation will reduce the carbohydrate content and increase the intake of vegetable in diet of all age groups. This study was delimited to incorporation of carrot and spinach puree. **Materials & Methods:** Carrot and spinach puree were separately incorporated at 0, 10, 20, 30, 40 and 50g per 100g of wheat flour. Noodles were prepared by cold extrusion process and studied for sensory, nutritional and cooking qualities. **Result:** Spinach/carrot enriched instant noodles showed preference in sensory evaluation at 40g puree incorporation level per 100g wheat flour. Proximate analysis of both test noodles at 40g puree addition level revealed increase in crude fibre (94.6% / 110%), ash content (120% / 46%). The chlorophyll content of dried spinach noodles was found to be 16.1 mg per 100g and beta carotene content 7.58 mg per 100g of dried carrot noodles. In comparison to control noodle sample an improved mineral content was observed with calcium (11.69% / 54.55%), phosphorous (5.79% / 139.91%), potassium (37.04% / 26.79%), iron (280 % / 82.4%) and zinc (6.66% / 10%) for both (spinach and carrot) test noodles respectively. Incorporation of vegetable puree had a positive effect on cooking properties with reduced cooking loss (48.36% / 39%), cooking time (20.46/% / 27.88%) which could be due to increased fibre content and dilution of gluten in test noodles. **Conclusion:** Vegetable purees such as spinach and carrot have proved their potential for addition in instant noodles at level of 40 g per 100g wheat flour with improved crude fibre, micronutrients like vitamin, mineral content. Vegetables fibre incorporation also improved the cooking properties of noodles. This study can find new avenues for increasing the vegetable intake in diet of kids and all age group people. **Keywords:** Noodles, spinach, carrot, micronutrients.

PPFSN-22 PROXIMATE AND ANTI-NUTRIENTS ANALYSIS OF PINEAPPLE PLANT (ANANAS COMOSUS) STEM AND LEAVES. ***Rinju R***, University of Calicut, Email:- rinju.64@gmail.com

Background & Objectives: The pineapple (Ananas comosus) is a tropical plant with edible fruit and highly demanding for its fruits. It is the most economically significant plant in the Bromeliaceae family. Fruit is the only used part of this plant and other portions mainly stem and leaves remain as waste in the farm field. To utilize this plant parts for the production of value-added products, we have to assess the proximate and anti-nutritional contents of pineapple stem and leaves. The objective of this study is to analyse the proximate and anti-nutritional factors present in the stem and leaves of the pineapple plant.**Materials & Methods:** Proximate analysis was determined using the standard official methods of analysis of the AOAC (1990) and anti-nutrient [(Phytate P (Wheeler and Ferrel, 1971, Sadasivam and Manickam, 1996), cyanogenic glycosides (Hogg PG, Ahlgren HL , 1942, Sadasivam and Manickam, 1996), oxalic acid (Vasant Naik et al., 2014), hemagglutinating activity (Bhagyawant et al., 2015), tannins (Sadasivam et al., 2005), saponin (AOAC 1984), trypsin inhibitor activity (Kakade et al., 1974 and 1969), alkaloid screening using LCMS and total phenols (Tepe and Sokmen, 2007)] analysis were also carried out. **Result:** The result showed that this stem and leaves contain a considerable amount of nutrients (total carbohydrates, crude protein, crude fat, crude fibre, ash and moisture). Anti-nutritional factors are very low except the oxalic acid content. The oxalic acid content can be reduced by simple heat treatments. **Conclusion:** Results indicate the usefulness of this agro waste in making value-added products.**Keywords:** pineapple, proximate analysis, anti-nutritional factors, value added products.

PPFSN-23 STUDIES ON STORAGE STABILITY OF GRAPE POMACE POWDER INCORPORATED FUNCTIONAL HEALTH MIX. ***Mariammal. A***, Saravanakumar. R, Email:- maribanurose@gmail.com

Background & Objectives: Grape pomace is the solid waste product leftover from juice and wine processing and generally consists of pulp, skins and seeds. Most of the potentially useful natural compounds in grape remain in the pomace. Grape pomace represents a low cost raw material for the extraction of value added compounds like antioxidant contents and activity with potential as food additives or nutraceuticals. Hence the present study was conducted to observe the storage stability of the grape pomace powder incorporated functional health mix during storage in different packaging materials. **Materials & Methods:** The grape pomace was processed into flour by drying in a cabinet drier. Four per cent level of incorporation of grape pomace powder was found to be highly acceptable for health mix in all sensory quality attributes.**Result:** The grapes had the moisture content of 87.74 per cent, water activity (aw) 0.970, acidity 0.48 g per cent, pH 3.0, total soluble solids 16º brix, total sugar 18.50 g per cent, reducing sugar 16.8 g per cent, vitamin C 10.5 mg per cent, total polyphenols 99.75 mg GAE/ 100 gm, total flavonoids 125 mg QE/ 100 gm, total antioxidant activity 1020 mg AAEAA/100 gm and tannins 11.70 mg /100 g per cent. The grape pomace powder had the 6.5 per cent, 0.219 , 0.56 g per cent , 2.26, 4.5º brix, 16.6 g per cent, 7.9 g per cent , 8.3 mg per cent , 6300 mg GAE/ 100 gm, 14,300 mg QE/ 100 gm, 3,500 mg AAEAA/100 gm, 1,200 mg /100 g per cent of moisture, water activity (aw), acidity, pH, total soluble solids, total sugar, reducing sugar, vitamin C, total polyphenols, total flavonoids, total antioxidant activity and tannin contents

respectively. The total polyphenol, total flavonoids, total antioxidants and tannin contents of grape pomace incorporated health mix were found to be decreased throughout the storage periods in all packaging materials. A slight increase in bacterial and yeast and mould counts was noted during storage and were found to be within safe acceptable limits. The sensory quality characteristics of the grape pomace powder incorporated health mix were found to be decreased gradually through out the storage period. **Conclusion:** The study found that the there is high potential to obtain antioxidants through the incorporation of grape pomace powder in health mix. **Keywords:** Grape pomace powder, health mix, antioxidants.

PPFSN-24 PROXIMATE ANALYSIS AND SENSORY CHARACTERISTICS OF SOYA DATES SANDESH. ***Aparna Nagendra***, NU Hospitals, Bangalore,
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Background & Objectives: BACKGROUND: Soybean has established itself as a major rainy season crop in the rain fed agro-ecosystem of central and peninsular India. Soybean is not consumed directly, but is processed into a large variety of popular products and has attracted worldwide interest. They are an excellent and cheap source of calories and quality protein. Therefore aim of our study was to innovatively formulate the traditionally prepared sweet, Sandesh to a nutrient rich Soya Dates Sandesh. OBJECTIVE: To enrich the nutritional value of the traditional Sandesh sweet by addition of soya paneer and dates and also to meet the needs of health conscious consumers. **Materials & Methods:** Raw materials like cowΓÇÖs milk, soya bean, granulated sugar, dates, honey and rose essence were procured from the local market in Bangalore city. Soya milk was extracted from soya beans for the preparation of soya paneer and cowΓÇÖs milk was used to prepare milk paneer. Three products were prepared, Control (Sandesh: Paneer+ Sugar) with 2 variations, Variation 1 (V1: Cow milk paneer: Soya milk paneer=3:1+Dates+Honey) and Variation 2(V2: Cow milk paneer: Soya milk paneer=1:1+Dates+Honey). Proximity analysis was determined by BIS (Bureau of Indian Standard) methods (2005) and Sensory evaluation was done among a panel of 10 members using a 9 point hedonic scale.**Result :** It was seen that protein and moisture content of the soya dates sandesh increased significantly as soya paneer was substituted at 25% and 50% to cow milk paneer (Control: 12.72%) whereas, fat content reduced from 14.1% in control to 11.57% and 8.42% in variation 1 and 2 respectively which was statistically significant. pH was reduced from 6.57% in control to 5.50% in variation 2. Water activity was at 0.348. Sensory attributes between cow milk paneer and soya milk paneer showed a significant difference in all the attributes ($p>0.05$) except texture when compared with the control. **Conclusion:** Present study showed that nutritious soya dates sandesh compared to cow milk sandesh can be produced by substituting soya paneer up to 25% (Variation 1) which was better accepted compared to variation 2 and also maintained the organoleptic properties as cow milk snadesh. **Keywords:** Soya dates sandesh, Variation 1-V1, Variation 2-V2.

PPFSN-25 EFFECT OF GERMINATION ON ASCORBIC ACID AND ANTIOXIDANT ACTIVITY IN HORSE GRAM (MACROTYOMA UNIFLORUM) SEEDS. ***T G Thippeswamy***, H S Sunilkumar, Department of Studies and Research in Biochemistry, Tumkur University, Tumakuru, Karnataka.
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Background & Objectives: Food plays fundamental functions for maintaining good health. The recent research data showed high prevalence of non-communicable diseases including cardiovascular disease, cancer, diabetes, and chronic lung disease. The aim of the present study was to estimate the concentration of ascorbic acid and antioxidant activity in germinating seeds of horse gram. **Materials & Methods:** The horse gram seeds were collected from the Ramanagara District of Karnataka state, India. The ascorbic acid was estimated by DNPH method and total antioxidants by DPPH method. **Result:** The concentrations of ascorbic acid in dry and rehydrated were found to be 17.25 mg and 20.97 mg / 100 g respectively. The present results showed 20.88, 30.08 and 30.27 mg% at 12, 18 and 24 h of germination of horse gram seeds respectively. There was increase up to 52.77 mg at 4th day of germination. The IC50 values of germinating horse gram seeds were estimated to 475, 285, 230, 345, 315 and 495µg at dry, 0, 6, 12, 18 and 24 h of germination seeds respectively. Further. IC50 values from 2, 3, 4, 5, 6 and 7 days were found to be 480, 595, 630, 895, 1005µg and 895µg seeds respectively. **Conclusion:** The ascorbic acid and antioxidant activity in germinating seeds of horse gram were estimated and the results showed good amount of ascorbic acid and antioxidant activity. The germinated horse gram seeds are being used in traditional diet as a beneficial source of food with very high nutritional value and support the concept of functional foods to our daily recommended allowance to maintain good health. This information may useful to the food industry and an individual of the society. **Keywords:** Ascorbic acid, Antioxidant activity, Germination.

PPFSN-26 PREPARATION OF NUTRACEUTICAL RICH ΓÇŸSTEAMED INDIAN RICE CAKEΓÇÖ MIX USING DIFFERENT VARIETIES OF BLACK GRAM AND ITS PHYSICO-CHEMICAL CHARACTERISTICS. ***B.Kavitha***[1], D.Sugasini[2], PK.Prasanth kumar[2], Poorna CR Yalagala[2], 1=Dept of Horticulture, Nammalvar Agricultural College, TNAU, 2=Dept of Medicine, Specialization in Nutrition, University of Illinois, USA, Email:- kavitharamesh82@gmail.com.

Background & Objectives: Rice is an indispensable food supply in India and it is used for traditional Indian foods. Adding of brown rice, blackgram and vegetables increases the nutraceutical value to the rice cake mix. The intake of antioxidants primes to a decrease in oxidative stress which leads to cancer and cardiovascular disease. Nutraceuticals from vegetables are more effective and reduce the free radical formation and act as a natural antioxidant. Therefore, recently, the use of natural antioxidants present in plant foods has more attention due to their assumed safety and nutritional value. Hence this study was performed to enhance the nutraceutical value of Indian brown rice cake with the addition of black gram and vegetables. **Materials & Methods:** The quality characteristics of selected black gram varieties viz., T9, VBN 5, CO 6, ADT 3 and VBN 7 were evaluated for their suitability to prepare rice cake. The physico-chemical characteristics, nutritional value and antioxidant activity were evaluated in nutraceutical rich brown rice cake. **Result:** The foaming stability and foaming capacity was found to be maximum in VBN 5 and T9. The arabinogalactan was also found to be high in VBN 5 (80.9 mg/g) and T9 (73.6 mg/g). The physico-chemical properties of nutraceutical rich brown rice cake batter for the selected varieties were evaluated. Maximum rise in volume was recorded in VBN 5 and ADT 3 (163 ml) followed by T9 (161 ml). The bulk density was found to be lower in VBN 5 (0.81 w/v) and T9 (0.88 w/v) which is an indication good quality of rice cake. Brown rice cake were prepared with the incorporation of green leafy vegetables and other nutraceutical properties rich vegetable mix used in the rice cake mix preparation. Brown rice cake prepared using 5 black gram varieties were analysed for physico-chemical properties were anlaysed. The texture profile viz., springiness, cohesiveness, chewiness and gumminess was evaluated for VBN 5, T9 and VBN 7 respectively. The protein content was higher in brown rice cake prepared from T9 (28.8/100 g) compared to VBN5 (26.0 g/100g). **Conclusion:** Among the selected varieties, T9 and VBN5 had good mucilaginous content, texture, and microstructure and were found to be the most suitable for nutraceutical rich brown rice cake and instant brown rice cake mix preparation. The nutritional value and antioxidant capacity were significantly increased in nutraceutical rich brown rice cake as compared to control. Hence it may helpful for preventing CVD and cancer. **Keywords:** Brown Rice cake, Brown rice cake mix, black gram, Nutraceuticals, antioxidant, green leafy vegetables and other vegetable.

PPFSN-27 A STUDY ON THE ACCEPTABILITY OF PLANT-BASED MILK AND CURD AMONG THE LACTOSE INTOLERANT PEOPLE. ***Shweta Singh***,
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Background & Objectives: Lactose intolerance is a common, gastrointestinal disorder. Its prevalence is highly variable depending on ethnicity. Hypolactasia or lactase deficiency may result in lactose malabsorption, which combined with clinical symptoms, consists in the image of lactose intolerance. Management of lactose intolerance requires a total or partial exclusion of dairy products from diet. Plant milks may serve as boon since it contains no lactose. They are considered as suitable economical substitute for cowΓÇÖs milk and ideal nutritional supplement for lactose intolerant patients. On the other hand, yogurt is a fermented product that is also well tolerated by them. The present study aimed at finding and developing a local substitute for milk based product determining the physicochemical analysis and sensory evaluation of Milk and ΓÇ£DahiΓÇ¥ (from oats, rice and almond) with a view of knowing the consumer acceptability of the product. **Materials & Methods:** Milk samples were prepared from different plant sources (oats, rice and almond) and then ΓÇ£DahiΓÇ¥ samples from these milk(s) were prepared using Lactobacillus sp. as culture starter (Vizylac Capsules) Milk and ΓÇ£DahiΓÇ¥ samples were also subjected to chemical parameters (pH, acidity, Calcium, Protein, Carbohydrate). **Result:** The results from analyses were encouraging since the developed product contains no lactose. Milk and Curd prepared from almonds was liked most and contains appropriate amount of nutritive values. **Conclusion:** Milk and curd developed from plant sources may be represented a safe food for lactose intolerant people as part of their diet. **Keywords:** Lactose intolerance, plant milk, probiotics, yogurt, milk.

PPFSN-28 DEVELOPMENT AND EVALUATION OF NUTRICOOKIES DESIGNED FOR TYPE 2 DIABETES. ***Najma Chokli***[1], Dr. Anooja Thomas[2],1= St. TeresaΓÇÖs Autonomous College, Ernamkulam, 2= CMS College, Kottayam,
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Background & Objectives: In developing countries like India with the increasing urbanization, the demand of processed also increasing rapidly. Among processed foods, bakery products, particularly biscuits or cookies command wide popularly in rural as well as urban areas among the all age groups. **Materials & Methods:** Raw materials selected were jackfruit seed, finger millet, horse gram, refined flour, boerhavia diffusa& whole wheat. For the purpose of standardization, a number of trials were conducted .The dough prepared using 30 g of horse gram, 20g of finger millet, 30g of jack fruit seed, 20g of whole wheat flour, 0.5g of sodium chloride, 50g of water and 2g of curry leaves, boerrhavia diffusa and baking powder was selected and baked in preheated oven at 250╥Üc for 30 minutes. These cookies were assessed for its physicochemical and organoleptic qualities along with glycemic index. **Result:** The different quality attributes were ranked based on their mean scores using KendallΓÇÖs (W) Coefficient of Concordance. Changes in physical properties were seen in the cookies after baking. Maximum texture value of developed cookies is 62.6 N and least value is 15.8 N. Nutrients like carbohydrate, total protein, crude fibre ,total fat, vitamin c and peroxide value present in cookies were 53.9%,10.06%,9.3%,21.93%,285mg and 18.26meq/kg respectively. No visible microbial growth was observed initially. The glycemic index of the selected cookie is lower. **Conclusion:** The nutrients present in the developed cookies are suitable for diabetics as carbohydrates and fat are lower than control. However the nutrients beneficial for diabetes like fibre and proteins are high. **Keywords:** Diabetes, Nutricookies, physicochemical properties

PPFSN-29 DEVELOPMENT OF SORGHUM HEALTH MIX FROM POPPED SORGHUM. ***Anithasri. M. J***, Vennila. P, Ilamaran. M, Email:- anithasri1964@gmail.com

Background & Objectives: Millets also referred to as coarse cereals, are a variety of small edible grasses belonging to the grass family, that are cultivated as grain crops, primarily on marginal lands of dry areas in temperate, subtropical and tropical regions. Millets are good source of energy. Sorghum (Sorghum bicolor (L.) Moench) popularly called as jowar, is the ΓÇ£King of milletsΓÇ¥ and is the fifth in importance among the worldΓÇÖs cereals, after wheat, rice, maize and barley. It is a staple food grain in many Indian states. Sorghum is a powerhouse in terms of nutrients. Popping is a simplest, inexpensive and quickest traditional method of dry heat application, wherein grains will be exposed to high temperature for short time (HTST). Popping is a process in which kernels are heated until internal moisture expands and pops through the outer shell of the kernels, where in puffing process sudden expansion of the kernel is carried out. **Materials & Methods:** Sorghum varieties such as K 12, CO 30 and local variety were used for the popping. The physico - chemical and popping characteristics were analysed for all the three sorghum varieties. Among the varieties, K 12 showed the maximum physico - chemical and popping characteristics. From the selected sorghum variety - K 12, popped sorghum was prepared and used for the preparation of sorghum health mix. Sorghum health mix was prepared in different combinations by using popped sorghum flour, malted cumbu flour, malted wheat flour, malted greengram flour, roasted bengal gram flour, powdered sugar and milk powder. The proportions of sorghum health mix 20:15:15:15:10:20:5 were organoleptically scored maximum values. **Result:** For preparing drink, 20 g of sorghum health mix was taken and cold paste was prepared by adding 100 ml of water and then added 100 ml of milk. The content was cooked for 2 - 3 min. and cooled to lukewarm temperature (40 - 50┬▒C). **Conclusion:** The developed health mix from popped sorghum is having high potential for commercialization and marketability not only in India but also in other countries too. **Keywords:** Sorghum varieties, Popping, Health mix, Physico - chemical and popping characteristics.

PPFSN-30 STARCH DIGESTIBILITY AND GLYCEMIC INDEX OF READY TO COOK FOXTAIL MILLET FLAKES. ***Sonal Aigal***, Bharati Chimmad, Pushpa Bharati, University of Agricultural Sciences, Dharwad, Email:- sonalaigal@gmail.com

Background & Objectives: Foxtail millet is nutritious but neglected crop and its utilization for food is confined to the traditional consumers due to non availability of convenience foods. Hence objective of the study was to explore the potentials of foxtail millet for development of ready to cook (RTC) millet flakes, to evaluate the starch digestibilities and glycemic index of RTC flakes. **Materials & Methods:** Conventional batch processing methods and partial gelatinization of grains were followed for the development of RTC millet flakes. Dietary fibre (DF) of grains and flakes, in vitro starch digestibility (IVSD) and estimated glycemic index (EGI) of flakes were evaluated

using the standard procedures. **Result:** Soluble dietary fibre (SDF), insoluble (IDF) and total dietary fibre (TDF) of millet grains (1.5, 22.67 and 24.17 percent respectively) were significantly higher than RTC millet flakes. SDF of RTC millet flakes (1.05 %) was on par with rice flakes (1.60%) but significantly higher in oats (3.66%). IDF of RTC millet flakes was 21.10 percent was significantly higher followed by rice (15.33%) and oat flakes (13.66%). TDF was found to be significantly high in millet flakes (22.15%) while rice flakes (16.93%) were on par with oat flakes (17.32%). Starch digestibility of millet flakes exhibited low values (63.23) when compared to rice (77.21) and oat flakes (75.54). It was observed that at 90 min the starch digestibility of RTC millet was lower (50%) when compared to oats (52.40%) and rice flakes (57.33%). The EGI of RTC millet, rice and oat flakes were 67.16, 71.17 and 68.47 respectively. **Conclusion:** Hence RTC millet flakes could be a suitable choice for diabetics and for those recommended a low glycemic index food. **Keywords:** Dietary fibre, Foxtail millet flakes, Glycemic index, Starch digestibility

PPFSN-31 DEVELOPMENT OF LOW GLYCAEMIC INDEX FOOD PRODUCTS. ***Kalpana Lahadee***, Vijaya Nalwade, Email:- lahadekalpana15@gmai.com

Background & Objectives: There is global research- based evidence that nutritional transition is negatively associated with health status and it has been implicated as the major factor responsible for the increasing prevalence of noncommunicable diseases such as type 2 diabetes, cancer, and coronary heart disease. World Health Organization recommended low- GI diets as a viable way to prevent NCDs. Hence the present study aimed at formulating low glycaemic index food products. **Materials & Methods:** Four low glycaemic index food products namely, Nutri-Sticks, Shev- mix, Rajma mix and Dumplings were formulated utilizing food Bajara, Barnyard millets, Oats, Bengal gram dal, Rajma, Soybean, Curry leaves powder, drumstick leaves powder and Spices. Acceptability of the developed food products was studied by 10 semi trained panel members using five-point ranking test. Six normal subjects those willing to serve were selected for experiment. Each test food evaluated individually in all subjects. Blood glucose response technique was employed to evaluate the glycaemic index of each test food (Jenkins DJ, et.al, 2002). **Result:** Results indicated that Nutri-sticks and Shev-mix obtained the highest scores (5.0 + 0) for overall acceptability followed by Rajma mix (4.5 + 0.5) and Dumplings (4.3±0.3). Nutri-sticks, Shev-mix, Rajma mix and Dumplings found to have 27.37+ 16.08, 29.87+ 15.18, 17.9 + 2.89 and 18.14 + 2.52 value of glycaemic index respectively. On the whole Rajma mix recorded the lowest and Shev-mix recorded the highest glycaemic index values. **Conclusion:** Results inferred that all the developed food products found to have good acceptability and <30 glycaemic index values. Hence it can be considered as low glycemic index food products, which will be beneficial for the consumption by the NCD'S. **Keywords:** Low glycaemic index foods Acceptability evaluation of GI NCD'S

PPFSN-32 READY TO COOK FOXTAIL MILLET FLAKES: EXTENDED USES AND ORGANOLEPTIC EVALUATION. ***Sonal Aigal***, Bharati Chimmad, Pushpa Bharati,University of Agricultural Sciences, Dharwad, Email:- sonalaigal@gmail.com

Background & Objectives: Foxtail millet is a neutraceutical grain having potential to yield convenient foods in the form of ready to cook (RTC) flakes for health conscious consumers. The study was aimed to develop extended products from foxtail millet flakes and evaluate organoleptically among consumers. **Materials & Methods:** RTC millet flakes were developed involving seed to flake method where grains were subjected to partial gelatinization and resultant flakes were obtained after passing through rollers. Organoleptic evaluation was assessed using nine point hedonic scale among semi trained panelists. Consumer acceptability of millet poha, and carrot millet kheer were evaluated using fact scale among 171 and 73 consumers respectively, which included staff and students of University of Agricultural Sciences, Dharwad. **Result:** The developed millet flakes were light yellow, dry, very light and crisp in texture. RTC millet flakes found wide utility as an ingredient in many traditional and novel products and could be blended exceptionally well in all the products tried viz., poha, kheer, dosa, paddu, cutlet, sponge cake, egg patties, fish fry, pakoda and chewda. Mean sensory scores of poha and kheer was 7.58 and 7.38 respectively. Freshly prepared RTC millet poha, kheer, dosa and paddu were highly acceptable with acceptability indices of 84.25, 82.03, 85.92 and 84.25, respectively. Consumer acceptability of RTC millet poha indicated that staff (56.52%), postgraduate (20.83%) and undergraduate students (31.70%) preferred to consume millet poha, for every opportunity they had. It was reported that 84.93 percent of consumers liked the millet kheer whereas 15.06 percent disliked. Majority of the consumers (92.60%) belonging to age group of 36 -45 years liked the kheer followed by 89.47 percent under age group of 46 -55 years. **Conclusion:** Hence developed RTC millet flakes can be utilized successfully in various extended products and could benefit the

health and nutritional status of modern consumers. **Keywords:** Foxtail millet flakes, Kheer, Millet poha, Organoleptic

PPFSN-33 EXTRACTION AND CHARACTERIZATION OF PECTIN FROM UNDERGROUND STEM OF BANANA. ***N. S. Rajendran***, Dr. B. S. Harikumaran Thampi, Dept. Of Life Sciences, University Of Calicut, Email:- Pectin2018@Gmail.Com

Background & Objectives: Pectin is a soluble dietary fibre, extracted from plants and used as gelling/thickening agent in food, confectionery and pharmaceutical industries. Pectin is reported to have many clinical and therapeutic values. Traditionally, pectin is obtained from citrus peel and apple pomace, both of which are not abundantly available in our country. The possibility of extraction of pectin from agricultural waste materials such as underground stem of banana (Musa sps.) is explored. The optimum conditions of extraction such as temperature, SLR, pH and time duration of heating etc. are studied and the yield is analysed. The pectin obtained is characterized to a certain extent.**Materials & Methods: Materials:**1. Preparation of plant material:Underground stem of Poovan variety (USP) of banana (Musa sp.) was collected from a local farmer, washed withwater, chopped in to small pieces, pulverised using a food processor, dried to constant weight, powdered and kept in an air tight vessel for further use.2. Preparation of extractant solution: Distilled water is mixed with hydrochloric acid to attain a particular pH values3. Extraction of crude pectin:10 g of the powdered material is mixed with extractant solution, heated at a constant temperature and pH for a certain duration of time. Then the flask is cooled to room temperature, Then pH is brought above 6.0, centrifuged at 5000 rpm for 10 minutes and the supernatant is collected, evaporated to minimize volume, equal volume of isopropyl alcohol is added, kept at room temperature for 24 hours, centrifuged at 5000 rpm for 10 minutes, and the precipitated crude pectin is dried to constant weight, powdered and transferred to air-tight vials for further analysis.4. Characterization: a. Degree of esterification is estimated.b. FTIR spectrum is obtained using Jasco-4100 (Japan) machine. c. NMR spectra at 400MHz, used liquid state NMR spectrometer (Bruker AV 400) with D2O as solvent for analysis. **Result:** Up to 28 % (by weight) of high methyl pectin was obtained from underground stem of banana (Musa sps.). The yield was highest at pH 1.5, Solid to liquid ratio (weight to volume of extractant) of 1:50, temperature of 82 degree Celsius, and 52 minutes heating were found to be the optimum conditions for the extraction. The percentage of calcium pectate obtained is 56.871 %. The degree of esterification was found to be 62.5 %. **Conclusion:** India, being the largest cultivator of banana (Musa sps.) in the world, has a great potential to be the largest producer and exporter of banana pectin. Production of value added products such as pectin from the waste materials of banana cultivation may increase the income of the farmer, thereby attracting modern educated youth in to the field of agriculture. At the same time, it may create additional agro-based industries in the rural village areas, with more employment opportunities. Also it will reduce the volume of agriculture waste. **Keywords:** Pectin, Value added products, Agricultural wastes.

PPFSN-34 INDIA'S TRANSITION FROM FOOD SECURITY TO NUTRITION SECURITY. ***Dr. Shagufta Yasmin,*** Email:- drshagufta13@gmail.com

Background & Objectives: M.A in Home Science (Ph.D), Add- W/o- Fazlur Rahman Mo+Po- Near Big Masjid Barahpura, Dist- Bhagalpur- 812001 (Bihar)
Materials & Methods: In 1950ΓÇÖs India the second most populous country in the world, was not self sufficient in food grain production and had to import wheat the continued high fertility rate (TFR) of 61 and relatively lower mortality [Crude Death Rate (CDR) of 251] resulted in high population growth rate and consequent increase in improving rates of under and malnutrition. Between 2006 and 2016 stunting in children below five years declined from 48% to 38%. The concept of food security has undergone considerable changes in recent years Food availability and stability were considered good measures of food and security till the seventies and the achievement of self ΓÇô sufficiency was accorded high priority in the food policies of developing countries. Though india was successful in achieving self ΓÇô sufficiency by increasing its food production and also improved its capacity cope with years to year fluctuation in food production problem, production, it could not solve the problem of chronic household food insecurity. After over 60 years of independence, India is still a country development transition and continues to battle with infectious diseases and conditions related to under nutrition. Nutrition security implies physical economic and social access to balanced diet, clean drinking water, safe environment and health care for every individual. Several programs mission and acts including a National Nutrition Policy (1993), National Nutrition Plan of Action (1995) and National Nutrition Mission (2001) have been formulated with scientific and technological underpinning. But they have yet to achieve nutrition goals. **Result:** NA. **Conclusion:** NA. **Keywords:** NA.

PPFSN-35 FORMULATION AND STANDARDIZATION OF IRON AND VITAMIN C ENRICHED DARK CHOCOLATE. ***K.Geethanjali***, K.Devi, Avinashilingam Institute of Home Science and Higher Education for Women, Coimbatore, Email:- geethanjalikamaraj15@gmail.com

Background & Objectives: Iron deficiency anemia is a challenging nutritional deficiency in India. Processing of foods with bio available iron could be the intervention strategy. The objectives of the present study was to formulate and standardize dark chocolate incorporated with Dates and Amla and analyse the consumer acceptability and enriched content of iron and vitamin C as compared to control dark chocolate. **Materials & Methods:** Dark chocolates were prepared in three variations. Variation 1 was prepared with the incorporation 50% of dates, Variation 2 was with the incorporation of 2 % of Amla, and Variation 3 was with incorporation of both Dates and Amla at 40% and 10% respectively. Three variation of chocolates were analysed for consumer acceptability by a panel of 15 semi trained member based on five point hedonic scale. Nutritive value was calculated for proximate composition and enriched amount of iron and vitamin as compared to control dark chocolate. **Result :** The mean scores for overall acceptability of Control, Variation 1, 2 and 3 were 4.3±0.5, 4.2±0.2, 4.8±0.5 and 4.2±0.2 respectively ($P<0.05$). Energy values were 497, 494, 491, 489 Kcal and carbohydrate (g) was 49.1, 45, 48.4 and 45, Protein (g) was 6, 5.6, 2.9, 5 and 2.89 and Fat (g) was 33.7, 30.9, 29.6, 30.5 and 29.6 in Control, Variation 1, 2 and 3 respectively. Enrichment of iron content (mg) was 2.78, 2.67,1.33 and 2.49 in control and variations 1, 2 and 3 respectively and Vitamin C (mg) was 2.5, 5.9 and 7.9 in Variation 1, 2 and 3 respectively. **Conclusion:** Hence dark chocolates with 50 % of dates and 2 % of Amla and both 50% and 2% of Amla were acceptable to consumer and enrichment of iron and vitamin C was also proved as compared to Control dark chocolate. **Keywords:** Anemia, Iron, Vitamin C, dark chocolate, Dates, Amla, Bioavailability.

PPFSN-36 GUNDRUK A TRADITIONAL FERMENTED FOOD OF HIMALAYAN REGION WITH POTENTIAL PROBIOTIC AND HEALTH BENEFITS. ***Srividhya Raghunathan (Kayastha)***, Mahendri. N. V, Email:- srividhyar1911@gmail.com

Background & Objectives: Probiotics are living organisms that include bacteria and yeast, have been consumed by humans since long as part of fermented foods. “Gundruk”, is a non-salted, traditional fermented vegetable product that includes cabbage, and leaves of radish, mustard cauliflower, indigenous to Himalayan region of India and Nepal, which is popular as an appetizer and traditional medicine for indigestion. The advance in the understanding of microorganisms has attracted research in probiotics particularly lactic acid bacteria (LAB) in the traditional fermented foods, but there is paucity of data it in Gundruk. So the current study was undertaken to isolate, identify and study new strains of LAB in Gundruk and study their probiotic properties. **Materials & Methods:** Gundruk is prepared for isolation by standard spread plate method on De Man Ragaosa Sharpe (MRS) agar under anaerobic conditions. The pure cultures were preserved at −20 °C on MRS broth containing 40 % glycerol (v/v) in deep freezer. To screen bacteriocin producer both the bit disk and well diffusion methods were used. Bacteriocin activity in cell free supernatants was determined by activity unit per milliliter (AU/ml). Hyper bacteriocin producer isolate G2 was subjected to 16S rRNA gene sequencing. **Result:** The new bacterial isolate found was Lactobacillus spicheri G2 a probiotic strain. Lactic acid production and auto aggregation capacity of this strain were 1.44 and 53.65 % respectively.Isolate showed some degree of bile salt tolerance, bacteriocin production potential and was found to be sensitive to several antibiotics. Overall, L. spicheri G2 fulfills a cumulative potentiality of 95.83% as the probiotic with a better value. **Conclusion:** L. spicheri G2 was the new strain isolated from Gundruk that fulfills the criteria of potential probiotics and this finding confirms the role of Gundruk as a probiotic and to demonstrate the beneficial effects of it on humans needs further studies. **Keywords:** probiotic, Gundruk, Lactobacillus spicheri

PPFSN-37 QUALITY EVALUATION OF SWEET POTATO GENOTYPES OF DIFFERENT FLESH COLOURS. ***Samreen K Kittur***, Pushpa Bharati, College of Community Science, University of Agricultural Sciences, Krishi Nagar, Dharwad,
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Background & Objectives: A study was conducted during 2016-17 in UAS1, Dharwad, to evaluate physico-chemical properties, nutrient composition, cooking quality, acceptability and flour production potential of sweet potatoes of different flesh colours. **Materials & Methods:** All the parameters were analysed by standard AOAC2 methods **Result:** The sweet potatoes GP-HUB-14, GP-HUB-95, GP-HUB-66 and URT-TSP-12-12 were white, cream, orange and purple fleshed respectively. Length, weight and volume were higher in white fleshed sweet potato GP-HUB-14 (16.57±2.40 cm, 397.90±176.25 g and 477.00±147.96 ml, respectively). Higher width,

circumference, pH and TSS were found in cream fleshed genotype GP-HUB-95 (10.91±2.45, 28.98±6.98 cm, 7.00±0.20 and 11.50±0.50 °B, respectively). Bulk density was higher in orange fleshed genotype GP-HUB-66 (2.10±0.48). Purple fleshed sweet potato URT-TSP-12-12 showed higher dry matter (41.20±0.20 g%). Moisture, protein, crude fibre and starch were higher in white fleshed [74.10±1.00 (fwb), 7.23±0.03, 4.96±0.03 and 65.00±0.50 g%, respectively], while, available carbohydrate, calcium, reducing, non-reducing and total sugar were more in recorded in orange fleshed (80.24±0.24 g%, 850±1.00 mg/100 g, 5.00±0.20, 6.45±0.17 and 9.40±0.20 g%, respectively).GP-HUB-95 exhibited higher copper (0.35±0.08), zinc (1.52±0.07 mg/100g), soluble, insoluble and total dietary fibre (5.76±0.25, 9.43±0.06 and 15.20±0.20 g%, respectively). After boiling, pressure cooking and baking the cream fleshed genotype was the most acceptable with acceptability index of 83.70±8.36, 86.11±14.49 and 89.44±8.94, respectively. The purple fleshed genotype showed higher flour yield, bulk density and swelling power (32.56±0.06 g%, 0.86±0.01 g/ml, 10.55±1.00 g/g, respectively). The GP-HUB-95 recorded higher solubility (35.08±0.69 %). **Conclusion:** To conclude cream fleshed genotype GP-HUB-95 was better in terms of width, circumference, pH, TSS, copper, iron, zinc, dietary fibre, acceptability on boiling, pressure cooking and baking and solubility of flour.

PPFSN-38 Wandhekar Sangram Sanjay - Withdraw

PPFSN-39 DEVELOPMENT OF VALUE ADDED PRODUCT FROM TOMATOES (SQUASH, HALWA AND TOFFEE) AND THEIR NUTRITIONAL COMPOSITION. ***Dr. Merrylin. J***, Kavitha. R, Department of Food Science and Nutrition, Sarah Tucker College, Tirunelveli, Email:- merrylin_86@yahoo.co.in

Background & Objectives: Tomato and tomato-based foods are considered healthy for the reason that they are low in calories, but possess a remarkable quantity of antioxidants and micronutrients. Tomatoes and tomato products are rich sources of folate, vitamin C, and potassium. Relative to phytonutrients, the most abundant in tomatoes is the carotenoids. Tomatoes are the major dietary source of the antioxidant lycopene, which has been linked to many health benefits, including reduced risk of heart disease and cancer. Lycopene is the most prominent carotenoid followed by beta-carotene, gamma-carotene, and phytoene as well as several minor carotenoids. The antioxidant activity of lycopene, as well as several other carotenoids and their abundance in tomatoes, makes these foods rich sources of antioxidant activity. The provitamin A activity of beta- and gamma-carotene, their modest levels in tomato products, and the high consumption of these foods result in a rich supply of vitamin A activity from tomato-based foods. Tomatoes also contain several other components that are beneficial to health, including vitamin E, trace elements, flavonoids, phytosterols, and several water-soluble vitamins. **Materials & Methods:** In this study, three different tomato products are developed and they are analyzed for their nutritional composition and lycopene content respectively. Tomatoes with deep red color were purchased from Tirunelveli local market. Tomatoes were processed to develop 3 products, namely squash, halwa and toffee according to standardized recipes. The nutrient analysis of the various products was done through an online software named “verywellfit”. The approximate values obtained are tabulated and analyzed. The lycopene content was determined spectrophotometrically by extraction with hexane/ethanol/acetone and the absorbance measured at 503nm **Result**: It was noted that tomato toffee provides more calories (364 kcal/100gms of tomato) compared to tomato squash and tomato halwa which provided 110kcal and 235kcal respectively. Similarly, the lycopene contents were also more in toffee (about 1630g) which indicates that significant initial loss of lycopene content was induced by thermal treatment for 20 min at 100 °C. During the more intensive treatments that followed the lycopene content was first leveling off and then slightly increased. **Conclusion:** To conclude, the tomatoes can be effectively processed to develop highly acceptable products like squash, halwa, and toffee. Tomato products are a good source of micronutrients, rich in β-carotene and lycopene and thus may confer better health to the consumers. **Keywords:** Lycopene, Tomato products, Tomato toffee, Tomato Squash, Tomato Halwa

PPFSN-40 DEVELOPMENT AND QUALITY EVALUATION OF RIDGE GOURD PEEL DIETARY FIBRE FORTIFIED EXTRUDED SNACK. ***P. G. Prabhakara Rao***, A. Nagender, G. Sulochanamma, R. Sridhar, G. Narsing Rao, K. Sathiya Mala, CSIR-Central Food Technological Research Institute, Resource Centre, Habsiguda, Hyderabad, Email:- rao.pamidighantam@gmail.com

Background & Objectives: Ridge gourd (Luffa acutangula) is a popular vegetable in India. Ridge gourd peel is an edible bio waste possessing high dietary fiber. The present study was carried out to develop a dietary fibre rich extruded snack utilizing ridge gourd peel and evaluate its acceptability. **Materials & Methods:** Ridge gourd peel was separated and preserved by dehydration using a tray dryer. Extraction of total dietary fibre from ridge gourd

peel powder was carried out by a method using acetate and HCl-KCl buffer followed by precipitation with alcohol. The extracted dietary fibre from the peel was incorporated at levels of 1, 3, 5 & 10% in the preparation of a ready-to-eat extruded snack using a single screw extruder with amaranth, corn grits, green gram and rice. The developed snack was coated with a tomato and Hibiscus based spice mixes and refined vegetable oil in a coating pan and evaluated for sensory acceptability for various attributes on a 9 point hedonic scale. The extruded snacks were also evaluated for nutritional composition and texture. **Result:** Ridge gourd peel was found to be rich in dietary fibre (45%) which could be enhanced by refining to about 66%. The nutrient analysis of ridge gourd peel dietary fibre incorporated snack was found to be rich in protein (13.8%), fibre and minerals such as iron and phosphorus. The snacks with 5 and 10% fortification of dietary fibre were found to be acceptable; however expansion and crispness were lower in the 10% product. The fortification by 10% peel extract resulted in enhancement of dietary fibre of the product to 16.4% which can augment ~10% of RDA requirements of Indians, when 25g of the snack is consumed. **Conclusion:** The results indicated that ridge gourd peel powder can be conveniently fortified in extruded snack products for improving its nutritional quality without affecting the sensory quality. **Keywords:** Ridge gourd peel, dietary fibre, extruded RTE products

PPFSN-41 EFFECT OF HYDROTHERMAL PROCESSING ON ANTIOXIDANT PROPERTIES OF COWPEA FROM ORGANIC AND CONVENTIONAL SOURCES. ***Rajesh Devisetti***, Jamuna Prakash, Department of Food Science and Nutrition, University of Mysore, Mysuru, Email:- rajeshjrg@gmail.com

Background & Objectives: To study the effect of hydrothermal processing on antioxidant properties of cowpea from organic and conventional sources. **Materials & Methods:** The samples were subjected to hydrothermal processing such as Microwaving, Pressure cooking, open Steaming and open pan boiling. Polyphenols, flavonoids, tannins and antioxidant activities such as 2,2-diphenyl-1-picrylhydrazyl scavenging activity [DPPH], 2,2′-Azino-bis(3-ethylbenzthiazoline-6-sulfonic acid) scavenging activity [ABTS], ferric reducing antioxidant power [FRAP], superoxide anion radicle scavenging assay [SARSA] and hydroxyl radical scavenging activity [HRSA] were measured by using standard methods. **Result:** The total phenolic content [TPC] of free and bound phenolics ranged from 1.27-5.14 mg/g. the total flavonoid [TFC] and condensed tannin [CT] content were in the range of 0.69-2.03 mg/g and 11.6-2.16 mg/g respectively. The TPC, TFC and CT of free phenolics found to be higher in the conventional cowpea whereas in case of bound phenolics the organic cowpea was higher. Free phenolics of conventional cowpea exhibited higher DPPH and ABTS scavenging activity (7.05 mg trolox eq per g and 233.67 mg of trolox eq per g) whereas in bound phenolics organic samples showed higher activity. The FRAP, SARSA and HRSA also followed the similar trend. In hydrothermal processing microwaving retained greater amounts of phenolics followed by open steaming, pressure cooking and open pan boiling. **Conclusion:** To summarise, the organic cowpea had higher amounts of bound phenolics whereas the conventionally grown cowpea had greater amounts of free phenolics. Antioxidant activities followed similar trend as phenolics and was highest in microwave processing because of faster cooking times when compared to other methods. **Keywords:** Cowpea, Hydrothermal processing, Antioxidants.

PPFSN-42 NUTRITIONAL ASSESSMENT, ANTIOXIDANT AND ANTIMICROBIAL ACTIVITY OF NIGELLA SATIVA SEEDS. ***G. Sulochanamma***, P. G. Prabhakara Rao, D. Madhusudhan Rao, R.G. Math, K. Sathiya Mala, CSIR-Central Food Technological Research Institute, Resource Centre, Habsiguda, Hyderabad, Email:- sulochanapraveen98@gmail.com

Background & Objectives: Nigella sativa L. belongs to the family Ranunculacea and has been used as a spice and food preservative. The present study aims to investigate the nutritional composition, antioxidant and antimicrobial activity of the Nigella seeds. **Materials & Methods:** Nigella seeds purchased from local market, were coarsely ground and analyzed for proximate composition, minerals, polyphenols by standard methods. The antioxidant activity of the alcohol extracts was determined by DPPH, FRAP and ABTS assays. FAMEs of fatty acids were identified by GC and GC-MS. The extraction of volatile oil was carried out by standard hydro distillation method from Clevengerâ€™s apparatus and its composition was determined by GC and GC-MS. The antibacterial property of the volatile oils was tested against 9 gram positive and gram negative bacterial strains by disc diffusion method using the Kirby-Bauer method. **Result :** Proximate analysis of the seeds showed a composition of 19.8% protein, 36.21% fat, 13.96% crude fibre, 5.44% moisture, 3.88% ash. The seed was found to be a rich source of phosphorus (412.85 mg/100g) iron (14.37 mg/100g) and polyphenols (3409.47mg/100g). Antioxidant activity of the ethanol extracts indicated IC50 values of 12, 4.8 mg/ml in DPPH and ABTS assays respectively. Fatty acid analysis of the extracted oil showed 57% linoleic acid, 24.1% oleic acid, 12.7% palmitic

acid, 2.9% stearic acid and 2.1% eicosadienoic acid as major fatty acids. The volatile oil possessed thymoquinione as the major component. The volatile oil showed very good antimicrobial activity against Klebsiella pnemoniae (MTCC-39), Proteus vulgaris (MTCC-1771) and Staphylococcus aureus (ATCC-25923) at 20ÂµI concentration. **Conclusion:** The significant content of fat, protein and minerals in the nigella seeds could be utilised for potential applications in processed foods. The seeds with high PUFA fat and rich polyphenol contents exhibited potential antioxidant and antimicrobial activities. Appropriate products suitable for local consumption could be developed for providing potential health benefits. **Keywords:** Nigella sativa, fatty acids, antioxidant activity, volatile oil, antimicrobial activity.

PPFSN-43 PREPARATION OF PROTEIN CONCENTRATE FROM NIGELLA SATIVA SEEDS AND EVALUATION OF FUNCTIONAL PROPERTIES. ***Sridhar Rachakonda***, P. G. Prabhakara Rao, R.G. Math, K. Sathiya Mala, CSIR-Central Food Technological Research Institute, Resource Centre, Habsiguda, Hyderabad, Email:- sreedharr@cftri.res.in

Background & Objectives: There is a growing interest in the utilization of plant proteins for the formulation of new food products. Seeds of Nigella sativa Linn., a rich source of protein, have been widely used in functional foods. The present study aimed to isolate the protein from defatted nigella seed flour and evaluate its functional and antioxidant properties. **Materials & Methods:** Nigella seeds procured from local market were finely ground and passed through BSS 30 sieve (500 Âµm). The Protein Concentrate (PC) was prepared from defatted Nigella Seed Flour (NSF) by iso-electric precipitation at 4.5-5.0 pH based on the solubility studies. The NSF and PC were evaluated for proximate composition, antioxidant activity by DPPH, ABTS assays, total polyphenols by Folin-Ciocalteu method and functional properties namely oil and water absorption, foam capacity and stability by standard methods. **Result:** The seeds on grinding and sieving yielded 90-92% flour with a protein content of 19.5% which on deafatting yielded 55.5% of meal with a protein content of 30.7% . The flour on solubilization at 10.5 pH and further precipitation at 4.5 pH yielded 22% PC with protein content of 67.8%. The bulk density of the PC was 0.8432 g/cc. The total polyphenols of NSF and PC were 304.4 and 171.2 mg/100g respectively. The IC50 of NSF and PC assayed by DPPH (12.8 and 23.5mg/ml) and ABTS (2.9 and 9 mg/ml) indicated higher antioxidant activity of NSF. The foam capacity of protein concentrate was found to be 128 ml/g which was highly stable (86% after 1 hr). **Conclusion:** The seeds on isoelectric precipitation yielded a good protein concentrate with possessing potential antioxidant activity and functional properties. The protein concentrate with high water and oil absorption capacities and high foam capacity with good stability can find applications in bakery industries. **Keywords:** Nigella sativa, protein concentrate, antioxidant activity, functional properties.

PPFSN-44 MOISTURE ADSORPTION ISOTHERMS OF PRE-TREATED AMARANTH FLOUR FITTED AT GAB MODEL. ***Srinivasulu K***, Sathiya Mala K, Math R G, CSIR-CFTRI, Resource Centre, Habsiguda, Hyderabad, Email:- srinivasuluk@cftri.res.in

Background & Objectives: Sorption properties of foods are essential for the design and optimization of drying, packaging and storage. The present study aimed to measure and model the water adsorption isotherms of pre-treated amaranth flours and to fit the GAB mathematical model to the experimental data in a range of water activity (0.11 to 0.92). **Materials & Methods:** Amaranth grains were purchased from local market and cleaned to remove dust and stones. The seeds were analyzed for moisture, protein, fat, crude fibre and ash. The seeds were subjected to different pre-treatments which included hot water blanching (85ï‚°C for 2 min), Autoclaving (121ï‚°C for 15 min) and roasting (120-125ï‚°C, 8-10 min). Untreated seeds served as control. The control and pre-treated seeds were milled into flour (50BSS). Moisture equilibrium data of the flour samples were determined by using the static gravimetric method of saturated salt solutions. Experimental data obtained was fitted to GAB model which reflects the adsorption pattern in the range of aw 0.05 to 0.95 by calculating the correlation coefficient (R2) and the mean relative percentage deviation modulus (MRD%). **Result:** The critical moisture content of the pre-treated amaranth flours was 10.97% (Control), 6.44% (Roasted), 8.17% (autoclaved) and 10.37% (blanched) which equilibrated to 62, 32, 40 and 60% respectively. The moisture content of the pre-treated amaranth flours increased by the increasing of water activity (aw). The experimental data showed that the moisture adsorption followed type II behaviour. The GAB model described the characteristics of pre-treated amaranth flours with the value of MRD ranging from 0.0086% (autoclaved) to 1.14% (roasted) and correlation coefficient (R2) ranging from 0.993 (roasted) to 0.997 (autoclaved). **Conclusion:** An MRD value below 10% is indicative of a good fit for practical purpose. Hence, in the present study, the GAB model was the best in for sorption isotherms of pre-treated amaranth flour obtaining less than 10% MRD. **Keywords:** Sorption studies GAB model.

PPFSN-45 STANDARDIZATION AND QUALITY EVALUATION OF MILLET COOKIES. ***Alisha P***, Meera M,Department of Food and Nutritional Sciences, Sri Sathya Sai Institute of Higher Learning, Anantapur, Email:- meeram@sssihl.edu.in

Background & Objectives: Background: Millet cookies are ideal for nutrient availability, convenience, palatability, longer shelf life and for better health. **Objective:** Development of functional cookies with millets, their standardization and quality evaluation. **Materials & Methods:** Methodology: Seven varieties of cookies were developed using barnyard millet, pearl millet, foxtail millet, finger millet, kodo millet, little millet and proso millet as cereal base and compared with control cookies prepared with wheat flour. The developed cookies were subjected for sensory evaluation by 20 semi-trained panelists on a 9- point hedonic Scale. Cookies were analyzed for physical characteristics: weight, thickness, diameter, spread ratio, percent spread factor and bulk density. The nutrient content of the cookies was analyzed. **Result:** The result of sensorial analysis revealed that cookies prepared with barnyard, pearl and foxtail millets indicated significant difference in overall acceptability compared to cookies prepared with wheat flour. However, significant difference was not observed in cookies prepared with finger, kodo, little and proso millets. The nutrient content of millet cookies indicated a significant difference compared to control cookies. The protein content of cookies developed with proso and pearl millet was higher compared to control cookies. Significant difference was not observed in weight, diameter and spread ratio of the cookies developed with millets compared to control (wheat) cookies. Significant difference was seen in the thickness of cookies developed with proso millet compared to control sample. Significant difference was seen in bulk density of pearl, finger, kodo, little, proso millet cookies compared to control sample. **Conclusion:** The study suggested the use of substituting wheat with millet flour for developing bakery products for better health and to alleviating nutritional deficiencies in vulnerable segment of population. **Keywords:** Keywords: Millet, shelf-life, nutrients.

PPFSN-46 EVALUATION OF FUNCTIONAL PROPERTIES OF CYDONIA OBLONGA SEED EXTRACT. ***Bushra Shaida***, Dr. Karuna Singh, Email:- gulbushra@gmail.com

Background & Objectives: Quince, scientifically known as Cydonia oblonga, is a deciduous tree of Rosacea family. Its leaf, fruit, pulp etc. have been used for the treatment of dysentery, ulcers, cancer and sore throat. However the study on the properties of quince seeds is limited. **Materials & Methods:** Seeds from quince fruit were collected, ground into powder and extracted from ethyl-alcohol. The extract was divided into five parts and in each part a known amount of DPPH (1,1-Diphenyl-2-picryl hydroxyl) was added in order to study antioxidant property. Spectrophotometer was used for the study. In order to have an idea about anti-inflammatory property in the extract albumin was added and analysed spectrophotometrically. **Result:** Results showed that seeds have high antioxidant and anti-inflammatory properties.The ethanolic extract of Cydonia oblonga seeds remarkable high antioxidant activity with the IC 50 value of 299.89 g/ml and the percentage inhibition for anti-inflammatory were obtained and tabulated From the results one can conclude that the seeds can be used as drug for curing many disorders related to oxidative stress and inflammation. **Conclusion:** Our findings suggest that Cydonia oblonga seed extract contains potential antioxidant and anti-inflammatory compounds which could be tested as drug candidates against oxidative and inflammation-related pathological processes in medicinal chemistry studies. **Keywords:** Cydonia oblonga, Anti-oxidant, Anti-inflammatory, 1,1-Diphenyl-2-picryl hydroxyl (DPPH).

PPFSN-47 PRODUCT DEVELOPMENT AND NUTRITIONAL VALUE OF CHIKKI WITH UNDERUTILIZED PUMPKIN SEEDS. ***Mohana Rubini.G.S***, K.Devi, Avinashilingam Institute for Home Science and Higher Education for Women, Email:- mohanarubini1996@gmail.com

Background & Objectives: Pumpkin seeds are nutritionally dense, but underutilized seeds. Only very few people use pumpkin seeds in snacks and food decorative ingredients. Chikki is basically prepared out of ground nuts, but possibly prepared with nuts and seeds. The objectives of the study were to formulate and standardise the preparation of chikki with pumpkin seeds and also analyse the nutritional value as compared to groundnut chikki. **Materials & Methods:** Raw pumpkin seeds were dehulled and roasted. Chikki was prepared with pumpkin seeds alone following the same protocol of preparation of ground nut chikki. Sensory evaluation was carried out by a panel of semi trained members using five point hedonic scale. Nutritive value was calculated from food composition table and compared with pumpkin seed chikki. **Result :** Sensory evaluation showed that pumpkin seed chikki scored 4.5 Â± 0.2, 4.8Â±0.5, 4.8Â±0.2 and 4.9Â±0.4 for appearance, texture, colour and overall acceptability respectively whereas control chikki scored those of 4.6Â±0.3, 4.7Â±0.7, 4.7Â±0.6 and 4.9Â±0.5 respectively (P>0.05). Pumpkin seed chikki and control chikki were respectively found to provide energy value of

937.72 and 873.8 kcal, protein of 26.16 and 25 g, fat of 47.36 and 39.8 g, calcium of 157 and 161 mg, Iron of 10.12 and 8.06 mg, magnesium of 262 and 168 mg, zinc of 15.86 and 3.64 mg, fibre 1 and 10.38 g ($P<0.05$) **Conclusion:** It could be concluded that pumpkin seed chikki could be formulated with consumer acceptability and desirable nutritional value as compared to ground nut chikki. This study evidenced the development of value added product from underutilized foods. **Keywords:** Pumpkin Seeds, Nutrient dense, Chikki, Sensory Evaluation.

PFSN-48 DEVELOPMENT AND QUALITY EVALUATION OF PEA FLOUR INCORPORATED MILLET COOKIES. ***K Avanthika***, Meera M, Department of Food and Nutritional Sciences, Sri Sathya Sai Institute of Higher Learning, Anantapur, Email:- meeram@sssihl.edu.in

Background & Objectives: Background: Cookies are favourite snack item for all age group. An attempt was made to develop the processing and preparation method for gluten free, nutrient dense, longer shelf life snack food item to reduce nutrient deficiency. **Objectives:** Development and quality evaluation of pea flour incorporated millet cookies. **Materials & Methods:** Methodology: Composite flour was formulated by incorporating foxtail millet, barnyard millet, pearl millet, and finger millet. Four types of cookies were developed with different composition of pea flour by partial replacement with composite millet flour. The products were studied for sensorial, physical, proximate, antioxidant, anti-nutrient, water absorption capacities, color, pH, shelf life analysis and cost formulation. **Result:** Results: A significant increase in nutrient content, quality analysis and sensorial attributes in experimental cookies in comparison with control cookies were observed. The nutrients analysed in the study are moisture, energy, protein, fat, fiber, carbohydrates, iron, phosphorus and calcium. The developed products were found shelf stable for a period of four months packed in polyethylene packaging material and no significant change in microbial analysis of experimental cookies compared to control cookies were observed and the developed products were found within the safe limit. **Conclusion:** Conclusion: Millet cookies enriched with pea four was found economically affordable and nutrient dense and can be incorporated in food preparations to alleviate nutritional deficiencies. **Keywords:** Key words: millet, shelf life, sensorial attribute.

PPFSN-49 ORGANOLEPTIC AND PROXIMATE ANALYSIS OF DEVELOPED HEALTH MIX ENRICHED WITH OMEGA-3 FATTY ACIDS. ***Harshitha.B.K***[1], Ms. SHUBHI AGARWAL[2],1=British Biologicals, 2=Department of Nutrition and Dietetics, Mount Carmel College, Email:- harshitha632@gmail.com

Background & Objectives: To formulate a nutritious omega-3 enriched health mix and to conduct proximate analysis of the developed health mix. The health mix was incorporated at varied concentrations into recipes of different cooking methods. To analyse the effect of varied temperature on omega-3 fatty acid of the health mix and also to check the acceptability of the developed product using omega-3 enriched health mix by sensory evaluation. **Materials & Methods:** The omega-3 health mix was formulated using different proportion of flax seeds, almonds, walnuts, chia seeds, sesame seeds and pumpkin seeds as the main components. The standard health mix was subjected to proximate estimation and incorporated at 30, 40 and 50% into different recipes prepared by different cooking methods namely chocolate (refrigeration), sweet momos (steaming), laddu (roasting) and eggless banana muffin (baking) to analyse the effect of varied temperature on omega-3 fatty acid content. The omega-3 health mix was also subjected to microbial analysis. **Result:** From the proximate analysis, the nutrient composition for 100g of health mix was 425±1.23 Kcal of energy, 17±0.35 g protein, 23.23± 0.83 g of total fat and 13.36 ± 0.10 g of dietary fibre and 3744.4±0.001 mg of omega-3 fatty acids. The incorporated food products were subjected to sensory evaluation and chocolate evolved the most accepted product (8.48± 0.65). As a result of comparison between nutrient and proximate analysis, maximum amount of omega-3 fatty acids was retained in eggless banana muffins.**Conclusion:** Baking was considered as the best cooking method as the later retains maximum amount of omega-3 fatty acids incorporated. Though there is a negative effect of three cooking methods on omega-3 fatty acids value of best selected variations, the proximate values obtained could still provide omega-3 fatty acids more than the daily requirement of omega-3 fatty acids intake. **Keywords:** Omega-3 fatty acid, flax seed, chocolate, almond, baking

PPFSN-50 PROCESS STANDARDIZATION FOR B CAROTENE ENRICHMENT OF COCONUT BURFI WITH PAPAYA. ***Neelavathani M***, Devi K, Email:- neelavathani@gmail.com

Background & Objectives: Coconut Burfi is the most popular traditional sweet in South India and prepared to be rich in energy and fat. Papaya is rich in β Carotene and locally available seasonal fruits in South India. The objective of the study was functionally focused to enrich β carotene in coconut burfi with the incorporation of

papaya and compare sensory as well as nutrition quality with control coconut burfi. **Materials & Methods:** The standard protocol of coconut burfi was standardized for the incorporation of papaya pulp with coconut and the mixture was mixed with sugar. Sensory evaluation was conducted by a panel of 15 semi trained members using 5 point hedonic rating scale. Proximate composition and β carotene were calculated from food composition table for both the papaya and control coconut burfi. **Result:** Sensory evaluation showed that sensory scores of papaya burfi were 4.9 ± 0.3, 4.8 ± 0.4 ,4.8 ± 0.5 , 4.8 ±0.4 and 4.9 ±0.2 for appearance, taste, texture, color and overall acceptability respectively whereas those were 4.7 ± 0.4, 4.4 ±0.5 , 4.5 ± 0.3 , 4.0 ±0.5 and 4.3 ± 0.4 for coconut burfi respectively. Energy (Kcal), protein (g), fat (g) and β Carotene (µg) were 722, 4.3, 41.5 and 2676 for papaya burfi (100g) and those were 697, 3.9, 41 and 204 for coconut burfi (100 g) respectively. **Conclusion:** Papaya burfi could be prepared with enriched β carotene content and this could lay the foundation for nutritional value addition of sweets as a nutritional intervention strategy. This β carotene enriched papaya could be a nutritious snack against vitamin A deficiency. **Keywords:** Burfi, Papaya, Sensory evaluation, β Carotene, enrichment.

PPFSN-51 VALUE - ADDITION OF HORTICULTURAL CROPS OF NORTH-EAST INDIA FOR ENSURING FOOD AND NUTRITION SECURITY. ***Ruchita Agarwal***, Mamoni Das, Assam Agricultural University, Email:- ruchhere@gmail.com

Background & Objectives: North–east India is known for its congenial agro-climate, soil and topography which offer an immense potential for growing tropical and subtropical fruits and vegetables. Assam is famous for its huge production in different varieties of papaya, pumpkin, ginger, lemon and banana which are rich in vitamins, minerals and other bio-active molecules. Improper post-harvest management system, a bulk quantity of produce gets damaged during the process of handling, transportation and marketing, resulting in enormous annual losses. Therefore, the primary objective of this study was to develop novel value-added products with enhanced functional properties which can aid in efficient post- harvest management and ensure food and nutrition security. **Materials & Methods:** Standardized protocols were used to develop ginger lemon Ready to Serve (RTS) beverage and nutties (candies) from papaya, pumpkin and banana. For sensory evaluation 9"– point Hedonic scale was used. The developed products were quantitatively evaluated for texture, physico-chemical properties and storage stability for 2 months. **Result:** Based on the sensory properties ginger lemon RTS beverage containing juice 10% and TSS 12% brix found to be best giving highest score over other combinations. Addition of fat and nuts improves the value of energy, protein, carbohydrate and fat in nutties as against the fruit alone. The sensory evaluation revealed that 35:75 proportion of fruit and sugar possessed highest acceptance. The use of sugar, fat and nuts with fruit pulp resulted in suitable firmness and texture of the product. **Conclusion:** The findings show that developing value-added products have the potential to reduce wastage of locally available fruits and vegetables which are rich in micro-nutrients. Future work will include packaging and transferring the technologies to the small and medium scale food processors for better product development for enhancing their income and promoting food and nutrition security. **Keywords:** value, addition, food, nutrition, security.

PPFSN-52 DEVELOPMENT AND STANDARDIZATION OF SORGHUM BASED EDIBLE CUTLERY. ***M Yogitha Chowdary***, Meghana Badveli, Vignan's (Deemed To Be) University, Email:- yogithachowdary@hotmail.com

Background & Objectives: The cutlery currently being used is made out of non-biodegradable materials like plastics and it is quite a concern to the environment. The main objective is to find a more economical and safe substitute for these plastic cutlery. The edible cutlery like a grain based edible spoon would be an efficient option as a biodegradable substitute for plastics and also in terms of nutrition available from consumption of this edible spoon. The key ingredient used in making this grain based edible spoon is sorghum flour as it is highly nutritious (iron and phosphorous content is high, gluten free). It is also very environmental friendly to produce in a massive scale. **Materials & Methods:** The materials required are sorghum flour, rice flour, salt, butter, water, natural flavorings (sugar ,cinnamon ,pepper,spinach etc.) and baking powder. As per standardized formulation and method, a dough is prepared out of all ingredients and kneaded 20-25 minutes. The dough is sheeted using a rolling pin and then cut into desired shape and size of spoon. The cut dough is baked in microwave oven at 200℃ for 15-25 minutes. **Result:** The grain based edible spoon's overall sensory acceptance was also assessed and a 7 on 10 point hedonic scale was achieved for the formulation applied. The sensory evaluation was done for texture, taste (flavor, aroma)appearance, palatability parameters. **Conclusion:** The formulation was standardized after experimenting with several blends of sorghum flour and rice flour in 90:10;80:20 ; 70:30; 60:40 ; 50:50 .Best results were obtained when formulated using 80:20 ratio. The obtained outcome- edible spoon serves the purpose of spoon and is a treat to the taste buds as per sensory results obtained. Increasing usage of these

edible cutlery will definitely enhance nutrition intake and health benefits of an individual. **Keywords:** sorghum, grain, edible cutlery, nutrition

PPFSN-53 EFFECT OF FORTIFICATION ON NUTRITIONAL AND SENSORY QUALITY OF PAPAYA AND GUAVA FRUIT BAR. ***Appani Laxman Kumar***, Sri Konda Laxman Telangana State Horticultural University, Email:- appanilaxman123@gmail.com

Background & Objectives: Papaya (Carica papaya L.) and Guava (Psidium guajava L.) are important tropical fruits and claims superiority over other fruits by virtue of their commercial and nutritional values. The present study was conducted at College of Horticulture, Anantharajupeta Andhra Pradesh during 2015-2016 with the objective of enhancing the protein content of papaya-guava fruit bar and increasing its nutritional quality by fortifying with defatted soya flour and skimmed milk powder. **Materials & Methods:** Total soluble solids, Moisture content, Titrable acidity, Reducing , Total sugars, Ascorbic acid, Protein and Total carotenoids of fortified fruit bar was studied using different methods. **Result:** Different treatments of fortified fruit bars contained Total soluble solids ranged from 77.45 to79.24 0°Brix, moisture content from 14.92 to 15.01 percent, pH from 3.38 to 3.87, titrable acidity from 0.80 to 0.98 percent, Reducing sugars from 36.59 to 48.94 percent, total sugars from 61.15 to 74.45 percent, ascorbic acid from 81 .70 to 133.70 mg/ l00g, total carotenoids from 849 to 1340µg/l00g and protein content from 0.69 to .2.1 0 percent. **Conclusion:** However, on the basis of sensory evaluation, the treatment T7 (60% papaya pulp + 40% guava pulp (AS) + 6% skimmed milk powder) found to be the best with maximum score for colour and appearance, flavour, texture, taste and overall acceptability among all treatments at zero as well as 30, 60 days of storage**. Keywords:** fortification, fruit bar.

PPFSN-54 FORMULATION, STANDARDISATION, PROXIMATE COMPOSITION AND POPULARIZATION OF CHIA SEEDS (Salvia hispanica L.) BASED RECIPES. ***V.Sathiya***, Faheemaafsin.K, Department of Nutrition and Dietetics, PSG College of Arts and Science, Coimbatore, Email:- sathiya2022@gmail.com

Background & Objectives: Introduction: Chia seed is an ancient oilseed used by Mayas and Aztecs as a food stuff. Chia can be considered as â€œfunctional food" because apart from contributing to human nutrition chia helps to increase satiety index, prevent cardiovascular diseases, inflammatory and nervous system disorders, and diabetes. Objectives: To develop recipes using Chia seeds and to popularize and create awareness to the public about the health and nutritional benefits of Chia seeds. **Materials & Methods:** The recipes formulated with Chia seeds were Chia seed millet balls, Chia seed cookies, Chia peppermint drink, Chia chikki balls and Chia smoothie and was organoleptically evaluated and nutritive value was assessed. Based on the acceptability, one recipe was chosen and popularized among different age groups. The nutritional and health benefits of the Chia seeds were also made aware as a part of popularization through a presentation. **Result:** Results: The sensory scores revealed that Chia formulated recipes had higher mean score and was acceptable. The nutritive value of Chia recipes had a considerable increase in all the nutrients. The protein, fat, fiber, iron, calcium, magnesium and phosphorus increased greatly proving Chia is a good source of these nutrients. The popularized recipe was also acceptable among different age groups and increased the awareness about Chia seeds. **Conclusion:** Chia seeds proved to be an effective ingredient in the food products to be consumed by the public. The essential nutrients like omega-3 present in Chia have a great impact in the health of an individual and also would help the vegetarians to use Chia seeds as a source of omega-3 fatty acids. Therefore, the Chia seeds are considered to be a functional food. **Keywords:** Chia seeds, nutritional benefits, health benefits, recipes, omega- 3 fatty acids.

PPFSN-55 Kushwaha Pratibha - Withdraw

PPFSN-56 BIOCHEMICAL CHARACTERIZATION OF DICOCCUM WHEAT GENOTYPES OF PENINSULAR ZONE. ***Kavita B. Patil***[1], Suma Biradar[1], Rudra Naik[2], Sudha T.[1],1= All India Coordinated Wheat and Barley Improvement Project, University of Agricultural Sciences, Dharwad, 2= Directorate of Research, University of Agricultural Sciences, Dharwad, Email:- kavita.kotagi@gmail.com

Background & Objectives: Dicoccum wheat (Triticum dicoccum Shrank schubl) is nutritionally superior as compared to commercially available wheat with high protein, and dietary fiber contents. It is also a rich source of micronutrients viz., iron, copper and manganese. As it is grown in limited area, dicoccum wheat with good quality is presently needed in consumer driven market. Hence the present investigation was undertaken to analyse the quality characteristics of dicoccum genotypes. **Materials & Methods:** The trial was conducted at six locations of

Peninsular Zone viz., Arabhavi, Dharwad, Kalloli, Ugar, Mudhol and Pune in the year 2017-18. Three entries viz., MACS 5051, HW 4101 and DDK 1054 were tested against two dicoccum checks viz., DDK 1029 and HW 1098 and one bread wheat check i.e. MACS 6222. The grains were threshed and sorted to remove broken wheat and foreign particles. The samples were analysed for thousand grain weight, protein content, sedimentation value and yellow pigment by following standard procedures. **Result:** The overall mean thousand grain weight ranged from 43.51 (DDK1054) to 43.84 g (HW 4101). Protein content in grains plays an important role in determining its suitability to end product. The mean protein content in the grain samples of the entries under test was more than 13.0 per cent and there was less variation among different entries. It ranged from 13.22 per cent (MACS 5051) to 13.61 per cent (HW 4101). The entry HW 4101 recorded protein content higher than the best check (HW 1098). Higher sedimentation value is positively correlated with better bread making quality. The overall mean sedimentation value of the genotypes ranged from 27 ml (MACS 5051) to 32 ml (HW 4101). The entries viz., HW 4101 and DDK 1054 were the promising genotypes for this trait. There was no much variation among the test entries for yellow pigment content. It ranged from 3.39 ppm (MACS 5051) to 3.59 ppm (HW 4101). **Conclusion:** The present investigation indicated the superiority of dicoccum genotypes for protein content and sedimentation value. The genotype HW 4101 found superior for protein content and sedimentation value whereas, DDK 1054 for sedimentation value. **Keywords:** Dicoccum wheat, protein, sedimentation value and yellow pigment.

PPFSN-57 NUTRIENT ANALYSIS OF READY-TO-EAT PRODUCT BY INCORPORATION OF RAW JACKFRUIT PULP POWDER. ***Christina George***, Dr. Sarla Lakhawat, College Of Community And Applied Sciences, Mpuat,
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Background & Objectives: Jackfruit (Artocarpus heterophyllus L.) is an underexploited tropical fruit crop, which is commonly referred to as “poor man’s food” due to cheap, plentiful, and supplemented with nutritional and health promoting constituents. One of the most problems associated with jackfruit is its seasonal availability, handling, and storage, and it can best be solved if the fruit is processed into various forms to have a longer shelf life. This study was undertaken to develop a nutritive ready-to-eat product Desi Jackfruit Karanji, by incorporation of raw jackfruit pulp powder with evaluation of nutritional properties. **Materials & Methods:** Koozha variety and other raw ingredients were procured from Udaipur market. The pulps were dried through solar dryer for powder preparation. The standardized recipe was prepared of three different treatments, that is, 30%, 40% and 50% with control (T4). Sensory evaluation with 10 panel members using nine point hedonic scale and proximate compositions by standardized methods of NIN and Jain & Mogra. One way ANOVA analysis was, applied to determine the significance difference in sensory characteristics. **Result:** Based on sensory, nutritive value of selected treatment, that is, T3 (50%) observed to have moisture (1.55%), protein (7.76 g), fat (13.19 g), ash (1.99 g), fibre (2.23 g), carbohydrate (73.27 g), and energy (442.85 kcal) per 100 g with control. Statistical data revealed no significant difference in colour, flavour, taste, texture, appearance, and overall acceptability at 5 percent level ($p < 0.05$) with control. **Conclusion:** It can be concluded from the above results that the product prepared was nutritious and acceptable. Hence, the standardized product can be highly recommended for utilisation on a large scale for the community. **Keywords:** jackfruit pulp powder, ready-to-eat product, nutrients, standarized product.

PPFSN-58 STERLING IMPACT OF MALTODEXTRIN ON TEXTURAL PROPERTIES OF JACKFRUIT (Artocarpus heterophyllus) BAR USING A SOLAR CABINET DRYER. ***G. Karishma Yadav***[1], Pooja Mandlik[2], M.Ramakrishna Rao[3], 1= Avinashilingam Institute of Home Science and Higher Education for Women 2= Department of Microbiology and Food Science & Technology, Institute of Science, GITAM Visakhapatnam 3= Research and Development, Society for Energy Environment and Development (SEED), Hyderabad, Email:- gkarishma94@gmail.com

Background & Objectives: Advancements in Food and Nutritional Security play a vital role in alleviating poverty and improving the nutrition profile of the masses. Jackfruit is an underutilized tropical fruit from the family Moraceae. The study was aimed at preservation and value addition of this exotic fruit in the form of a fruit bar. **Materials & Methods:** An attempt was made to standardize the Jackfruit bar without maltodextrin (M0), with 2.5% maltodextrin (M1) and with 5% maltodextrin (M2). Other ingredients like sugar (25%), citric acid (1.9%), pectin (2.5%), mango pulp (5%), Potassium metabisulphite (0.2%) and water was blended with pulp (60%), in right proportions and processed to obtain a value added, Ready-To-Eat [RTE] jackfruit bar using solar dehydration technology. The proximate analysis of the final product was performed by estimation of Moisture, TSS, Acidity, pH, Total Ash, Acid Insoluble Ash, Browning Index, Ascorbic acid, Crude fibre, Crude fat, Total and Reducing

sugar, Carotenoids, Phenols, Flavonoids and microbial parameters (TBC, E.Coli, Yeast and Mold count). The organoleptic properties (Colour, Appearance, Taste, Texture and Overall Acceptability) were also evaluated by trained panellists. **Result:** The findings revealed that the solar-dried Jackfruit bar M2 had good percentage of Total and reducing sugars and was remarkably a rich source of Iron and Sodium, compared to the samples M0 and M1. The microbial parameters were within the limits for TBC, E.Coli, yeast and mold. The results of the sensory evaluation showed that the product M2 was ranked best in terms of colour, appearance, texture, taste and overall acceptability, based on the 9 point Hedonic Scale Rating. **Conclusion:** It was concluded that the best remarkable results were obtained for sample M2 (2.5% maltodextrin) in terms textural aspects and also nutritional, sensory and microbial properties than the other samples (M0) and (M2), hence is recommended. **Keywords:** Nutritional security, Jackfruit, fruit bar, solar dehydration, sensory evaluation.

PPFSN-59 DEVELOPMENT AND NUTRITIONAL EVALUATION OF VALUE ADDED CHICKEN MEAT SAUSAGES. ***Abhirami Sivaprasad***[1], Manjula Kola[2], G.Vijaya Bhaskar Reddy[3],1= Avinashilingam Institute for Home Science and Higher Education for Women, 2= Sri Venkateswara University, Tirupati, 3= College of Veterinary Science, Tirupati, Email:- abhiramisiv@gmail.com

Background & Objectives: Meat is as a concentrated source of protein which is not only of high biological value but its complete amino acid composition complements that of cereal and other vegetable proteins. It is also a good source of iron, zinc and B Vitamins, and liver is a very rich source of vitamin A.Meat products can be modified by value addition using functional ingredients beneficial for health. In the present investigation, an attempt was made to standardize the procedure for the preparation of the product with three levels of barley flour and to arrive at a suitable formulation with extended shelf-life during refrigeration temperature. **Materials & Methods:** The study was conducted in two phase. In the first phase, the product was standardized with the best suitable formulation with one optimum level concentration of barley flours and the second phase was designed to study the shelf life of the product with the addition of selected concentration of barley powder (6%) under refrigeration (4±1°C) temperature. **Result:** Results revealed that the mean pH values of control and value-added sausages were increased significantly throughout out storage periods. Developed product recorded substantially ($P<0.05$) lower the 2-TBARS values and percent free fatty acid (FFA) values than control during the up to storage period. Lipid oxidation and microbial counts of product incorporated with barley flour were acceptable limits up to25 days at refrigerated storage. Results showed that chicken meat sausages extended with 6 percent barley flour was considered superior in respect to its quality and was found to be stable for a period of 25 days under refrigerated storage without any deterioration. **Conclusion:** Besides health benefit effects, dietary fiber supplementations increase the bulk and prevent cooking loss in meat products with no or fewer changes in textural parameters by enhancing water binding capabilities and carries unique economic advantages for both the consumers and processors. **Keywords:** Nutrional Evaluation, Free Fatty Acid (FFA), Functional Foods.

PPFSN-60 BLACK CARROT CONCENTRATE AS NATURAL COLOURANT FOR YOGHURT. ***Bhavesh Baria***, Ashish Kumar Singh, ICAR-National Dairy Research Institute, Karnal, Haryana, Email:- bariabhavesh2@gmail.com

Background & Objectives: Health concern over synthetic food colourants leads to increasing demand for natural colourants. Anthocyanins are natural pigments, which provides various shades of red, pink and blue to food materials, depending on their pH and additional health benefits including antioxidant potential. Exotic vegetable crop black carrot is rich source of anthocyanins (1750 mg/kg). In this study, anthocyanins rich black carrot concentrate (BCC) was used as natural colourant in yoghurt preparation. Present study was based on the following objectives: (1) Optimization of the level (%) of anthocyanins rich black carrot concentrate (BCC) in yoghurt. (2) Anthocyanins stability during storage of yoghurt. **Materials & Methods:** Yoghurt added with different levels of black carrot concentrate and control yoghurt by addition of 100 ppm synthetic colour a according to standard protocol. Yoghurt samples were analyzed for Total anthocyanins using pH differential method, Total phenolic content using Folin-ciocalteu method and Antioxidant activity using DPPH free radical scavenging method. Colour values were analyzed using Colourflex Hunter colorimeter. Sensory analysis of yoghurt was carried out using composite scorecard on 100 point scores. **Result:** Total anthocyanins, Total phenolic content and DPPH antioxidant activities were increased significantly with increasing black carrot concentrate in yoghurt. Sensory scores were significantly with increasing black carrot concentrate but at 2% level it was criticized due criticized for perceived astringency, predominant phenolic, medicinal aroma and unnatural colour that their natural counterparts. Yoghurt added with 1.5% level of black carrot concentrate was found best with respect to sensory

scores similar to control yoghurt. The total anthocyanins content of 30.86 mg/kg, total phenolic content of 198.26 mg/kg and DPPH antioxidant activity of 182.94 (µg of TEAC/g) obtained with 1.5% level of Black carrot concentrate. Black carrot anthocyanins were found stable in yoghurt with 3.5-4 % marginal loss during storage at <5ºC indicating better stability of pigments. **Conclusion:** Black carrot concentrate 1.5% showed similar strawberry shade as compare to control sample. Black carrot concentrate can be use as alternative to synthetic food colourant in food products providing red shade in acidic pH. Black carrot concentrate as natural colourant showed very good stability during storage of yoghurt. It can also serve as quality assurance tool by its ability to give different colour shades over different range of pH. **Keywords:** Black carrot, Anthocyanin, Yoghurt, Natural colour.

PPFSN-61 DEVELOPMENT OF A NUTRIENT RICH WEANING FOOD COMPOSITE OF YELLOW PEAS/ BENGAL GRAM WITH MAIZE, RICE AND SKIMMED MILK POWDER BY EXTRUSION COOKING PROCESS. ***Anamika Singh***, Ashish Kumar Singh, ICAR-National Dairy Research Institute, Karnal, Haryana, Email:- anamikanshu@gmail.com

Background & Objectives: The need for weaning food for some babies from six months to two years old is being met through commercially produced by sophisticated technologies are costly and is not within the reach of low income groups. It is therefore desirable to develop low cost complementary foods adopting simple technologies, so that the foods can be supplied at affordable prices. Extrusion cooking is one of the contemporary food processing technologies applied for preparation of a variety of inexpensive snacks, specialty and supplementary foods. The basic objective of this project is to develop low cost value added nutritious weaning foods for children. **Materials & Methods:** Sample of extruded high protein weaning foods were formulated at different ratios using blends of rice, maize, yellow peas/ Bengal gram and SMP. The addition of Yellow peas flour/ Bengal gram flour (20, 30, 40%) were blended and extruded (twin screw) to make precooked, ready-to-eat, weaning foods. Comparative evaluations of the three variations of extruded products were undertaken. Sample of each blends were analyzed for moisture, fat, protein, ash, carbohydrate and fiber according to AOAC methods. **Result:** The extruded products were found to have better nutritional quality as indicated by the good protein content 11.34, 12.35, and 13.05%, respectively. the fat content of product was very low that is 1.23, 1.56 and 1.98%. fiber content was also very low which is 1.78,1.99 and 2.54% respectively.Moisture content was 8.36, 8.65 and 8.97. **Conclusion:** This study revealed that ready to eat complementary food products formulated from locally available food commodity, can meet the macro nutritional needs of infants and children. However certain aspects like the digestibility and bioavailability of macronutrients in these local diets needs further investigation. **Keywords:** weaning food, extrusion technology, nutrients.

PPFSN-62 ENGINEERING DIACYLGLYCEROL OIL PRODUCTION FROM MEDIUM CHAIN FATTY ACIDS, CATALYSED BY BOTH ENZYMATIC AND CHEMICAL PROCESSES FOR JUXTAPOSED COMPARATIVE ANALYSIS OF ESTERIFICATION REACTION: A PILOT STUDY. ***Ms. Kankana Das***, Dr. Mahua Ghosh, department of chemical technology, university of calcutta, Email:- daskank2013@gmail.com

Background & Objectives: Diacylglycerols (DAGs) with proven nutraceutical potential requires cost-optimised engineering methods and interventions for production from naturally occurring lipid sources such as medium-chain fatty acids, for wide-scale incorporation into our daily diet to promote, translate the health benefits of DAGs for the masses. In this context, the present study endeavored to explore the cost aspects vis-à-vis downstream processing of the synthesis of DAGs from therapeutically potent medium chain fatty acids(MCFAs)using catalysts of various nature and sources for industrial relevance and applications. **Materials & Methods:** The production of synthesizing structured diacylglycerols from bioactive medium chain fatty acids in a stirred tank reactor was carried out by known methods of catalysis i.e. enzymatic and chemical on a comparative basis. Enzymatic esterification was performed using two commercially available immobilized lipases viz. Rhizomucor meihei and Candida antarctica, whereas, chemical was carried out using concentrated sulphuric acid (H2SO4) as acid catalyst. Two different medium chain fatty acids caprylic (C8:0), capric (C10:0) along with glycerol were used as the substrates for the esterification process. Thin layer chromatography was used to monitor the reaction and physical appearance of the desired diacylglycerols. High performance thin layer chromatography was carried out for the separation of the different isomers. Gravimetric analysis was done by column chromatography. **Result:** Significant structured diacylglycerol yields of about 58.86±4.05% and 53.77±3.74% were obtained with C8:0-RMIM and C8:0-NS435 enzyme at 18th and 6thhr respectively. About 55.41±3.95 %, 51.89±2.60 % significant yields were also obtained in case of C10:0- RMIM and NS435 enzymes at 18th and 6thhr respectively. Significant

structured diacylglycerol yields of about 56.52±0.28 and 46.38±0.24 were obtained with C8:0 at 1 hr and C10:0 at 2 hr respectively. **Conclusion:** The study provides empirical qualitative comparative analysis of DAG yield from MCFAs facilitated by both enzymes and chemical catalysts. **Keywords:** Medium chain fatty acids, Diacylglycerol, synthesis, food engineering.

PPFSN-63 IN VITRO STUDY OF ANTIOXIDANT AND ANTIHYPERTENSIVE ACTIVITY OF PROTEIN HYDROLYSATES FROM FRESHWATER MUSSEL LAMELLIDENS MARGINALIS. ***Madhushrita Das***[1], Ankhi Halder[1], Tanmoy Kumar Dey[1], Roshni Bhattacharya[1], Pubali Dhar[1], Jana Chakrabarti[2], Mahua Ghosh[1],1=Department of Chemical Technology, University of Calcutta, 92, A.P.C Road, Kolkata, 2= A.P.C Roy Govt. College, Himachal Vihar, Matigara, Siliguri,
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Background & Objectives: Dietary proteins have long been recognized for their nutritional and functional properties. Currently, bioactive peptides from fishes and vegetable proteins are gaining importance to treat lifestyle diseases. Unconventional animal protein sources can be explored for this purpose and mollusca as a group have good prospects. The freshwater mussel Lamellidens marginalis is well accepted as food all over India. Ethno-medicinal uses of the flesh of Lamellidens among rural people in India have been documented.To study the potential of bioactive peptides from Lamellidens against hypertension and oxidative stress. **Materials & Methods:** Proximate analyses for nutritive value were done. Protein hydrolysate was prepared using commercially available protease: Alcalase2.4L. Degree of hydrolysis (DH %) was calculated. Anti-oxidative activity, Angiotensin Converting enzyme [ACE] inhibitory activity were analyzed according to the method of Shimada et al (1992), Chusman et.al, (1971). Matrix assisted laser ionization- time of flight [MALDI-TOF] was performed to determine the amino acid sequence of the ultra-filtrate of AlcH120. **Result:** Present investigation shows that mussel meat contains moderate amount of protein (41.5 ± 0.67%), carbohydrate (40.05 ± 0.38%) and reducing sugar (23.75 ± 0.07%), but less amount of fat (5.1 ± 0.20%). Mussel protein hydrolyzed by Alcalase2.4L at 120 minute gives maximum (85.45%) peptide bond cleavage. 10mg/ml protein concentration (AlcH120) shows maximum hydroxyl radical (36.65±0.10) and DPPH radical (56.12±0.08) scavenging activity. ACE inhibitory assay was done and IC50 value of Alcalase 2.4L is 47.22µg/ml. A novel ACE inhibitory peptide IGPGPFSR (IC50 45.6Âµg/ml) selected to compare the binding affinities of l- hippuryl- His- Leu [HHL] following captopril, natural peptide interactions with ACE. Natural peptide shows more drastic effect on HHL than captopril. **Conclusion:** Present investigation reveals that bioactive peptides derived from the fresh-water mussel Lamellidens marginalis provide opportunities for utilizing them in various food formulations and pharmaceuticals and thus can be used for nutraceutical therapy. **Keywords:** bioactive peptide, functional food, Lamellidens marginalis.

PPFSN-64 PREPARATION OF AMINO ACYL GLYCERIDES AS NOVEL FOOD FORMULATION. ***Sriparna Chkraborty***, Dr. Mahua Ghosh, Department of Chemical Technology, University of Calcutta, Email: sriparnachakraborty16@gmail.com

Background & Objectives: Recent challenges for the food industry are towards the development of tailor-made food formulations to cater the necessary requirements for improving the nutritional score of food. According to previous research, food formulations can be effectively favourable for proper functioning of the body. Currently, fatty acid and amino acid conjugates, together termed as aminoacyl glycerides are gaining importance for their usefulness in various food formulations. Therefore, the present scope of the study was aimed towards the production, application and exhibition of a significant food formulation as a proper functional food. **Materials & Methods:** Two products are developed starting with mono-oleate and glycine and arginine respectively. Products are characterised structurally using by 1H NMR and SEM. The food formulation was confirmed and compared by few physicochemical parameters such as foaming capacity, surface activity and CMC by surface tension, antimicrobial activity by 96-well plate technique, cholesterol lowering activity (in vitro) by ferric chloride method. **Result:** The results showed that compound containing arginine as polar head possesses surface tension as low as 21.6 dyne/cm at 3.3% chloroform solution and compound containing glycine as polar head possesses 25.2 dyne/cm at same concentration. Similarly cholesterol transfer rate is also higher in case of arginine derivative. Both the compounds are found to be effective as anti-microbial agent with gram negative and gram positive strains. The structure-property relation could explain the phenomenon considering the curvature into the structure which might lead to the good surface activity, antimicrobial activity and cholesterol lowering activity (in-vitro). **Conclusion:** Thus, aminoacyl glycerides constituted an interesting class of speciality food formulation with good surface properties, good lipid lowering activity, low potential toxicity and high biodegradability. Such type of food

formulation could exert healthy benefits to combat diet related non communicable diseases in humans. **Keywords:** Food formulation, Antimicrobial activity, Cholesterol lowering agent.

PPFSN-65 Asima Saqib - Withdraw

PPFSN-66 A COMPARATIVE STUDY OF TOTAL PHENOLS, ANTHOCYANINS, ASCORBIC ACID AND ANTIOXIDANT ACTIVITY OF WILD MULBERRY SPECIES. ***Archana Tewari***, Kiran Bains, Kirandeep Kaur, Punjab Agricultural University, Ludhiana, Email:- tiwariarchana587@gmail.com

Background & Objectives: Mulberry trees can be found growing wildly in North India. Mulberry fruit is packed with bioactive compounds but due to its highly perishable nature and difficult harvesting, it is not utilized efficiently resulting in wastage of the fruit. It is imperative to assess the bioactive compounds and antioxidant activity of common wild species of mulberry to determine their suitability for the preparation of high antioxidant health foods. **Materials & Methods:** The fruit of three species namely Morus rubra (red) and Morus nigra (black) and Morus alba (white) grown wild in the campus of Punjab Agricultural University, Ludhiana was collected. The fruit was cleaned, sorted, washed and analyzed for ascorbic acid, anthocyanins, total phenols and antioxidant activity using standard methods. **Result:** The ascorbic acid content in red, black and white mulberry was 23.43, 27.77 and 19.24 mg/100g, respectively. The corresponding values for total phenols were 255.44, 542.35 and 78.61 mg Gallic acid equivalent [GAE]/100g. The anthocyanins in the three species were 97.75, 267.76 and 7.84 mg/100 g, respectively. Antioxidant activity in red, black and white mulberry was 63.5, 68.81, and 27.00, respectively. The statistical analysis revealed that ascorbic acid, total phenols, anthocyanins and antioxidant activity of white mulberry species were significantly ($p \leq 0.01$) lower as compared to the other two species. Further, black mulberry had a significantly ($p \leq 0.01$) higher total phenols and anthocyanins in comparison to red mulberry, whereas, ascorbic acid and antioxidant activity of red and black mulberry was comparable. **Conclusion:** The black species of mulberry had the maximum ascorbic acid, total phenols, anthocyanins and antioxidant activity followed by the red species, hence these two species hold potential for their use in the preparation of high antioxidant products with enhanced shelf life to provide nutritional security to the general masses who cannot afford many fruits due to their high market prices. **Keywords:** Mulberry, Bioactive compounds, Total phenols, Anthocyanins, Antioxidant activity

PPFSN-67 OPTIMIZATION, SENSORY AND NUTRITIONAL EVALUATION OF BEETROOT ENRICHED NUTRITIOUS SNACK BAR. ***Priyanka Tangariya***, Pratima Awasthi, Department of Foods and Nutrition, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Udham Singh Nagar, Uttarakhand, Email:- priyanka.tangariya@gmail.com

Background & Objectives: Consumers nowadays demand nutritious, convenient and tasty snacks that provide hunger gratification. Snack bars, typically designed to be quick, less perishable, handy and highly satisfying than prepared foods, ideally fit these criteria. Therefore, the present study was focused on optimization, sensory and nutritional evaluation of snack bar using beetroot powder, since beetroot contains various bioactive compounds which offer antioxidant and anti-inflammatory activities. **Materials & Methods:** Raw materials namely; Bengal gram, flax seeds, sesame seeds, coconut chips, peanuts, honey and beetroot powder, were used in different proportions for preparation of fifteen snack bars. Thereafter, all the snack bars were taken for sensory evaluation using Nine Point Hedonic Scale and Sensory Score card (Amerine et al. 1965). Based on sensory evaluation, one control and one beetroot snack bar, were selected followed by nutritional evaluation including; proximate analysis (AOAC, 2000), carbohydrate (by difference), physiological energy (Mudambi et al. 1989), total phenol (Singleton et. al. 1999), flavonoid (Zhishen et al. 1999), Total Antioxidant Activity (Brand- Williams et al. 1995) and Folic acid (Ranganna, 1986) analysis. Two way ANOVA and t-test were used for statistical analysis. **Result:** Based on the sensory evaluation, control snack bar A3 and beetroot enriched snack bar D3 were found highly acceptable and selected for nutritional analysis. Nutritional analysis showed that D3 snack bar had significantly higher amount of total ash and carbohydrate content than control snack bar A3 ($p<0.05$). D3 snack bar also had good protein, fat, crude fiber, energy and folic acid content. Antioxidants analysis revealed that D3 snack bar had significantly higher amount of total phenol (228.24 mg GAE/100g), flavonoid (252.60 mg RE/100g) and total antioxidant activity (635.94 mg RE/100g) than control snack bar A3 ($p<0.05$). **Conclusion:** D3 snack bar being rich in antioxidants can be offered to the patients with hypertension and atherosclerosis and may result in improved clinical outcomes. **Keywords:** Snack bar, beetroot powder, carbohydrate, antioxidants.

PPFSN-68 DEVELOPMENT AND STANDARDIZATION OF BETA CAROTENE RICH SQUASH. ***S.Udhaya Geetha***, Dr.M.Amirthaveni, Department of Food Science and Nutrition, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Email:- udhayageetha92@gmail.com

Background & Objectives: Vitamin A is needed for vision, growth, reproduction, cellular differentiation and proliferation, and for the integrity of the immune system. Green leafy vegetables, oranges, yellow fruits and vegetables such as mangoes, carrots, sweet potato, and pumpkin are rich source of beta-carotene. These fruits and vegetables were not only rich in beta-carotene but also rich in antioxidants and phytochemicals and strengthen the immune system, helps to keep skin, intestinal tract, eyes, and lungs healthy. The liver converts beta-carotene into vitamin A. Beta-carotene, rich squashes were prepared in this study to improve the vitamin A status. Objectives: To develop a product, Evaluate the products, Analyze the nutrients and Shelf life of the product. **Materials & Methods:** Fruits and vegetables like mango, papaya, orange and carrot which are rich in beta-carotene were selected. In the present study, fresh squashes were prepared out of the beta-carotene-rich fruits and vegetables and evaluated. Also the nutrients and shelf life analysis of squashes were carried out. Different varieties of squashes combining different fruits and vegetables were prepared and compared with the standard papaya squash. Papaya with carrot (V1) and papaya with mango (V2), papaya with orange (V3) papaya with mango and orange (V4) was the different types of squashes prepared and evaluated organoleptically. **Result:** In these squashes except (V4), other squashes obtained high scores in an organoleptic evaluation. The nutrients like energy-yielding nutrients, vitamin C, calcium, iron, and phosphorus were analyzed for prepared squashes. The energy content of variation 4 (papaya, mango, orange) was higher than standard and other variations in which the energy was comprised of carbohydrate. Beta-carotene content was higher in variation 1 (Carrot). The vitamin C content was higher in variation 2 (orange) squash. The calcium and phosphorus content was higher in variation 1 (carrot) of squash varieties. Iron was rich in variation 4 (orange, mango). **Conclusion:** From the study, it is concluded that beta-carotene and functional components rich fruits and vegetable squashes can be prepared and consumed to prevent vitamin â€“A deficiencies. **Keywords:** Papaya, Orange, Mango, carrot, Sugar, water and citric acid.

PPFSN-69 EFFECT OF PROCESSING TREATMENTS ON ANTIOXIDANT POTENTIAL OF INDIAN SESAME SEEDS. ***Akriti Jaiswal***, Harpreet Kaur, Department of Food and Nutrition,College of Home Science, Punjab Agricultural University, Ludhiana, Email:- jaiswalakriticsa@gmail.com

Background & Objectives: Sesame seed (Sesamum indicum L.) is one of the oldest oilseed crops having valuable nutrients and antioxidants important for human health. This study was carried out to investigate the effect of different processing treatments on antioxidant activities of Indian black (RT54) and white (RT346) varieties of sesame seeds. **Materials & Methods:** Both black (BSS) and white (WSS) whole sesame seeds were processed by germination (37°C, 3 day's), roasting (200°C, 20 min) and steaming (121°C, 15 min). Effect of processing on their total phenolic content (TPC) and total flavonoid content (TFC) were estimated by using standard methods. In-vitro antioxidant activity was estimated by three different assays viz. 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging, 2,2'-azino-bis (3-ethylbenzthiazoline-6-sulfonic acid) (ABTS) radical scavenging, and ferric reducing antioxidant power (FRAP) assay. **Result:** TPC of unprocessed WSS and BSS were 2.33 ± 0.02 and 3.52 ±0.03 mg QE/g samples, respectively. After processing TPC increased in all sesame seeds with the highest content in BSS after germination (6.02 ± 0.17) followed by roasting and steaming. TFC of WSS was higher than BSS after processing with the maximum TFC in roasted seeds. After processing DPPH• scavenging activity increased in both BSS as well as WSS. Increase in DPPH• scavenging activity of BSS was higher than WSS. The decreasing order of DPPH• scavenging activity among processing treatments were germination > roasting > steaming. The similar trend was also observed for ABTS• scavenging activity and FRAP. Highest ABTS• scavenging activity was observed in germinated BSS (69.99 ± 0.58 µmol TE/g) while minimum activity was found in steamed WSS. Highest FRAP was found in germinated BSS (35.78 ± 0.87 µmol Fe (II)/g sample) while, lowest (12.14 ± 0.45 µmol Fe (II)/g sample) in WSS. **Conclusion:** Results revealed that germination is the best method for processing of both black and white sesame seeds for the development of bio-functional quality products. **Keywords:** Sesame seed, germination, roasting, antioxidant, flavonoid.

PPFSN-70 Jyothi.H- Withdraw

PPFSN-71 PROCESSING FOR VALUE ADDITION OF STARFRUIT. ***N. Kapaini Basena***[1], Dr. Jamuna K. V.[2], 1= Dept. of Food Science and Nutrition, Assam Agricultural University, Jorhat, 2= Dept. of Food Science and Nutrition, UAS, GKVK, Bangalore, Email:- kapainibasete@gmail.com

Background & Objectives: Starfruit (Averrhoa carambola) is a tropical fruit with sweet and tart flavor. The fruit is oval in shape with 5 to 15 cm in length. Starfruit is imbued with many nutritional benefits but neglected due to perishable, higher moisture content, and gone as waste. The availability of fruit during the season makes it a good choice to be used for development of products with an appealing taste. The present study was conducted with the objective to evaluate the nutritive composition of starfruit, to develop food product from underutilized starfruit and to study its quality and stability of the product. **Materials & Methods:** Chemical properties of starfruit were analyzed. Fruit leather was developed with 100% of starfruit and in combination with guava at different ratio viz., 90:10, 75:25 and 50:50 respectively. Variations of fruit leather were evaluated for organoleptic characteristics. The best accepted product was further carried out for quality and stability for 60 days under ambient temperature with respect to sensory scores. **Result:** Starfruit has moisture content of 90%, TSS 6.9 °Brix, 3.71 pH, ascorbic acid, reducing sugar 5.93, non-reducing sugar 0.46%, total sugar 6.39%, titrable acidity 0.26%, ascorbic acid 35.41 mg/100, potassium 125 mg/100, phosphorus 19 mg/100, calcium 4.52 mg/100. Preparation of fruit leather with 90% starfruit and 10% guava showed maximum score for organoleptic characteristics due to better taste and colour. The shelf-life study of fruit leather at ambient temperature showed decreases in the sensory parameter with the increasing days of storage. **Conclusion:** Fruit leather prepared with 90 per cent starfruit and 10 per cent guava showed better performance when compared to other variations. Therefore, starfruit can be utilized for conversion into different value-added products. Exploitation of underutilized crops can become a solution to the social problem of health and nutrition insecurity, poverty, and unemployment. **Keywords:** Starfruit, chemical properties, fruit leather, sensory evaluation, shelf-life.

PPFSN-72 PREBIOTIC POTENTIAL OF FINGER MILLET SEED COAT POLYPHENOLS. ***V Geetha Balasubramaniam***, Dr Usha Antony, Centre for Food Technology, Department of Biotechnology, Anna University, Email:- geethavbala@gmail.com

Background & Objectives: The metabolism of dietary polyphenols by the intestinal microbiota are crucial for understanding the role of these compounds and their impact on our health. Polyphenols are growingly recognized as prebiotics defined to stimulate the growth of commensal and beneficial microbiota while pathogenic strains are inhibited. The present study therefore aims to evaluate the potential of finger millet seed coat (FMSC) polyphenols as prebiotics. **Materials & Methods:** The prebiotic efficacy was investigated by in vitro fermentation studies. Probiotic bacterial strains - L. plantarum, L. acidophilus, L. fermentum and B. amyloliquefaciens were used as positive controls while E. coli served as negative control. MRS carbohydrate free basal media with FMSC polyphenolic extract (1%) and MRS media were used to study the growth of probiotic strains over a period of 24 h. Prebiotic Activity Score (PAS) was calculated at different concentrations of polyphenols to investigate the growth of probiotic compared with that of enteric organisms. **Result:** An efficient utilization of prebiotics was evident from the maximal growth rate (109 cells) between 6-9 h of the logarithmic phase by the microbes. A sharp drop in pH was recorded, a characteristic feature of lactic acid bacteria (LAB) growth due to the production of short chain fatty acids. LAB grown in prebiotic media showed significantly high cell mass compared to control and the PAS was increased by 2â€“3 log (colony forming units), while E. coli growth was limited by the use of the prebiotic polyphenols. **Conclusion:** The LAB in polyphenols enriched media (1%) showed a better growth pattern to that of dextrose substrate (2%); L. plantarum showing enhanced growth among the different strains. The ability of FMSC polyphenols to promote the growth of beneficial bacterial species in the gut that could confer positive health benefits is substantiated. **Keywords:** finger millet seed coat, polyphenols, prebiotics, probiotics, prebiotic activity score.

PPFSN-73 EFFECT OF FRUITS CONSUMPTION ON BLOOD GLUCOSE LEVEL OF DIABETICS. ***G.Kaviya***, Email:- kaviya.gk6@gmail.com

Background & Objectives: Diabetes mellitus is a metabolic disorder in which there is hyper glycemia accompanied with glycosuria. In this modern scenario, prevalence of diabetic accompanied with many metabolic syndrome is increasing due to their life and dietary pattern and restricting many food items like fruits. This research topic was focused on the consumption pattern of fruits and its effect on blood glucose level of the selected diabetic subjects. **Materials & Methods:** In this clinical trails, 30 Type 2 diabetics of both sex (30- 50

years) were selected from the residential area of Coimbatore city. The selected diabetics were interviewed and collected data related to socioeconomic status, diabetic clinical profile and other relevant data through questionnaire, the study subjects (N= 30) were requested to consume 500g of fruits (orange, apple, watermelon, pineapple, grapes) daily during the study period of 30 days. Fasting blood glucose level of the selected diabetic subjects were recorded in the initial and final stage of the study. **Result :** The consumption of fruits rised the blood fructose level and also lowered the blood glucose level of the diabetics. A weighed quantity of 500 grams of fruits per day were suggested to the diabetic participants without making any changes to their medicinal care and support. The inclusion of fruits in the regular diet pattern was continued for four weeks and after four weeks the diabetic subjects were checked for their final fasting blood glucose level. The readings were noted down and interpreted for reduction in blood glucose level. Among the selected subjects 90% of diabetic subjects who consumed fruits regularly had an appreciable reduction in their blood glucose level whereas the other diabetics showed no reduction in their blood glucose level, as they were not regularly consumed the fruits. **Conclusion:** Consumption of larger quantity of fruits decreases our blood glucose level, as Fructose present in the fruits reduces the blood glucose level of the body and controlling the complications related to diabetes mellitus. **Keywords:** Diabetics, Effect of Consumption, Fruits, Fasting, Blood glucose and Fructose.

PPFSN-74 MILLET MILK- A POTENTIAL SOURCE OF CALCIUM FOR INFANTS. ***Kimeera Ambati***, Dr. K V Sucharitha, A Alekhya, Sri Venkateswara University, Email:- kimeeraa@gmail.com

Background & Objectives: Calcium, the very important nutrient helps in maintaining health and development especially in Infants. Calcium helps in building strong bones, teeth, helps in proper functioning of nerves and muscle, helps in blood clot and also helps in activating the enzymes that convert food into energy. Infants and Children are growing new bone all the time, they need continuous supply of calcium to support the healthy growth. This study is to develop the milk extracted from traditional food, Millet's (Finger Millet & Pearl Millet). **Materials & Methods:** Millet milk was extracted by using traditional methods which help in retaining and increasing the nutritional content in Millet. Millet's was procured and subjected for cleaning and washing, and then it is subjected to 12 hour soaking and later 24 hours sprouting and drying under shade and milk was extracted. The extracted milk was analyzed for calcium content using the ICPMS. **Result:**The Calcium content of the Millet milk was 50mg/100ml. The Millet milk was rich in Calcium when compared to soya milk which is 25mg/100ml, available in the market and also when compared to Human Milk which is 28mg/100ml. The extracted milk can be consumed by just warming for just 1minute. The developed milk was supplemented for 6 weeks to Albino Rats and Calcium content in Tibia was measured using the OES. The Calcium content of the Tibia for Albino Rats ranged between 15.35±3.50mg/dl in Experiment group fed with Millet Milk, which was slightly similar to 20.40±3.74mg/dl in Control Group which was fed with Cow's Milk. **Conclusion:** The developed Millet Milk can be used as Substitution milk for Lactose Intolerant Infants. **Keywords:** Keywords: Millets, Milk, Calcium, Tibia.

PPFSN-75 COMPARATIVE ANALYSES OF CALCIUM CONTENT OF VARIOUS SOURCES OF MILK; COMMONLY CONSUMED BY THE PEOPLE OF ASANSOL. ***Arnab Chatterjee***, Department Of Nutrition, Asansol Girls' College, Asansol, West Bengal, Email:- arnabchatterjeenin@gmail.com

Background & Objectives: Background & Objectives: NNMB reports suggest that milk consumption of people of West Bengal significantly lower than the RDA recommendation. Milk is the primary source of calcium, and the importance of calcium irrespective of age is well established scientific fact. This study investigated the calcium content of different sources of milk usually consumed by people of the second largest metropolis of the West Bengal; Asansol. **Materials & Methods:** Materials & Methods: Asansol city was geographically divided into four parts; north, east, west and south. Milk was collected from the local milk vendors from these four parts. Daily packaged milk and tetrapack milk packet was collected from local market and super market respectively. Then for each milk sample six sets of titration were performed by using the complexometric titration method. Mean value of the titration was taken into consideration for the final calculation of the calcium content. **Result :** Results: The results showed the calcium content of the milk collected from the milk local vendors of the northern, eastern, western and southern region were 189.4 mg/dl, 158.3 mg/dl, 190.5 mg/dl and 165.2 mg/dl respectively. Calcium content of the daily packaged milk and tetra packed milk were 105.5 mg/dl & 120.0 mg /dl respectively. **Conclusion :** Conclusion: Indian economy is growing fast and so the rate of urbanization is rapid. In this context the food purchasing pattern is changing drastically. This study revealed that the calcium content of the daily packaged and tetra packed milk was lesser than locally available milk sources. Careful observation of the data signifies, that faulty food purchasing pattern depriving people from the nutrition security. **Keywords:** Calcium content, nutrition security.

PPFSN-76 IN VITRO ANTIOXIDANT AND ANTIDIABETIC POTENTIAL OF PUMPKIN SEED PROTEIN (CUCURBITA MAXIMA L.). ***Sarah Jane Monica***[1], Sheila John[2], Saraswathi. K[3], Arumugam P[4],1,2= Department of Home Science, Women's Christian College, Chennai, 3,4= Armats Biotek Training and Research Institute, Chennai,
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Background & Objectives: Proteins present in seeds have gained considered attention as they possess potential therapeutic properties. Pumpkin seeds are being utilized as a protein rich food supplement and also as a nutraceutical agent by various indigenous cultures. There is paucity of data on pumpkin seed proteins and its specific therapeutic health benefits; therefore the objective of the present study was to evaluate the antioxidant and antidiabetic activity of pumpkin seed protein. **Materials & Methods:** Proteins present in pumpkin seeds was obtained using phosphate buffer extraction (0.2M; pH 7), followed by acetone precipitation and dialysis. The electrophoretic profile of the partially extracted proteins was studied using sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS PAGE). Antioxidant activity was determined using in vitro antioxidant assays namely DPPH●, ABTS●+, Fe3+ reducing power and phosphomolybdenum reduction assay. Alpha amylase inhibition assay was used to test the antidiabetic effect. Data analysis was carried out using SPSS version 15.0. Data are expressed as mean ± standard deviation. One way ANOVA followed by Tukey's HSD test was carried out and p value <0.05 was considered statistically significant. **Result:** The molecular weight of the partially extracted proteins ranged from 25 to 45 kDa. The proteins exhibited significant potent antioxidant activity that increased with increase in concentrations in all the four in vitro antioxidant methods. The IC50 value of DPPH● assay and ABTS●+ assay was found to be 0.67±0.01mg/mL and 3.49±0.02µg/mL respectively. Similarly, pumpkin seed proteins showed statistically significant remarkable alpha amylase inhibitory activity ($p<0.01$) and the IC50 value was 127.94±1.47 µg/mL. **Conclusion:** Findings of the present study clearly highlight the therapeutic activities of pumpkin seed proteins and hence they can be used in nutraceutical industry for various applications. **Keywords:** pumpkin seeds, plant protein, antioxidant potential, antidiabetic activity.

PPFSN-77 FORMULATION AND EVALUATION OF LOW SUGAR NUTRIBARS. ***Prabhavathi S.N***, Rohini S, Rajesh Devisetti, Jamuna Prakash. University of Mysore ,
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Background & Objectives: Background: Consumers in recent years are becoming aware of the foods they consume and their impact on the health. This has led to increased demand for the production of health foods. **Objective:** Formulation and evaluation of low sugar nutri-bars. **Materials & Methods:** Methodology: Three types of nutria-bars namely; puffed amaranth (Amaranthoideae) + corn flakes (Zea mays), puffed barnyard millet (Echinochloa spp.) +cornflakes (Zea mays) and puffed sago (Manihot esculenta)+mixed flakes (Sorghum spp, Oryza sativa and Eleusine coracan) were developed. For control product honey was used as a sweetening agent and for the experimental product, it was partially replaced with sucralose. The formulated products were analyzed for nutrients, phytochemicals, sensory quality and storage stability. **Result :** Results: The nutritional analysis of puffed barnyard millet + corn flakes bar showed that the experimental bar (16.4%) had considerably higher dietary fiber than the control bar (10.4%). Protein content was similar for both experimental and control product (8.37 and 8.34g/100g). Radical scavenging activity in puffed amaranth seed + corn flakes experimental bar was 53.67% as against 79.28% in control bars. Free polyphenols in control and experimental bars of Puffed sago + mixed flakes were found to be 270 and 240Âµg Ferulic acid Eq/g respectively. Among the three bars, a considerably higher calorie reduction was noticed in puffed barnyard millet + cornflakes bar (9.77%) followed by puffed amaranth seed + cornflakes nutri bar with a total reduction of 7.79%. Sensory scores indicated that all formulated products were accepted well with slight differences in scores. In moisture sorption studies experimental bars showed lower moisture uptake in contrast to control bars which suggests that the former has better storage stability and keeping quality. **Conclusion:** Conclusion: Thus, it could be said that cereal and millet flakes along with sucralose could be used to formulate low sugar nutri-bars, which can be used for diabetics also. **Keywords:** nutri-bars, moisture sorption, millets, nutritional analysis, low sugar.

PPFSN-78 NUTRITIONAL PROPERTIES OF GROUNDNUT SEED CAKE AND THEIR UTILIZATION IN THE FORMULATION OF BAKED PRODUCTS. ***Ranjitha N.L***, University of Mysore,
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Background & Objectives: Background: Oilseed cakes are the by-products obtained after mechanical extraction from the seeds and is largely used as animal feed. **Objective:** To determine the quality parameters of defatted

groundnut cake flour (DGCF) and to evaluate the nutritional and sensory quality of seed cake incorporated baked products. **Materials & Methods:**The study involved the analysis of proximate composition, antinutrient and phytochemical content of DGCF. The seed cake flour was also subjected to thermal treatment in order to reduce the anti-nutrient content. The thermally treated seed cake flour was utilized in the formulation of baked products such as sponge cake and flaky puff with the incorporation level of 15, 30 and 45%/ 100g of the product.The formulated products were analysed for their nutritional content and sensory quality. **Result:** The nutritional analysis of seed cake indicated considerably higher amount of protein (49.7±0.00g/100g of the seed cake). A greater reduction in oxalate content was evident after thermal treatment. The total flavonoid in seed cake sample was 0.38±0.03mg CAT Eq/g. For sponge cake the protein content was found to have increased after the addition of seed cake (2.46± 0.00 Vs 5.25± 0.00). Scores given for flaky puff also showed that they fared better with respect to all the sensory attributes.**Conclusion:** Thus it could be said that, these seed cakes could be utilized as potential ingredients for enriching the product with respect to nutritional quality which is the need of the hour in the present world for combating major nutrient deficiency disorders. **Keywords:** Key words: seed cake, proximate content, thermal treatment, anti nutrient, phytochemical.

PPFSN-79 Keerthi Kiran D M - withdraw

PPFSN-80 Chingakham Sima Chanu - withdraw

PPFSN-81 DEVELOPMENT OF VALUE ADDED EXTRUDED FOOD PRODUCT WITH THE INCORPORATION OF CENTELLA ASIATICA. ***Yashmin Nongrum***, Email:- yeshminnongrum@gmail.com

Background & Objectives: In the present time, research on plants have been enthralled throughout the world to emblematize the tremendous potential of medicinal plants. Medicinal plants are the important source of life saving drug for 80% of world's population and a potential renewable natural resources. Centella asiatica (Gotu kola) is one such medicinally important herb with well known biological activities in terms of immunomodulatory, memory enhancer, antidepressant , anti aging, proved by clinical studies. Centella is commonly eaten fresh as vegetable, salads, juices, herbal noodles using its extract in different countries. In India, Centella is also commonly used for making herbal tea.The present study was conducted with the following objectives to develop nutrient rich extruded product by the incorporation of Centella asiatica and to assess the organoleptic attributes, nutritive value and cost of the developed product. **Materials & Methods:** Noodles were prepared with the incorporation of Centella asiatica powder with refined wheat flour under treatment T1(5:95), T2(10:90), T3(15:95). Proximate analysis of Centella asiatica (powdered form), organoleptic evaluation, assessment of nutritive value and cost calculation was done. **Result:** It was found that the nutrient content i.e. energy, protein fat carbohydrate, iron, vitamin c, carotene and fiber was increased with the addition of Centella asiatica powder . The acceptable limit for the incorporation of the Centella asiatica powder for developing extruded product was found to be 5g in 95 g refined wheat flour (T1) based on organoleptic evaluation. **Conclusion:** The best treatment T3 hold the highest amount of nutrient content that is found to be both macro and micro nutrient rich and treatment T1 resulted out to be the best treatment based on the organoleptic evaluation. **Keywords:** Centella asiatica, Proximate analysis, organoleptic evaluation

PPFSN-82 FORMULATION AND NUTRITIONAL ANALYSIS OF LOW COST ENTERAL FORMULAE FOR NUTRITION THERAPY. ***Premila L. Bordoloi***, Mridula S. Barooah, Ruma Bhattacharyya, Moloya Gogoi, Mansi Tiwari, Department of Food Science and Nutrition, College of Community Science, Assam Agricultural University, Jorhat, Assam, Email:- premilajmch13@gmail.com

Background & Objectives: Nutritional composition, physical characteristics and acceptance of the formulated enteral formulae are important qualities to meet satisfactory nutritional requirement of hospitalized patients. Enteral formula feed which is nutritionally balanced and posed in good hygienic conditions can assure or re-establish the supply of macronutrients, vitamins and minerals necessary for metabolism in the patient. **Materials & Methods:** Three enteral formulae namely Balanced Enteral Formula, High Protein Enteral Formula and High Energy Enteral Formula were formulated as per standard guidelines, using ingredients like malted rice flour, malted green gram flour, popped amaranth flour, flaxseed flour, skimmed milk powder, whey protein powder and coconut oil. The developed formulae were analysed for nutrient composition and subjected to evaluation of sensory attributes. **Result:** The Balanced Enteral Formula feed was estimated to deliver 417.17 kcal energy,

15.96 g protein, 11.69 g fat, 62.03 g carbohydrate, 1.96 g crude fibre and 2.93 mg of total mineral per 100 g of the formula feed, the High Protein Enteral Formulae was estimated to deliver 420.35 kcal energy, 22.58 g protein, 11.07 g fat 62.03 g carbohydrate, 2.12 g of crude fibre and 1.47 g of total mineral per 100 g of the formula feed and the High Energy Enteral Formula was estimated to deliver 471.17 kcal of energy 18.18 g protein 21.25 g fat, 50.89 g carbohydrate, 3.11 g crude fibre and 1.29 g total mineral content per 100 g of formula feed. **Conclusion:** The formulation of enteral feeds with simple indigenous technologies, using natural ingredients would provide the wholesome nutrition, equal or more to the natural balanced diet and would provide nutritional support at affordable cost to patients suffering from wide range of diseases. These developed formulae would be beneficial for both oral and enteral feeding in developing countries in lieu of commercial formulations, which tend to be expensive. **Keywords:** Enteral feeding, flax seed, nutrient composition, sensory attributes, low cost.

PPFSN-83 ANTIOXIDANT AND ANTIBACTERIAL ACTIVITY OF WILD ROSE HIPS OF KASHMIR VALLEY. ***Irshad Ahmad Shah***, Sabeera Muzaffar, Sajad Ahmad Mir, F.A Masoodi, Department of Food Science & Technology, University Of Kashmir, Hazratbal, Srinagar, Email:- irshadshah401@gmail.com

Background & Objectives: Rose hips of Rosa webbiana Wall. ex Royle are fruits of Rosa genus belonging to Rosaceae family. Roses are deciduous, rarely evergreen, and upright or climbing shrubs, with more or less prickly branches. This shrub flowers in June-July and fruits (hips) ripen from September-¬October. Fruit is reddish when mature. It grows wildly in the valley of Kashmir, locally called Chhaunch. These have been used among the tribes as remedies in certain diseases since times antiquity. Traditionally used in Amchi system, principally a Tibetan system of medicine. Provide medicinal properties against cough, cold, Liver ailments, nasal bleeding. Rose hips are known to be rich in phenolics. Objective of the study was to evaluate the antioxidant and antimicrobial potential so as to explore its wildly growing nature for efficient utilization in foods as futuristic nutraceutical. **Materials & Methods:** Rose hips were collected at the ripe stage from the selected shrub Rosa webbiana Wall. ex. Royle. The fruits were selected according to uniformity in shape and color and were identified by the courtesy of centre of plant taxonomy, Department of Botany, University of Kashmir. Fruit pulp was homogenised and extracted using methanol water (80:20). The extracts obtained were centrifuged at 7000 rpm for 10 minutes and the supernatants were collected and dried under controlled conditions. The dried extracts were stored at -18 ºC for subsequent analysis of antioxidants. Qualitative analysis of tannins, saponins & flavonoids was done in aqueous extracts by standard biochemical method. Antioxidant assay of methanol extracts of Rose hips was carried out using TPC. 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging effect of methanol extract was compared with the standard α-tocopherol at different concentration from 100-600 µg/ml. Reducing power of extract was compared with Butylated hydroxytoluene at 100-700 µg/ml concentrations. Antimicrobial activity of methanol extract at concentrations of 100-500mg/ml was evaluated using disc diffusion method against Staphylococcus aureus, Micrococcus, Escherichia coli & Salmonella typhii & zone of inhibition was measured in mm.**Result:** Qualitative phytochemical screening for tannins, saponins and flavonoids provide positive confirmatory presence. Rose hip extract was found to contain total phenolics as 46.16 mg GAE/g dw. Percentage inhibition of DPPH by methanol extract was found concentration dependent, Rose hip extract at concentration of 700µg/ml shows 90.92 % much higher inhibition than α-tocopherol showing 69%. Reducing power of extract was found to inhibit 70% as compared to Butylated hydroxytoluene (BHT) which inhibited 92% at same concentration. Antibacterial activity of extract was concentration dependent, zone of inhibition increases with increasing concentration. The maximum zone of inhibition was observed for S.aureus, a gram positive bacterium with a diameter of 15.23 mm. **Conclusion:** It can be concluded that hips of Rosa webbiana are rich sources of biologically active secondary metabolites; it seems to be a good candidate against the life style diseases. Therefore, deserves greater attention for substitution in different food formulations as nutraceutical.**Keywords:** Rose hips, TPC, DPPH, Reducing power, Antimicrobial.

PPFSN-84 Chandrima Mandal - Withdraw

PPFSN-85 Value Addition to Nippat Through Incorporation of Little millet. ***Swetha .S***, Dr.Kasturiba B, College of community Science, UAS Dharwad, Email:- shwetaswetus2599@gmail.com

Background & Objectives: INTRODUCTION Little millet nippat is a very spicy, crunchy and tasty snack. Nippat is a south Indian crispy snack, originated in Karnataka and itâ€™s also liked by all age groups of people. Little millet is rich in cholesterol when consumed it increases good cholesterol in the body, suitable for growing kids. It strengthens the body. Itâ€™s complex carbohydrate digest slowly which is very helpful for diabetic patients. It contains high phosphorous, especially good for people who has low body mass. **OBJECTIVE:** value addition and

standardisation of nippat and incorporation of little millet to nippat for nutrient enrichment. **Materials & Methods:** MATERIALS & METHODOLOGY: Little millet was incorporated in nippat. Three trials have been done in the ratio of 100: 0, 80: 20 and 70:30 (Rice flour and little millet flour). objective parameters like weight of the dough, weight of raw ingredients and number of nippats were taken during each trials. Prepared nippat was evaluated for the sensory parameters like taste, texture, flavour, appearance and over all acceptability by the trained panel members by using nine-point hedonic scale. Panel members were asked to given score for each parameters for each trials. Average was calculated for each parameters for each trials, finally the trial which has scored highest in all sensory parameters is considered as best and accepted product. **Result :** RESULTS: Results shows that ratio of 80: 20 is good in taste, flavour, appearance, texture and overall acceptability. This sample has got highest score from the average of scores given by the panel members when compared to the other trials. **Conclusion :** CONCLUSION: Among these samples 80:20 trial is good in the parameters like appearance, colour, texture, flavour, taste and overall acceptability. From the experiment it can be concluded that little millet can be incorporated upto the percent of 20. Trail by using 80:20 (Rice flour & Little millet flour) has got highest score in all parameters. Hence trial with ratio of 80:20 is considered as most accepted product. **Keywords:** Little millet, Nippat.

PPFSN-86 CASHEW APPLE- A LESSER KNOWN FRUIT WITH HIGH FUNCTIONAL BENEFITS. ***Shuchita Anand***, Dr. Mahak Sharma, Manav Rachna International Institute of Research and Studies, Email:- shuchita.anand96@gmail.com

Background & Objectives: The pseudo fruit called cashew apple is a juicy fibrous nutritious fruit. Cashew apple contains sugars, amino acids, tannin, ascorbic acid (Vitamin C) and crude fibre. Cashew apple contains antitumor, antimicrobial and antibacterial properties. Therefore, it is the demand of present time to increase the awareness about cashew apple as it will not only reduce the fruit waste but will also help people all over the world, reap its health benefits. **Materials & Methods:** 30 research papers were assessed regarding the nutritional component of cashew apple from Pubmed, NCBI, Google Scholar and national and international food science journals. The data was reviewed and analysed. **Result:** the data revealed that Cashew apple is very rich in ascorbic acid (240 mg/100 g) which is almost six times that of citrus fruits (40 mg/100 g), a very rich source of Vitamin C. Besides vitamin C, cashew apple contains free soluble sugars most of which are reducing sugars. Cashew apple is quite rich in crude fibre and on a dry weight basis the crude fibre content varies from 15% to 18 %. Phenols, tannin and flavanols present in cashew apple could serve as natural antioxidants which play a major role in destroying free radicals. Cashew apple is a good source of Vitamin C and fibre. **Conclusion:** the study concluded that consumption of cashew apple could help in overcoming the Vitamin C deficiency and also constipation. It enhances fat utilization and is an inexpensive source of beneficial probiotics. It is also a useful ingredient as ethanol biofuel. No value added product is developed in any of the research paper. **Keywords:** vitamin C, reducing sugars and fat metabolism.

PPFSN-87 OIL QUALITY OF HIGH OLEIC GROUNDNUT VARIETY DH 245. ***Roopa U.***, University of Agricultural Sciences, Dharwad, Email:- roopsu.08@gmail.com

Background & Objectives: Groundnut is a good source of oleic acid (40-43%), the mono unsaturated fatty acid, which is known to have beneficial effects on human health and diseases. Several efforts are being made to further increase the oleic acid content by different breeding techniques. Groundnut variety, Dh 245 was developed at University of Agricultural Sciences, Dharwad which was having oleic acid content of >70%. This variety was released for cultivation as it is resistant to major foliar diseases in northern dry zone and Northern Transitional Agro-climatic zones (3 &8) of the Karnataka. **Materials & Methods:** The oil extracted from this variety was studied for its quality along with other normal oleic groundnut varieties (GPBD 4, G 2-52, TMV 2 and JL 24). The kernels were stored at accelerated aging condition of 1000 C and peroxide value of the oil extracted from the kernels was determined on timely intervals. **Result :** The peroxide value of oil from all the varieties was within the permissible limit with Dh 245 having the least value before starting the storage study. The peroxide value in all the varieties increased along with the storage period. Though the peroxide value exceeded the permissible limit in all the normal oleic acid groundnut from first day itself, the high oleic groundnut Dh 245 was fit for consumption even after 4 days of accelerated aging storage. **Conclusion :** This indicated the longer shelf life of groundnut owing to presence of naturally occurring high oleic acid content in the variety Dh 245 against the regular groundnut varieties. This groundnut oil can be used as a economically viable substitute for other costlier oils in the market. **Keywords:** Groundnut, oleic acid, oil quality.

PPFSN-88 VALUE ADDITION OF INDIGENOUS FRUITS AND VEGETABLES OF NORTH-EAST REGION FOR ENSURING FOOD AND NUTRITION SECURITY. ***Vishakha Singh***, Mamoni Das, Ruchika Agarwal, Shenaz Hasmi, Manisha Sharma, Deptt. of Food Science and Nutrition, Assam Agricultural University, Email:- duttaankita2017@gmail.com

Background & Objectives: North–east region offers an immense potential for growing tropical and subtropical fruits and vegetables due to its congenial agro-climatic condition.Assam is famous for its huge production in different varieties of Papaya, moranada, nemutenga and pineapple which are rich in micronutrients. Due to absence of proper post-harvest management system,a bulk quantity of the produce get damaged during the process of handling,transportation and marketing resulting in 10-20% annual loss.Study was undertaken with the objective of utilizing the local food resources for developing novel value added products for ensuring rural livelihood as well as food and nutrition security.**Materials & Methods:** Fruit candies(six prototypes) were developed using papaya,ginger and combination of pineapple and ginger and were subjected to organoleptic evaluation.Product with the highest acceptability scores were further subjected to nutrient analysis & storage studies. **Result:** Results revealed that the papaya, ginger, mixed pineapple–ginger candies with TSSof650, TSSof700 and TSS of550 had the highest score.Proximate analysis revealed that the energy value,carbohydrate,protein and fat content of papaya candies were 345.98 Kcal,83.5gm, 0.77gm, 0.45 gm / 100 gm of the sample respectively.Energyvalue,carbohydrate,protein and fat content of ginger candies were 351 Kcal,83.11gm,1.86gm and 0.62gm / 100 gm of the sample.Energy value of pineapple- ginger candies was 283.2Kcal,carbohydrate(86.8gm),protein(0.7gm) and fat(0.34gm) respectively.Storage studies revealed that both the papaya and ginger candies are best stored for 3 months and pineapple-ginger candies for 45 days under refrigeration.Moisture content of papaya, ginger, and pineapple-ginger candies increased from an initial value 3.76gm to 3.91 gm, 3.83gm to 3.93gm & 10.20gm to 12.01 gm at the end of the storage period. **Conclusion:** It can be concluded that processing of the local fruits and vegetables into various value added products have great potential for commercialization as well as ensuring food and nutrition security for promoting better health among vulnerable population. **Keywords:** Value addition, indigeneous, moranada, pineapple, papaya.

PPFSN-89 PHYSICOCHEMICAL PROPERTIES OF BUCKWHEAT. ***Latha Rani R***, Kulkarni U.N.,College of Community Science, UAS Dharwad, Email:- latharanjurani@gmail.com

Background & Objectives: Buckwheat (Fagopyrum esculentum) an annual crop, it is a pseudocereal and a member of the Polygonaceae family. A major benefit of buckwheat compared to other grains is that it has a gluten-free property and unique amino acid composition that gives special biological activities. These include cholesterol-lowering effects, anti-hypertension effects and improving digestion by relieving constipation. Though the physiological importance of pseudocereal is laid since ancient times, the physicochemical properties of buckwheat studies are in vague, hence the objective of the study is to assess the physicochemical properties of buckwheat varieties. **Materials & Methods:** Buckwheat varieties were selected from a wheat scheme, MARS, Agricultural University Dharwad. Two buckwheat varieties viz, PBR-1, Neelageri along with one bread wheat were selected for the study. Physicochemical properties like hundred kernel weight, length, width, breadth, volume, bulk density, hydration capacity, hydration index, swelling capacity, and swelling index were analyzed. Functional properties like water absorption capacity, oil absorption capacity were analyzed. **Result:** The Buckwheat varieties did not vary much, PBR-1 variety had highest 100 kernel weight (1.96±0.01), volume (2.3±0.47), bulk density (0.87±0.14) while Neelageri variety had highest grain length (4.02±0.15), breadth (1.53±0.17). The width was same for both the varieties (2.8±0.6). Hydration capacity (1.22±0.03) and swelling index (0.94±0.009) were highest in Neelageri variety. Hydration index (0.78±0.78) and swelling capacity (0.37±0.004) were highest in PBR-1 variety respectively. Among the functional properties water absorption capacity higher in buckwheat (2.23±0.012) than the bread wheat, oil absorption capacity highest in bread wheat (2.2±0.141) than buckwheat. **Conclusion:** Results conclude that buckwheat varieties had good physicochemical properties and hence it can be used in different food recipes. It is gluten-free and thus it is good for celiac patients. **Keywords:** Buckwheat, gluten-free, pseudo cereal.

PPFSN-90 PERFORMANCE OF HIGH OLEIC ADVANCED BREEDING LINES OF GROUNDNUT (Arachis hypogaea L.) UNDER NATURAL DROUGHT CONDITIONS. ***Roopa U.***, Goudar I.V., Omprakash, Gangadhar, Nadaf H.L., University of Agricultural Sciences, Dharwad, Email:- roopsu.08@gmail.com

Background & Objectives: Groundnut (Arachis hypogaea L.) although requires less water compared to other commonly grown oilseed crops rapeseed-musturd and sunflower, but drought at critical stage of pod filling results

in decreased pod yeild and quality. High oliec groundnut cultivars are sought with their merits of better human health and extended shelf life of oil or its derived products. **Materials & Methods:** The natural drought conditions prevailed during 2015 rainy season at Main Agricultural Research Station of UAS, Dharwad with receipt of 278 mm rainfall during crop growth period, of which only 100.4 mm was recorded till maturity stage, was the better opportunity to know the performance of 21 high oleic advanced breeding backcross lines under these moisture stress conditions. However, one irrigation was given at pod filling stage to save the crop from complete wilting. **Result :** Three advanced high oleic breeding lines viz. #56 (5607, 4267 & 1985 kg/ha), #35 (5684, 4396 & 2060 kg/ha) and # 12 (5331, 4101 & 1916 kg/ha) significantly higher pod (in first two cases only), kernel and oil yield compared to the popular check, GPBD-4 (4516, 3382 & 1579 kg/ha) of the region but were on par with recently released cultivar, G2-52 (5340, 3964 & 1812 kg/ha). **Conclusion :** These superior high oleic lines can be evaluated further over seasons and locations to confirm their superior performance both for yield and oil quality under limited moisture conditions before their commercial cultivation. **Keywords:** Groundnut, drought, High oleic.

PPFSN-91 IDENTIFICATION OF POTENTIAL CONFECTIONERY GROUNDNUT GENOTYPES FOR CULTIVATION IN KARNATAKA. ***Goudar I. V.***[1], Roopa U.[1], Kenchanagoudar P. V.[1], Nadaf H. L.[1], Upadhyaya H.D[2],1= University of Agricultural Sciences, Dharwad,2= ICRISAT, Patancheru, Telangana, Email:- ivgaicrp@gmail.com

Background & Objectives: Groundnut is one of the major oilseeds crop grown in India. However, there has been a major shift in utility of groundnut from use for edible oil to confectionery purpose as prevailed in majority of the developed countries. Therefore, identification of suitable confectionery variety for cultivation is an important task. **Materials & Methods:** In this direction an International Confectionery Varietal Trial consisting of 15 advanced breeding lines of confectionery type received from ICRISAT, Hyderabad were evaluated along with local check, TGLPS-3 in RCBD with three replications at MARS, Dharwad for three years (2010-2012) during Kharif season. **Result :** The results of three years evaluation indicated the superiority of three genotypes viz., ICGV-06189 (3730 & 2539 kg/ha), ICGV-05782 (3558 & 2590 kg/ha) and ICGV-05174 (3441 & 2546 kg/ha) that recorded significantly higher mean pod and kernel yield compared to the local check, TGLPS-3 (3055 & 1979 kg/ha). The high yielding genotype ICGV-06189 also recorded significantly higher sound matured kernel per cent (93.2%) and 100 seed weight (64.3 g) with on par shelling per cent compared to the local check, TGLPS-3 (89.0 % & 55.6 respectively). **Conclusion :** Hence this genotype ICGV-06189 after multi location testing was identified for adaptive trials on farmers fields during kharif 2016 and 2017 and was released for cultivation in northern transitional agroclimatic zone of Karnataka. **Keywords:** Groundnut, confectionery.

PPFSN-92 EARLY GENERATION SELECTION FOR DROUGHT TOLERANCE IN GROUNDNUT (Arachis hypogaea L.). ***Goudar I. V.***, Roopa U., Nadaf H. L., University of Agricultural Sciences, Dharwad, Email:- ivgaicrp@gmail.com

Background & Objectives: The severe drought conditions that prevailed during 2015 rainy season at Main Agricultural Research Station of UAS, Dharwad with receipt of only 100.2 mm rainfall during crop growth period and 174.4 mm during maturity stage provided the opportunity to screen groundnut breeding material for field tolerance to drought conditions. **Materials & Methods:** Seventy seven plant progeny selections were made from two potential crosses viz. R 2001-2 X GM 4-3 and ICGV 07211 X ICG2381 with least wilting symptoms from which the top high yielding five progenies from each were chosen for further evaluation under induced mid-season drought conditions in 2015-16 post-rainy season at MARS, Dharwad. Two irrigations after flowering initiation were skipped to simulate mid-season drought conditions. These top 10 progenies selected were evaluated with checks in RCBD design under normal irrigation and simulated mid-season drought conditions. **Result :** The results indicated that four progenies of R 2001-2 X GM 4-3 (#12, 16, 20 & 23) and one progeny of ICGV 07211 X ICG2381 (#13) recorded higher drought tolerance index (â‰¥ 1.15) compared to the reported drought tolerant checks, ICGV086031 (0.54 and 0.54) and Dh 86 (0.82 and 0.81) and commonly grown cultivar on farmers field TMV-2 (0.93 & 0.87) for pod and kernel yield respectively. **Conclusion :** The progenies, R 2001-2 X GM 4-3-20 (4611 & 3428 kg/ha) and R 2001-2 X GM 4-3-12 (4420 & 3126 kg/ha) recorded significantly higher pod and kernel yield compared to best check, Dh 101 (3013 & 2371 kg/ha) under mid-season drought conditions. These genotypes have waxy thick leaves that are being further tested on large scale over different locations before their adoption. **Keywords:** Groundnut, drought.

PPFSN-93 EFFECT OF MULTI-NUTRIENT SUPPLEMENTATION ON THE HEALTH STATUS OF MALNOURISHED SCHOOL AGE CHILDREN. ***Vishakha Singh***[1], Sujata Maharana[2], Manisha Sharma[1], Pallavi Singh[1], 1=Deptt. of Food Science and Nutrition, Assam Agricultural University, 2= College of Home Science, Sambalpur University, Burla Sambalpur Odisha, Email:- duttaankita2017@gmail.com

Background & Objectives: School age is the dynamic period of physical and mental development of the child. The school age period is nutritionally significant because this is the prime time to build up body stores of nutrients in preparation for rapid growth during adolescence.The major nutritional problems observed among the school children areprotein energy malnutrition, iodine deficiency disorder, iron deficiency anaemia and vitamin A deficiency. **Materials & Methods:** To determine the prevalence of PEM and iron deficiency anaemia, a study was undertaken among the school children studying in U.P. School Bhubaneswar Odisha. 60 children was selected by simple random sampling technique. Their height and weight were measured to know the nutritional status. Blood haemoglobin level was estimated by using haemoglobin scale. Children were also examined for clinical signs and symptoms of malnutrition & anaemia. Dietary intake of food was collected by 24hr recall method. **Result :** From the study it was found that the overall prevalence of underweight were 35.0% out of which 30.0% were in Grade-I and 5.0% were in Grade-II. 26.67% were stunted. 58.33% were wasted out of which 46.67% were mild and 11.67% were moderate. 60.0% were suffering from anaemia out of which mild and moderate anaemic were found to be 50.0% & 10.0% respectively. Inadequate consumption of protein, energy, vitamin and iron rich foods was the major contributing factor for PEM and anaemia among children. Keeping these fact, an intervention was made from locally available and low cost food like Bengal gram, rice flakes, ground nuts, gingelly seeds, sugar and oil. The supplementation for the period of 6 month resulted significant improvement in height (from 123.52cm to 124.8cm), weight (from 22.39kg to 23.63kg), and haemoglobin level (from 11.38g/dl to 12.57g/dl). **Conclusion :** Hence the multi-nutrient supplement is an effective approach to combat malnutrition and iron deficiency anaemia. **Keywords:** School aged children, malnutrition, multi-nutrient supplement.

PPFSN-94 SCREENING OF GENERALLY RECOGNIZED AS SAFE PHYTOCHEMICALS AND EVALUATING THEIR ANTI-VIRULENT POTENTIAL AGAINST YERSINIA. ENTEROCOLITICA. ***Nisha Jha***, Sivasankar C, Shetty PK, Department of Food Science and Technology, Pondicherry University, Email:- nishajha.22121995@gmail.com

Background & Objectives: This study focuses on screening and evaluation of bioactive phytochemicals against food borne pathogen having quorum sensing activity on different parameters where objectives were to screen and evaluate bioactive compounds and their interaction with antibiotics against Yersinia enterocolitica. Here we successfully reduced anti-virulence property by the application of bioactive compounds.**Materials & Methods:** Yersinia enterocolitica(KT266804) 1.Screening Of Bioactive Materials For Quorum Sensing. 2. Evaluation Of Bioactive Principle For Anti-quorum Sensing Activity, Anti-swarming Assay. Antibiotic Sensitivity Assay. EPS production&quantification. Foaming Assay. 3. Interaction Of Bioactive Principle With The Antibiotics Against Yersinia **Result :** 1. Inhibition in swarming motility of Yersinia enterocolitica at 400ppm of supplementation of bioactive principle. 2. It also potentiated the activity of antibiotics at a MIC of .031 Âµg/ml against the pathogen. 3. The huge declivity about 52% of EPS production was also observed and FTIR analysis showed the declivity in the zones of polysaccharide and proteins. 5. Foaming assay showed a 5 fold decrease in the activity of Yersinia enterocolitica showing decrease in the surfactant production which shows that formation of emulsion is decreased.This signifies that utilization of energy also declines as less source of energy is available. **Conclusion :** Upon screening nearly a twenty Generally Recognized as Safe (GRAS) phytochemicals, a bioactive lead was identified with significant inhibition of swarming motility of Yersinia enterocolitica from contaminated food. Further, the bioactive principle was demonstrated with motility inhibitory activity against drug resistant & sensitive Yersinia enterocolitica isolate. Thus the identified bioactive lead can be developed as a promising controlling agent against Yersinia in food systems and an excellent therapeutic agent. **Keywords:** Anti-quorum sensing, bioactive compounds, food borne pathogens , antibiotics, therapeutic agents.

PPFSN-95 Nimitha Suresh - Withdraw

PPFSN-96 DEVELOPMENT OF MICRONUTRIENT RICH, STABILIZED VEGETARIAN OMEGA-3-FATTY ACID FORMULATION FOR FOOD FORTIFICATION. ***Anand Zanwar***, Amit A. Jagtap, Mahabaleshwar V. Hegde, Centre for Innovation in Nutrition Health Disease, Interactive Research School for Health Affairs, Bharati Vidyapeeth (Deemed to be University), Pune, Email:- anandzanwar10@gmail.com

Background & Objectives: Omega-3 fatty acids have favorable effect in several pathological conditions. However Omega-3 fatty acid availability in our diet is precariously low. Flaxseed is richest vegetarian source of omega-3 fatty. However major obstacle in the process of food fortification is omega-3 fatty acids are very unstable and are prone to oxidation. The objective of the present study was to formulate stable emulsified omega-3-formulation with essential micronutrients and carry out nutritional analysis, sensory evaluation for consumer acceptability. **Materials & Methods:** Primary emulsion was prepared by using flaxseed oil, water and sucrose ester as an emulsifier along with essential micronutrients and antioxidants such as niacin, vitamin B6, zinc, vitamin E and magnesium. There was phase separation for the period of 4 months. Further this formulation was subjected to nutritional evaluation and microbial load determination as per FSSAI guidelines, fatty acid analysis by gas chromatography and oxidative stability (peroxide value, free fatty acid content and acid value) as per AOAC guidelines. Sensory evaluation studies was carried out by trained panelist using hedonic scale. **Result :** In the present study, an innovative approach was developed to prepare nutritionally rich formulation containing plant derived omega-3 fatty acid (alpha-linolenic acid) along with important vitamins and micronutrients through emulsification. Various combinations of flaxseed oil and micronutrients were tried and their rheological properties and parameters were studied to select best water miscible form of formulation. The developed formulation was tested for nutritional evaluation and microbial load as per FSSAI guidelines. Further sensory evaluation study revealed, developed formulation was readily acceptable as food supplement by trained panelist. **Conclusion :** The developed formulation is a novel approach to deliver vegetarian omega-3 fatty acid along with other key micronutrients to any food products. Water miscible and vegetarian nature of the product, wider consumer acceptability, makes the formulation versatile. **Acknowledgement:** Authors are thankful to DST-SERB (ECR/2016/002024) for financial support. **Keywords:** Flaxseed; nutrition; micronutrients; omega-3-fatty acid; oxidative stability, polyunsaturated fatty acids.

PPFSN-97 DEVELOPMENT OF PROTEIN RICH WITH GOOD ANTIOXIDANT POTENTIAL EXTRUDED READY-TO-EAT SNACK USING KIDNEY BEANS AND BOERHAVIA DIFFUSA. ***K. Balaswamy***, G. Sulochanamma, T. Jyothirmayi, CSIR-Central Food Technological Research Institute, Resource Centre, Hyderabad, Email:- kbswamy@cftri.res.in

Background & Objectives: Atikamamidi (Boerhavia diffusa) is a lesser known leafy vegetable and termed as Punarnava. It has various medicinal properties. Kidney beans are one of the rich sources of protein. The present study deals with development of a palatable functional Ready-to-Eat (RTE) snack with antioxidant activity using Punarnava leaves. **Materials & Methods:** Standardised the recipe for the preparation of protein rich RTE snack using maize flour, green gram flour, defatted soya flour and kidney beans. Kidney beans were pre-soaked in water overnight, pressure cooked and made into paste by adding water at 1:2 ratio. The dried Punarnava powder was incorporated at 1, 2 & 3% levels in the preparation of extruded RTE snack using a single screw extruder. The RTE snack was coated with a tomato based spice mix and refined vegetable oil in a coating pan and evaluated for sensory acceptability. The extruded snacks were also evaluated for nutritional composition and texture. **Result :** The proximate composition revealed that the snack product is rich in protein (22.2%). Punarnava powder showed higher crude fibre (2.4%) and total ash content (21.4%) might be rich minerals which constitutes iron 52.61 mg/100 g and phosphorus 262.29 mg/100 g. The colour values Hunter L*, a* and b* values were 74.65, 4.77 and 20.89 for the control and 73.21, 3.41 and 21.09 upon addition of leaf powder. The snacks with 2% Punarnava powder have shown an improvement in expansion and crispness compare to control. Methanolic extract of punarnava showed good antioxidant activity. The texture quality was measured and the peak load was found to be 1445 g for the control and 1989 g for leaf incorporated snack product. **Conclusion :** The results demonstrated that the snack is rich in protein with minerals and with antioxidant activity. Atikamamidi and kidney bean incorporated extruded snack product can be categorised as functional food. **Keywords:** Extruded snack, Boerhavia diffusa leaves, Kidney bean, Functional food.

PPFSN-98 STANDARTIZATION OF CLARIFIED SAPOTA RTS BEVERAGE FROM SAPOTA FRUIT. ***BASKAR M***, KANCHANA, S., Email:- baskar.fsn@gmail.com

Background & Objectives: In India, sapota ranks fifth both in production and consumption next to mango, banana, citrus and grapes. The annual post harvest losses of fruits and vegetables is about 25 to 30 per cent due to spoilage, inadequate post harvest handling, lack of processing facilities, transport, storage and marketing. In the present study, an attempt was made to study on Optimizing processing and preservation techniques of clarified RTS beverage from PKM 1 sapota fruits. **Materials & Methods:** The objective of the present study was to standardize the conditions (incubation time, temperature and enzyme concentration) for enzymatic clarification of sapota juices. The pectinase enzyme juice was purchased from Novozymes, Bangalore, India. In this study ripe, matured fruits were selected. The enzyme added fresh pulp and kept under incubation at 450 C for 2 hours. After incubation, the enzyme was inactivated by heating the pulp at 900C for 5 minutes. The clear juice was extracted from the pulp by filtering through double fold muslin cloth and yield was noted. **Result :** The clarified RTS beverage pH, total sugar, Vitamin C, clarity and color (L* value) content was initially 3.60, 14.35, 14.40, 0.140 and 41.30 after the storage periods also it was slightly reduced 3.51, 13.83, 12.37, 0.116 and 36.05 was observed. The clarified RTS beverage acidity and reducing sugar content was initially 0.435 % and 6.58 after the storage periods also it was slightly increasing 0.483 % and 8.19. After the storage period also having good quality of the product. The TSS content of clarified RTS beverages maximum value in PKM 1 (T1) was 21.990 brix was observed. Overall acceptability score of freshly prepared PKM 1 clarified sapota juice was more acceptable from the judges. **Conclusion :** In the present study, an attempt was made to study on processing and preservation techniques of sapota juice. The sapota pulp of the above sapota varieties were processed into clarified RTS beverage. Hence, utilization of Sapota fruits will create awareness about the nutrition important of sapota fruits and protect the community from life threatening diseases. **Keywords:** clarification, sapota, fruits, RTS.

PPFSN-99 Pameu Khenmungan - Withdraw

PPFSN-100 EXTRACTION OF CAROTENOIDS USING GREEN BIOREFINARY CONCEPT. ***Bhavesh Baria***, Ashish Kumar Singh, ICAR-National Dairy Research Institute, Karnal, Haryana, Email:- bariabhavesh2@gmail.com

Background & Objectives: Carotenoids are natural pigments providing various shades of yellow, orange and red colour in food products. Naturally derived carotenoids have potential benefit as colourants and dietary supplement having therapeutic properties. Conventional solvent extraction methods have been used to isolate natural pigments, but presence of certain health hazards, longer extraction time coupled with disposal of used solvents lead to environmental pollution. Alternative to it natural green biorefinery concept has emerged for extraction and isolation of bioactive molecules. Lipophilic nature of carotenoids required application of nonpolar lipids like, which could be utilized as green solvent for extraction of carotenoids. The present investigation was carried out to standardize the extraction of carotenoids from marigold using vegetable oils and to characterize the extract for various physicochemical and antioxidant potential. **Materials & Methods:** Carotenoids extraction was carried out from marigold petals using C18:1, C18:2 and C18:3 rich oils, 3 different ratios of raw materials to green solvent and high shear disintegration technique with a varying time period (2 to 10 minutes). The extracts were analyzed for total carotenoids content and optimized extraction conditions determined using Split-plot design. The optimized extract was analyzed for Colour (L*, a* and b*) values, antioxidant activities (ABTS, DPPH and FRAP), peroxide value and FTIR analysis. **Result:** Carotenoids extraction carried out using varying conditions showed that increasing extraction time and a ratio of raw materials to oil showed improvement in carotenoids extraction. The optimized conditions for carotenoids extraction obtained using high shear dispersion technique were C18:1 rich vegetable oil as solvent, 4:1 as raw material to solvent ratio and 6 minutes of extraction time. The total carotenoids content of the optimized extract was 2142.67 Âµg/ml. The carotenoids extract showed higher antioxidant activities as compared to control oil. The extract exhibited dark yellow shade by showing L* value of 6.69 Â± 0.26 and b* value of 0.12 Â± 0.03. The extract had lower peroxide values indicating the better stability of extract. The FTIR analysis authenticated the presence of lutein, zeaxanthin pigments in extracted carotenoids by showing their characteristic structural bonding at specific wavenumber. **Conclusion:** Green solvents and high shear dispersion resulted in higher and better extraction of natural carotenoids from plant waste. Extract could be utilized as a natural colourant in lipid-based products with additional health benefits possessing antioxidant potential. **Keywords:** Carotenoids, Green biorefinary, High shear dispersion, Antioxidant activity, Vegetable oil.

PPFSN-101 ***Laxmi Pandey*** - Withdraw

PPFSN-102 IN VITRO ANTIOXIDANT AND ANTIDIABETIC ACTIVITY OF PROTEIN EXTRACTED FROM WOOD APPLE (LIMONIA ACIDISSIMA L.) SEED. ***Priyadarshini S***[1], Sheila John[1], Saraswathi K[2], Arumugam P[2],1= Department of Home Science, Women's Christian College, Chennai, 2= Armats Biotek Training and Research Institute, Chennai, Email:- priyadarshinis02@gmail.com

Background & Objectives: Significant growth of interest on plant protein as an alternative for animal protein has been observed in recent years, as it is economical and environmentally sustainable. Research suggests that plant protein have the potential to be used in different areas such as human nutrition, functional agents and pharmaceutical products. Previous works on wood apple seed protein (WASP) focussed on studying its nutrient and amino acid composition; and functional properties. Therefore the present study was aimed to investigate the in vitro antioxidant and α-amylase inhibitory properties of WASP. **Materials & Methods:** WASP was extracted with phosphate buffer (0.2 M; pH 7.0) followed by 65% acetone precipitation. The extracted protein was partially purified through dialysis. The protein was quantified using Bradford reagent and electrophoresis of the protein extracted was carried out on sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS PAGE) gel. The antioxidant and antidiabetic activity of the extracted seed protein was assessed using DPPH•, ABTS•+, FRAP and phosphomolybdenum assay; and α-amylase inhibition assay respectively. Ascorbic acid was used as the standard for antioxidant assays and acarbose as standard for α-amylase inhibitory assay. **Result:** The protein content was found to be 40.49±3.15 mg/mL. SDS PAGE of the WASP showed four protein bands ranging from 25 kDa to 40 kDa. The IC50 value for the antiradical scavenging assays DPPH• and ABTS•+ were 392.83 µg/mL and 102.97 µg/mL. In the determination of reducing ability via FRAP and phosphomolybdenum assay the WASP showed highest absorbance of 0.67 and 0.78 respectively at the concentration of 120 µg/mL. The protein exhibited 85.5±0.71% α-amylase inhibition at the concentration 300 µg/mL and IC50 value at 46 µg/mL. **Conclusion:** The results of the study signify that extracted WASP is potential antioxidant and antidiabetic agents. WASP can be included in food system as a functional ingredient. **Keywords:** Limonia acidissima, wood apple, seed protein, antioxidant, antidiabetic.

PPFSN-103 FORMULATION AND EVALUATION OF NUTRIENT AND ANTIOXIDANT RICH BAR WITH THE INCORPORATION OF CHIASEED AND MANGO. ***Poonam Jethwani***, Department of food and nutrition, College of Home Science, Punjab Agricultural University, Ludhiana, Email:- poonam.jthi@gmail.com

Background & Objectives: Keeping in view the increasing epidemic of coronary heart disease the present study was aimed to formulate and evaluate a nutrient and antioxidant rich bar for the hyperlipidemic subjects. **Materials & Methods:** The control bar was formulated with puffed wheat (30 g), peanuts (10 g) and honey (15g). In the first standardization trial chiaseed was incorporated in the control bar in 3, 4, 5 and 6 g level of incorporation. Further in the second trial mango fruit leather (4, 8, 12 g) and mango peel powder (1, 2, 3 g) was incorporated in the highly acceptable bar of first trial. Sensory evaluation, proximate, mineral, vitamin, bioactive compounds and antioxidant activity analysis of the developed mango-chiaseed bar was then conducted using standard protocols. **Result:** The weight of the bar developed was found to be 55±2 g. Incorporation of chiaseed, mango leather and mango peel powder was found to be highly acceptable at 5 g, 8 g and 2 g respectively. The fat, fibre, ash and energy was increased significantly in the developed bars i.e. from 4.20 to 5.71 g/55g, 4.32 to 6.12g/55g, 0.81 to 1.02 g/55g and 262.02 to 268.94 Kcal/55g respectively. The significant increase in Calcium, vitamin C and β-carotene was also observed i.e. from 19.29 to 60.75 g/55g, 0.85 to 4.95 g/55g and 24.55 to 325.24 g/55g respectively. Increase in total phenols, flavonoids and tannins content significantly, was recorded when compared to control bar i.e. from 64.50 to 71.22 mgGAE/ 55g, 48.48 to 56.68 mgQE/ 55g and 31.20 to 48.23 mg/55g respectively. The significant increase in DPPH activity (76.38 to 80.09% inhibition), FRAP assay (81.55 to 480.40 µmolFe2+/g), ABTS activity (38.17 to 45.49 mmolTE/55g) and RPA assay (63.33 to 222.92 mg TE/55 g) was observed. **Conclusion:** The nutrient and antioxidant rich mango-chiaseed bar can be a healthy choice of snack which can also contribute in the management of heart disease. **Keywords:** mango-chiaseed bar, sensory evaluation, proximate composition, mineral and vitamin, bioactive compound, antioxidant activity.

PPFSN-104 DEVELOPMENT AND EVALUATION OF NUTRIENT AND ANTIOXIDANT RICH BAR WITH THE INCORPORATION OF FLAXSEED AND GUAVA. ***Poonam Jethwani***, Department of food and nutrition, College of Home Science, Punjab Agricultural University, Ludhiana, Email:- poonam.jthi@gmail.com

Background & Objectives: With the rising demand for the food that is ready to eat, convenient and healthy, the present study was aimed to develop and evaluate the nutrient and antioxidant rich bar prepared with the incorporation of flaxseed and guava. **Materials & Methods:** The control bar was formulated with puffed wheat (30 g), peanut (10 g) and honey (15 g). In the first standardization trial flaxseed was incorporated in the control bar in 3, 4, 5 and 6 g level of incorporation. Further in the second trial guava fruit leather was incorporated in 5, 10 and 15 g levels to the highly acceptable bar of first trial. Sensory evaluation, proximate, mineral, vitamin, bioactive compounds and antioxidant activity analysis of the developed guava-flaxseed bar was then conducted using standard protocols. **Result:** The weight of the developed bar was found to be 55±2 g. It was found that incorporation of flaxseed and guava leather was acceptable at 5 g respectively. The protein, fat, fibre, ash and energy was increased significantly in the developed bars i.e. from 5.08 to 5.58 g/55g, 4.20 to 6.11 g/55g, 4.32 to 6.59 g/55g, 0.81 to 1.05 g/55g and 262.02 to 272.90 Kcal/55g respectively. The significant increase in Calcium, vitamin C and β-carotene was also observed i.e. from 19.29 to 33.62 g/55g, 0.85 to 10.10 g/55g and 24.55 to 79.77g/55g respectively. Increase in total phenols, flavonoids and tannins content significantly was recorded when compared to control bar i.e. from 64.50 to 120.36 mgGAE/ 55g, 48.48 to 49.78 mgQE/55g and 31.20 to 53.90 mg/55g respectively. The significant increase in DPPH activity (76.38 to 77.76% inhibition), FRAP assay (81.55 to 130.42 µmolFe2+/g), ABTS activity (38.17 to 39.32 mmolTE/55g) and RPA assay (63.33 to 114.58 mg TE/55 g) was also observed. **Conclusion:** The nutrient and antioxidant rich bar prepared with incorporation of flaxseed and guava can be a healthy choice to satisfy short term hunger in mid-morning or mid-evening. **Keywords:** guava-flaxseed bar, sensory evaluation, proximate composition, mineral, vitamin, bioactive compounds, antioxidant activity.

PPFSN-105 EFFICACY OF POMEGRANATE PEEL EXTRACT IN SUPPRESSING THE RANCIDITY OF *MATHRI.* ***Khushboo Singh,*** Harpreet Kaur, Department of Food and Nutrition Punjab Agricultural University, Ludhiana, Punjab 141004, Email: khush16.1990@gmail.com

Background: Rancidity is the main factor which affects the shelf life, sensory properties and nutritive value of fried foods. Antioxidants are added in order to increase the shelf life of food products. There has been a shift from synthetic to natural antioxidants because of potential carcinogenicity of synthetic antioxidants. Pomegranate peels being rich in bioactive compounds can be utilized as a natural source of antioxidants which is the major by-product of fruit processing industry. Therefore an attempt was made to evaluate the efficacy of pomegranate peel extract (PPE) to prevent rancidity in *mathri* during storage. **Methods:** Antioxidant fraction of pomegranate peel was extracted (by using ethanol) and its antioxidant activity was evaluated by DPPH method. The antioxidant fraction was dissolved in water in the ratio of 1:25. Four treatments of *mathri* were prepared by incorporating 0, 10, 20 and 30 percent of dissolved antioxidant fraction into dough. The total amount of water needed for kneading the dough was kept constant at 45 ml in all the treatments. *Mathri* were stored in open zip-lock pouches at ambient temperature (30±°C) for a period of three months. Peroxide value and sensory properties were determined at the interval of 30 days. **Results:** Incorporation of PPE had a non-significant effect on sensory properties of the product. The peroxide value of control *mathri* was found to be highest (0.65-1.05 $mEqO_2$/100 g) and *Mathri* incorporated with 30% PPE exhibited lowest peroxide formation (0.04-0.05 $mEqO_2$/100 g) as compared to other treatments during entire period of study. **Conclusion:** PPE has a strong antioxidant potential and can be utilized for suppressing the rancidity of food products. Antioxidant extract from fruit peels can be utilized as a source of low cost natural antioxidant. There is a huge scope for exploitation of these by-products and need to be converted from waste to value.

PPFSN-106 SENSORY ANALYSIS, GRANULE MORPHOLOGY AND ESTIMATED GLYCEMIC INDEX OF SELECTED STEVIA BASED INDIAN DESSERTS. ***Shrutika Umralkar***, Lohith Mysuru Shivanna, Namratha Pai Kotebagilu, Asna Urooj, Department of Studies in Food Science and Nutrition, University of Mysore, Manasagangotri, Mysuru, Email:- shrutika.umralkar@gmail.com

Background & Objectives: To develop low glycemic index Indian desserts using Stevia rebaudiana extract for diabetics. **Materials & Methods:** Five Indian desserts viz. Gulab Jamun, Rasgolla, Besan Laddoo, Kesar Peda and Carrot Halwa were tested using commercially available 3 different brands of Stevia rebaudiana extract viz.

Weltec, Organic India and Gaia Lite. They were subjected to sensory analysis using Quantitative Descriptive Analytical tool. Scanning Electron Microscopy (SEM) was used to obtain micrographs of 2 selected Indian desserts at room temperature and refrigerated temperature. In vitro starch digestibility was carried out to obtain starch fractions and thereby, predicted glycemic index (GI) of the 2 selected Indian desserts. **Result:** Kesar Peda (KP) and Carrot Halwa (CH) with 2 variations of 100% substituted stevia (Variation 1) and 60:40 of Sugar : Stevia (Variation 2) were selected and prepared along with the standard (100% sugar) using one brand of stevia, Gaia Lite. The micrographs of Variation 1 products had low moisture, rough appearance compared to standard while Variation 2 products had dry surfaces with smooth edges comparable to both standard and Variation 1 products. The four starch fractions viz. Rapidly Digestible Starch (RDS), Slowly Digestible Starch (SDS), Resistant Starch (RS) and Total Starch (TS) of 100% stevia based products were found to be less than the standard and 60:40 ratio products both in CH and KP. The predicted GI of Variation 1 of CH was 37.73 ± 2.09 and of Variation 1 of KP was 40.70 ± 0.8. The GI of Variation 2 of KP and CH was significantly ($p \leq 0.05$) closer to the standard. **Conclusion:** The results suggest the suitability of usage of Stevia rebaudiana extracts in Indian desserts as an alternative sweetener with health benefits such as low calorie and low glycemic index. **Keywords:** Stevia rebuadiana, Indian desserts, glycemic index, scanning electron microscopy, sensory analysis, starch fractions.

PPFSN-107 ***Sanjana Agarwal*** - Withdraw

PPFSN-108 STANDARDIZATION AND DEVELOPMENT OF MILLET NIPPATTU WITH NATURAL INGREDIENTS. ***Sindhu. S***, Smt. VHD Central Institute of Home Science, Bangalore, Email:- sindhuyogitha19@gmail.com

Background & Objectives: * 2018 is observed as National Year of Millets.* To incorporate millets in people's regular diets, due to high health benefits.* To develop traditional indigenous Nippattu snack to a value added product.* To standardize product (Millet Nippattu) for sensory evaluation and proximate analysis. **Materials & Methods:** Place of study - department of Food and Nutrition, at Smt. V.H.D Central Institute of Home Science and Research centre, bangalore. Sensory Evaluation of developed products were carried out in Ramaiah advanced testing laboratory. Making millet nippattu and to study its acceptability in terms of its organoleptic properties such as appearance, colour, flavor, texture and overall acceptability. Good quality raw ingredients were used. Sensory evaluation was performed by 25 panel members using 9 - point hedonic scale and results were tabulated. Materials - Jowar flour, Proso millet flour, Roasted bengal gram flour, Rice flour, Groundnut, Curry leaves, Chilly powder, Fennel and Coram seeds, salt and oil. **Methods :** 1. Mixing Jowar and Proso millet flour. 2. Add roasted bengal gram flour and rice flour. 3. Add roasted Groundnut and chopped curry leaves, chilly powder, Fennel and Coram seeds and salt. 4. Add water and make a soft dough. 5. Make small sized balls out of dough and pressing with help of presser. 6. Take heavy bottom frying pan, after heating the oil place nipattu in it. 7. Fry them till it turns golden brown colour and allow them to cool and store in air tight container. **Result:** Sensory Evaluation - Two variations of millet nippattu were made with different composition of Millet flour. Based on 9 point hedonic rating the overall acceptability of variation 1 was highest with sensory score and fell in category of Excellent compared to variation 2. The appearance of 2 Variations ranging from 8.0 and 8.8. The mean scores of texture, colour and flavour was higher for variation 1 ie, 8.7, 8.9 and 8.8 respectively. It is comparable to our regular nipattu. Result of proximate analysis for per 100gm of product gives Energy - 414.3Kcal, Protein - 10.8g, Fat - 17.1g, Carbohydrate-66.1g, Fibre <0.1, Ash - 2.3%, Moisture content - 3.4%. At 5% level of significance, there is significant difference between mean responses and with respect to texture and odour between variation 1 and variation 2 with p-value = 0.27 and 0.019. A shelf life study was done for standardized millet nippattu is packed in food grade box was observed and kept at room temperature (36 degree Celsius). It was seen that at room temperature, the quality was good till 15 days without any rancid smell and texture variation. The off odour and rancid smell started after 15 days and taste also changed. **Conclusion:** In recent times the eating habits and lifestyle pattern of people in India have changed due to industrialisation with many ready made unhealthy snacks available. People want something convenient, fast, healthy and beneficial. The standardized traditional indigenous millet nippattu snack is a value added product and good source of energy. It is different from regular available nippattu as rice is substituted with millets and serves as an ideal snack for children adolescents and adults. **Keywords:** Children, adolescents and adults, Millets, value addition, fried snack, high energy, high protein and nutri dense.

PPFSN-109 NUTRITIONAL AND ORGANOLEPTIC EVALUATION OF FRUIT BASED COMPLEMENTARY FOOD MIX FOR PREGNANT AND LACTATING MOTHER. ***Yashmin Nongrum***, Mamoni Das, Ruma Bhattacharyya, Okram Abemsana, Department of Food Science And Nutrition, College Of Community Science, Assam Agricultural University, Email:- yeshminnongrum@gmail.com

Background & Objectives: Pregnancy and lactation is a period of considerable physiological stress which imposes increased nutritional demands. Many studies have revealed that in developing countries, pregnancy diets are monotonous and they lack in essential nutrients. The present study was an attempt to develop a nutritious low cost Fruit Based Complementary Food Mix for pregnant and lactating mother using local resources. **Materials & Methods:** Fruit Based Complementary Food Mix (FBCFM) was developed from rice flour, bengal gram dhal, groundnut, sesame, and fruit mix comprising of 30%, 40% and 50% incorporation of apple, papaya and bhimkol powder. FBCFM1 (50:10:5:5:10:10:10), FBCFM2 (40:10:5:5:13.3:13.3:13.3),FBCFM3 (30:10:5:5:16.6:16.6:16.6). Proximate analysis was done using standard AOAC method (2000). Porridge was made from FBCFM1, FBCFM2 and FBCFM3 which was subjected to organoleptic evaluation using 9 point hedonic scale. **Result:** The fruit based mix porridge made from FBCFM1 had the highest acceptability scores in terms of all the sensory parameters compared to FBCFM2 and FBCFM3. Nutrient analysis revealed that the porridge made from FBCFM1 was more nutrient dense in terms of energy (349kcal), carbohydrate (85.2g), protein (1.53g), fat (0.05g) followed by FBCFM2 and FBCFM3. FBCFM1 had mineral content (2g), potassium (343.79mg), calcium (387.44mg), iron (6.91mg), vitamin C (94.38mg) and crude fibre (3.78g) content respectively. **Conclusion :** It can be concluded that utilisation of local fruit like bhimkol and papaya for processing include dried fruit mix can be effectively incorporated in the preparation of complementary foods resulted in a nutrient dense product with higher sensory attributes. This type of low cost fruit based complementary food mix can bridge the gap of protein, hunger and malnutrition and address the issue of food and nutrition security among the vulnerable section of society with special reference to pregnancy and lactation. **Keywords:** Pregnancy, lactation, complementary food, organoleptic evaluation, proximate analysis, hedonic scale.

PPFSN-110 DEVELOPMENT AND STANDARDISATION OF NUTRITOS (MILLET NACHOS). ***Sushma.S***, Smt.VHD CENTRAL INSTITUTE OF HOME SCIENCE, Email:- sushma1sushmas@gmail.com

Background & Objectives: millets are the small grains which are grown in almost all parts of india.these crops were cultivated by using minimum water and in dry areas. millets were consumed by the people with poor socio economic background in the early years.millets contain good nutritional value and contain good amount of fiber .the main objective of this study was to incorporate millets into a value added healthy snack. which can be consumed by all .millet nachos is a multi grain snack which is prepared and standardized. **objectives:-**To develop nutritos (millet nachos).Sensory evaluation using 9 point hedonic rating of various millet nachos variations and to study its acceptability. To standardize nutritos (millet nachos). Shelf life studies of standardized nutritos (millet nachos). **Materials & Methods:** Raw materials: Whole wheat flour , Bajra flour, Sorghum flour, Brown top millet flour, Flax seeds, Oil, Spices(chilly powder, turmeric , salt). METHOD OF DEVELOPING THE VALUE ADDED PRODUCT: step 1:- procurement of raw materials,step 2:-development of variations, step 3:- sensory evaluation of the developed variations. step 4:-statistical analysis of the variations. step 5:- developing the best accepted product 1.Selection of raw materials from the store Wheat flour (20%)+ bajra flour(20%) +sorghum flour(20%)+ browntop millet flour(30%) +flax seeds(10%). 2.Cleaning the ingredients 3.Mill the ingredients finely (Wheat flour , bajra flour, sorghum flour, browntop millet flour) separately. 4.Dry roast the flax seeds and coarsely grind. 5.Mixing the ingredients in a bowl Wheat flour (20%)+ bajra flour(20%) +sorghum flour(20%)+ browntop millet flour(30%) +flax seeds(10%)+spices (chilly powder, turmeric ,salt)+ 3 ml of oil. 6.Add required amount of water and make a soft dough consistency 7.Make small balls from the dough (about 10-15gm). 8.Kneed it in circular shape 9.Cut it into triangle shape. 10.Heat the oil (for 2270c -2320c) 11.Add the cut triangles into the oil and deep fry (for 2-2.5 min). 12.It can be stored in air tight containers (for 10-15 days). step 5:- shelf life study of the developed product. **Result:** Different preliminary trails were carried out to prepare nutritos (millet nachos) to observe the sensory attributes of nachos such as appearance colour, flavor and texture.sensory evaluation of these trails was done using 9 point hedonic rating by 16 semi trained panelist. the first 2 trails were not accepted by most of the panel members and the most accepted variation by general population is selected as final product.the selected product had the maximum mean scores.shelf life study of the product was conducted under room temperature (25-32 0 C) for 10 days. after that the product developed a rancid smell and taste. Nutritional composition of the standardized product was determined by conducting proximate analysis (moisture content,

carbohydrate, ash,fibre, fat, protein, energy, calcium) of final product using different methods (IS 7874, IS 16566 and physic chemical method). the developed product per 100g contained moisture 2.80 g,ash 2.32 g,protein 9.08 g,fat 23.88 g ,fibre 0.17g,carbohydrate 61.75g,energy 450 kcal,calcium 155.80 mg.the product developed contained good amount of calcium which can help in development and strengthening of bones. **Conclusion:** Millets have good nutritional value. The millets can be incorporated in our daily diet and they can also be incorporated into snacks like nachos which is most loved by the children and teenagers .the product has a very good shelf life of about 10-12 days when stored at room temperature in an air tight box. And the products developed using millets also had high acceptability. Hence millets can be incorporated into foods easily and can also be recommended on our daily diet. millets based snacks are a healthy options instead of snacks prepared from refined wheat flour refined. **Keywords:** millets,nachos,sensory evaluation, proximal analysis.

PPFSN-111 ***Senjuti Saha*** – withdraw

PPFSN-112 NUTRIENT AND PHYTOCHEMICAL COMPOSITION OF DEVELOPED FRUIT BARS (KIWI AND POMEGRANATE). ***Dr S Thilagavathi***, Periyar university , Salem, Email:- thilakachandru@gmail.com

Background & Objectives: The fruits are rich in phytochemicals and polyphenolic compounds that plays vital role on health. These fruits can be preserved by applying processing techniques and new processed foods can be developed. Fruit bars are the new way of preserving fruits .Thus the research carried out to develop fruit bars and assess the physical and chemical polyphenolic properties of the developed fruit bars. **Materials & Methods:** 4. The physico-chemical properties like titratable acidity, pH, total soluble solids (TSS), moisture, ash and reducing sugars were analyzed using standard procedure.. 5. The nutrient composition like carbohydrates, protein, fat, potassium, magnesium, iron, vitamin C and beta carotene of the developed fruit bars were analysed using standard procedures.sensory evaluation was carried out using five pont scale n phytochemicals were assessed using uv spectrophotometer. **Result :** The acidity of, kiwi and pomegranate bars were, 0.5 and 0.6 percentage respectively. The pH of the developed fruit bars were 3.34 percent in kiwi bar and 3.83 percent in pomegranate bar. About 68-70 brix was present in the developed fruit bars. The moisture percentage of kiwi bar was high as 11.01 percent and pomegranate bar was 1.41 percent. . kiwibar has higher protein content (1.05g) and fat (0.73g) content when compared to other type.Micronutrients like potassium, magnesium and vitamin C were also found higher in kiwibar when compared to pomegranate bar.The mean score of acceptability of developed fruit bars shows no-significant difference at one percent level. The polyphenolic evaluation of the developed fruit bars confirmed the presence of higher level of secondary metabolites with antioixidant property. **Conclusion :** The fruit bars are the best method of processing and preserving fruits..These developed fruit bars proven the same containing abundant amount of nutrients and phytochemicals. **Keywords:** kiwi bar , pomegranate bar, phytochemical, polyphenols.

PPFSN-113 DEVELOPMENT AND SHELF STABILITY OF FLAX SEED AND GARDEN CRESS SEED INCORPORATED HEALTH COOKIES. ***Meera M***, Asharani P, Department of Food and Nutritional Sciences, Sri Sathya Sai Institute of Higher Learning, Anantapur, Email:- meeram@sssihl.edu.in

Background & Objectives: Background: Bakery industry is considered as one of the major segment of food processing in India. Use of composite flour as a mixture of flours, starches, and other ingredients intend to replace wheat flour partially or totally in bakery products for health benefit. **Objectives:** Development and shelf stability of flax seed and garden cress seed incorporated health cookies. **Materials & Methods:** Methodology: Composite flour was developed using pearl, fox tail, finger, barnyard and wheat flour in various proportions. The optimized formulation was partially replaced with 10 and 20% levels of flax seed and garden cress and compared with control cookies made of only composite flour. The developed products were subjected for physical, chemical, sensorial, antioxidant, anti-nutrients, pH, color and microbial assay. **Result :** The protein content of cookies at 20% flax seed and 20% garden cress seed was found to be 7.5% and 7.9% compared to control at 5.8%. The dietary fiber content was 4.5 % and 3.5%; fat content of 32% and 38.9% and the sensorial score of 8.3 and 7.8 compared to control cookies indicating 1.03%, 25.6% and the sensorial score of 8 respectively. The iron content was 6.06 and 13.09% compared to control at 3.58%. Calcium content was 59.9% and 74.9% compared to control at 53.6% respectively. The effects of storage on anti-nutritional profile (tannins, phytate and oxalate was studied for three months and compared with control cookies. The effect of storage on color, pH, moisture uptake and microbial analysis were estimated. **Conclusion :** The results revealed that flax seed and garden cress seed flour incorporated cookies showed promising functional properties and could satisfy the growing demands of

consumers and to improve the nutritional status of population. **Keywords:** Key words: garden cress, shelf life, flax seed.

PPFSN-114 NUTRIENT CONTENT OF SOLANUM NIGRUM BERRIES CULTIVATED IN KITCHEN GARDEN. ***Lakshmi Jithendran***, C.A. Kalpana, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Email:- lakshmi_jithendran@yahoo.com

Background & Objectives: Solanum nigrum is a species which belongs to Solnaceae family. Several studies demonstrated its potential as a reservoir of antioxidants having hepatoprotective, anti-tumor, cytostatic, anti-convulsant, anti-ulcerogenic and anti-inflammatory effects. The present study was aimed to cultivate Solanum nigrum in kitchen garden and analysing the nutrient content of the berries; with the prime objective of identifying the feasibility in cultivating them as a household plant to be used for natural remedies. **Materials & Methods:** The seedlings were first raised in seed pots and transplanted to the garden soil 30-45 days after sowing, when the plants attained 8-10 cm height. Soil testing and water quality test was done. Plant species was certified by a taxonomist and berries of Solanum nigrum have been assessed for its nutrient content. **Result:** Results revealed that the soil was slightly acidic, and rich in nitrogen and phosphorus which supported optimal plant growth. Proximate analysis of the berries indicates that protein 3.87%, carbohydrate 41.76% and fat 2.56%. Calorific value was found out to be 181.47Kcal/100g. Ash and moisture content were found to be 6.935% and 10.28% respectively. Mineral analysis showed the following results such as iron 58.40mg/kg, Calcium, 3284mg/kg and copper, 23.3mg/kg respectively. Fibre content was 34.60%. **Conclusion:** The research findings proved that the available soil supports Solanum nigrum to be cultivated in our households as part of kitchen garden and the nutrient content of berries also proved its nutritional benefits. **Keywords:** Key words: Solanum Nigrum, Cultivation, Soil analysis, Nutrient content.

PPFSN-115 DEVELOPMENT OF TRADITIONAL LOW GLYCAEMIC INDEX SNACK PRODUCT FROM BARNYARD MILLET FLAKES AND EVALUATION OF ITS NUTRITIONAL QUALITY. ***Prakruthi M***[1], Chaitra GH[1], Mahesh MS[1], Shobha D[2], 1= Department of Food Science and Nutrition, Yuvaraja's College Mysore, 2= Department of Nutrition, ZARS, VC Farm, Mandya, Email:- prakruthi.s.lakshmi@gmail.com

Background & Objectives: 'Chivda' is one of the savory snack product from the Indian cuisine which includes authentic taste and flavors. Snacking, a most common habit of eating between meals to fit extra nutrients and prevent overeating at mealtimes. Careless snacking shoots up your energy intake making one overweight, insulin resistant and diabetes over time. In Indian cuisine most of the snacks are prepared from rice / potato / wheat / and or legumes which are rich in refined carbohydrates and low in fiber making them high glycaemic index food and thus unhealthy. In this study an attempt has been made to develop a healthy snack with Barnyard Millet Flakes (BMF). **Materials & Methods:** 'Chivda' from BMF were developed and was compared with 'chivda' from Rice flakes (RF). Both the 'chivdas' were subjected to sensory evaluation (9 point hedonic scale), nutrient analysis (AOAC methods) and storage studies including peroxide, free fatty acid and microbial analysis. **Result :** The experimental results showed that, organoleptically, there was a significant difference between RF and BMF 'Chivda' in terms of taste and overall acceptability. However, the 'Chivda' from BMF were superior to that of 'Chivda' from RF. 'Chivda' from BMF had increased protein (2X), crude fiber (7X) and decreased carbohydrate, fat and energy. Further the BMF 'Chivda' had a better keeping quality when compared to Rice flakes 'Chivda'. **Conclusion :** Snacking may help control appetite, or it may contribute to recreational eating and excess calories. Many of the most widely consumed snack foods are high in refined carbohydrates or added sugar and low in nutritional value. BMF 'chivda' had less carbohydrate and high fibre, thus makes it a low glycaemic index snack. Being nutritional superior with a better keeping quality is a healthy alternative snack to RF 'chivda' .**Keywords:** 'Chivda', Barnyard Millet Flakes, Rice Flakes, glycaemic index, high fire , low carbohydrate.

PPFSN-116 FORMULATION AND ACCEPTABILITY OF FOXTAIL MILLET INCORPORATED CAKE. ***Mounika Patiballa***, Kasturiba B, Pushpa Bharati, Department of Food Science and Nutrition , College of community science, UAS Dharwad, Email:- monicamonu819@gmail.com

Background & Objectives: Foxtail millet is one of the oldest millet, widely cultivated in India, grown in adverse agro climatic conditions. Bakery products are inevitable in today's diets, which are calorie dense with low nutritive value. To make these products healthier and nutritious incorporation of neutraceutical ingredients like millet is

better option. Hence the present study was undertaken with the objective of formulation and evaluation of foxtail millet incorporated cake. **Materials & Methods:** Standard procedure of cake preparation was employed for incorporation of foxtail millet flour at 15% and 30%. Standard cakes with refined flour served as control. Cakes were evaluated for physical parameters (height and weight) and sensory quality. Acceptability was evaluated employing 9 point hedonic scale and evaluated by trained panel members. **Result :** Results indicated that increase in millet proportions increased height and weight of the cake, indicating increased density. Sensory scores of cake increased with increase in incorporation of foxtail millet flour. Cake with 30% incorporation scored 8.6 (appearance), 8.5 (color and taste), 8.4 (flavor and texture) and 8.4 (overall acceptability), while control sample received scores of 7.6 (appearance), 8.3 (color and taste), 8.4 (color) and 8.2 (texture and overall acceptability). Acceptability indices were 90.74, 90.92 and 94.07 per cent for control, 15 and 30% incorporation respectively. **Conclusion :** Hence cake developed with 30% incorporation levels had better sensory attributes thus can be encouraged in bakery industry to enhance nutritional value especially fiber content of bakery products. **Keywords:** Cake, Foxtail Millet, Sensory evaluation.

PPFSN-117 PRODUCT DEVELOPMENT, SENSORY EVALUATION, GLYCEMIC INDEX AND LIPEMIC RESPONSE OF AMLA (Emblica officinalis) POWDER INCORPORATED RECIPES. ***Shonima Venugopal***, Uma Iyer, Richa Sanghvi, The Maharaja Sayajirao University of Baroda, Vadodara, Email:- shonima118@yahoo.co.in

Background & Objectives: Diabetes is a major health challenge worldwide. Glycemic index [GI] is a physiological basis for ranking carbohydrate foods based on the blood glucose responses they produce after ingestion. Amla is a medicinal plant that supposedly has hypoglycemic and hypolipidemic properties. Study objectives were to develop 10 equicarbohydrate recipes incorporating amla powder at 3 levels, to carry out sensory evaluation and GI and lipemic response determination of the recipes. **Materials & Methods:** Ten equicarbohydrate recipes namely Cutlet, Handvo, Dhokla, Muthiya, Pulav, Poha, Upma, Methi Thepla, Thalipith and Missi Roti were incorporated with amla powder at 2g, 3.5g and 5g levels. Sensory evaluation was carried out by 30 semi trained panellists using the composite rating and hedonic rating scale. Four recipes were selected for GI assessment. The International Organization for Standardization protocol was followed for GI estimation. 15 healthy volunteers were enrolled. Two sets of each of the 4 recipes was prepared, one without amla powder and one with 2g of amla powder. **Result :** Amla powder could be effectively incorporated in the recipes with high acceptability at 2g level. The lowest glycemic response was for Methi Thepla (60.90 Â± 15.54) and highest was for Handvo (90.57 Â± 33.88) for recipes without amla powder. Cutlet, Muthiya and Methi Thepla fell under the medium GI category. Amla powder incorporation brought about a non-significant reduction in GI. Handvo shifted to the medium GI category (68.63 Â± 26.81). Cutlet and muthiya showed a fall in TG levels (3.9%); whereas there was a rise of 20.2% with methi thepla. Amla powder incorporation in muthiya led to a further fall in the TG levels (7.8%). **Conclusion :** Incorporating amla powder in recipes could bring about a reduction in the postprandial glycemic and lipemic responses. Amla powder may be used as a functional food aimed at preventing the progression of co-morbidities associated with diabetes. **Keywords:** Glycemic Index, Amla, Diabetes.

PPFSN-118 STUDIES ON PREPARATION AND SENSORY QUALITY OF SOYBEAN INCORPORATED VADA. ***Rajeshwari F Kurbett***, Email:- raj10681995@gmail.com

Background & Objectives: To evaluate organoleptic characteristics of Soybean incorporated Vada for acceptability prepared with different level of incorporation of Soybean. **Materials & Methods:** Vada were prepared from combination of Blackgram dhal and Soybean as 100:0, 75:25, 50:50, 25:75 percent. The prepared Vada were analyzed for its different quality attributes. The sensory quality attributes of prepared vada such as colour, taste, flavor, texture, appearance, mouthfeel and overall acceptability were determined by using the 9 point Hedonic scale. **Result :** It was concluded from above studies that good quality Vada having good overall acceptability can be prepared by using the 75% Blackgram dhal and 25% Soybean. Further it was noticed that incorporation of Soybean at more than 25% was unacceptable in terms of sensory attributes. The sensory score of vada decreased with increase in Soybean incorporation level. The use of Soybean in the preparation of vada is useful to optimize the consumption of protein and energy rich food. It also helps in the utilization of Soybean at the home level and to overcome Protein- energy malnutrition among the public specially in children. **Conclusion :** Studies revealed that good quality Vada having good overall acceptability can be prepared by using the 75% Blackgram dhal and 25% Soybean. **Keywords:** 9 point Hedonic scale.

PPFSN-119 BLACK RICE- PROXIMATE AND MINERAL COMPOSITION, PHYTOCHEMICAL SCREENING, POLYPHENOL CONTENT, FUNCTIONAL PROPERTIES AND PRODUCT DEVELOPMENT. ***Tokpam Reshma Chanu***, Dr Vanitha Reddy. P,
Department of Water and Health - Faculty of Life Sciences, Division of Nutrition & Dietetics, JSS Academy of Higher Education & Research, Mysore, Email:- misnahenbi123@gmail.com

Background & Objectives: Black Rice (BR) is a type of rice species Oryza Sativa L. cultivated in Asia. It is highly glutinous, rich in anthocyanin, packed with high level of nutrients believed as panacea of many culinary diseases. Objective: To screen phytochemicals, analyse polyphenols and functional properties and product development by incorporating Black Rice. **Materials & Methods:** BR was purchased from agriculture farm of Imphal- Manipur. The rice was analysed for proximate and mineral composition and in sequential extracts, polyphenols and phytochemical screening was done. Functional properties were compared with white and brown rice. Three traditional Indian breakfasts - Neer Dosa, Idiyappam and Puttu were prepared by incorporating BR at different concentrations (10, 20, 30, 50 and 100%). In the products functional properties were analysed and sensory evaluation of prepared recipes were measured using standard score card. **Result :** The BR was good source of phosphorus and potassium. Polyphenol content was high in methanol (0.119 mg/g), ethanol (0.24 mg/g) and water (0.57 mg/g) extracts compared to other extracts. Alkaloids, Terpinoids, Triterpinoids, Steroids, Phyto-steroids and Quinones gave positive in all the sequential extracts. Functional properties water absorption capacity, foam formation and emulsification capacity were comparable with white rice and less than the brown rice. Among the functional properties, Water absorption, emulsification and gelatinization temperature increased with the increased concentration of BR compared to standard. Bulk density and Foaming capacity did not change in Black rice products compared to standard. The Neer Dosa, Idiyappam and Puttu were well accepted with BR incorporated at 10, 20 and 30%. **Conclusion :** As a good source of Polyphenols especially Anthocyanins the BR can be used in regular diet preparations and also in the therapeutic diets for the target populations. Keeping the health benefit of BR there is a need to explore BR by incorporating in disease specific food formulations and product development. **Keywords:** Black rice, functional properties, phytochemicals, neer dosa, idiyappam, puttu.

PPFSN-120 DEHYDRATED GREEN LEAFY VEGETABLES AS FUNCTIONAL INGREDIENTS IN TRADITIONAL INDIAN RECIPE -CHUTNEY POWDER. ***Seetharamu JJ***, Dr Vanitha Reddy. P, Division of Nutrition & Dietetics, Department of Water & Health-Faculty of Life Sciences, , JSS Academy Of Higher Education and Research (JSSAHER), Mysuru, Email:- seetharamujj@gmail.com

Background & Objectives: Background: The process of dehydration of Green leafy vegetables - GLVs not only preserves them for prolonged period but also can act as a rich source of micronutrients and phytochemicals for use in sparse season. They have potential against degenerative diseases. Objective: To prepare Chutney Powder by incorporating 6 dehydrated GLV viz, (Curry leaves -CL, Coriander leaves-CoL, Mint leaves-ML, Fenugreek leaves-FL , Drumstick leaves-DrL, Dill leaves-DL) at different combinations. **Materials & Methods:** Standard (CL & CoL) and three variations (V1-CL, CoL & ML, V2- CoL, DrL & DL, V3- CL, FL & DrL) of chutney powder were prepared along with standard. The products were analyzed for moisture, ash, iron and functional properties. The variations prepared were subjected to sensory evaluation (parameters-colour, flavour, texture, taste, after taste, appearance and overall acceptability) in combination with idly, rice and ghee. **Result :** The incorporation of GLV increased the iron content in the order of V1< V2 < V3 < Standard. The bulk density, emulsification, water and fat absorption increased in all variations compared to standard. All variations of chutney powder were well acceptable compared to standard. The results indicate that the GLV incorporated products have potential to be used as functional food ingredient due to less calories, low fat and high in dietary fiber and phytochemicals. In case of acceptability, all the GL are the regular vegetables used frequently at house hold preparations hence the flavour and tastes were well accepted. **Conclusion :** There are limited studies reported on the food product development and functional properties of dehydrated GLV. Hence, more products can be developed by incorporating dehydrated GLV for healthy and disease specific subjects. **Keywords:** Green leafy vegetables, micronutrients, phytochemicals, functional properties, sensory evaluation.

PPFSN-121 Anupriya Mamgain - Withdraw

PPFSN-122 Senjuti Saha - Withdraw

PPFSN-123 Bhavya Pande - - Withdraw

PPFSN-124 PHYSICOCHEMICAL AND AMINO ACID PROFILE OF GROUNDNUT (ARACHIS HYPOGAEA L.) GERM AND ITS SUBSTITUTED COOKIES. ***Sivananth.C***[1], Amutha.S[1], Hemalatha.G[1], Mini.M.L[2], Karthikeyan.G[3],1= Department of Food Science and Nutrition, Home Science College & Research Institute, Tamil Nadu Agricultural University, Madurai, 2= Department of Soil Science and Agricultural Chemistry, Agricultural College & Research Institute, Tamil Nadu Agricultural University, Thoothukudi, 3= Department of Plant Pathology, Agricultural College & Research Institute, Tamil Nadu Agricultural University, Coimbatore, Email:- sivananth.c@gmail.com

Background & Objectives: Groundnuts are mainly utilized for oil extraction, apart from this they are used in the production of peanut butter, whole edible nuts, blanched groundnuts, roasted and salted groundnuts, dry roasted groundnuts and in a variety of groundnut based confectionery products.Groundnut processing generates mainly groundnut seed coat and groundnut germ as major by-products. Groundnut germ contributes 5 - 6 percent of the total weight of the processed groundnut. It is rich in many therapeutic and nutraceutical components such as essential fatty acids, vitamin E, B vitamins etc. But till date, the groundnut germ is utilized only for cattle feed. It has the potential to yield many commercially valuable compounds such as groundnut germ oil and functional food ingredients such as protein isolate, B vitamins etc. **Objectives:** i. Collection and analysis of physicochemical parameters of groundnut germ. ii. Substitution of groundnut germ flour in cookies and analysis of amino acid profile. **Materials & Methods:** The groundnut germ was collected from the groundnut chikkis industry located in Madurai district, Tamil Nadu. The groundnut germ flour was substituted in the cookies at different levels. Further the substituted cookies were analyzed for physicochemical, sensory properties and amino acid profile using UHPLC. **Result :** Groundnut germ had fat and protein content of 44.55Â±1.36 g/100g and 25.38Â±0.67 g/100g respectively The highest fat and protein content of 24.92 g/100g and 11.54 g/100g respectively was recorded in groundnut germ incorporated cookies. This is due to the high content of native fat and protein in groundnut germ.The highest content of essential amino acids such as tyrosine, histidine, isoleucine, leucine, lysine, phenylalanine, threonine, tryptophan and valine content was 0.39, 0.24, 0.50, 0.75, 0.33, 0.58, 0.28, 0.09 and 0.45 g/crude protein respectively was observed in cookies substituted with groundnut germ. **Conclusion :** Groundnut germ contains many functional compounds, such as protein, essential fatty acids etc which can be incorporated into processed foods to serve as functional ingredients.The groundnut germ contains high amount of essential amino acids hence it may be utilized as a protein source in food products. **Keywords:** Groundnut germ - Protein - UHPLC analysis - Amino acids - Cookies.

PPFSN-125 PHYSICOCHEMICAL PROPERTIES OF INDIGENEOUS RED RICE VARIETIES OF TAMIL NADU. ***Kavitha Ravichandran***, Ann Raeboline Lincy E, Usha Antony,Centre for Food Technology, Department of Biotechnology, A. C. Tech. Campus, Anna University, Chennai, Email:- kavisri9@gmail.com

Background & Objectives: Green revolution in early 1970s encouraged mono culture and growth of hybrid crops alone. So today, roughly 6,000 varieties of rice survive in India and the growth of coloured rice varieties which are indigenous to our country decreased and in the long run they were no longer in cultivation. However, few red rice varieties survived the odds due to their medicinal and ritual importance. This study focuses on four red rice varieties of Tamil Nadu and namely, Eyarkai Samba, Maappillai Samba, Koliyal and Kattu Yanam. **Materials & Methods:** The selected rice cultivars were procured from the local and organic markets in Chennai. They were cleaned, washed, and drained; dried in a tray dryer at 50Ës C for 3 hours, ground to flour and used for further analysis. The proximate content, functional properties, colour analysis, phytochemical analysis and DPPH assay to determine its anti-oxidant capacity were carried out. **Result :** The functional properties of selected red rice flour revealed that Maappillai Samba and Kattu Yanam have better emulsion activity (0.47%; 0.51%), least gelation concentration (50.0 g/L and 70.0 g/L) while Eyarkai Samba possesses good water absorption index (2.62 g/g) and swelling capacity (18.70 mL). The colour of the rice grains varied and the corresponding rice flour showed lower colour intensities due to the mixing of white endosperm, when it was ground. Kattu Yanam and Koliyal lead the table in phytochemical composition and the antioxidant capacity of the grains was attributed to the presence of phenolic compounds and anthocyanins. **Conclusion :** From this study it is understood that the selected red rice varieties are rich in nutrients and phytochemicals making them more suitable for the development of functional foods. **Keywords:** Indigenous red rice, Tamil Nadu, Green Revolution.

PPFSN-126 SENSORY EVALUATION OF THERAPEUTIC SOUP DEVELOPED WITH BASIL SEEDS. ***Akshatha***,Yuvaraja college, University of Mysuru,Mysuru, Email:- akshatha95sai@gmail.com

Background & Objectives: Basil [Ocimum Basilicum] most famous herb belongs to family Lamiaccae, it also called as king/royal herb. Basil seeds have abundant amount of phytochemical and antioxidant with gelling, thickening and stabilizing agent apart from high protein and mineral content. Basil seeds have extensive therapeutic uses in weight, acidity, constipation, and diabetes management. Other benefits of basil seeds are coolant, appetite control, lower the cholesterol and improves memory. Therefore the present study aimed to develop therapeutic soup with Basil seeds and evaluate its sensory acceptability. **Materials & Methods:** Four variants soups with 300ml volume were developed with 1g, 2g and 3g basil seed and 3g corn flour as standard. All four soups were evaluated with 9 point hedonic scale for the sensory attributes like appearance, colour, consistency, flavour, taste and overall acceptability. The nutritional compositions of soups were calculated using NIN food composition table and published research studies. **Result :** The nutritional composition of 100 gm of basil seeds was 48g carbohydrate, 23g of protein, 2240mg of calcium and 89mg of iron as reported by the several studies. Among four variations soups, the soup developed with 2g basil seed was on par with standard corn soup for its all sensory attribute and overall acceptability score was 7.5. The nutritional composition of developed 2g basil soup was protein 3g, fat 0.53g, calcium 80.57mg and iron 2.mg per 300ml volume. **Conclusion :** Therapeutic soup developed with 2g of basil seeds composition was highly accepted and can be replaced with corn flour. The basil seed soups are with higher percent of nutrients when compared with corn soup. Basil seed based soups are therapeutic food to mitigate micronutrients malnutrition and health problems. **Keywords:** Basil seeds,Therapeutic soup ,Nutritional composition.

PPFSN-127 IMMUNOMODULATION OF MONOCYTES THROUGH PROBIOTIC ISOLATES IN THP-1/ HT-29 DOUBLE LAYERED CO-CULTURE MODEL. ***Sandeep Jaiswal***, Satya N Pradhan, Prince R Prabhu, Shreya Shrivstava, RB Narayanan, Usha Antony, Centre for Food Technology, Department of Biotechnology, Anna University, Email:- jaiswalsandeep2025@gmail.com

Background & Objectives: Immunomodulation through probiotic strains is an evident phenomenon and major regulator of our Immune system. Although multiple factors affect gut health, probiotics are the major component which tends to maintain gut homeostasis. The current investigation attempted to study the immunomodulatory potential of indigenously isolated probiotics namely Lactobacillus plantarum (from Koozh, fermented millet beverage) and Pediococcus lolli (from Bhaati Jaanr, fermented rice product) using a simulated model that would mimic intestinal lumen that was achieved by co-culturing colon cancer cells (HT-29) along with monocyte cell line (THP-1) in a double-layered cell culture-plate-assembly. **Materials & Methods:** The study involved in setting up the co-culturing system with HT-29 and THP1 .HT-29 layer was treated with 106 CFU of probiotic isolate and further was challenged with pathogen Salmonella enterica. Total RNA was isolated from the treated cells (HT-29/THP-1) and expression of pro-inflammatory/anti-inflammatory cytokines were estimated by q-PCR. Expression of CD markers was studied with Flow cytometer (FACS). **Result :** Significant difference was observed in cytokine gene expression levels in various treatment conditions like (HT-29+LAB), (THP-1+LAB), (HT-29/THP-1+LAB). Further, HT-29 cells were challenged with S.enterica in the above mentioned groups. Immunomodulation of HT-29 with probiotic was largely strain dependent and probiotics were found to act as an immune-suppressant with down regulation of IL-8, TNF-Î±, IL12 and IFNÎ³. Significant down-regulation was observed in expression of pro-inflammatory cytokines like IL-1Î², IL-6 and TNF-Î± in monocytes layer of pathogen-probiotic stimulated HT-29 cells. **Conclusion :** Isolated probiotic strains were able to significantly alter the immune parameters and proved to be anti-inflammatory in presence of pathogens. **Keywords:** fermented foods, probiotics, immunomodulation, monocytes, co culture, cell lines.

PPFSN-128 CO-IMMOBILIZED HYDROLASES ON NANOPARTICLES: APPLICATION IN FOOD INDUSTRY. ***Nithyakalyani Doraiswamy***, Mahalakshmi Sarathi, Centre for Biotechnology, Anna University, Chennai, Email:- nithyakalyani.dr@gmail.com

Background & Objectives: The potential of enzymes in the food industry is realized and is growing at a rapid pace. Lipases along with proteases occupy the largest share of enzyme-catalyzed process technologies due to their application in both the non-organic and organic systems. In food industries, lipases and proteases are mainly employed in the synthesis of flavor constituents and modification of food functional properties respectively. But these desirable enzyme characteristics and its application in the industry are hindered due to loss of long-term

operational stability, reusability, and recovery of the enzymes. Immobilized enzymes overcome these problems with nanoparticles as immobilization matrix, reduce the protein unfolding and thus enhance the stability and activity of the enzymes. **Materials & Methods:** The effect of different parameters such as the substrate to enzyme ratio, temperature, and pH were investigated for both free and immobilized enzymes and the reaction product was characterized by FT-IR and HPLC techniques. **Result :** FT-IR and HPLC confirmed the synthesis of flavor esters and modification of functional properties of the food.**Conclusion :** The magnetic nanoparticles supported hydrolytic enzymes showed better activity and stability in comparison to other nanoparticles in their application in the flavor development and functional modification of food. **Keywords:** Lipases, proteases, flavor esters, functional property, nanoparticles, immobilization.

PPFSN-129 Ratika Oberoi - Withdraw

PPFSN-130 DEVELOPMENT AND EVALUATION OF MILLET BASED – DRY FRUITS ICE CREAM. ***Deepika D***, Smt, VHD Central Institution of Home Science And Research Centre (Autonomous), Bangalore, Email:- deepikagowdaraj@gmail.com

Background & Objectives: 1) Millets have a greater health benefits. 2) 2018 as National Year of Millets.3) To incorporate millets in people regular diet. **Objective:**To Develop Frozen dessert millet based dry fruit ice cream for value added product,To subject the developed product to sensory evaluation,To study the shelf life of standardized product, To Standardized Millet Based Dry Fruits Ice Cream for Proximate Analysis. **Materials & Methods:** Foxtail Millet, Almond, Pistachio, Fresh Cream, Condensed Milk, Saffron, and Cardamom. **Methods:** * Selection and Purchase of Raw Materials * Foxtail Millet (30g) * Boil for 10min (0.160 C) * Coarse almond, pistachios (10g) * Whisk condensed milk and fresh cream for smooth consistency * Add the boiled foxtail millet, saffron and pinch cardamom powder and grind it well * Pour the mixture into food grade cups add coarse dry fruits mix well * Freeze it for 4 to 8 hours or more until it sets * Decorate with dry fruit(1g) and saffron (1g) on the top of the ice cream * Serve cold. **Result :** Sensory evaluation scores indicated that Millet Based Dry Fruits Ice Cream with different variations was acceptable to consumers. (Variation 1: Foxtail Millet 30%, Dry Fruits (Almond & Pistachios) 9%, Fresh Cream 35%, Condensed Milk 25%, Cardamom 0.25%, Saffron 0.75%) (Variation 2: Foxtail Millet 30%, Kiwi 20%, Papaya 20%, Banana 5%, Dry Fruits (Almond & Pistachios) 3%, Fresh Cream 7%, Condensed Milk 14.98%, Cardamom 0.1%, Saffron 0.1%). The Millet Based Dry Fruits Ice Cream had the highest mean scores for all attributes being compared. The mean scores of appearance of all variations were range from 8.4 to 8.9, the lowest score is of variation 2 (8.4) and maximum being variation-1 (8.9). The mean scores of taste range from 8.1 to 8.5, where the variation – 1 shows maximum mean score of 8.5. The mean scores of texture colour and flavor was higher for variation – 1, i.e., 8.7, 9 and 8.8 respectively. Thus it can concluded that the mean scores of overall acceptability was highest 8.9 and it fell in the category of “Excellent”. Among all the variations, variation – 1 has been selected as standardized final product as its mean values were more when compared with other two variations. It was selected by panel members, as it has significant higher mean scores for appearance (9), taste (9), texture (9), colour (9), flavor (9) and overall. **Conclusion:** In recent times the eating habits and pattern of people in India have changed, there has been industrialization and urban sprawl. There is so much change in lifestyle with it brings change in eating patterns as well. People want something convenient and fast but also healthy and beneficial. This standardized value added natural millet-based, indigenous ice cream with dry Fruits Ice Cream is nutri dense. It serves as a good value-added frozen dessert thereby meeting the demand of consumers today and helps in popularizing use of millets by all age groups and requires less than 20min of preparation time. For freezing it needs four hours or more. It is different from the regular commercially available ice cream as it is filled with benefits of Foxtail Millet, Almond, and Pistachios, making a good to healthy snacks or dessert. **Keywords:** All age group, millets, value addition, frozeen dessert, high energy, nutrientdense.

PPFSN-131 Daisy Sharma - Withdraw

PPFSN-132 PROCESS STANDARDIZATION FOR FOXTAIL METHI KHAKHRA. ***N Ilakya***, Email:- ilakya16@gmail.com

Background & Objectives: Khakhra is a most popular snack in Guajarati and Rajasthani cuisine, which yields energy. Foxtail millets are rich source of B-vitamins and traditional millet which is being used in various preparation in various product. The objective of the study was to develop a heathy snack using traditional millet with incorporation of methi leaves. **Materials & Methods:** The standard protocol of khakhra was standardized for the incorporation of foxtail millet with methi leaves and the mixture was mixed with masalas. Sensory evaluation was conducted by a panel of 15 semi trained members using 5 point hedonic rating scale. **Result :** Sensory evaluation showed that sensory scores of foxtail methi khakhra were 4.4 ± 0.5, 4.6 ± 0.4, 4.4 ± 0.5, 4.6 ±0.5 and

4.6 ±0.5 for appearance, taste, texture, color and overall acceptability respectively whereas those were 4.7 Â± 0.4, 4.8 Â±0.2, 4.7 Â± 0.3, 4.7 Â±0.4 and 4.6 Â± 0.4 for wheat khakhra respectively. Energy (Kcal), protein (g), fat (g) and Carbohydrate (g) were 323.18,11.5,3.1 and 62.22for foxtail methi khakhra (100g) and those were 312.73, 10.57, 1.53 and 64.17 for wheat khakhra (100 g) respectively. **Conclusion :** Foxtail methi khakhra was prepared to provide a healthy snack and to develop the traditional practice of using millets in the food. **Keywords:** foxtail, methi, khakhra.

PPFSN-133 PEANUT A NATUREâ€™S NUTRITIOUS FOOD AND GOOD SOURCE OF IRON AND ZINC. ***Amrit Lal Singh***, Sushmita, M.K. Mahatma, V. Chaudhari, C.B. Patel, Lokesh Kumar, ICAR-Directorate of Groundnut Research, PB 5, Gir Natl Park Road, Junagadh, Email:- alsingh16@gmail.com

Background & Objectives: The peanut (Arachis hypogaea L), is the most important source of protein and edible oil and about 42 million (m) tonne of its pods are harvested from about 25 m hectares of land in 120 countries of tropical and subtropical world mainly in Asia and Africa. However, it is consumed worldwide either as raw, roasted, boiled, fried or through various culinary preparations and snacks, and its consumption as food has gone very high in recent past. **Materials & Methods:** Standard analytical procedures were followed. **Result:** Peanuts are rich source of minerals with nearly 30 essential nutrients and vitamins (niacin, folate, and vitamin E). There are more than 200 peanut cultivars released in India with large variations in oil, protein and mineral contents which also vary with growing environments. The analysis of seeds of these peanut cultivars grown over locations showed 41-59 % oil, 18-35 % protein, 350-800 ppm Ca, 25-93 ppm Zn and 40-110 ppm Fe and can act as source for alleviating Zn deficiency, a common problem of Indian population. A number of cultivars high in oil, protein, Fe and Zn have been identified. The peanut contain â€œgoodâ€ fat (unsaturated and free from trans types) which help in maintaining blood cholesterol levels and is heart friendly. With sufficient quantities of MUFA (oleic acid, 40-50%) and PUFA (linoleic acid, 25-35%) its oil is good from both nutritive and culinary purpose. Also due to its high oleic/linoleic ratio, itâ€™s oil has a longer shelf-life and presence of antioxidant tocopherol (~1 mg/g oil) prevents development of rancidity. **Conclusion :** The high yielding cultivars GG 20, M13, ALR 2, BAU 13, ICGS 76, CSMG 9510, CSMG 84-1, and BG 3 with > 52 % oil and ALR 2, TG 37A, CO 2, GG 5, GG 7, TG 26, with > 25% protein can enhance oil and protein productivity of the country. **Keywords:** peanut, Fe and Zn, oil and protein.

PPFSN-134 FEASIBILITY AND ACCEPTABILITY OF GUAVA LEAF POWDER (GLP) INCORPORATED TRADITIONAL INDIAN RECIPES AND DETERMINATION OF SHELF LIFE AND PHYTOCHEMICAL ESTIMATION OF GLP INCORPORATED INDIAN CRISPY BITES (ICB), ***Swati Parnami***,K Chamthoi, Mini Sheth, Uma Iyer, Komal Chauhan, Swati Dhruv, Shonima Venugopal, Vijayata Sengar, Unnati Bhavsar, Meghana Patel,Padmini Thakore, Neha Soni, Riya Rammohan, Charanjeet Salooja, Jesna Mathew, The M.S.University of Baroda, Email:- swatiaap@gmail.com

Background & Objectives: With a storehouse of phytochemicals and thus its therapeutic properties, Guava leaves have been reported in countless in vitro and in vivo studies, as well as a few clinical trials, to be a functional food with immense potential in numerous disease conditions such as diabetes, cardiovascular and liver diseases, cancer, dental health, diarrhoea, gastroenteritis, wounds and skin diseases, degenerative muscular diseases as well as inflammatory diseases such as rheumatism. Guava leaves have been explored for its benefits as tea and extracts, however, there is scarce data on the incorporation of Guava Leaf Powder (GLP) in indigenous foods to obtain its numerous health benefits. Hence an attempt was undertaken to: 1) Incorporate GLP in traditional Indian recipes and conduct their feasibility and acceptability trials. 2) Determine the nutrient composition of the standard and GLP incorporated recipes. 3) Study the phytochemical profile of GLP and Guava leaf incorporated Indian Crispy Bites (ICB). 4) Determine the shelf life of the Guava leaf incorporated ICB. **Materials & Methods:** Four traditional Indian recipes, selected with different methods of cooking were Handwa, Thepla, Muthiya and Indian Crispy Bites (ICB), and incorporated with Guava Leaf Powder at the levels 5%, 7.5% and 10% by substitution in Handwa, Thepla, Muthiya and addition in Indian Crispy Bites. Sensory evaluation was used to evaluate the acceptability of the sensory attributes through the sensory tools-Composite Scoring Test, Hedonic Rating Scale and Difference Test.The shelf life of the GLP incorporated ICB after packaging in LDPE was determined by microbial analysis, moisture content, Peroxide and Fatty Acid Value, and sensory evaluation for change of sensory characteristics. **Result :** Feasibility and acceptability studies of traditional Indian GLP incorporated recipes revealed Guava leaf powder can be successfully incorporated up to 10% level in ICB and Muthiya, 7.5 % in Thepla and up to 5% in Handwa. All the GLP incorporated recipes were significantly different

from the standard which could be masked by addition of spices, sauces or such flavour masking alternatives. Relative ranking revealed that amongst the recipes, ICB had highest overall acceptability at varying levels of GLP incorporation. On the Hedonic Rating Scale, 5 % level of GLP incorporation was found to have the best acceptability amongst all levels of incorporation. The phytochemical analysis of leaf powder of Guava showed presence of Phenols, Flavonoids and Tannins. However, its incorporation in ICB showed presence of phenols and tannins and absence of flavonoids. This loss may be attributed to losses during cooking and low concentration of GLP in ICB (10 g per 100g). The shelf life study of GLP ICB showed that values of chemical analysis (Peroxide Value, Fatty Acid Value and Moisture content), microbial analysis (Total Plate Count, Yeast and Mold, and E.coli count) and sensory analysis on a period of 3 months were within the acceptable limits. **Conclusion :** Hence it could be concluded that Guava Leaf Powder incorporated Indian Crispy Bites were rich in phytochemicals, acceptable and safe for human consumption at least for 3 months of storage period. Guava leaf powder is a rich source of phytochemicals and could be added to oneâ€™s daily diet. However, further scientific investigation in the regards to other novel foods is needed to be carried out. **Keywords:** Guava leaf, phytochemicals, Acceptability trial, Feasibility study, traditional Indian recipes.

PPFSN-135 DEVELOPMENTOF MILLET LADOO MIX. ***Pavitra.K,***
Email:- Pavitrapaviaug@gmail.com

Background & Objectives: Development of calcium rich Millet ladoo mix for pregnant women,lactating mothers,adolecents and calcium deficient group and to mark the year of millets **Materials & Methods:** The study was carried out in smt.VHD central institute of home scienceand research center Bangalore , Karnataka .to develop value added millet based product with a combination of millets,edible gum and flax seeds using experiment method and variation was evaluated on nine point hedonic scale by 15 semi trained panel members in the college and the variation with highest acceptance was chosen as final product which was then chemically analysed for micro and macro nutrients in the lab and shelf life study was done for 15days. **Result:** The developed millet ladoo mix had a shelf life of 12 days with a nutritive value of : ash 2.31%,mositure 6.52%,fibre 1.63g,carbohydrates 76.1g, energy 365.29kcal ,protein 3.03g, fat 10.38g and calcium 193.221 mg per 100g of the product. **Conclusion:** Hence the developed millet ladoo mix is rich in calcium with 193.22mg per 100 g .as it is natural with no added flavours , artificial colours and refined sugar so it is safe and can be consumed by all age group to maintain good bone health and to minimise the risk of osteoporosis in future and to restore the calcium levels during pregnancy ,lactation and by other calcium deficient group. **Keywords:** Calcium,millets,edible gum.

PPFSN-136 DEVELOPMENT OF VALUE ADDED MULTI MILLETS NAMKEENS. ***Sudha kumbar,***
Dr.Usha Devi C, Dr. Navneetha. R, Department of Food and Nutrition and Research Centre, Smt. V.H.D Central Institute of Home Science (Autonomous), Seshadri Road, Bengaluru Email:- sudhakumbar.sudhi@gmail.com

Background & Objectives: Aim: Development of value-added multi millets Nankeens. Objective: 1. To develop value added multi millets Namkeens using different proportions of millets. 2. To standardize millets based Namkeens. 3. To subject the developed product to Sensory evaluation of various value added multi millets Namkeens variations using 9-point hedonic scale and to study its acceptability. 4. To do shelf life study of standardized value-added multi millets Namkeens. 5. To study the nutritional composition of standardized value added multi millets Namkeens. 6. To assess the cost and nutritional labelling of packed developed product. DEVELOPMENT OF VALUE ADDED MULTI MILLETS NAMKEENS Sudha kumbar 1, Dr.Usha Devi C2, and Dr. Navneetha. R3 (1. Research Scholar 2. Head of Department, 3. Assistant Professor, Department of Food and Nutrition and Research Centre, Smt. V.H.D Central Institute of Home Science (Autonomous), Seshadri Road, Bengaluru – 560 001) Email: sudhakumbar.sudhi@gmail.com Abstract The study was carried out keeping in mind the current interest of value addition of foods because of increasing awareness among the consumers. Millets are one of the oldest foods known to human and possibly the cereal grain to be used for domestic purpose. Millets are highly nutritious, non-glutinous and not acid forming foods, they are smoothing and digest. The main of study conducted was to develop a value added multi millets namkeens. A value added multi millets namkeens are rich in fibre, rich in various proportions of millets flour such as jowar, foxtail millet, Ragi, Bhajra and little millet. Two variations of multi millets namkeens developed with different millet and pulses flour combinations were attempted in this investigation. One variation is with jowar flour20%, bhajra flour20%, little millet flour 10%, ragi flour 10%, foxtail millet flour10%, besan flour. combination and another one is only with jowar flour10%, bhajra flour20%, little millet flour 10%, ragi flour 10%, foxtail. **Materials & Methods:** Materials required:Jowar(sorghum), foxtail millet flour,Ragi flour,Bhajra flour,little millet flour,black gram dhal flour,Bengal gram dhal flour,Carom seeds,

White sesame seeds, Curry leaves,Green chilies,Oil,Packaging material,Equipments such as Weighing machine, frying pan, bowl and vessels etc. **Method:** the method used for study is experimental. **Result:** Most of the millet Namkeens commercially available in the market are made with Maida, baking powder. Usually commercial millet Namkeens are prepared with maida, baking powder along with chemical preservatives, acidity regulators, food colors etc. this caused the need for this study. Various trials were made in an attempt to get a with Natural Ingredients that is acceptable by the general population. 1st trial was done with Jowar flour20%-bhajra flour20%-little millet flour 10%- ragi flour 10% -foxtail millet flour10% - besan flour 20%-carom seeds, spices and oil (deep fry)10%. which was very good, kept in room temperature for 20 days. Next trial was made with Jowar flour10%-bhajra flour20%-little millet flour 10%- ragi flour 10% -foxtail millet flour10% - besan flour 10%- black gram dhal flour 20%- carom seeds, spices and oil (deep fry)10% and other natural ingredients, which was giving crispy can be kept at room temperature for 15 days. Among the two trials second trial was accepted by most of the population were the proportion of the trial was Jowar flour10%-bhajra flour20%-little millet flour 10%- ragi flour 10% -foxtail millet flour10% - besan flour 10%- black gram dhal flour 20%- carom seeds, spices and oil (deep fry)10%. It was giving a very good odour and taste. Sensory evaluation conducted by 20 semi trained panel members the results indicated that millet Namkeens with different variations was acceptable to consumers. **Conclusion:** Government of India announced 2018 year as “National Year of Millets” so, I have selected the project topic as value added Millet Namkeens.The multi Millet Namkeens were prepared with natural ingredients and rich in protein. It can be preserved without any added preservatives and flavoring agents. The multi millet Namkeens has good acceptable taste and good flavour, most of all age group people are addicted to junk foods which effect the health of individual. So this product is help full to be used as snacks. This product has good quality, nutritious and health benefits with maximum consumer acceptance. **Keywords:** Keywords: millets, value addition, good source of nutrients.

PPFSN-137 DEVELOPMENT OF TRADITIONAL BREASTFAST FOOD FROM WHITE RAGI. ***Tousif pasha*[1],** Prakruthi M[1], Dr.Shobha D[2] , Shabeena Sultana[1], Dr.Mahesh MS[1], 1= Department of food science and nutrition (yuvaraja's , 2= Zonal Agricultural Research Station, VC Farm, Mandya, Email:- sudhakumbar.sudhi@gmail.com

Background & Objectives: Introduction: Ragi (Elusive coracana) also known as finger millet is a staple food of millions inhabiting the arid and semiarid tropic of the world. Being nutritionally superior to rice, provides proteins, minerals and vitamins to poorest of the poor with least water and carbon footprint. Its proximate composition is superior to wheat, maize, sorghum and rice with regard to dietary fiber, calcium and few micronutrients. Ragi varies in color from black to brown to white depending on the variety. White ragi is gaining importance due its superior nutrition content compared to brown ragi in terms of proteins. Thus in the present study traditional breakfast food Roti (rotti, an unleavened pancake) was prepared from white ragi flour. **Materials & Methods: Methods:** Rotti was prepared from both brown and white ragi flour as per standard recipe with different variations. Five variations (100:0, 75:25 50:50, 25:75, 0:100 BR:WR) where a part of BRF were replaced with WRF. Roti thus prepared were evaluated for their sensory attributes by a semi trained panel members using hedonic scale. The highly accepted WRR was selected for further study the nutritional composition vis-à-vis Roti from BR. **Result:** Among the 5 variants, WRR prepared replacing BRF completely with WRF was most preferred by sensory panellist with overall acceptability (OAA) score of 8/9 and was on par with control (100% BRF). Both the product received similar scores for all the sensory attributes. While moisture levels, CHO and energy provided were same, WRR had higher protein content (1.5 X) and low in phosphorous. **Conclusion: Discussion:** WRF is superior to rice and has 2X more protein and equivalent to wheat minus gluten. Both BRF and WRF are rich in fiber and low Carbohydrates which makes them a low GI foods. They are also rich in calcium and Iron compared to rice. Replacement of BRF with WRF into traditional Ragi recipes may improve the nutritional constituent of the product. **Keywords:** White Ragi Rotti.

PPFSN-138 COMPARATIVE EVALUATION OF SENSORY AND NUTRITIONAL QUALITY OF DUMPLINGS FROM BROWN AND WHITE RAGI. ***Sushmitha LJ* [1],** Shabeena S[1], Prajna B[1] , Dr.Shobha D[2], Dr.Mahesh MS[1], 1= Department of food science and nutrition (yuvaraja's , 2= Zonal Agricultural Research Station, (ZARS), VC Farm, Mandya, Email:- sudhakumbar. kslj771995@gmail.com

Background & Objectives: Introduction: Ragi dumpling is one of the traditional foods consumed in lunch and dinner. It’s popular dish for rural population. In cities health conscious people are consuming ragi but still it’s not very popular owing its dark color and certain associated taboo. There’s urgent need to popularize the once

popular ragi since its superior to rice in terms of protein and fiber and micronutrients. White ragi is even superior owing to its higher protein content. Hence in this study an attempt was made to prepare dumplings from white ragi flour (WRF) and compare its nutritional quality vis-à-vis brown ragi flour (BRF). **Materials & Methods: Methods:** Dumplings were prepared by varying the proportion of WRF and BRF i.e. 100% BRF,100% WRF,50:50 (BRF&WRF) and 75:25(WRF & BRF).Sensory attributes were evaluated by semi trained panel members using 9 points hedonic scale. The highly accepted dumpling was selected for further study of nutritional composition by standard AOAC methods. **Result:** Among 4 variantdumplings, dumpling prepared with 50:50 was most preferred by sensory panellist with overall acceptability score of 8.4/9. When compared with normal brown ragi dumpling 50:50 dumpling scored better in flavour, taste, appearance and texture. Overall acceptance profile got enhanced by addition of50% WRF. While moisture levels and energy provided were same, dumplings from WRF had higher protein content (1.5 X) and low in phosphorous. Other macro and micro nutrients were akin to BR. **Conclusion: Discussion:** WR is superior to rice and has 2X more protein and equivalent to wheat minus gluten. Both BR and WR are rich in fibre and low Carbohydrates which makes them a low GI foods. They are also rich in calcium and Iron compared to rice. Incorporation of WR into traditional ragi recipes may improve its color and nutritional profile. **Keywords:** White and Brown ragi dumpling.

PPFSN-139 DEVELOPMENT AND STANDARDIZATION OF WAT-TEA. ***Syeda Sara Huma,*** Smt. VHD Central Institute of Home Science, Email:- syedsarahuma@gmail.com

Background & Objectives: The study was carried out keeping in mind the current interest of value added foods because of increasing awareness among the consumers and to develop value added watermelon seeds based "Wat-Tea" using different proportions of ingredients. Wat-Tea is a healthy nutritious beverage made by using naturally available ingredients with the value addition of seeds that are accepted by general population of consumers. It was developed with the goodness of 50% watermelon seeds, 20% saunf, 20% mint leaves, and 10% cumin seeds, with no added preservatives, artificial colours and flavours. **Materials & Methods:** The present study aimed at sensory evaluation, proximate analysis and shelf life study. The product was subjected to sensory evaluation by 15 semi trained panelists. Sensory qualities include appearance, colour, texture, taste, odour and overall acceptability. A 9-point hedonic rating scale was used. **Result:** There was no statistical significant difference with respect to appearance and overall acceptability. The nutritionally enhanced product was rich in fiber, antioxidants, fatty acids and lots of minerals with a shelf life of 5-6 hours at room temperature and 2 days at refrigerator temperature. **Conclusion:** Wat-Tea can be a good replacement for the commercially available green teas filled with added colours and preservatives. It plays an important role in maintaining overall health, digestion and detoxifying the body. **Keywords:** Value added product, Watermelon seeds, no added preservatives, antioxidant rich.

PPFSN-140 DEVELOPMENT OF BREAKFAST PRODUCT FROM BARNYARD MILLET - SHIAVALAKI (UROCHOLA RAMOSA). ***Yashwanth Kumar LS[1],*** Chaithra GH[1], Prakruthi M[1], Dr.Shobha D[2], Dr.Mahesh MS[1], 1=Department of food science and nutrition (Yuvaraja's college), 2=Zonal Agricultural Research station ,VC farm, Mandya, Email:- yashunayak82@gmail.com

Background & Objectives: Introduction: Breakfast, the first meal of the day is mostly dominated by products derived from Rice, wheat, corn etc., Millets were used as breakfast items before world shifted to Rice and wheat after green revolution. Millets are still consumed in pockets and not wide spread. Rice with low protein and fiber and high in carbohydrates are high GI foods. Wheat though rich in protein, gluten is not tolerated by a large section of people. Millets have protein content equivalent to wheat minus gluten and have very high fiber content making them low GI food. Thus in this study we developed a traditional breakfast food (SihiAvalakki) from Barnyard millet flakes (BMF). **Materials & Methods: Methods:** SihiAvalakki (SA) was developed as per traditional recipe for both Rice Flakes (RF) and BMF. SA thus prepared were evaluated for their sensory attributes by a semi trained panel members using hedonic scale. Also analysed for its nutrient profile (AOAC. **Result:** Organoleptically, there was no significant difference between the SAs in all the sensory attributes. However, the SA from BMF was superior to that of SA from RF in its nutritional profile. BMF SA had 16 kcal less energy and 8 g less carbohydrates compared to RF SA. Further it had 1.5X protein, 2X minerals and 4X crude fiber than SA form RF. Fat and moisture remained same. **Conclusion: Discussion:** SA is one of the most basic tiffin/breakfast from Karnataka cuisine cooked generally with flakes in powdered form. BMF is ideal for breakfast since its GI and GL is very low and delivers better protein levels. Low GI and GL foods are the need of the hour to counter the pandemic rise of insulin resistance and diabetes. BMF SA had fewer calories and compared to RF SA and hence

can used for any diet regimen for weight loss, obesity, insulin resistance and diabetes. **Keywords:** Breakfast product shiavalaki

PPFSN-141 DEVELOPMENT OF BREAKFAST PRODUCT FROM BARNYARD MILLET - GOJJUAVALAKI (UROCHOLA RAMOSA). ***Bhramarambha MS*** [1]**,** Prakruthi M[1] ,Chaithra GH[1], Dr.Shobha D[2], Dr.Mahesh MS[1], 1=Department of food science and nutrition (Yuvaraja's college), 2=Zonal Agricultural Research station ,VC farm, Mandya, Email:- bhramarambhamsbhramarambhams@gmail.com

Background & Objectives: Background & Objective: Breakfast, the first meal of the day is mostly dominated by products derived from Rice, wheat, corn etc., Millets were used as breakfast items before world shifted to Rice and wheat after green revolution. Millets are still consumed in pockets and not wide spread. Rice with low protein and fiber and high in carbohydrates are high GI foods. Wheat though rich in protein, gluten is not tolerated by a large section of people. Millets have protein content equivalent to wheat minus gluten and have very high fiber content making them low GI food. Thus in this study a traditional breakfast food (GojjuAvalakki) was developed from Barnyard millet flakes (BMF). **Materials & Methods: Methods:** GojjuAvalakki (GA) was developed as per traditional recipe for Rice Flakes (RF). Five variations (100:0, 75:25, 50:50, 25:75, 0:100) where a part of RF were replaced with BMF was tried. GA thus prepared were evaluated for their sensory attributes by a semi trained panel members using hedonic scale. The highly accepted BMF GAwas selected for further study the nutritional composition vis-à-vis GAfrom RF. **Result:** Among the 4 variants, GA prepared replacing RF completely with BMF was most preferred by sensory panellist with overall acceptability (OAA) score of 8.32/9 and was on par with control (100% RF). Both the product received similar scores for all the sensory attributes. BMF GA had 18 kcal less energy and 8 g less carbohydrates compared to RF upma. Further it had 1.5X protein, 2X minerals and 8X crude fiber than GA form RF. Fat and moisture remained same. **Conclusion: Discussion:** GA is one of the most basic tiffin/breakfast from Karnataka cuisine cooked generally with flakes in powdered form. BMF is ideal for breakfast since its GI and GL is very low and delivers better protein levels. Low GI and GL foods are the need of the hour to counter the pandemic rise of insulin resistance and diabetes. BMF GA had fewer calories and compared to RF GA and hence can used for any diet regimen for weight loss, obesity, insulin resistance and diabetes. **Keywords:** Breakfast product Gojjuavalaki.

PPFSN-142 DEVELOPMENT OF HEALTHY SNACK PRODUCT (LADDU) BY BROWN TOP MILLET. ***Aruna P*** [1]**,** Prajna B[1] , Dr.Shobha D[2], Dr.Mahesh MS[1], 1=Department of food science and nutrition (Yuvaraja's college), 2=Zonal Agricultural Research station ,VC farm, Mandya, Email:- arunaaru30101996@gmail.com

Background & Objectives: Introduction: Laddu is a ball shaped popular sweet snack in Indian subcontinent. It is made with variety of cereals and legumes flour with jaggery, sugar and other flavouring ingredients which vary by recipe. Often served in festival and other joyful occasions laddu with its sugar content shoots up the blood glucose levels. One of the very popular and common type of laddu is besan laddu prepared from Bengal gram flour (BGF). In this study an attempt has been made to prepare laddu from millets particularly brown top millet (BTM). BTM flour selected to replace since BTM has similar protein levels but higher fiber content than besan and millets are easy to grow and economical. **Materials & Methods: Methods:** BTM flour (BTMF) was prepared from decorticated BTM. Besan flour from the recipe was replaced at different proportion [Variation A(100:0% BGF) B(100%BTM) C(75:25%BTMF:BGF), & D(50:50% BTMF:BGF)] with BTM flour. Laddu was prepared as per recipe and subjected to sensory evaluation on 9 point hedonic scale. Further, best among the variation was analyzed for its nutrient composition (AOAC).**Result:** Among all those 4 different variations the equal proportion of BTM and Besan flour was accepted as the best product. Laddu prepared from BTMF alone was not acceptable had low scores, however laddu with 1:1 BTMF and BGF had sensory scores on par with control (100% BGF). Further analysis of proximate composition revealed that both product had similar protein, fat, CHO and energy content. Moreover, laddu from BTMF had more (2X) fiber compared to control. **Conclusion: Discussion:** Unlike other cereals and legumes, Millets are easy to grow and can be grown in dry and harsh environmental conditions with little or no irrigation. There's urgent need to popularize millets and bring millets into forefront of Indian diet since both rice and wheat are having high carbon and water foot print and high GI. Wheat proteins are not well tolerated and rice is poor in protein. Millets like BTM can effectively take the place of rice and wheat and thus impart of health benefits. But millets with its certain alkaloids and rich saponins are slightly bitter to taste. When used in combination of besan, its bitter after taste was masked and the product was on par with control. With its nutrition composition equivalent to legumes, BTM is superior to all cereals and can serve has better alternative to them and impart several health benefits. **Keywords:** Browntop millet laddu.

PPFSN-143 Basirath Afreen I - Withdraw

PPFSN-144 FINGER MILLET SANDIGE. ***Nethra vathi G,*** Smt. VHD. Central Institute of Home Science, Email:- nethrav14@gmail.com

Background & Objectives: To develop value added Millet based sandige with no added artificial colour ,no added preservative and to standardise the Sandige. To study the shelf life and to subject the standardised sandige to proximate chemical analysis. **Materials & Methods:** Ragi flour,sago,green chilly,jeera seeds,flax seeds, sesame seeds,water and salt. The method used is experimental. Various trials were carried out with different variation. A total of 4 variations were developed. Sensory evaluation was done by a panel of 18 semi trained panelist's using a 9 point hedonic scale and the results were tabulated. Based on the results and all over acceptance Ragi Sandige was selected and standardised with appropriate packaging, nutritional labelling, shelf life studies, budgeting and marketing. **Result:** Sensory evaluation scores were tabulated and sent for the statistical analysis of ONE WAY ANOVA. Based on the over all acceptance variation 2 (I.e ragi sandige) was chosen. Standardisation was done. The Nutritional composition of the Finger Millet Sandige per 100g are as follows: Protein - 3.97, Fat - 0.95g, Fibre - < 0.1mg, Carbohydrate -81.47g, Energy - 307.12kcal, Ash - 3.65%, Moisture- 9.96%, Calcium-203.45mg. The shelf life of the Finger Millet Sandige is 6-12 months. **Conclusion:** In recent times the eating pattern of people in India has been changed. People now prefer more of fast foods and commercially available snacks and junks rather than home made snacks. Ragi sandige is a traditional homemade fryums which is a tasty snack cum a very good accompaniment for a meal. It can be a better substitute for commercially available snacks. Ragi sandige is rich in calcium and high energy which can be enjoyed by any age group. It also has a longer shelf life which can be preserved for 6-12 months. **Keywords:** Finger Millet, standardisation, proximate chemical analysis, statistical analysis.

PPFSN-145 Mehanaz Fathima - Withdraw

PPFSN-146 USING PRANIC-ENERGY TO INCREASE YIELD OF KNOL-KHOL (BRASSICA OLERACEA) AND THUS ENSURING NUTRITION SECURITY. ***Mahesh Shivananjappa***[1]***,*** Nethra M[1] , Srikant Jois[2], Nagendra Prasad[2], Shekhar Naik R[1], 1=Department of Food Science and Nutrition, Yuvaraja's College (Autonomous), University of Mysore, 2= World Pranic Healing Foundation India – Research Center, Mysuru, Email:- mayavishiva@gmail.com

Background & Objectives: India's agrarian crisis has gone beyond agrarian. It's a societal crisis, a Civilizational crisis with largest body of small farmers and labourers on earth fighting to save their livelihoods and thus affecting their food and nutrition security. Green revolution fatigue, uncontrolled usage of fertilizers pesticide has resulted in toxic food produce with low yield. Conventional agri-practices are not yielding desired results. There's a need to explore simple, innovative and inexpensive approaches to double farm income to ensure food and nutrition security. Pranic-agriculture, an ancient science which uses Prana to enhance plant growth. Present study was aimed to understand the application of pranic-energy on growth and yield of knol-khol. **Materials & Methods:** Knol-khol seeds were randomly divided into two groups (control and Pranic). Seeds were sown in rectangular pots housed in green house. Both groups received same amount of water, fertilizers etc., Germination percentage, pre-mature death, growth parameters (lengths and weights of roots, shoots, leaves and whole plant), number of leaves and were all recorded on weekly basis till the end of the study. **Result:** Pranic group had better germination percentage (83v/s77) and reduced premature deaths. Plant height was significantly increased (35.7 cm v/s 32.9) with similar increase in shoot and root lengths. Plant weight was also increased in pranic group (20 g v/s 18.6 g) with similar increase in shoot and root weights. Further, number of leaves and their weight were also significantly increased in pranic group. **Conclusion:** Harnessing traditional knowledge and integrating it with modern technology is the need of the hour to tide over current Agrarian crises. Heavy investment and energy expensive modern technology may not be able to reach a large section of farmers. Simple inexpensive techniques like Pranic healing which can be easily taught and may help farmers in farming as well as post-harvest management of produce and thus enhance Food and Nutrition security **Keywords:** Nutrition Security, Food Security, Agrarian Crisis, Pranic Agriculture, Knol khol.

PPFSN-147 EFFECT OF DIFFERENT PROCESSING METHOD ON NUTRITIONAL QUALITY OF BROWNTOP MILLET (UROCHOLOA RAMOSA). ***Prajna B*** [1]**,** Dr.Shobha D[2], Dr.Mahesh MS[1], 1=Department of food science and nutrition (Yuvaraja's college), 2=Zonal Agricultural Research station , VC farm, Mandya, Email:- prajnad24@gmail.com

Background & Objectives: Introduction: Millets are miraculous in nutrition content and superior to rice in protein content and equal to wheat without gluten. Their increased fiber and low carbohydrate makes them beneficial in lifestyle diseases. Although nutritionally superior their utilization is limited due to the presence of anti-nutritional factors. Treatments like decortication, pearling, soaking sprouting, and malting can overcome these constraints. Brown top millet (BTM) is one of the least researched millet and in this study we investigate the effect of de-cortication (DC), soaking, roasting and pressure cooking (PC) on its nutritional quality. **Materials & Methods: Methods:** BTM was procured from millet section of ZARS and subjected to decortications, soaking, roasting and pressure cooking separately. Macro and micro-nutrient analysis (AOAC methods), anti-nutritional factors (ANF), antioxidant capacity (AOC) and storage studies were carried out as per standard procedures. **Result:** Moisture was decreased in PC followed by roasting (8.2 g to 5.4 g, 5.9 g), fat increased in PC, soaking and roasting (4.2 g to 6.5 g, 4.8 g and 4.6 g) content of BTM. Further PC increased carbohydrates content and energy provided. Fiber and mineral levels remained same. However there was significant increase in iron, calcium and phosphorous levels than DC. Also decrease was observed in the case of tannins, phytic acid, total polyphenols and AOC. In soaking, roasting and PC. **Conclusion: Discussion:** Unlike ragi, BTM is difficult use as a whole grain due to its thick seed coat. DC makes BTM more palatable but reduces protein and fiber content thus increasing its GI the processing techniques increased the physic chemical accessibility of micro nutrients and the content of compound that improves bioavilability. **Keywords:** Nutritional quality of brown top millet.

PPFSN-148 DEVELOPMENT AND EVALUATION OF NUTRI-FRUITY JAM FOR ALL AGE GROUPS. ***Hifza khan,*** Smt VHD Central Institute of Home Science, Email:- hifzakhan76@gmail.com

Background & Objectives: Jams available in the market are made up of articial flavours and preservatives that can cause many harmful health effects. The nutri-fruity jam is made up of natural ingredients that gives the product a high nutritional value and medicinal benefits with use of natural flavoring substance like cinnamon. **OBJECTIVES:** To develop a Nutri-fruity jam using chia seeds and muskmelon seeds and variation using cinnamon. To standardize and study the nutritional composition of the standardized Nutri-fruity jam and shelf life of the product. Materials & **Methods:** Grapes, Muskmelon, Apple, Pineapple, Chiaseeds, Muskmelon seeds, Cinnamon, Lemon juice, Sugar. **METHOD:** The chia seeds and muskmelon seeds were powdered separately. All the fruits were blended and pulp was strained and the juice was taken for preparation. The blend was poured into a non-stick pan and kept on medium flame. As the blend came to a boil after 2-3 mins, sugar was added stirred for a while. Then all the other ingredients were added and stirred well. The jam was let to cook for 10 mins on a medium flame. Then it was continuously stirred for about 5-8 mins until the jam thickened and reached the desired consistency. The jam was then removed from the flame and let to cool at room temperature and filled in an air tight container and stored in refrigerator. **Result:** Different variations were tried with no flavor addition (Regular) and addition of spices for two different flavours. The variation with cinnamon flavor was selected by the panel members and from proximate chemical analysis per 100g of the jam contained, 310.40kcal,Protein-<0.5g,Fat-10.77g, Fiber-<0.1g, CHO-62.53g, Ash-0.89% and moisture-25.81%. **Conclusion:** Nutri-Fruity jam contains goodness of mixed fruits, mixed nutritious seeds, prepared using all natural products, is free from artificial colouring agents, artificial preservatives and is vegan. All age groups of consumers can enjoy this Nutri-Fruity jam with a variety of food preparations. **Keywords:** Nutri-Fruity jam, chia seeds, muskmelon seeds, cinnamon.

PPFSN-149 DEVELOPMENT AND QUALITY EVALUATION OF LYCOPENE ENRICHED WHEY BASE FUNCTIONAL BEVERAGE. ***Kavita Amol Mane***, Snehal Ghadage, Vasant N. Pawar, MIT College of Food Technology, MIT ADT University, Rajbaug, Pune, Email:- kavita83.more@rediffmail.com

Background & Objectives: The production and consumption of functional foods has gained much importance as they provide health benefits beyond the basic nutritional functions. At present, beverages are by far the most active functional food category because of convenience and possibility to meet consumer demands. Moreover, they are an excellent delivering means for nutrients and bioactive compounds including lycopene. Lycopene is a

potential antioxidant than other forms of carotenoids. The efficacy of lycopene to reduce risk against cancer, coronary heart disease and other chronic conditions was assessed by various groups of scientists to justify relative health claim. Inherent capacities of human body to explore health benefit potential of lycopene as a food ingredient totally depends on outsource consumption against in vivo synthesizing inability. Whey is a water base dairy industry by-product delivered after coagulation of milk constituents. Whey proteins as specialty protein molecules containing essential branched chain amino acids notified their significance as a nutritive ingredient helps in growth and repair of tissue and body composition through improved muscle strength. The endeavour of the said research work undertaken in MIT College of Food Technology, Pune is to formulate lycopene enriched whey base fruit beverage and assess its acceptability as functional beverage. The lycopene enriched whey base beverage certainly offers more nutritional value and has to be projected for health claim base goodness to upgrade its commercial potential. **Materials & Methods:** In present investigation, a dairy waste, whey from paneer processing was utilized for development of value added beverage using tomato puree which is a rich source of lycopene. Whey fruit juice beverages were formulated using different proportions of whey and tomato puree and evaluated for organoleptic properties by sensory evaluation and physico-chemical properties (pH, TSS, acidity, ash content, total solids, reducing and total sugars, fat, protein and lycopene content) by standard procedures. **Result:** The results revealed that whey can be successfully utilized for development of lycopene enriched whey fruit juice beverage with optimum sensory characteristics. The beverage with 10% of tomato puree was liked most by sensory panel members as compared to other combinations. The tomato puree concentration of 15% and above superimposed its effect as bitter taste so found less acceptable. The progressive increase was observed in nutritional quality of beverage with increase in tomato puree level. **Conclusion:** Blending of fruit juice and tomato puree for preparation of whey base beverages could be a convenient way of utilization to have value added product considering the health benefits of whey and tomato puree. The results of the study showed that whey, a dairy industry by-product can be successfully utilized for the development of lycopene enriched whey fruit juice beverage with optimum sensory characteristics. **Keywords:** Lycopene, Whey, Mango, Pineapple, Tomato puree, Beverage, Sensory, Quality.

PPFSN-150 POTENTIAL OF HIGH-PRESSURE PROCESSING PRESERVATION AS A SUSTAINABLE SOLUTION TO MALNUTRITION. ***Mamtha Chandra singh[1],*** William E Price[2], Yasmine Probst[1].1=School of Medicine (University of Wollongong, Australia) and Illawarra Health and Medical Research Institute (Australia),2= Australian Institute of Innovative Materials (AIIM, University of Wollongong, Australia).Email:-mcs931@uowmail.edu.au

Background & Objectives: Food preservation is in global demand for efficient management of the agricultural produce and distribution chains. Numerous benefits of food processing from transformation of agricultural products to preservation provides a variety of foods to consumers. Novel High-Pressure Processing (HPP) of food represents high quality foods with minimal processing and increased stability of nutrients. This cold pasteurization technique adheres to sensorial and nutritional properties, maintaining freshness of food products. However, this should not neglect the properties of the foods subsequently accomplishing nutrient degradation during storage. Nutrient loss on storage may be more substantial than commonly perceived causing malnutrition. Anthocyanins present in bright coloured fruits and vegetables are strongly associated in preventing various chronic diseases. In this interest, the influence of processing and storage on the stability of anthocyanins in HPP Queen Garnet Plum (QGP) nectar, known to be rich in anthocyanins, was analysed by at -20℃ for 9 weeks for the anthocyanin content. **Materials & Methods:** QGP, nectar stored at -20℃ was analysed by Association of Official Analytical Chemists pH differential methods for total monomeric anthocyanin pigment content of fruit juices. HPP nectar, sterilised and vacuum-sealed in a narrow-necked container was freeze thawed a number of times and analysed. **Result :** The initial concentration was 297.41mg/L of anthocyanins and reduced to 270.51mg/L (9.04%) at -20℃ in 9 weeks. Loss of anthocyanins during 9-week storage at -20℃. **Conclusion :** Despite knowledge of advanced processing and storage methods, anthocyanin degrades on storage. The cause for anthocyanin degradation at -20℃ is unknown. The possibility of oxidation, heterogenicity of the sample, multiple freeze thaw conditions and headspace may be probability of degradation. Freeze-thaw cycles, during transportation and handling processes may affect anthocyanin content. To be potential for in vivo bioactivity the mechanisms underlying the causes of degradation is required.**Keywords:** Anthocyanin, storage, plum, HPP

POSTER PRESENTATIONS - OTHERS

16th Nov 2018 **3.00 pm – 5.00 pm**

Code No.	Name and Address	Title of Presentation
PPON-01	Maneesha Bhatt, College of Community Science University of Agricultural Sciences, Dharwad Email: manishabhattstudent674@gmail.com	Climate Change: Vulnerability On Children Health.
PPON-02	Srishti Mediratta, Pulkit Mathur, University of Delhi Email: - srishti31@gmail.com	Suitability Of Different Profiling Models In Assessing Healthfulness Of Foods In The Indian Scenario.
PPON-03	Kumaresan Kuppamuthu, Microbiology Lab, Department of Biotechnology, Kumaraguru College of Technology, Post Box No: 2034, Coimbatore Tamil Nadu, India. Email: - kumaresan.k.bt@kct.ac.in	Anti-Microbial And Antitumerogenic Efficacy Of Phytoconstituents Derived From Four Medicinal Plant Extracts.
PPON-04	Netra M, Department of Food Science and Nutrition, Yuvaraja College, Mysore. Email: - netramiser2@gmail.com	Effect Of Pranic Energy On Ensuring Nutritional Security By Enhancing Yield Of Amaranth By Pranic Energy.
PPON-05	Prajna. B, Dept. of Food Science and Nutrition Yuvarajas college, Mysore Email: - prajnad24@gmail.com	Effect Of Pranic Energy On Ensuring Nutritional Security By Enhancing Yield Of Knol-Khol (Brassica Oleracea).
PPON-06	Prajna. B, Dept. of Food Science and Nutrition Yuvarajas college, Mysore Email: - prajnad24@gmail.com	Effect Of Pranic Energy On Ensuring Nutritional Security By Enhancing Yield Of Carrot (Daucus Carota Sativus).

PPON-01 CLIMATE CHANGE: VULNERABILITY ON CHILDREN HEALTH. ***Maneesha Bhatt,*** College of Community Science University of Agricultural Sciences, Dharwad Email: - manishabhattstudent674@gmail.com

Background & Objectives: Climate change threatens human health, including mental health and access to clean air, safe drinking water, nutritious food and shelter. Present paper aims to review the available researches conducted on the health impacts of climate change on children and to propose guidelines for action. **Materials & Methods:** It includes historical research method to get an insight into ample amount of past research studies on health impact of climate change on young children across the globe. **Result:** Findings of previous studies indicate that young children are far more vulnerable to climate-related changes because of (1) their growing bodies and internal changes (2) their unique behaviors and interactions with the world around them and (3) their dependency on caregivers. Climate change has resulted in outburst of various respiratory problems, allergies, skin problems, infectious diseases like Malaria, Dengue, Encephalitis and Lyme disease. **Conclusion:** Climate change has its severe impact on young children health through the outbreaks of various diseases. Thus, there is a growing need to propose essential guidelines to overcome severe health impact on children due to climate change. **Keywords:** Climate change, children health.

PPON-02 SUITABILITY OF DIFFERENT PROFILING MODELS IN ASSESSING HEALTHFULNESS OF FOODS IN THE INDIAN SCENARIO. ***Srishti Mediratta,*** Pulkit Mathur, University of Delhi; Email: - srishti31@gmail.com

Background & Objectives: Nutrient profiling models enables people to make healthy food choices. The study aims to find suitability of nutrient profiling models in the Indian scenario. **Materials & Methods:** Nutritional information of packaged food (n=342) was collected from supermarkets and freshly cooked food (n=79) from fast food eating outlets across the city. Nutritive value of freshly cooked foods was taken from food composition tables. Products were profiled using five nutrient profiling models, i.e. Pan American Health Organization (PAHO), Choices, Traffic light, WHO-South-East Asia Region (WHO-SEARO) and Food Standards Australia New Zealand (FSANZ). **Result:** WHO-SEARO and Choices Programme model are category specific and have more stringent cut offs. In categorising Indian products using Choices programme it was difficult to place products in specified categories. Few (n=22) products could be classified according to FSANZ due to lack of required label information. About 45% foods were unhealthy as they did not clear the set criteria. About 83%-95% bakery and confectionary products exceeded fat cut offs, 14%-64% sugar cut offs according to different nutrient profiling models. Among breakfast cereals 22%-61% products exceeded sugar cut offs and 17%-41% saturated fat cut offs. Sugar content was exceeded by 34%-100% beverages. Trans fats cut offs were exceeded by 14%-54% desserts. In desserts category, one unit increase in energy resulted in reduction of 0.27 units in calcium. Correlation between FSANZ score and sugar content was statistically significant ($r=0.72$; $p<0.05$, two tailed). An association between FSANZ score and Traffic light fat, sugar cutoff was found ($p<0.05$, $F=0.0489$) whereas no association was found between salt cut off limits. **Conclusion:** WHO-SEARO and Traffic light model could be used on almost all Indian food products, however the cut offs of the former were more stringent. Majority of products were high in total fat, sugar and salt. This highlights the need for changes in recipes, product formulation and eating habits. **Keywords:** Nutrient profiling, food choices, labelling, regulations, healthy eating.

PPON-03 ANTI-MICROBIAL AND ANTITUMEROGENIC EFFICACY OF PHYTOCONSTITUENTS DERIVED FROM FOUR MEDICINAL PLANT EXTRACTS. ***Kumaresan Kuppamuthu[1]***, Shree Sarvatha B1[1], Bharathi Santhose Narasimman[2], Sathish Kumar Thiyagarajan[1], Thirumurugan Alagu[1], Vinohar Sthephen Rapheal[1],1=Microbiology Lab, Department of Biotechnology, Kumaraguru College of Technology, Post Box No: 2034, Coimbatore Tamil Nadu, INDIA.2=Department of Clinical Microbiology, Government Coimbatore Medical College Hospital, Coimbatore, Tamil Nadu, INDIA. Email: - kumaresan.k.bt@kct.ac.in

Background & Objectives: The uses of chemicals for the treatment of diseases have tremendous side effects, whereas the importance of developing drugs from natural sources is prominent nowadays. The aim of the study is to investigate the antimicrobial and anti-tumerogenic activity of the selected plants Ipomoea mauritiana, Atrocarpus hirsutus, Oxalis corniculata and Cassia auriculata. **Materials & Methods:** To extract and screen the phytoconstituents of the selected plant extracts (Ipomoea mauritiana, Atrocarpus hirsutus, Oxalis corniculata and

Cassia auriculata) using cold percolation method. To determine the Antimicrobial and anti-tumorigenic activity of the selected plant extracts. The fractionized is subjected to TLC and 2DPTLC for separation and these separated individual bands was subjected to LC-MS analysis **Result:** Studies on antimicrobial properties of hexane, chloroform, ethyl acetate and methanolic extract of selected plants was evaluated against bacteria Staphylococcus aureus, Klebsiella species and fungal species Candida albicans and Candida tropicolis by agar well diffusion method, then the zone of inhibition was measured. It was observed that the chloroform extracts exhibited a significant zone of inhibition in the antimicrobial susceptibility test. From the TLC and PTLC analysis, plant extracts revealed the presence of phenolic acids (Ipomoea mauritania, Oxalis corniculata and Cassia auriculata) and flavonoid (Atrocarpus hirsutus,). The anticancer activity of selected plant extracts were tested against MCF 7 cell line. From this percentage of inhibition and IC50 values were evaluated. The IC50 value for the selected plant extract (Ipomoea mauritania, Atrocarpus hirsutus, Oxalis corniculata and Cassia auriculata) was found to be 107.80 µg/ml, 553.4 µg/ml, 165.5 µg/ml and 226 µg/ml. Our investigation proved that the selected plant extracts have a promising antimicrobial and anti-tumerogenic activity, thus it can serve as an alternative therapy. **Conclusion:** The presence of Caffeoyl glucose derivative belong to phenolic acid class is recorded by LC MS analysis in the tuber of Ipomoea mauritiana may be responsible for the significant inhibition. Finally, it can be concluded that Ipomoea Mauritania, Atrocarpus hirsutus, Oxalis corniculata and Cassia auriculata can be used as a efficient alternate against synthetic drugs to manage fungal infection. This enables us to conclude the authenticity of traditional medicine. **Keywords:** Anti-microbial, Phytoconstituents, Phenolic acids, flavonoid, Antitumerogenic.

PPON-04 EFFECT OF PRANIC ENERGY ON ENSURING NUTRITIONAL SECURITY BY ENHANCING YIELD OF AMARANTH BY PRANIC ENERGY. ***Netra M*** [1]**,** Dr. Mahesh MS[1]**,** Srikant Jois[2]**,** Dr. Nagendra Prasad[2] 1= Department of Food Science and Nutrition, Yuvaraja College, Mysore.2= WPHF, I-RC, Mysore Email: - netramiser2@gmail.com

Background & Objectives: India's agrarian crisis has gone beyond agrarian. It's a Societal crisis, a Civilizational crisis with largest body of small farmers and labourers on earth fighting to save their livelihoods and unable to find a bride. Green revolution fatigue, uncontrolled usage of fertilizers pesticide has resulted in toxic food produce with low yield. Conventional agri-practices are not yielding desired results. There's a need to explore simple, innovative and inexpensive approaches to double farm income. Pranic-agriculture, an ancient science which uses Prana to enhance plant growth. Present study was aimed to understand the application of pranic-energy on ensuring nutritional security by enhancing growth and yield of Amaranth. **Materials & Methods:** Amaranth seeds were randomly divided into two groups (control and Pranic). Seeds were sown in rectangular pots housed in green house. Both groups received same amount of water, fertilizers etc., Germination percentage, pre-mature death, growth parameters (lengths and weights of roots, shoots, internode, leaves and whole plant), number of nodes, leaves, flowers were all recorded on weekly basis till the end of the study. **Result :** Pranic group had better germination percentage (76 v/s 60) and reduced premature deaths. Plant height doubled (42.1 cm v/s 21.6) with similar increase in shoot and root lengths. Plant weight was also greatly increased in pranic group (18.3g v/s 8.3g) with similar increase in shoot and root weights. Further, number of nodes, leaves and flowers, lengths of inter-nodes were also significantly increased in pranic group. **Conclusion:** This clearly shows that pranic agriculture has a potential to double the yield and provide more crop per drop. Pranic agriculture can be incorporated into any form of agriculture to further enhance the yield. **Keywords:** Prana, plant growth, green leafy vegetables, yield, Amaranth.

PPON-05 EFFECT OF PRANIC ENERGY ON ENSURING NUTRITIONAL SECURITY BY ENHANCING YIELD OF KNOL-KHOL (BRASSICA OLERACEA). ***Prajna. B*** [1], Mahesh MS[1], Srikanth Jois[2], Nagendra Prasad[2] , Netra M[1], 1=Dept. of Food Science and Nutrition Yuvarajas college, Mysore 2=, WPHF, I-RC, Mysore, Email: - prajnad24@gmail.com

Background & Objectives: Indian agriculture is presently at the cross-roads and small and marginal farmers who account for 80% of farmers are on suicide mode with distress. Escalating cost of production, low agricultural productivity and its stagnation, un-remunerative and often volatile output prices have raised question of viability of farming as livelihood. Conventional agri-practices are not yielding desired results. There's a need to explore simple, innovative and inexpensive approaches like zero budget farming, pranic agriculture etc., to double farm income. Pranic-agriculture, an ancient science which uses Prana to enhance plant growth. Present study was aimed to understand the application of pranic-energy on growth and yield of knol-khol. **Materials & Methods:**

Knol-khol seeds were randomly divided into two groups (control and Pranic). Seeds were sown in rectangular pots housed in green house. Both groups received same amount of water, fertilizers etc., Germination percentage, pre-mature death, growth parameters (lengths and weights of roots, shoots, leaves and whole plant), number of leaves and were all recorded on weekly basis till the end of the study. **Result:** Pranic group had better germination percentage (83 v/s 77) and reduced premature deaths. Plant height was significantly increased (35.7 cm v/s 32.9) with similar increase in shoot and root lengths. Plant weight was also increased in pranic group (20 g v/s 18.6 g) with similar increase in shoot and root weights. Further, number of leaves and their weight were also significantly increased in pranic group. **Conclusion:** This clearly shows that pranic agriculture has potential to help distressed farmers and mitigate agrarian crisis to some extent without much input cost. . Heavy investment and energy expensive modern technology may not be able to reach a large section of farmers. Simple inexpensive techniques like Pranic healing which can be easily taught and may help farmers in post-harvest management of produce and thus enhance Food and Nutrition security. **Keywords:** Prana, roots, tubers, growth, yield, knol-khol.

PPON-06 EFFECT OF PRANIC ENERGY ON ENSURING NUTRITIONAL SECURITY BY ENHANCING YIELD OF CARROT (DAUCUS CAROTA SATIVUS). ***Prajna. B*** [1], Mahesh MS[1], Srikanth Jois[2], Nagendra Prasad[2] , Netra M[1], 1=Dept. of Food Science and Nutrition Yuvarajas college, Mysore 2=WPHF, I-RC, Mysore, Email: - prajnad24@gmail.com

Background & Objectives: Indian agriculture is presently at the cross-roads and small and marginal farmers who account for 80% of farmers are on suicide mode with distress. Escalating cost of production, low agricultural productivity and its stagnation, un-remunerative and often volatile output prices have raised question of viability of farming as livelihood. Conventional agri-practices are not yielding desired results. There's a need to explore simple, innovative and inexpensive approaches like zero budget farming, pranic agriculture etc., to double farm income. Pranic-agriculture, an ancient science which uses Prana to enhance plant growth. Present study was aimed to understand the application of pranic-energy on growth and yield of carrot. **Materials & Methods:** Carrot seeds were randomly divided into two groups (control and Pranic). Seeds were sown in rectangular pots housed in green house. Both groups received same amount of water, fertilizers etc., Germination percentage, pre-mature death, growth parameters (lengths and weights of roots, shoots, leaves and whole plant), number of leaves and were all recorded on weekly basis till the end of the study. **Result:** Pranic group had better germination percentage (89 v/s 78) and reduced premature deaths. Plant height was significantly increased (36.2 cm v/s 32.3) with similar increase in shoot and root lengths. Plant weight was also increased in pranic group (15.6 g v/s 14.3g) with similar increase in shoot and root weights. Further, number of leaves and their weight were also significantly increased in pranic group. **Conclusion :** This clearly shows that pranic agriculture has potential to help distressed farmers and mitigate agrarian crisis to some extent without much input cost. Heavy investment and energy expensive modern technology may not be able to reach a large section of farmers. Simple inexpensive techniques like Pranic healing which can be easily taught and may help farmers in post-harvest management of produce and thus enhance Food and Nutrition security. **Keywords:** Prana, roots, tubers, growth, yield, carrot.

POSTER PRESENTATIONS - REVIEW SESSION

16th Nov 2018 **3.00 pm – 5.00 pm**

Code No.	Name and Address	Title of Presentation
PPRS-01	Ruchika Gahlot, Email:- ruchika.gahlot7@gmail.com	Web Based Evaluation Of Nutrition And Empowerment Knowledge Of College Going Girls And Implementation Of Intervention Programme
PPRS-02	Varsha Balu Dhaygude	Withdraw
PPRS-03	Patil Chetan Dnyaneshwar, Email:- patilc083@gmail.com	Preparation Of Bottle Gourd Barfi,
PPRS-04	Sunita Kumari**,** Central Agricultural University, Pusa, Samastipur, Bihar**,** Email:- skap16@yahoo.com	Strategy For Improving Nutritional Status Of Schedule Caste Households In Bihar,
PPRS-05	Shruti Kumari, University Department of Home Science - Food and Nutrition, Tilka Manjhi Bhagalpur University, Bhagalpur Email: - shrutisingh121089@gmail.com	Pshychology Of Unusual Eating Behaviour Among Girls Residing In Hostels And Lodges. A Study Of Patna Town.
PPRS-06	Nitesh Kumar , Post Graduate Department Of Zoology Tilkamanjhi Bhagalpur University, Bhagalpur, Email:- niteshkashyap916@gmail.com	Coarse Grains Way To Nutrition Security For Better Life Style
PPRS-07	Chhotu Kumar Chandan, T N B College Bhagalpur Department Of Zoology Tilkamanjhi Bhagalpur University, Bhagalpur, Email: - chhotuchandan4u@gmail.com	Use Of Iron Way To Food Security For Better Life Style.
PPRS-08	Pushparani D Department Of Food Science And Nutrition, Holy Cross Home Science College, Tuticorin. Email: - pushparani040682@gmail.com	Impact Of Dietary Pattern And Other Causes On The Occurrence Of Diabetes And Mellitus In Individuals (30 -60 Years).
PPRS-09	Vani. Garag Email:- vanigarag12@gmail.com	Effect Of Addition Of Soyachunks And Palak On Poori
PPRS-10	Golmei kadunshinlu, Email: - Kadunshinlu@gmail.com	Junk Food Consumption Pattern Of The School Going Children And Adolescents
PPRS-12	Ishita Agarwal, Institute of Home Economics, University of Delhi, New Delhi, India, Email:- ishita.agarwal215@gmail.com	Role Of Ayurvedic Intervention In Anemia - A Review.
PPRS-13	A.M Beulah Sri Venkateswara University, Email: - beulahbhagath@gmail.com	Application Of Casein Edible Coatings On The Postharvest-Life Of Guava Psidium Guajava L).

REVIEW SESSION (Contd...)

Code No.	Name and Address	Title of Presentation
PPRS-14	Ayushi Chatterjee, Amity Institute of Food Technology, Amity University, Email: - ayushichatterjee@gmail.com	In-Vitro Meat: Meet The New Possibility.
PPRS-15	Krishna Mishra, Department of Food Science and Nutrition, College of Community and Applied Sciences, Maharana Pratap University of Agriculture and Technology, Udaipur, Rajasthan, Email:- krishna.mamuni@gmail.com	Red Rice-The Power-House Of Nutrients For Providing Nutritional Security.
PPRS-16	Drishti Bansal	Withdraw
PPRS-17	Urmila Vijayan	Withdraw
PPRS-18	Mansi Bhardwaj, Department of physiotherapy, Manav Rachna Internation Institute for Research and Studies, Email: - mansibh97@gmail.com	Comparison Between Fat Free Mass Of Basketball Players And Badminton Players Following Same Diet Caloric Intake.
PPRS-19	Meenakshi, Sheena arora, Mansi Bhardwaj, EX-Student, Department of physiotherapy, Manav Rachna Internation Institute for Research and Studies, Email: - meenakshi21am@gmail.com	Comparison Between Percentage Of Body Fat Of Basketball Players And Badminton Players Following Same Caloric Intake
PPRS-20	Jula Sarma, Food Science and Nutrition Email:- julasarma.1995@gmail.com	Morbidity Pattern Of Neonates Admitted To Nicu Of Jorhat Medical College And Hospital, Assam
PPRS-21	Soja Louis, Department of Zoology, St. Teresa's College, Ernakulam, Kochi, Email:- sojalouis@yahoo.co.in	Synergestic Action Of Vitamin C In Preventing Chronic Ailments.
PPRS-22	B.Gwyneth Madhulika, Email: - winnimadhulika@gmail.com	Maintaining Nutrition Security And Diet Quality: The Role Of Food.
PPRS-23	Medha Gupta, Amity Institute of Food Technology, Amity University, Noida, U.P., Email: - medhagupta35.mg@gmail.com	Effect Of Skipping Breakfast On The Nutritional Status Of Adolescents.
PPRS-24	Himavarshaa, Osmania University, Email: - himavarshaa2@gmail.com	A Bumpy Road From Food To Nutrition Security- Slow Evolution Of India's Food Policy.
PPRS-25	Mubina Abdul Aziz Shaikh, SRT University, Nanded (M.S.) India, Email: - shaikhmubeen12@yahoo.com	Evaluation Of Food Security Practices In Midday Meal Programmes In Rural And Urban Areas Of Beed District
PPRS-26	Anushi Dhiman	Withdraw

REVIEW SESSION (Contd...)

Code No.	Name and Address	Title of Presentation
PPRS-27	Fariha Sameen, St.Ann's College for women, Email:- fariha.sameen96@gmail.com	The Need Of The Hour: "Raising The Level Of Nutrition".
PPRS-28	S.Keerthika Reddy, Osmania University, Email: - keerthikareddy23@gmail.com	Nutrition security - An integral component of food security.
PPRS-29	Arushi Jain,	Withdraw
PPRS-30	Megha Kakkar,	Withdraw
PPRS-31	Surabhi Singh Yadav, Department of Nutrition and Dietetics Symbiosis School of Biological Sciences, Symbiosis International (Deemed) University, Lavale, Pune Email:- surabhi.singh@ssbs.edu.in	Socioeconomic, Sociodemographic And Lifestyle Factors In Childhood Undernutrition – Indian Context
PPRS-32	Harsha Chandirani	Withdraw
PPRS-33	Shivangi Singh,	Withdraw
PPRS-34	Manasa V S, PSG College of Arts and Science, Coimbatore Email:- vsmanasavs@gmail.com	A Review On The Positive Effects Of Cultivating Endogenous Dash Diet On Cardiometabollic Syndrome.
PPRS-35	Prathiba Manjunath, Smt.VHD central institute of home science college Bangalore, Email: - prathi.prathi22@gmail.com	Red Rice Flakes Chivda With Goodness Of Melon Seeds.
PPRS-36	Indirani. K Email:- dieticianindhu@gmail.com	Therapeutic Potential Of Honey In Radiation Induced Oral Mucostits (Riom) – Review.
PPRS-37	Elizabeth Jose PSG College of Arts and Science, Email: - elizzy.star@gmail.com	The Mediterannean Diet
PPRS-38	Ankita Yadav G.B.P.U.A.T., Pantnagar, Email: - ankitayadav17@gmail.com	Total Phenol Content And Antioxidant Activity Of Selected Cowpea (Vigna Unguiculata) Genotypes And Health Benefits.
PPRS-39	Disha Sood	Withdraw
PPRS-40	Logaprabha P Department of Home Science, Gandhigram Rural Institute Deemed to be University, Gandhigram, Tamilnadu. Email: logaprabha23@gmail.com	Chemical Composition Of Mango Seed (Mangifera *Indica L)*.

REVIEW SESSION (Contd...)

Code No.	Name and Address	Title of Presentation
PPRS-41	Bhuvaneshwari J The Gandhigram Rural Institute-Deemed to be University, Gandhigram Dindigul (dt), E-mail: bbhuvi01@gmail.com	Health Benefits Of *Garcinia Cambogia*.
PPRS-42	P. Manjupriya Department of Home Science, Gandhigram Rural Institute-Deemed to be University, Gandhigram, Dindigul, E-mail: manjuprmani@gmail.com	Effect Of Consumption Of Wheat And Wheat Production Diabetes Mellitus.
PPRS-43	R.Nithya, The Gandhigram Rural Institute-Deemed to be University, Gandhigram E-mail: nithikanth@rocketmail.com	Phyto Chemical, Functional Properties And Proximate Analysis Sweet Potato Flour
PPRS-44	Jancy Rani.D The Gandhigram Rural Institute-Deemed to be University, GandhigramTamil Nadu E-mail: jancyranifsn@gmail.com	Profile Of Phytochemical, Antioxidant Activities And Lycopene In Fresh And Dried Fruit Proportions
PPRS-45	Kowsalya J, The Gandhigram Rural Institute-Deemed to be University, Gandhigram,Tamil Nadu, E-mail: kowsalyajaganathan98@gmail.com	Qualitative Analysis Of Nutrient And Anti Nutrient Components In Commerical Foods**,**
PPRS-46	Vadumitha A, E-mail: cashereka@gmail.com.	Formulation And Standardization Of Barley Incorporated Noodles”

PPRS-01 WEB BASED EVALUATION OF NUTRITION AND EMPOWERMENT KNOWLEDGE OF COLLEGE GOING GIRLS AND IMPLEMENTATION OF INTERVENTION PROGRAMME ***Ruchika Gahlot,*** Email:- ruchika.gahlot7@gmail.com

Background & Objectives: The health status of women directly reflects the health status of the nation. College girls show common unhealthy eating patterns such as meal skipping, eating away from home, snacking and fast food consumption etc. Faulty dietary patterns may contribute to obesity and may increase the risk for several chronic diseases later in life. Another aspect is reproductive health issues which urgently needs to be addressed. Due to disturbed life style various problems like irregular or infrequent cycle, resulting into polycystic ovarian disease, ovarian tumor, heavy menstrual bleeding may arise. There is a need to address young women regarding their rights because women's empowerment and equality is a fundamental human right and critical to achieve development objectives. Web based nutrition programme focus on a sensory modality view which enhance learning and also involves presenting material that is both visually and auditorially. Objectives: To design a Knowledge and attitude based questionnaire using google forms. To apply internet technology in improving their knowledge. To assess the impact of implemented campaign using same questionnaire. **Materials & Methods:** The study was conducted on120 college girls of IIS University. The pre and post test questionnaire was designed using google forms and the link is emailed to the selected subjects. The designing and implementation was done in three sessions with the help of various IEC material. **Result :** The pre and post test result obtained using t-test showed p value less than 0.05. The p- value obtained between post test scores and follow up was also less than 0.05. **Conclusion :** The awareness regarding nutrition, reproductive health, women empowerment is very less. The government needs to frame policy not only for rural girls but also for girls in urban areas. **Keywords:** Nutrition, Reproductive health, Polycystic ovarian disease, ovarian tumor.

PPRS-02 **Varsha Balu Dhaygude- Withdraw**

PPRS-03 PREPARATION OF BOTTLE GOURD BARFI, ***Patil Chetan Dnyaneshwar,*** B.Tech (Food Tech) Email:- patilc083@gmail.com

Background & Objectives: To prepare nutritious and delicious product.To study nutritious value and product **Materials & Methods:** The bottle gourd burfi is prepared by using milk sugar and bottle gourd. Bottle gourd was grated and mix with sugar and milk.then it was heated upto optimum temperature then it is cooled and packed. Moisture, ash, protein, fat, fiber, are calculated by using AOAC method **Result:** Moisture content in bottle gourd burfi was 48%, ash content is 1%, protein 6.1%, fiber 6.28%, fat 8.62%, carbohydrates 30%. **Conclusion:** Bottle gourd burfi is rich in protein, fat, carbohydrates. **Keywords:** Bottle gourd, fiber rich, mineral rich.

PPRS-04 STRATEGY FOR IMPROVING NUTRITIONAL STATUS OF SCHEDULE CASTE HOUSEHOLDS IN BIHAR. ***Sunita Kumari,*** Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur, Bihar***,*** Email:- skap16@yahoo.com

Background & Objectives: Nutritional Status reflects the condition of health of people which can be attributed to the foods they habitually consume. Despite India's marvelous increase in food production during last thirty years, the nutritional problems of Schedule Caste are still deplorable, mainly due to inadequate food intake. Objective of the study was to develop strategy for improving nutritional status of Schedule Caste household. **Materials & Methods:** The study was conducted on nutritional status of Schedule Caste households in Samastipur district at Dr Rajendra Prasad Central Agricultural University, Pusa (Bihar) **Result:** Nutritional status of any society can be improved by increasing their physical access and economic access to food materials. Strategies for improving physical access to food materials:

(a) Crop diversification - - To promote cultivation of horticultural crops;
- To develop kitchen garden.
- To encourage farmers for production of non-cereal crops

(b) Diversification of activities to non crop enterprises –
- To promote livestock production.
- To create awareness for fish culture.
- To introduce scientific bee-keeping.and mushroom cultivation.

Strategies for improving economic access to food materials:

- Increasing employment opportunities in farm and non- farm sectors
- To increase allied agricultural employment activities, such as processing and preservation, etc.
- To arrange training and facilities to women in preparation of preserved food (pickle, papad, jam, jelly, chips etc) mat making, decorative pieces (the best out of waste), stitching, knitting etc.
- To develop market institutions and infrastructure for sale of home produced products.

Facilitating Strategy: To have a real physical access and an economic access to food materials, facilitating strategies are:

- Improving female literacy and Nutrition education
- Improvement of outreach to basic health care Food quality control
- Use of media for promoting wholesome dietary practices. **Conclusion:** Suggested strategies may not require any subsidy from the government because subsidized strategies are non-sustainable. The local institutions/ beneficiaries should be involved in identification of beneficiaries in different rural development programmes in general and programme of nutritional development, in particular. It will go in long way in improving nutritional security of Schedule Caste society. **Keywords:** Nutritional Status, Schedule Caste, Strategy

PPRS-05 PSHYCHOLOGY OF UNUSUAL EATING BEHAVIOUR AMONG GIRLS RESIDING IN HOSTELS AND LODGES. A STUDY OF PATNA TOWN. ***Shruti Kumari,*** University Department of Home Science - Food and Nutrition, Tilka Manjhi Bhagalpur University, Bhagalpur Email: - shrutisingh121089@gmail.com

Background & Objectives: Food intake is governed by Physiological, environmental and behavioural factors. Food habits are not necessarily static. They are changed according to the need to adapt to a new in new environment, to a new attitudes, to a new values. Eating disorders happen as a result of serve disturbance in eating behaviour, such as unhealthy reduction of food intake or extreme overeating. They include binge eating disorder where people eat a large amount in a short period of time, anorexia nervosa where people eat very little and thus have a low body weight, bulimia nervosa where people eat a lot and then try to rid themselves of food, pica where people eat non-food items. The objectives of the study is to know the etiology of eating disorder among girls, to know the awareness about eating disorder. **Materials & Methods:** A cross sectional study was conducted on girls of 16-21 years to assess unusal eating behaviours. A total 50 girls were selected as a sample. 24 hours dietary recall method, Anthropometric measurement and the self framed questionnaire were used. **Result:** The finding of the study reveals that 90% of the girls were suffering from unusual eating behaviours. 10% respondents had knowledge about eating disorders. The study observes that 35% of the respondents were aware about nutrient where as 65% were not aware about it. 20% of the respondents felt self conscious about body weight or body size. **Conclusion:** From the above analysis, it can be concluded that unusual eating behaviour, as deriving from dieting, feeling of distress or concern about body shape or weight gain and there is a need for nutritional counselling to address this issue. Thus no feast for fast & no fast for feast **Keywords:** eating behaviour, eating disorders.

PPRS-06 COARSE GRAINS WAY TO NUTRITION SECURITY FOR BETTER LIFE STYLE
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Background & Objectives: list of cereals common name (english & colloqual name) botanical name 1. rice or paddy (dhaan chawal) oryza sativa 2. wheat (gehoon) triticum vulgare 3. maize or corn (makka) zea mays 4. barley (jaun) hordeum vulgare 5. oat (jaii) avena sativa 6. ragi or finger millet eleusine coracana 7. sorgham (jowar) sorghum vulgare 8. bulrush millet (bajra) pennisetum typhoideum 9. rye secale cereal 10. kheree millet foxtail; **Objectives** above cereals belongs to gramineae family and are cultivated as annual crops. Cereals constitute the main foodstuff of human beings all over the world. the cereals are rice, wheat, maize, major millets juar, ragi, bajra, kheree, oats, barley are essential for proper nutrition of the human body.above cereals should be included in a balanced diet in right proportion. Mojority of them contains friendly fibres in large proportion which help in improving nutrition.Nutritional status is influenced by a complex interplay of factors. Including availability and access to nutritional foods. Sanitation & access to safe water,maternal education,women's empowerment in agriculture have potentials to influence a number of above factors directly or indirectly regulate the pathways between agriculture and nutrition have been identified. Apart from the role of agriculture as a source of food, it serves as an important source of income for a large section of our population. Agriculture policies and food prices

have profound impacts on intake and nutrition .Incrising feminization of agriculture has implications for women's nutritional status and their ability to manage the care , feeding and health of young children . Refined grains have remained staple diet of approximately 55-56 % of india.highly polished rice is full of starch instead of less polished rice which is rice in bran being discouraged by so called elites. The above ten grains which were being used traditionally as now being rested to only wheat & rice with neutraceutical use of corn, oats, barley .The millets (juar, bajra) ragi, rye foxtail have been eliminated. Restriction of diet on few grain possesses a danger on grain availability and human sustainability. These close linkages between agriculture and nutrition mean that although agricultural initiatives alone cannot solve the nutrition crises in india,they can certainly play a much bigger role toward that end they have thus far. **Background** cereals are the major source of energy rich foods. Millets have occupied an important place in the quantam of cereals in the 21st centuary for its enriched nutritional properties and more over these crops can be grown in dryland areas**. Materials & Methods**: Methods in many states of india, rice occupies first position followed by wheat.a survey was done in bhagalpur district of bihar regarding the use of diverse cereals and millets. **Result:** it was found that major cereals were rice.wheat and maize followed by jowar,bajra kheree oats and barley.there are about ten grains which are being traditionally used but at present wheat and rice are most commonly used cereals.it has been found that barley,oats,kheree,have neutraceutrical properties. The extentive use of rice and wheat may possed a threat to grain availabiality and sustainability. The time has come to give more emphasis on the cultivation and consumption of lesser known cereals and millets because of the health enhancing properties of these cereals are beneficia to person suffering from diabetes,coronary,heart disease, cancer,inhibiting tumour growth and also helps in managing cholesterol.**Conclusion:** conclusion from the review it can be concluded that cultivation and consumption of different types of cereals and millets is not only helpful in management of different of different diseases but also enhance the food quality and better nutrition. **Keywords:** GRAINS , NEUTRACEUTICAL, SUSTAINABILITY, CULTIVATION, CONSUMPTION.

PPRS-07 USE OF IRON WAY TO FOOD SECURITY FOR BETTER LIFE STYLE. ***Chhotu Kumar Chandan,*** T N B College Bhagalpur Department Of Zoology Tilkamanjhi Bhagalpur University, Bhagalpur***,***
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Background & Objectives: Nutrition Nutrition ,Nourishment or Aliment is the supply of materials – Food required by organism and cell to stay alive Nutrition is the process of taking in nutrients from the food we eat. Nutrients are the substances that allow our body to make energy, build and maintain tissues and regulate bodily processes There are 6 important nutrients needed for our bodily processes . They are Carbohydrates, Lipids, Proteins, Water, Vitamins and Minerals. Nutrition. Carbohydrates are quick energy,Lipids provide sustainable energy and Proteins are last resort source of energy. Water makes up about 60% of our body wait . It functions as lubricates to our joints, transports substances around our body and regulates our body temperature. Vitamins and Minerals are required in small quantities. Function of vitamins include energy metabolism, maintaining our visions, protecting our cells from damage and helping with blood clotting. Function of minerals include transporting oxygen in our blood, helping with proper thyroid function and strengthening our bones. Iron an essential Nutrient. Iron are found in all living organisms ranging from the evolutionarily to human. Iron is a component of a number of proteins including hemoglobin , myoglobin , cytochromes and enzymes involved in redox reaction. Almost two third of body iron is found in hemoglobin so the color of blood is red. Iron containing protein called hemoglobin is a perfect transporter of oxygen to tissues. Iron is necessary to support proper metabolism for muscles and other active organs. Iron an essential Nutrient. Almost all the cell in our body burn dietary calories to create energy through a process that requires iron. Iron is a part of many enzymes and is used in many cell functions. Enzymes helps our body to digest food and also help with many other important reactions that occurs within our body. **Materials & Methods:** Types of Iron There are two types of Iron-Heme Iron, Non-heme Iron. The Iron in meat is about 40% heme and 60% non-heme. Much of the Iron in diet, however is in the non-heme form. This is the form found in plant sources such as fruits, vegetables, grain products and in iron fortified foods . About 25-35 percent of heme iron is absorbed, yet this percentage drops to 3-20 percent for non-heme iron. This difference is important because heme iron is found only in animal flesh. For this reason vegetarians compared to non-vegetarians requires 1.8 times the amount of iron when consuming the foods that contains only non-heme iron. Iron Deficiency & It's concern. Iron deficiency is a condition resulting from too little iron in the body. It is the most nutritional deficiency and the leading cause of Anemia. Anmia occurs when a person has lower-than-normal level of red blood cells in th blood . About its concern – Iron deficiency can delay normal infant motor function or mental function. Iron deficiency anemia during pregnancy can increase risk for small or early babies. Small or early babies are more likely to have health problem or die in the first year of life. Iron deficiency can cause fatigue that impairs the ability to do physical works in adults. Iron deficiency may also affect memory or other mental functions

in teens. **Result:** Symptoms of Iron deficiency. Anxiety, Depression, Constipation, Hair loss, Brittle nails, Weakness, Cold hand and feet, Strange cravings for non food items, such as dirt ,ice ,clay……etc, Swelling sorness in the tongue,Missed menstrual cycle, Palpitation, Sleepiness, Breathlessness, Pale yellow skin, Poor appetite, Fainting etc, Causes of Iron deficiency. Due to rapid growth infants and toddlers need more iron than older children. Sometimes it can be hard for them to get enough iron from their normal diet.Women who are pregnant have higher iron needs. Increased blood loss during period in female.Frequent blood donation. Some stomach and intestinal condition(food sensitivity or hook worms. Inability to absorb iron due to certain disorders or surgeries. How it can be Diagnosed & Treated. Diagnosed – It can be diagnosed by complete blood cell test which measure the amount of all component in blood – RBCs , WBCs, Hemoglobin, Platelets. A doctor might also perform additional diagnostic tests to rule out internal bleeding from other parts of body. **Conclusion:** Treated- By taking iron supplements which helps to restore iron level in our body. Diet is an important thing for maintaining iron level in our body naturally we should take rich iron food items in our meal. By treating the underlaying causes of bleeding. Prevention: Iron deficiency can be prevented by taking diet high in iron rich food and vitamin C. **Keywords:** Nourishment, Anaemia, Constipation, Heme Anexity,Depression

PPRS-08 IMPACT OF DIETARY PATTERN AND OTHER CAUSES ON THE OCCURRENCE OF DIABETES AND MELLITUS IN INDIVIDUALS (30 -60 YEARS). ***Pushparani D***. Sathya Lakshmi Department Of Food Science And Nutrition, Holy Cross Home Science College, Tuticorin. Email: - pushparani040682@gmail.com

Background & Objectives: Good health is a major resource and an important dimension of the quality of life. But in the present times, changes in life style and dietary pattern stemming from rapid modernization have favoured increase in the occurrence of non-communicable chronic diet related disorders, among which Diabetes mellitus occupies a primary place. Nutrition education is a major strategy to prevent the incidence of diabetes.**Materials & Methods:** Assessment of Lifestyle pattern, diet history, anthropometry such as height weight, BMI measurements was done on 100 diabetics in selected hospitals in Tirunelveli District. Blood glucose level was assessed using glucometer. Diet and lifestyle pattern were assessed using a questionnaire. Data on food consumption was collected using 24 – hour food recall method. Diet counselling and nutrition education was provided to the diabetics. **Result:** Fifty-eight percent of respondents had diabetes for more than four years, while 38 per cent were diabetic for less than four years. 88 percent of male respondents and all the female respondents took allopathic treatments. Insulin injection was taken by 58 percent of the respondents three times a day. Among the male respondents, 15 per cent were smokers while 20 percent were alcoholics. The respondents also had hypertension, renal disorder and cardiac complications. Regular exercise was followed by 80 percent the respondents, predominantly walking and jogging. 39 percent of the respondents had stress; 13 percent had family problems and 8 percent were pressurised by occupational environment. **Conclusion:** So from the present the study, it can be inferred that the causes for diabetes are heredity, smoking, alcohol, dietary habits and stress. **Keywords:** *Student Name*, **Lecturer**

PPRS-09 EFFECT OF ADDITION OF SOYACHUNKS AND PALAK ON POORI. ***Vani. Garag,*** Kasturiba .B, Email:- vanigarag12@gmail.com

Background & Objectives: INTRODUCTION: Poori is an unleavened deep-fried bread, originating from the Indian subcontinent and is most commonly served at breakfast. It is also served at special or ceremonial functions as part of ceremonial rituals along with other vegetarian food offered in prayer as prasadam and liked by all the age groups. So, addition of soya chunks and palak, makes poori more nutritious than the original poori. Hence, the present study was undertaken with the objective to study the effect of incorporation of soya chunks and palak filling in poori. **Materials & Methods:** MATERIAL AND METHODS: Soya chunks and palak filled poori was prepared in the following ratio, with 100 per cent wheat flour (control), filling of 25 per cent soya chunks (sample A), and 20 per cent soya chunks with 20 per cent palak (sample B). The nutritive value was compared using the nutritive value of Indian foods by NIN. The poori was evaluated for appearance, colour, flavour, taste, texture and overall acceptability, using nine point headonic scale by semi trained panel members. **Result: The** results revealed that filling of soya chunks and palak did not affect the quality of poori. Sample C scored highest overall acceptability score 8.40 and the scores of sample A and B were 7.90 and 7.80 respectively. There was increment in protein and iron with incorporation of soya chunks. The increment of protein in sample B and C was 13.5 % and 10.80 % respectively. And increment of iron in sample B and C was 2.6 % and 2 % respectively. **Conclusion:** CONCLUSION: Poori with incorporation of 20 per cent soya chunks and palak was found acceptable without affecting the sensory attributes. **Keywords:** Palak, Soya chunks

PPRS-10 JUNK FOOD CONSUMPTION PATTERN OF THE SCHOOL GOING CHILDREN AND ADOLESCENTS. ***Golmei kadunshinlu,*** Dr.A.Thirumani Devi,Email: - Kadunshinlu@gmail.com

Background & Objectives: Live to the full, we must be fit and energetic and enjoy living. Many things help to make us to fill life this. The most important is eating right quantity and quality of nutrient foods for health and adolescents are fond of eating foods especially fast/junk foods for their enjoyment. **Materials & Methods:** Household survey was conducted in the residential area of Coimbatore city (n=50) to find out the socioeconomic and dietary profile of the selected subject. Data related to harmful effect of junk foods, and how did junk foods affect health, nutrient present in junk food's reason for addiction of consumption and adverse or harmful health effect of junk foods were collected **Result:** Consumption pattern of junk foods among school children and adolescent girls was found to be 34 % and 32 % respectively. **Conclusion:** In this modern scenario women are mostly employed and gave less time for cooking and other household activities and peer group pressure and media advertisement were also considered as the factors for consumption of junk foods art side and invites many health problem including overweight and obesity. **Keywords:** School going children, adolescents, consumption of junk food, harmful health effects of junk foods.

PPRS-12 ROLE OF AYURVEDIC INTERVENTION IN ANEMIA - A REVIEW. ***Ishita Agarwa[1],*** Kapil Yadav[2], Tripti Rai[2], Gomathi Ramaswamy[3]. 1=Institute of Home Economics, University of Delhi, New Delhi, India, 2=Centre for Community Medicine, All India Institute of Medical Sciences, New Delhi, India,3= NCEAR A, All India Institute of Medical Sciences, New Delhi, India,
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Background & Objectives: Globally, 1.62 billion people are affected by anemia, which corresponds to 24.8% of the population. Apart from the existing modalities, Complementary and Alternative Systems/Traditional Medicines can also be explored for the control of anemia. Interventions with various herbal and iron formulations have been reported in Ayurveda. One such drug (Punarnavadi Mandura) is also included in the National Health Mission's drug kit for anemia. Hence, this review aimed to explore the effect of various ayurvedic drugs on anemia from the existing literature. **Materials & Methods:** Review of literature was carried out using PUBMED, Google Scholar, Cochrane Library, Medline (Ovid), IndMed and by cross-referencing of articles. Key words used included "Pandu Roga", "Anemia", "Ayurveda". Search was restricted to original research articles on human subjects in English language from January 2005 to June 2018. **Result:** The studies included randomized controlled/clinical trials on different study populations which assessed the effectiveness of ayurvedic drugs on improvement in haemoglobin as well as subjective parameters like weakness, anorexia and pallor. Studies reported an increase in haemoglobin with maximum effect by the drug Sarva-juara-hara-lauha in a dose of 500 mg (145.55 mg elemental iron) daily for 30 days using honey as vehicle. Increase in haemoglobin from 7.35±1.86 to 12.11±1.65 g/dL was observed. Significant improvement in haemoglobin was also observed by other drugs like Kasisa Bhasma and Dhatri Avaleha with a mean increase of 1.88g/dL and 1.2g/dL respectively. All studies that assessed the effect of the drugs on the basis of subjective parameters reported decrease in percentage of complaints by the patients. No adverse reactions were reported. **Conclusion:** The conclusion drawn from the review was that administration of ayurvedic drugs is an effective and safe approach for prevention and management of anemia in various population groups. However, larger multicentric studies are required to assess the exact potential of these drugs in the control of anemia. **Keywords:** Pandu Roga, Anemia, Ayurveda.

PPRS-13 APPLICATION OF CASEIN EDIBLE COATINGS ON THE POSTHARVEST-LIFE OF GUAVA Psidium guajava L). ***A.M Beulah,*** K.V.Sucharitha***,*** S.Dheeraj***,*** P.Prameela, Sri Venkateswara University,
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Background & Objectives: Guava is a highly perishable tropical and sub-tropical fruit undergoes rapid postharvest quality changes within few days under ambient condition. Various post-harvest processing techniques were used to extend the quality of fruits, but there are lot of conflicts are limited their use. Edible coating is a well advanced food preservation method described by several researchers as it forms thin layer on the surface of the fruit for the purpose of preservation and can be eaten whole with the food. Edible coatings create a modified atmosphere within the fruits internal matrix and regulates the processing of biochemical reaction, control on biochemical reactions results the delay of ripening process. **Materials & Methods:** In the present study, guava fruits were coated with casein a protein based biopolymer (5% and 10 %) and fortified casein was used to coat

the guava fruits for analyzing of shelf life quality. Ascorbic acid (5% and 10%) was used as fortifying agent in casein coating solution for few treatments and observed the ascorbic acid levels in the fruits. Total four samples were divided and coated with various concentrations and fortifications. Experimental samples were stored at 25±1°C (Ambient temperature) and studied for shelf life studies for a period of 16 days and vitamin C levels. **Result:** The findings of the study revealed that the addition of ascorbic acid to the coatings helped to preserve the natural ascorbic acid content in fresh guava at the same time increased levels were observed during the storage. The coating does not much interpret with the sensory quality of the fruits. **Conclusion:** Casein coating concentrations showed a potential as commercial coating in prolonging the post harvest-life of guava fruits under ambient storage conditions. **Keywords:** Guava, edible coating, casein, vitamin C

PPRS-14 IN-VITRO MEAT: MEET THE NEW POSSIBILITY. ***Ayushi Chatterjee,*** Dr. Meena Kumari***,*** Amity Institute of Food Technology, Amity University, Email: - ayushichatterjee@gmail.com

Background & Objectives: Could technology save animals and satisfy meat eaters? The answer is, yes. To meet the growing demands of meat consumption in today's time food scientist have figured out an alternative option, that is, in-vitro meat. In-vitro meat, also known as cultured, clean, synthetic or lab-grown meat, is grown from the muscle tissue in the laboratory. Cultured meat does not involves killing of animals as it takes only a small sample of muscle cells from the donor animals and it takes only several weeks to culture and harvest, therefore, this process is also time saving as it will be able to meet with the increased demand of meat. Since, there are very limited reports on in-vitro meat; therefore, we tried to focus on current reports on its novel development. **Materials & Methods:** Clean meat is obtained from real animal cells. Different types of cells which are used for the preparation are the embryonic stem cells and myosatellite cells also known as the adult stem cells. **Result :** When the meat is prepared in labs it can easily be enriched and fortified with essential nutrients which are absent in conventional meat, for example, harmful fatty acids like LDL's can be replaced with healthy fatty acids like omega-3 which can help prevent cardiovascular diseases. As the meat is grown in a controlled environment it can prevent the growth of infectious pathogenic micro-organisms like Salmonella, Campilobacter, E.Coli, Shrigella and also avert any disease transmission from affected animals. **Conclusion:** In-vitro meat reduces the problem of land use and opens the prospects for land reforestation and restoration of endangered species. As tissue culture technique requires only stem cells of desired animal, cells from endangered animals can be used to produce exotic meat. In-vitro Meat is no more an intriguing future; it is a need of the present. **Keywords:** In-vitro meat, Embryonic Stem Cells, Myosatellite Cells, Donor Animal.

PPRS-15 RED RICE-THE POWER-HOUSE OF NUTRIENTS FOR PROVIDING NUTRITIONAL SECURITY. ***Krishna Mishra,*** Renu Mogra, Department of Food Science and Nutrition, College of Community and Applied Sciences, Maharana Pratap University of Agriculture and Technology, Udaipur, Rajasthan,Email:- krishna.mamuni@gmail.com

Background & Objectives: Red rice (Oryza punctata) is a variety of rice that is coloured red by its anthocyanin content and has a nutty flavour. It is usually eaten unhulled or partially hulled, and has a red husk, rather than the more common brown. This study focuses on the nutritional benefits, processing aspects and therapeutic advantages of consuming red rice. **Materials & Methods:** The nutritional benefits, processing aspects and therapeutic advantages of consuming red rice was analyzed which focused mainly on its health benefits and its properties of combating different disorders. **Result:** Rich in fibre, it comes loaded with antioxidants, phytonutrients, phytochemicals, Vitamin E, protein, iron, zinc, potassium, sodium, manganese and other nutrients. This russet-coloured whole grain has a soft texture and goes well with most meats and vegetables or served as a pilaf or salad. A quarter cup serving of red rice contains 2 grams of fiber, meeting 8 percent of our daily value for fiber. One-fourth cup serving of red rice meets 2 percent of daily value for iron. This russet-coloured whole grain has a soft texture and goes well with most recipes. Its flour can be used to prepare various healthy recipes like khakhra, dhokla, appam etc.Red rice is also fat-free and high intakes of fat have been linked to heart disease and certain types of cancers, according to Penn Medicine. High intakes of fat also increase our risk of obesity. Red rice retarded the progression of atherosclerotic plaque (Ling et al., 2001). Njavara rice had 16.5% higher protein and contained higher amounts of thiamine (27–32%), riboflavin (4–25%) and niacin (2–36%) (Deepa et al.,2008). **Conclusion:** As it has plenty of fibre and is low glycaemic in nature it can be recommended for the patients with diabetes, hypertension, cancer, obesity and other such harmful disorders.**Keywords**: Red rice, fibre, low glycemic, atherosclerotic plaque.

PPRS-16 **Drishti Bansal-Withdraw**

PPRS-17 **Urmila Vijayan-Withdraw**

PPRS-18 COMPARISON BETWEEN FAT FREE MASS OF BASKETBALL PLAYERS AND BADMINTON PLAYERS FOLLOWING SAME DIET CALORIC INTAKE. ***Mansi Bhardwaj,*** Sheena Arora***,*** Meenakshi***,*** Department of physiotherapy, Manav Rachna Internation Institute for Research and Studies, Email: - mansibh97@gmail.com

Background & Objectives: now a days awareness of nutrition playing an important role in sports performance. Fat free mass refers to all of the body components except fat. It includes the body's water, bone, organs and muscle content. Some other studies show that dietary intake plays a major role. So this study was assisted in evaluating the effect of suggested same caloric intake on the fat free mass of the Basketball players and Badminton players. The purpose of this study was to find out the effect of different physical activities on fat free mass if the diet regime remains the same. **Materials & Methods:** Study was conducted at Manav Rachna International Institute for Research and studies, Fridabad, Comparative Study design was used. A total of 50 players participated in this study of which 25 were basketball players and 25 were Badminton players. All subjects were randomly selected on the basis of inclusion and exclusion criteria. All players aged between 18 to 26 years and were from Delhi and NCR region. Data collection for body composition that included fat free mass (FFM) was done with help of Bioelectrical Impedance Analysis. T test was used for data analysis. **Result:** The t value for FFM after comparing both the groups was 0.0025 showing a little difference with different physical activity with p value of 0.998. **Conclusion:** There were no significantdifference in the fat free mass of Basketball and Badminton players on following same diet regime. That concludes that diet and physical activity both are responsible in altering the fat free mass. **Keywords:** fat free mass, body composition, diet regime

PPRS-19 COMPARISON BETWEEN PERCENTAGE OF BODY FAT OF BASKETBALL PLAYERS AND BADMINTON PLAYERS FOLLOWING SAME CALORIC INTAKE. ***Meenakshi,*** Sheena arora***,*** Mansi Bhardwaj, EX-Student, Department of physiotherapy, Manav Rachna Internation Institute for Research and Studies,
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Background & Objectives: For different sports different energy expenditure is required for the Basketball and badminton players comes under group-3 in classification of sports and games according to energy expenditure. The Body Fat percentage is the amount of of body fat stored in the body and does not include lean body mass and muscle mass and some of study shows that physical activity suggested as a means to reduce and control body fatness. As this is dependent on both the physical activity and calorie intake so this study tend to evaluate that weather Body fat percentage changes with change in sports on keeping the caloric intake same for all subject **Materials & Methods:** Study was conducted at Manav Rachna International Institute for Research and studies, Fridabad, Comparative Study design was used. A total of 50 players participated in this study of which 25 were basketball players and 25 were Badminton players. All subjects were randomly selected on the basis of inclusion and exclusion criteria. All players aged between 18 to 26 years and were from Delhi and NCR region. Data collection for body composition that included Body fat percentage (PBF) was done with help of Bioelectrical Impedance Analysis. T test was used for data analysis. **Result:** The Mean and standard deviation of Demographic details (Age & height) of Basketball players (20.84 ± 1.5147) age, (177.12±7.46) height, and Badminton players (20.44±1.34) age, (166.9±8.28) height. The t value for PBF after comparing both the groups was 0.0007 with p value of 0.999. **Conclusion:** There were no significant difference in the PBF of Basketball and Badminton players on following same diet regime. That concludes that diet has a major role in altering the body composition. **Keywords:** body fat percentage, diet regime, body composition.

PPRS-20 MORBIDITY PATTERN OF NEONATES ADMITTED TO NICU OF JORHAT MEDICAL COLLEGE AND HOSPITAL, ASSAM. ***Jula Sarma,*** Ruma Bhattacharyya, Food Science and Nutrition
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Background & Objectives: Neonatal period is the most vulnerable period of life when both morbidity and mortality is considered since it is a period which is both physiologically and nutritionally important. In developing countries, death during the newborn period accounts for 50-70% of infant mortality. The present study was conducted to know the morbidity pattern of neonates. **Materials & Methods:** The hospital based retrospective study was carried out in the NICU, Department of Pediatrics at Jorhat Medical College, Assam. All babies referred for neonatal problems and admitted in NICU were included. **Result:** Results revealed that, a total number of babies admitted to NICU during the study period of 45 days(1st of October to 18th of November, 2017) was 406 of which 268(66%) were inborn neonates and 138(34%) were outborn neonates. The major causes of morbidity for admission to NICU were Jaundice requiring phototherapy(35%),HIE/moderate asphyxia(17%),other causes of respiratory distress(10%), Meconic aspiration syndrome(9%),Respiratory distress syndrome(8%) and Hypoglycemia(2%) and the overall NICU mortality was 14%(56/406).The mortality rate in inborn neonates was 46% whereas mortality rate in outborn neonates was 54%.The mortality according to sex distribution in males was 67% and in females was 33%.The maternal dietary pattern revealed that 90% of the respondents consumes cereals and pulses. 80% of the respondents consumes fruits and vegetables. 60% of the respondents consumes meat and milk products. **Conclusion:** The majority of morbidities and subsequently the mortalities can be prevented by improving antenatal care, maternal health, timely intervention, referring at appropriate time to tertiary care centres for high risk cases, preventing preterm deliveries and care of neonates at centres with facility. **Keywords:** Retrospective, Jaundice requiring phototherapy, HIE/moderate asphyxia, respiratory distress, Meconic aspiration syndrome, Hypoglycemia.

PPRS-21 SYNERGESTIC ACTION OF VITAMIN C IN PREVENTING CHRONIC AILMENTS. ***Soja Louis,*** Nimitha R. Chandran***,*** Department of Zoology, St. Teresa's College, Ernakulam, Kochi***,*** Email:- sojalouis@yahoo.co.in

Background & Objectives: Today human race focuses on health as a key factor for a better living. Nutrition provides the necessary materials to cells and other parts of the body to support life. It is a known fact that deficiency of nutrients causes deficiency diseases and studies have confirmed that deficiency of nutrients are also the reason for many chronic diseases like cardiovascular diseases, cancer, diabetes, AIDS etc. Many of these diseases can be prevented or alleviated with the intake of a healthy diet or nutrient supplementation. It is not the intake of any one single nutrient that ensures full health, but the intake of a complete spectrum of various different micronutrients, such as vitamins, minerals, amino acids and trace elements. Traditionally there are so many foods that we pair together and unknowingly they are a great combination for a healthy lifestyle. The effective element in each of these combination food items are the synergistic effect of the nutrients present in them. The clinical effectiveness of this approach has been confirmed in many studies, and also through other independent research. **Materials & Methods:** A survey on the effects of vitamin C have been studied and its synergistic effects also looked into. **Result:** The concept of nutrient synergy maximizes the health benefits of micronutrients i.e., which provide an added effect to the effect of nutrients on combination than their individual effect. Vitamin C has a great synergistic effect with several other nutrients. Vitamin C is a very important nutrient for human survival, it works in combination with many other nutrients which helps in elevating the function of both nutrients and has a great role in preventing many chronic diseases. As human body is incapable of producing Vitamin C, we need to supplement this in our daily diet. **Conclusion:** The paper focuses on the optimum supplementation of vitamin C and its synergistical benefits for living a healthy life. **Keywords:** Nutrients, Vitamin C, Synergistic effects

PPRS-22 MAINTAINING NUTRITION SECURITY AND DIET QUALITY: THE ROLE OF FOOD. ***B.Gwyneth Madhulika.,*** B.Deepika***,***
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Background & Objectives: *To examine the contribution of food and special supplementation for women,children and infants to the nutrition security and diet quality of low income households.*To achieve nutrition security through diet quality and role of food. **Materials & Methods:** Assessing the: 1. Food supplementation for women and infants. 2. Mid-day meals for school going children in government schools. 3. Implementation of low cost meals for rupees 5/- by government. **Result:** Implementation of nutrition security and

diet quality in low-income households has helped to bring: 1. Enhance in imperative status of women,family,society. 2. Improved diet quality and food security. 3. It helped low income households to achieve nutrition security. **Conclusion:** Significant and beneficial positive effects are seen by low income households by adopting nutrition education,nutrition security,diet quality etc. **Keywords:** 1.Food supplementation.

PPRS-23 EFFECT OF SKIPPING BREAKFAST ON THE NUTRITIONAL STATUS OF ADOLESCENTS. ***Medha Gupta,*** Dr. Meena Kumari***,*** Amity Institute of Food Technology, Amity University, Noida, U.P.***,*** Email: - medhagupta35.mg@gmail.com

Background & Objectives: Breakfast is the first and really important meal of the day. Culture, religion, economic status, socio-economic background, age, gender all plays a significant role in breakfast composition. It is very important to have a healthy and a well-balanced breakfast that delivers its energy slowly over the course of the morning. A healthy breakfast is found to correlate with the values like healthy lifestyles, improved daily nutrient intake, lower body mass index (BMI), high levels of physical activity as well as improved motor skills, attention, and cognition. Skipping of breakfast leads to lower metabolic rate, greater fatigue, and lower physical activity. People who skip breakfast tend to have high fat foods in later half of the day which in turn lowers the nutritional status. In India, there is no significant research on effect of breakfast on the nutritional status of the people. The effect of breakfast on lowering BMI is still not clear and most people on diet tend to skip there breakfast meal or just go for drinks. Therefore, in lack of this information, the present study focuses on the effect of skipping breakfast on the nutritional status of the people. **Materials & Methods:** As per one study, the breakfast habits and other lifestyle variables at age 16 years were assessed with the help of questionnaires (Wenneberg et.al. 2013). **Result:** In the above discussed research, the poor breakfast eating habits of adolescents at age 16 years were compared with regular breakfast eaters. According to Wenneberg et.al. (2013) the breakfast skippers at age 16 years were associated with central obesity and high fasting glucose. **Conclusion:** Thus, according to research, an unhealthy breakfast eating habits in adolescence can lead to metabolic syndrome in adulthood. Hence, an increased awareness of the importance of breakfast is needed to encourage the individuals to think twice before skipping breakfast, for the sake of healthy life. **Keywords:** Breakfast, nutrition, adolescent, metabolic syndrome, questionnaire.

PPRS-24 A BUMPY ROAD FROM FOOD TO NUTRITION SECURITY- SLOW EVOLUTION OF INDIA'S FOOD POLICY. ***Himavarshaa,*** Pranathi***,*** Osmania University***,*** Email: - himavarshaa2@gmail.com

Background & Objectives: The focus needs to shift from food security to nutrition security so that attention is paid not only to calories and proteins but also to micro nutrients. India has been able to fight protein and calorie hunger but now there is a need to fight hidden hunger (micronutrient deficiency) **Materials & Methods:** The 3 determinant's of nutrition security include: 1. Acess to adequate food. 2. are and feeding practices. 3. Sanitation and health; **Result:** The world health organization estimates that more than 2 billion people are suffering from micro nutrient deficiency globally. **Conclusion:** Its high time that we need to move from food security to nutrition security .All that needs to be done is to bring agriculture, health, nutrition together in a triangular relationships, which can only be achieved through partnerships. **Keywords:** The 3 determinant's, hidden hunger, triangular relationships.

PPRS-25 EVALUATION OF FOOD SECURITY PRACTICES IN MIDDAY MEAL PROGRAMMES IN RURAL AND URBAN AREAS OF BEED DISTRICT. ***Mubina Abdul Aziz Shaikh***[1], Nuzhat sultana M.B.[2],1=SRT University, Nanded (M.S.) India, 2=Home Science, Mrs. K.S.K. College, Beed (M.S.), Email: - shaikhmubeen12@yahoo.com

Background & Objectives: Children are high risk population in terms of food borne illnesses. Food security are the most important aspect for the success of midday meal programmes. Improper holding temperatures, cross contamination and poor personal hygiene of food handlers are the main causes for prevalence of pathogenic microbes in the food servicing areas. 1. To observe the food security rules at work place of selected anganwadies of Beed district 2.To study the health problems of anganwadi Children of Beed District.3.To know the dietary pattern of preschool children of selected anganwadies of Beed district. **Materials & Methods**: Two hundred and fifty preschool children in the age of 3 to 6 years from urban and rural anganwadies (pre-school center) of Beed district were selected. Nutritional status of preschool children was assessed by anthropometrical

& Clinical measurement. The study assessed the food safety and security with the help of personal hygiene and other security measures maintained by the food personnel working for midday meal programme, supplying mid meals to children in govt. anganwadies (pre- school center). The hygiene level, sanitary condition and microbial quality of food & water, pathological health examination of food handlers were assessed with the help of checklist.A questionnaire was designed to evaluate knowledge, attitude and practices of food handlers. **Result:** Results of the study show that the nutritional and health status of rural and urban preschool children was very poor. Many of the food handlers were not aware of general knowledge and hygiene practices to be followed during food preparation areas. An intervention programme of education and importing training at work places has shown a positive impact on the outcome of safety & security practices and safe hygienic practices of food handlers at work place. **Conclusion:** It was concluded that Nutrition education &intervention programmes has a positive impact on food security practices of food handlers at work place. This security Measure may also improve the health status of preschool children. **Keywords:** Food, Health, Preschool Children, Safety, Security.

PPRS-26 Anushi Dhiman-Withdraw

PPRS-27 THE NEED OF THE HOUR: "RAISING THE LEVEL OF NUTRITION". ***Fariha Sameen,***
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Background & Objectives: "The mankind shall regard raising the level of nutrition and standard of living and improvement in public health among their primary duties". Everyone has the inalienable right to be free from hunger and malnutrition in order to develop and maintain their physical and mental faculties. **Materials & Methods:** India has been in the forefront in developing national food and nutrition databases, undertaking research studies and surveys documenting the ongoing agriculture, food, nutrition and health transitions. India with 2.5 per cent of the global land mass and 16 per cent of the global population, however in the last five decades the rate of decline in under-nutrition has been slow; the mortality rate has come down by 50 per cent and the fertility rate by 40 per cent but the reduction in underweight rates is only 20 per cent. **Result:** Poverty and inability to purchase adequate food leading to under-nutrition and micro-nutrient deficiencies persist even today among the poor segments of population **Conclusion:** Nutritional security is the major deciding factor, as adequate nutrition is a basic human need. **Keywords:** Inalienable right, Health transitions, Micro-nutrient deficiencies, Nutritional security

PPRS-28 NUTRITION SECURITY - AN INTEGRAL COMPONENT OF FOOD SECURITY. **S.Keerthika Reddy,** D.Raksha Shakeena**,** Osmania University,
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Background & Objectives: BACKGROUND- When all people, at all times ,have physical ,social and economic access to sufficient , safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life . **OBJECTIVES-4** key dimensions of food security can be identified 1. AVAILABILITY; 2. ACCESS, 3. UTILIZATION, 4. STABILITY; **Materials & Methods:** A CONCEPTUAL FRAME WORK OF FOOD AND NUTRITION SECURITY: OPPORTUNITIES FOR PARTNERSHIPS; Availability (physical access); Accessibility (economic access); Absorption (nutritional outcome); Public sector; Private sector; Civil society; Multilateral / bilateral agencies / philanthropic foundations. **Result:** Comprehensive country - specific food security strategies and their implementation are key for development and peace. **Conclusion:** It is important not only to place greater emphasis on the nutrition components of food security , but also to shift focus to include an element of sustainability in providing dietary recommendations . This includes viewing food consumption patterns through a sustainability lens , considering sustainable food consumption and production simultaneously ; adopting public policies to support sustainable consumption and discourage food waste ; and revising food-based dietary guidelines to promote sustainable consumption. Finally, with regard to food stability, nutrition considerations including the macro and micro nutrient content of food must be taken into account. **Keywords:** food security, food sustainability, accessibility, sustainable consumption, nutritional outcome

PPRS-29 Arushi Jain-Withdraw

PPRS-30 Megha Kakkar- Withdraw

PPRS-31 SOCIOECONOMIC, SOCIODEMOGRAPHIC AND LIFESTYLE FACTORS IN CHILDHOOD UNDERNUTRITION – INDIAN CONTEXT. ***Surabhi Singh Yadav,*** Pooja Panchal***,*** Kavitha Menon***,*** Department of Nutrition and Dietetics Symbiosis School of Biological Sciences, Symbiosis International (Deemed) University, Lavale, Pune Email:- surabhi.singh@ssbs.edu.in

Background & Objectives: According to NFHS-4, 38% of children under five years of age suffer from chronic malnutrition, 22% from acute undernutrition and 36% are underweight further compounded by the burden of micronutrient deficiencies. In India, the triple burden of malnutrition could be attributed to multiple factors that influence the growth and development of the children. To mitigate the challenges of malnutrition, the study aimed to identify the proximate, intermediate and distal factors that are associated with undernutrition. **Materials & Methods:** This review sought to comprehensively understand the socioeconomic, sociodemographic and lifestyle factors that contribute to undernutrition in under-five children. PubMed and Google Scholar databases were searched for the last five years. The search results were screened, abstracts were collected and final selection of studies were done. The selected studies included primary studies, published results of national surveys, and studies pertinent to the Indian context. **Result:** The evidence showed a strong relationship between the proximate factors (i.e. birth-age and weight, breastfeeding and complementary feeding practices, gender, immunization) intermediate factors correlated to mother (SES, education, occupation, nutritional and health status) and distal factors pertaining to households (type of house, families, sanitation and hygiene, type of delivery) having impact on the health and nutritional status of children below 5 years of age. Furthermore, micronutrients displayed a vital role in the structural and functional changes of the brain activity leading to various mental health challenges. Even though high heterogeneity was observed amongst the studies, bilateral connexion was observed between nutrition and several determinants leading to adverse effects on physical as well as the mental health condition of children. **Conclusion:** Thus, the current review provided a deeper understanding of the impact of socioeconomic, sociodemographic, lifestyle determinants and the vital role of micronutrients in the nutritional and healthy wellbeing of young children across India. **Keywords:** SOCIOECONOMIC, SOCIODEMOGRAPHIC, LIFESTYLE FACTORS.

PPRS-32 **Harsha Chandirani-Withdraw**

PPRS-33 **Shivangi Singh- Withdraw**

PPRS-34 A REVIEW ON THE POSITIVE EFFECTS OF CULTIVATING ENDOGENOUS DASH DIET ON CARDIOMETABOLLIC SYNDROME. ***Manasa V S,*** PSG College of Arts and Science, Coimbatore.
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Background & Objectives: Cardiometabolic syndrome is a non-communicable disease that encompasses increases in blood sugar, blood pressure, waist circumference, and dyslipidaemia. The syndrome is becoming an epidemic in India with studies quoting the country as the capital for most of the syndrome's disease conditions. With a recent study by WHO quoting a whopping 1.4 billion "at risk for deadly diseases due to lack of exercise" and reasoning it with urbanization replacing farming, this article aims to study the beneficial effects of gardening on the syndrome through analysis of articles published by American Diabetic Association [ADA], National Institute of Health [NIH] and other sources. The article also aims at evaluating the positive effects on the syndrome resulting from the cultivation of endogenous Dietary Approaches to Stop Hypertension [DASH] diet. **Materials & Methods**: Studies thatwere relevant to the aims, those that have been published in the last 10 years with varying sample sizes and implementing different research methodologies have been collected and studied to evaluate the positive benefits of gardening and DASH diet. This article implements collecting relevant statistical data to support the thesis. **Result:** The findings of articles studied concluded that the DASH diet had significant desirable changes on obesity and waist circumference, reduced HbA1C and Fasting blood sugar levels by 29.4 mg/dl, LDL cholesterol was reduced by 17.2 mg/dl, systolic pressure was reduced by 13.6 mmHg and diastolic blood pressure reduced by 9.5 mmHg according to the American Dietetic Association after incorporating the diet for 8 weeks. According to the Centers for Disease Control, gardening is compared to "moderate cardiovascular exercise." Gardening 45 minutes a day can burn 150 to 300 calories. **Conclusion:** To conclude, the thesis statement was successfully proved with the help of the above quoted statistical data of major importance. **Keywords**: cardiometabollic, DASH diet, gardening.

PPRS-35 RED RICE FLAKES CHIVDA WITH GOODNESS OF MELON SEEDS. ***Prathiba Manjunath,*** Smt.VHD central institute of home science college Bangalore,
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Background & Objectives: *To develop value added red rice flakes chivda with goodness of melon seeds using different variations . *To standardize the product ; *To assess the chemical composition of the standardized product ; *shelf life studies of standardized product ; *To develop a healthy snack for all age group ; Materials & Methods: Value added product was standardized using, *Sensory evaluation using 9 point hedonic scale *Shelf life study at room temperature ; *Assessing the chemical composition of the product ; *finally packaging and labeling the standardized products. **Result:** Product was developed with 2 variations. Variation 1(spicy chivda) had more scores in sensory evaluation was selected for standardization. Standardized product was stable under room temperature till 20 days. At 5% level of significance, there is significant difference between mean responses with respect to taste and texture with p value <0.001. **Conclusion:** Red rice flakes chivda is a tasty healthy snack suggested for all age group. Red rice flakes chivda is rich in protein, healthy fat and calories. Addition of melon seeds make product more nutritious. **Keywords:** Sensory evaluation, proximate analysis, chivda, melon seeds.

PPRS-36 THERAPEUTIC POTENTIAL OF HONEY IN RADIATION INDUCED ORAL MUCOSTITS (RIOM) – REVIEW. ***Indirani. K,*** Krithika. V***,*** Email:- dieticianindhu@gmail.com

Background & Objectives: THERAPEUTIC POTENTIAL OF HONEY IN RADIATION INDUCED ORAL MUCOSTITS (RIOM) – REVIEW **Materials & Methods:** REVIEW ARTICLE
Result: ACCORDING TO REVIEW ARTICLE HONEY ACT AS A IMMUNE BOOSTER, REDUCE ULCER, MUCOSTITS OF CANCER PATIENTS UNDER RADIOTHERAPY **Conclusion:** IT MAY ACT AS A THERAPEUTIC POTENTIAL FOR RADIOTHERAPY PATIENT **Keywords:** ORAL MUCOSTITS, CANCER, RIOM

PPRS-37 THE MEDITERANNEAN DIET. ***Elizabeth Jose,*** PSG College of Arts and Science***,***
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Background & Objectives: cause of mortality in India, with a quarter of all mortality being attributable to CVD. Therefore, strategies that have the potential to slow and even stop the accelerating progression of CVD in India must be carefully considered and thoroughly investigated. The Mediterranean diet has been receiving growing interest in recent years. This diet refers to the usual intake of those countries near the Mediterranean, including Greece and Italy. The Mediterranean region had lower mortality from cardiovascular disease as compared to other regions and it has likely stemmed from difference in dietary habits, eating patterns and lifestyle in these regions. The main components of the general Mediterranean diet are higher consumption of olive oil, increased consumption of fruit and vegetables, increased consumption of legumes, increased consumption of fatty fish, whole grains and moderate consumption of wine along with a low intake of red meat and saturated fats. The acceptability and suitability of the Mediterranean diet has not been studied in an Indian population before. **Materials & Methods:** In this review article, we studied the recent evidence from papers and contrasted this previous information gathered. We also looked the potential of some of the parts of the Mediterranean diet being used in the Indian population and its feasibility. **Result:** Though no formal studies have been conducted into the use of the Mediterranean diet in the Indian population, the effects seen in other populations have depicted beneficial effects in heart health. Results vary among the different studies, but the prominent studies have been highlighted in this article. **Conclusion:** There is much variability in terms of the results from research into the Mediterranean diet. However, the main principles of the Mediterranean diet are consistent with healthy eating guidelines and the adoption of this diet in India may have the potential to reduce the incidence of CVD. Further research is needed, particularly in the Indian population. **Keywords:** CVD; Mediterranean diet; Indian population.

PPRS-38 TOTAL PHENOL CONTENT AND ANTIOXIDANT ACTIVITY OF SELECTED COWPEA (VIGNA UNGUICULATA) GENOTYPES AND HEALTH BENEFITS. ***Ankita Yadav,*** G.B.P.U.A.T., Pantnagar***,***
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Background & Objectives: In many parts of the world, cowpea (Vigna unguiculata), a legume is consumed as a high-quality plant protein source. The high content of protein and carbohydrate contents with a relatively low fat content and high anti-oxidant activity and polyphenol content is important nutritional food in the human diet. It has gained more attention worldwide because of its health beneficial properties which includes being anti-diabetic,

anti—inflammatory, anti-carcinogenic activities. **Materials & Methods:** The present investigation was planned to study the total phenol content and antioxidant activity in the seed coats and cotyledons fractions of improved genotypes of cowpea. For this purpose four improved genotypes of cowpea viz. PL-2, PGCP-11, PGCP-12 and PGCP-13 were taken from the Breeder Seed Production Centre, GBPUA&T, Pantnagar. The total phenol content was carried out by folin-ciocalteau method and anti-oxidant activity by DPPH method. **Result:** The study illustrates total phenol content in cowpea varied from (281.38±0.40mg GAE/100g) to (254.68±0.39mg/100g). The antioxidant activity in cowpea ranged from 32.30±0.037 to 82.30±0.41 per cent. There was highly significant difference among all the genotypes with respect to both total phenol content and antioxidant activity. **Conclusion:** The result showed that higher amount of total phenol content and antioxidant activity. The study suggested that cowpea could be utilized in future for its value in treatment of various chronic diseases due to presence of high phenol content and antioxidant activity. **Keywords:** cowpea, total phenol content, antioxidant activity, health benefits.

PPRS-39 Diksha Sood-Withdraw

PPRS-40 CHEMICAL COMPOSITION OF MANGO SEED (MANGIFERA *INDICA L*).

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Background: Fruits of tropical and subtropical regions are appreciated for their nutritional value, as well as for the presence of health-enhancing compounds. Mangiferaindica L. (mango) is known as “the king of fruits” because it is the most popular fruit in tropical regions. It is the national fruit of India and the Philippines. The mango fruit is classified as a deliquescent drupe; it contains a single seed surrounded by a fleshy mesocarp covered by a fibrous skin. the seed represents 10 to 25% of the total weight of the fruit, and the kernel represents 45 to 85% of the seed, or approximately 20 % of whole fruit ( ). **Objectives:** This review describes about the mango seed nutritional components, bioactive compounds and therapeutic uses. **Methodology:** Mango seed related research and review articles were collected from various sources and interpreted. **Results**: Nutritional components of mango seed shows carbohydrate (58-80%), Essential amino acids and lipids (6-13%), and it is a rich source of oleic acid and stearic acid. Bioactive compounds revealed that presence of carotenoids, Vitamin – C, Dietary fibre, and polyphenols compounds includes tannins, gallic acid, coumarin, ellagic acid, vanillin, mangiferum, ferulic acid and chinnamic acid. **Conclusion:** Based on the collected information it can be concluded that the research should continue to identify the profile of the bioactive compounds from different seed varieties and their bioavailability need to be done. Identified biocompouds can be isolated and used as supplement for various therapeutic uses.**Keywords:** Mesocarp, Kernel, Bioactive compounds, Bioavailability, Polyphenol.

PPRS-41 EFFECT OF CONSUMPTION OF WHEAT AND WHEAT PRODUCTSON DIABETES MELLITUS.

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Background*: Garcinia cambogia* a Malabar tamarind, it belongs to the family *Guttifereae*, is a pumpkin shaped fruit which is native to South East Asia and some parts of Africa. It contains 75% of moisture, 2.3g of protein, 0.5g of fat, 1.24g of fiber, 17.2g of carbohydrate,15.14mg of iron, 250 mg of calcium, 10mg of ascorbic acid. Hydroxy Citric acid (HCA) is an active ingredient which is being present in Garcinia cambogia. It seems to inhibit an enzyme in the liver which is responsible for turning excess carbohydrates into fat. Instead, triglycerides decreases with increase in the production of LDL cholesterol. Scientifically, research studies shows that Garcinia has influenced fat metabolism in mice and humans. The active constituent is considered effective for reducing acidity in stomach thereby protecting the gastrointestinal mucosa for reducing the cholesterol and blood lipid level for inhibiting cell damage caused by high blood lipid levels. The Garcinia fruit contains reducing sugar, cambogin, euxanthone, fats, glucinol, hydroxyl citric acid, lactone, benzophenones, flavonoids, saponins, tannins, alkaloids, garcinol, carbogiol, stearic acid, oleic acid, oxalic acid, ascorbic acid, terpenoids, phytosteroids, coumarins**.** ***Objectives*****:** To collect reviews of the health benefits of Garcinia cambogia…. ***Methodology***: The health benefit was studied by reviewing various articles from websites. **Results**: Garcinia will show effective results in reducing the bad cholesterol and thus decrease in triglycerides and aids in weight management. It lowers blood pressure and regulates the blood sugar. It reduces LDL known as bad cholesterol through the reduction of blood lipids in the bloodstream and

is also capable of encouraging the production of HDL good cholesterol. It is reported that Garcinia has a positive effect and it helps in biological activity, appetite supressant activity, anti diabetic activity, antimicrobial and anti-ulcer. ***Conclusions***: Garcinia has been linked to many other health benefits most importantly, this fruit also strengthen and improves the immune system. **Key Words:** Hydroxy Citric acid, Garcinia cambogia, Triglycerides, Metabolism, Appetite suppressant

PPRS-42 **HEALTH BENEFITS OF *GARCINIA CAMBOGIA*.** ***Bhuvaneshwari J,*** and Dr. Vijayanchali S.S, The Gandhigram Rural Institute-Deemed to be University, Gandhigram-624 302, Dindigul (dt), Tamil Nadu E-mail: bbhuvi01@gmail.com

Globally Diabetes Mellitus is considered as a most common disorder. People with this are advised to consume whole grains and foods with low Glycemic Index in concern with dietary management. Apart from the other whole grains the most recommended and consumed is Wheat – *Triticum*the most common species is *Triticumaestivum.* As the whole, wheat offer a complete packageof nutrient such as fiber, folate, thiamine, magnesium, vitaminB6,iron, selenium, vitamin E and zinc.Objectives: The present study is to review the health effect of over consumption of wheat and wheat products like wheat rava, whole wheat bread, chappathi. *Methodology: By* reviewing various research articles the effect of consumption of wheat and its by-products will be studied. **Result:** Though the consumption of wheat helps to control chronic disorders like Diabetes Mellitus, Chronic Heart Disease, and maintenance of weight. Some with celiac disease condition may show allergic reaction. Also people may develop non celiac symptoms due to over consumption. To conclude the overconsumption of wheat and its products result in the reduced fasting blood glucose level and also possess many beneficial effects like increased bowel movement, improves metabolism, prevents gall stones, relieving post menopausal symptoms, preventing childhood asthma, promote GI health and prevents chronic disease.**Key Words :** Diabetes Mellitus, Glycemic Index, consumption, chronic disorder.

PPRS-43 **PHYTO CHEMICAL, FUNCTIONAL PROPERTIES AND PROXIMATE ANALYSIS SWEET POTATO FLOUR, *R. Nithya,*** and S.S.Vijayanchali,The Gandhigram Rural Institute-Deemed to be University, GandhigramTamil Nadu
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Introduction: Sweet potato the sixth most important food crop in the world and ranks the seventh most important food crop in the World and fourth in the tropical countries (Waramboi *et al*., 2010). Sweet potato (pomoea batatas L.) Lam, is a perennial crop which belongs to the morning glory family or Convolvulaceae (Senanayake, 2013). It is a popular staple food of the tropical and subtropical areas with a nutritional benefit evidenced by increase in its cultivation and consumption. Sweet potato is mostly harvested for its tubers. It contains phytochemicals, which are important for human health (Islam, 2014*).* Sweet potato possess multifaceted actions, including anti-oxidant, antimutagenic, anti-inflammatory, antimicrobial and anti-carcinogenesis and thus are important for several health-promoting functions in humans. The processing of sweet potato into flour or other any other food products would increase its utilization, serve as a source of nutrients such as carbohydrates, beta-carotene (pro vitamin A), vitamin C, vitamin B6, and minerals such as calcium, phosphorus, iron, potassium, magnesium and zinc. Sweet potato flour can explored as an alternative raw material for extruded products. **Objectives:** 1.To process and prepare sweet potato flour; 2. To assess the functional properties, phyto-chemical properties and nutrient content of the sweet potato flour. **Materials and Methods:** Sweet potatoes were collected from local market, washed in running water, sundried, powdered and stored in airtight container. Sweet potato flour was analysed for its functional properties, phyto chemicals and proximate composition. Functional properties like: Bulk density, Water absorption capacity, Oil absorption capacity and gluten content. **Results:** The functional properties: Bulk density of sweet potato flour was 0.5 g/ml. Water absorption capacity was 1.0 mg/dl respectively. Oil absorption capacity was 0.5 mg/dl. The gluten content of the flour was found to be 1.4g respectively. The sweet potato flour contains flavonoids, phenol, saponins, tannins, terpenoids, amino acid and phlobalannins. The nutrient composition was 5g of moisture, 8.4 g of ash, 80 g of carbohydrate, 3.9g of protein, 3.4g of fat, 3.8g of fiber and 155mg of calcium, and 0.5mg of iron. **Conclusion**: The prepared sweet potato flour can be used to develop extruded products.**Key word**: sweet potato, phytochemical's.

PPRS-44 **PROFILE OF PHYTOCHEMICAL, ANTIOXIDANT ACTIVITIES AND LYCOPENE IN FRESH AND DRIED FRUIT PROPORTIONS,** ***Jancy Rani.D*** and Dr. Vijayanchali S.S ,The Gandhigram Rural Institute-Deemed to be University, GandhigramTamil Nadu E-mail: jancyranifsn@gmail.com

Background: Fruits are important part of human diet. They are commercially important and nutritionally indispensable food commodity. The annual production of fruits in India is estimated as 45 Million Tones from an area of 4 million hectares contributing 9-10 % of the total world fruit production. Fruits play a vital role in human nutrition, by supplying the necessary growth factors essential for maintaining normal health. They are rich sources of vitamins (A, B complex and C) and minerals (calcium, iron and phosphorus). **Objectives:** The present study was undertaken to carry out the drying process in proportions (skin, pulp and seed) of fruits (Tomato, Grapes, Watermelon and Pink Guava); to analyse the qualitative and quantitative phytochemical analysis: to estimate the lycopene: and to find out the antioxidant activity of the fresh and dried fruit samples. **Methodology:** Fresh and well ripened fruits were brought together from dissimilar organic cultivators. Among the assortment varieties of tomato CO 1, Guava 'Ruby Supreme', Grapes Bangalore blue and watermelon **Arka Manik** was selected. Collected fruits were washed thoroughly 2-3 times with running tap water and once with distilled water, after that it was spread in absorbent paper and kept at room temperature (25-35ºC) for 8 hours to remove any moisture on its surface. Later, the skin, pulp and seeds in fruits were separated and ground with pestle and motor with methanol extracts for fresh sample analysis. For dried samples skin, pulp and seeds in fruits was separated and placed in trays and kept in cabinet dryer and the temperature was maintained at 60^0 for 7 hours. After the heat treatment ground in to a coarse powder and stored in a well closed container free from environmental climatic changes till usage. Qualitative phytochemical screening was done with standard procedures. Phytochemical such as alkaloids, flavonoids, phenol, saponin, tannin, terpenoids, quinons, phlobatannins and steroids were analysed. Quantitative phytochemical test such as Alkaloids, Flavonoids and Total Phenol were done. UV spectrometry was used to do Lycopene analysis. DPPH method was used to find the antioxidant activity. **Results:** The fresh fruits are having abundant amount of phytochemicals and dried fruit sample has the increased level of lycopene when compared with fresh fruit sample. Antioxidant activity of the fresh and dried samples are more over similar. **Conclusion:** The phytochemical constitutes and invitro antioxidant activity of the fresh and cabinet dried fruit sample is better and can effectively contribute to the society for maintaining a healthy status. The study also revealed that the cabinet tray drying method was observed more suitable for dehydration of fruits.**Keywords:** Organic, Phytochemical constituents, Lycopene, invitro Antioxidant activity, Cabinet dryer.

PPRS-45 **QUALITATIVE ANALYSIS OF NUTRIENT AND ANTI NUTRIENT COMPONENTS IN COMMERICAL FOODS,** Kowsalya J[1],Dr. Lalitha Ramaswamy[2] and Dr. S.S.Vijayanchali[1],1=The Gandhigram Rural Institute-Deemed to be University,Gandhigram,Tamil Nadu, 2=PSG College of Arts and Science, Coimbatore E-mail: kowsalyajaganathan98@gmail.com

Background: The consumption of commercially available food products which include aerated drinks and several other foods are increased now-a-days since they are easily carriable and for their taste and appealing characteristics like color and consistency. This study mainly focus on the analysis of nutrient and anti-nutrient components in few commercially available products which is consumed in high amount by the people and which is high in caffeine which is not known by most of the people. **Objectives:** To find out the presence of caffeine in commercially available popular foods and to find out the nutrient and anti-nutrient component present in it and to educate the students based on the findings. **Methodology:** Some of the commercially available foods like aerated drinks, energy drink, dark biscuit, white chocolate, toffee and Coco powder, were selected since they were commercially available and consumed food products by the student community. Qualitative analysis of caffeine, amino acids, proteins, tannin, flavonoids, phenolic compounds were analysed. Nutrition education through posters was erected to the local students about the nutritional and anti-nutritional factors present in the foods and their effects on their health. **Result:** The components present in the most consumed commercial food products is caffeine, Amino acids and proteins were absent in all the aerated drinks and green tea while other components such as caffeine, flavanoids, tannins and phenolic compounds were present in other products and these food products could not be recommended for adolescent since they are the population who readily consume all this product. Hence education was given

to make awareness about these products among the adolescents and their feedback has been noted. To conclude, the selected commercially available products do not supply any nutrient for growth or support health. They only provide simple sugars which increases the blood glucose level.So awareness should be given among adolescent about these commercially available food products which is harmful to their health.**Keywords:** Anti-nutrient, Nutrition education. Adolescents, Caffeine, Phenolic compounds

PPRS-46 FORMULATION AND STANDARDIZATION OF BARLEY INCORPORATED NOODLES",*Vadumitha A*, R.Rekha, Madurai, E-mail: cashereka@gmail.com

Barley is a crop that is cultivated in all suitable areas.It is one of the most important food grains from ancient times. Its rich in phytochemicals. It has higher **glucan** a soluble fiber and phenolic compounds such as flavonols, tocotrienols and sterols. Barley has protective actions against certain types of cancer, cardiovascular disease and degenerative diseases such as arthritis.Due to their antioxidant activity this study titled "**Formulation and standardization of Barley incorporated Noodles"** has been carried out. The objectives of this study are i) to develop Noodles incorporated with Barley flour, ii) to assess the acceptability of the developed product, iii) to estimate the nutrient content of the developed product, iv) to analyze the shelf life of the formulated Noodles, Three different formulations of Barley incorporated Noodles in the proportion of 20 per cent, 40 per cent and 60 per cent were assessed by 10 panel members by using 5 point hedonic scale. Out of those, 40 per cent Barley incorporated Noodles gained the highest score for acceptability and it was selected for the further analysis. Nutrient content was determined for 40 per cent Barley incorporated Noodles. The energy content of 100 grams of Barley incorporated Noodles was 217 kcal, carbohydrate 71.2g, Protein 24g, Fat 2g, Fiber 10.5g. and the phenolic content of Barley incorporated Noodles was about 70%.The results of microbial assay showed that there were no bacterial and fungal growths till 30 days. The microbial growth occurred only after 30 days that is between 30 to 45 days in 200 gauge polyethylene and metalized polyester polyethylene bag.The study revealed that Barley incorporated Noodles had high score for the appearance, taste, texture, flavor and overall acceptability. The nutrient content was high in the Barley incorporated Noodles. A 30% significant difference was observed in the following nutrients -energy, carbohydrate, protein, fat, fiber and phenols. Barley incorporated Noodles packed in both 200 gauge and metalized polyester polyethylene 200 gauge pouches had the best results for storage and found free bacteria and fungi in 30 days. Further the results of the study emphasize the need to assess the impact of supplementation of barley malt extract for therapeutic conditions like breast cancer and cardiovascular diseases.