



International Conference on Food & Nutrition

*"Discovering the new advances and future challenges in food and nutrition for
sustainable development"*

Bali, Indonesia

18th -19th April, 2019

Organized by:

BioLEAGUES Worldwide

Preface

This book reports the Proceedings of the “*International Conference on Food and Nutrition*” held at *Swiss-Belhotel Rainforest Kuta, Bali* on the 17th & 18th of April – 2019, organized by *BioLEAGUES Worldwide*.

The publishing department has received more than 110 abstracts. After an initial review of the submitted abstracts, 30 papers were presented at the conference and were accepted for publication in the Conference Proceedings. The topics that are covered in the conference include food biotechnology, food microbiology, nutrigenomics, food adulteration and toxicology, pro-biotic and functional food, etc... We would like to thank all the participants for their contributions to the conference and the proceedings.

Reviewing papers of *ICFN-2019* was a challenging process that relies on the goodwill of those people involved in the field. We invited more than 15 researchers from related fields to review papers for the presentation and the publication in the *ICFN-2019* Proceeding. We would like to thank all the reviewers for their time and effort in reviewing the documents.

Finally, we would like to thank all the proceeding team members who with much dedication have given their constant support and priceless time to bring out the proceedings in a grand and successful manner. I am sure this proceeding will be a credit to a large group of people, and each one of us should be proud of its successful outcome...

From Bioleagues Directors's Desk...

On behalf of **BioLEAGUES Worldwide**, I am delighted to welcome all the delegates and participants around the globe to the *International Conference on Food and Nutrition* which is going to be held at *Swiss-Belhotel Rainforest Kuta, Bali* on 18th and 19th April.



Discovering the new advances and future challenges in food and nutrition for sustainable development is the main theme of this “**ICFN 2K19**”

It will be a great pleasure to join with Scientists, Academicians, Research Scholars, Students, Industrialists and other association people all around the globe. You are invited to be stimulated and enriched by the latest in “**ICFN 2K19**”, while delving into presentations surrounding transformative advances provided by a variety of disciplines.

I congratulate the reviewing committee, coordinator BioLEAGUES and all the people involved for their efforts in organizing the event and successfully conducting this International Conference and wish all the delegates and participants a very pleasant stay at Bali, Indonesia.

A handwritten signature in black ink, appearing to read 'R. B Satapathy'.

Mr. R. B Satapathy
Chief Executive Officer
Bioleagues Worldwide

From Bioleagues CEO's Desk...

It is indeed a privilege to acknowledge and thank all the supporters and organizers of the “**International Conference on Food and Nutrition**”, who contributed greatly to organize the conference successfully.



I would like to acknowledge and thank the Keynote speaker for her valuable speech in the *ICFN-2019*.

My special thanks to all of our Special Guests who so graciously accepted our invitation to participate in the conference.

I would like to specially thank our Advisory Committee Members from various Organization whose continuous support have helped us plan and execute the conference successfully.

I am highly indebted to the contribution given by all the Scientists, Academicians, Research Scholars and Students to the conference.

A handwritten signature in blue ink, appearing to read 'Ankit Rath' with a stylized flourish at the end.

Mr. Ankit Rath
Chief Scientific Officer
Bioleagues Worldwide

Keynote Speaker

Parenting Styles and Weight Status of School Children



Prof. Zenaida F. Velasco, RND,MAP

University of Santo Tomas/ Nutritionist-Dietitians' Association of the Philippines

Abstract

The parenting style is highly related in the development of overweight status of Filipino children. Being overweight among children involves not only the child but also the family. Parents have an important role in developing the behavior of the child as well as establishing the child's eating habits. There have been studies and theories about effective parenting and rearing children. Parenting styles may be predictive of overweight status and/or obesity incidence among.

Among the 4 parenting styles, permissive parenting poses a greater risk of developing overweight status in school children ages 6-10. Children with permissive parent/s were twice as likely to be overweight than those of authoritative and neglectful parent/s. Children with authoritarian parents were less likely to become overweight. Better understanding of how these parenting styles affect the eating patterns of children may help to create an effective prevention in developing overweight children.

With the limitations of the study, it is recommended to conduct another research that will tackle other factors like the maternal and paternal BMI, lifestyle such as daily physical activities/exercises, and cultural practices which could affect eating behavior that may lead to either being overweight or underweight

Biography:

ZENAIDA VELASCO is an associate professor of the University of Santo Tomas, Department of Food and Nutrition Sciences for the past 27 years. Awarded as the Most Outstanding Nutritionist-Dietitian by the Professional Regulation Commission and the Nutritionist-Dietitian Association of the

Philippines , she has 38 years solid experience in nutrition, health and wellness having pioneered the first live-in spa program in the Philippines . She was a member of the Philippine Olympic Committee Team during the SEA Games 2017 in Kuala Lumpur.

As a celebrity, she has appeared in numerous and major television programs. She is the president of the Nutrition & Emotional Wellness and Beauty Scene Salon . Ms. Velasco is the president of the NDAP, Vice-President of NDAP Foundation, an international facilitator of John Robert Powers International and an active member of the Academy of Nutrition and Dietetics.

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ABSTRACTS

Modulating Effects of Wheat Grass on High Fat Diet Induced Dyslipidemia, Hepatosteatosi s and Oxidative Stress Biomarkers in Streptozotocin-Nicotinamide (Stz-Na) Diabetic Rats



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Abstract

Diabetes mellitus, a group of metabolic diseases is characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. Several pathological processes are associated ranging from autoimmune destruction of the β -cells of the pancreas with consequent insulin deficiency to abnormalities that result in resistance to insulin action. The chronic hyperglycemia and associated hyperlipidemia results in long-term damage, dysfunction, and failure of various organs and organ

systems.

To simulate type 2 diabetes, a high-fat diet formulation combined with single intraperitoneal injection of streptozotocin (STZ) was used to induce obesity and diabetes in male albino wistar strain. The study was planned to evaluate the modulating effects of wheat grass (*T. aestivum*, 100mg/kg) in nicotinamide- streptozotocin (NA-STZ) (230mg and 55mg/kg body weight respectively) induced diabetes in wistar rats (150-200g) reared on high fat diet (15% saturated fatty acid, 1% cholesterol). The rats were given single intraperitoneal (i.p.) injection of STZ. Glibenclamide (5mg/kg body weight), atorvastatin (10mg/Kg body weight). The dietary regime was followed for a period of 45 days.

The *T. aestivum* showed the presence of various phytochemicals viz. phenols, tannins, polyphenols conferring to free radical scavenging capacity in vitro. The serum and hepatic biochemical parameters viz. blood glucose, HbA1C, insulin, glycogen levels, lipid- lipoprotein fractions, showed marked improvement ($p \leq 0.05$) in wheat grass treated group as compared to the diabetic control and HFD fed diabetic rats. The levels were near normal and comparable to the animals treated with standard drugs indicating its efficacy equivalent to them. The increased excretion of faecal lipids and bile acid content indicate that wheat grass powder was able to neutralize the effect of HFD and STZ thereby improving glycaemic and lipidemic biomarkers. Furthermore, antioxidative enzymatic (SOD, CAT, GSHPx, GSH) activity increased with concomitant decrease in lipid peroxidation and TBARS levels in treatment groups indicating wheat grass have a marked effect in scavenging free radicals thereby reducing oxidative stress. The histopathological examination of hepatic, pancreatic and renal tissues of wheat grass treated rats showed restorative and protective effect to the tissues whereas the diabetic rats showed necrosis, sterosis and cellular damage.

In conclusion, the study suggests that wheat grass possess ameliorative ability against metabolic alterations associated with diabetes. It can be effectually used for treatment for diabetes and its associated complications.

Biography:

Dr. Komal Chauhan has had the rare opportunity of being nurtured in varied regions and cultures of India bringing out the best in her. She did her doctorate in Food Science and Nutrition from Banasthali University Rajasthan. A meritorious student throughout her academic career she has been a scholarship holder and Gold Medalist at Masters Level.

She embarked on her teaching career from SD College Ambala Cantt and later to Banasthali University. At present she is working as Assistant Professor in Nutrition in the Dept. of Food Science and Technology at National Institute of Food Technology Entrepreneurship and Management, Kundli, Sonpat, Haryana, India. She has a teaching and research experience of more than two decades.

She has published and presented several papers in National and International Journals and conferences. She has been working in the area of Nutraceuticals and Functional Foods and Nutritional Biochemistry. She has working in the areas of malnutrition, and non-communicable diseases namely diabetes, cardiovascular diseases and obesity. She has worked on various projects sponsored by UNICEF, UGC MOFPI/ SERB and Ministry of Tribal Affairs, MP Govt.

Qualitative Assay Of Amino Acids In Gluten Waste Fermented With Staphylococcus Sciuri (Tkmft8) By Thin Layer Chromatography.



Abdul Rasheed K K

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Abstract

Bakery industry is one among the most promising areas in the food processing sector. These industries produce not only food products but also huge volumes of waste during different stages of operations. Among the bakery industries, halwa manufacturing units produce high amounts of gluten waste, which is a complex protein composed of several essential and nonessential amino acids. In the present study, a qualitative assay of amino acids in fermented gluten samples was performed by Thin Layer Chromatography (TLC). Samples were taken from the first day (day 1) to the last day (day 10) of gluten fermentation with *Staphylococcus sciuri* (TKMFT8). Presence of amino acids was determined every 24 hrs till the end of the fermentation period (10th day) and the effect of fermentation day on amino acids production was determined. Separation is based on the liquid-liquid partition of the compounds between two immiscible phases. Materials used for TLC were silica gel plate (stationary phase); 1-butanol, glacial acetic acid and water (mobile phase) in the ratio 4:1:1 ; known solutions of amino acids (standard), unknown solutions of amino acids (samples), micropipette, developing tank, 2% ninhydrin solution, heat gun, pencil and gloves. TLC analysis showed the presence of Glutamic acid, Isoleucine, Tryptophan, Cysteine, Valine, Threonine, Lysine, Phenylalanine, Leucine, Methionine, Isoleucine, Alanine, Serine and presence of unidentified amino acids labeled as X1, X2, X3, X4, X5, X6, X7, and X8. The maximum production of amino acids was observed on 48 hours (Day-2) of fermentation.

Biography

Dr. K.K. Abdul Rasheed, he is the Professor & Head of Department of Mechanical Engineering, TKM College of Engineering, Kollam. He has been the National Vice President of Association of Food Scientists & Technologists India (2014 & 15). He has been the Chairman of Pass Board (Vth&VIth Semester Mechanical)- University of Kerala (2014-15) as well as for Pass Board (VIIth&VIIIth Semester Mechanical) University of Kerala (2015-16)

He has also been the Principal of KMCT Engineering College, Kozhikode (2007-2009).

Acceptance of a Protein Fortified Biscuit Recipe for Use among Geriatric, Nutritionally Compromised Patients

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Abstract

Malnutrition is prevalent in the geriatric population, as is age-related decline in skeletal muscle mass. Research indicates that nearly forty percent of older adults in skilled nursing facilities across the nation are undernourished, with over half experiencing protein-energy malnutrition (PEM). Effects include a gradual loss of mass, strength and function. Concurrently, studies indicate optimal protein-energy intake increases the quality and length of life, and mortality may be reduced by supplementation in this group. However, as protein needs increase, skilled nursing facilities struggle to meet patient protein needs as appetite, amino acid metabolism, chewing, and swallowing capacity decline. Nutrient-dense foods are essential in promoting geriatric health with an emphasis on protein. Fortification of foods is a common, cost-effective approach to enhance nutritional health in this setting, as increasing the volume of food intake is not always a viable solution. The aim of this research was to create a functional food, fortifying a food item that is eaten as a part of a typical diet. Researchers modified a biscuit recipe to increase the protein and calorie content of this popular southern food and compared the acceptance among a sample of adults (n=97) during a blind trial, and the effects of adding two different protein powders, a whey protein modular or instant dry milk powder, on nutrient composition. Analysis of Variance and post hoc testing indicated a statistically significant effect when adding protein sources on acceptability, texture, and flavor ($P < 0.05$). Participants rated the flavor and overall acceptance of the milk fortified protein biscuit highest among variations, with the texture of the control and milk variations most similar; the whey variation was poorly accepted. Results suggest the addition of instant dry milk powder to a popular biscuit recipe may be a cost-effective method of improving its nutrient composition, while maintaining acceptability.

Advancements in Microarray Utility for Detection and Tracking of Foodborne Microbes in the Genomic Era

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Abstract

Outbreaks caused by foodborne microbes pose serious public health and food safety concerns worldwide. There is a great demand for rapid, sensitive and high-throughput methods to detect and track these pathogens in food, water and other environments. Recent advances in DNA genomic technology have enabled high-throughput analyses of strains by capturing total genomic content of strains and with concomitant comparative phylogenies. Microarrays are particularly adept for distilling large amounts of genomic DNA sequence information such as the gene(s) or genetic traits of hundreds of foodborne isolates in a single experiment. Hence, over the past two decades, microarray technology has advanced tremendously due to accessibility to thousands of complete and draft microbial genomes and this progress has led to the design and manufacturing of newer microarrays which can now identify gene sequence variations down to a single nucleotide polymorphism. DNA microarray remains a useful tool for rapid and refined genomic analysis of foodborne microbes. In this review, we will primarily focus our discussion on pathogen detection, serotype identification and tracking the genetic diversity and source of contamination of respective foodborne strains with our first-hand experience in using this technology.

Keywords:

DNA microarray; Foodborne pathogens; SNPs; Public health and food safety

Functional characterization of phenolic compounds from green coffee



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Abstract

Bioactive compounds from plants, animals and microbial sources are gaining importance in recent years. Due to growing evidence that diets rich in polyphenols may have potential health benefits for consumers and providing the nutritional supplement. Phenolic compounds are secondary metabolites generally involved in plant adaptation to environmental stress conditions. Chlorogenic acids (CGA) and related compounds are the main components of the phenolic fraction of green coffee beans, reaching levels up to 14 % (dry matter basis). The main groups of CGA found in green coffee beans include caffeoylquinic acids, dicaffeoylquinic acids, feruloylquinic acids, p-coumaroylquinic acids and mixed diesters of caffeic and ferulic acids with quinic acid, each group with at least three isomers. These compounds have a number of beneficial health properties related to their potent antioxidant activity as well as hepatoprotective, hypoglycemic and antiviral activities. During coffee processing, CGA may be isomerized, hydrolyzed or degraded into low molecular weight compounds.

Process parameters were optimized for the preparation of green coffee extracts (GCE) and analyzed for various functional attributes such as radical scavenging activity (DPPH), oxygen radical absorbance

capacity (ORAC), anti-tumour (P388 cell assay), anti-inflammatory (J774A.1) and anti-allergy (RBL-2H3) in different in-vitro model systems. Coffee extract was evaluated in mice model system for oxidative stress in terms of 8-hydroxy-2'-deoxyguanosine (8-OHdG) as a biomarker. Efficacy of GE against the oxidative rancidity of sunflower oil was also investigated. Product protocols were also optimized for the incorporation of green coffee extract in bread and soup mix.

GCE was found to contain total polyphenols of 5.8% (GAE) and showed anti-tumour activity in terms of cell viability. It was also observed that GCE was found to exhibit radical scavenging activity of 92.5% at 100-ppm concentration with the Trolox equivalents of 5498 μg . At the concentration of 1%, GCE reduces oxidative stress in terms of the biomarker as 8-OHdG and increases the serum HDL cholesterol significantly ($p < 0.05$) in BALB/c mice at the end of 14 days of experimental period. There is a significant increase in Trolox value in serum of coffee fed mice compared to control mice. However, GCE showed limited anti-inflammatory and anti-allergic activity. Results showed that the conserve was quite effective in restricting the oxidative changes (viz., Peroxide value, free fatty acids p-anisidine value), which are formed during the storage of refined oil. Also, the conserve was quite soluble in the fat system and did not have any adverse effect on the storage quality of the sunflower oil.

Results of the study provided scope for the research on the utilization of the green coffee conserve in various food systems. However, further study is required with respect to the other parameters such as toxicological aspects, carry through effect and standardization of the dosage levels.

Biography

Dr. Ramalakshmi Kulathooran has twenty six years of research experience in CSIR - Central Food Technological Research Institute, India, a prestigious Food Research Institution in the country. Presently she is working as the Professor & Head in Department of Food Technology at Bannari Amman Institute of Technology (affiliated to Anna University, Chennai), Sathyamangalam, Tamil Nadu, India from 09-09-2017.

Effects of Diabetes



Geeta Seth

Abstract

Diabetes Mellitus, a condition in the body where the blood glucose is out of range in normoglycemia. If not taken care the sugar goes up and starts affecting the internal body organs adversely.

This condition if persistent gives the body long term complications worsening the physical body.

As diabetes still has no cure ,we can help this condition with the help of correct ,low glycemic index diet and use the complex carbohydrates in daily diets. We can skip the complications and lead a normal life with the right diet.

The right diet is required to avoid sugar level fluctuations, which can be very harmful to the brain, and can affect the body adversely

Biography

Geeta Seth is a nutritionist and dietician since 2003. She has two gold medals in nutrition field topping the DAVV university in Madya Pradesh ,India.

Has worked with hospitals and Diabetes research Center.

She is a insulin pump trainer and a diabetic educator and counsellor.

**Anti-Oxidant Diet Effect to Embryo Quality of Infertile Male
Especially with Asthenozoospermia**



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Abstract

To explore the relationship antioxidant play in improving male fertility and which are the best food to consume. Literature views were done using PubMed, Cochrane electronic database, Medline, Oxford academic, NCBI, PopLine, EMBASE, and Trip Pro. Keywords used included antioxidants, semen, sperm function, pregnancy rate, and male infertility.

The first study result shows that the cases had a lower BMI of 19.9 against 26.1 and total energy intake of 1705.3 against 1935.8. Importantly, as it was expected because of the study design the sperm mobility in the cases was lower than in the controls. The second study shows the highest tertile of the

whole vegetables and fruits was associated with a low risk of asthenozoospermia. The subgroups of vegetables mainly increase of tomatoes, and dark green vegetables were associated with a low risk of asthenozoospermia. Fruits and vegetables were the primary sources of fibre intake in the population that was considered for the study. In the high research intake of processed meat mainly those that have high saturated fat it was evident there was reduced sperm mobility. The conclusion of the study can be stated that to improve the fertility of men, it is necessary they consume high intakes of fruits and vegetables and low intake of processed meat and dairy products.

Keywords:

Infertility, asthenozoospermia, male fertility, nutrition

Antimicrobial Food Packaging to Enhance Food Safety: Current Developments and Future Challenges

Sunil Mangalassary

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Abstract

The post-processing contamination is one of the major causes of foodborne illness and the associated food product recalls; a major public health issue and an economic burden for the food industry [1]. Therefore, post-processing antimicrobial interventions are gaining significance in order to control the growth of bacteria that contaminate the food product after the primary lethal treatment. Packaging of foods is one of the final steps in food processing before storage and consumption and therefore is a critical step for incorporating antimicrobial mechanisms especially to control the post-processing contamination. Antimicrobial packaging is a promising form of active packaging to improve safety and shelf-life of food products. In antimicrobial packaging, agents may be coated, incorporated, immobilized, or surface modified onto packaging materials [2]. Many compounds such as organic acids, bacteriocins, enzymes, spices and polysaccharides (chitosan) have been tried in antimicrobial packaging with varying degree of success.

Application of High Power Ultrasound and Microwave in Food Processing: Extraction

Anet Režek Jambrak

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Abstract

Ultrasonid is defined as sound waves having frequency that exceeds the hearing limit of the human ear (~20 kHz). Ultrasonid is one of the emerging technologies that were developed to minimize processing time, cost of processing, maximize quality and ensure the safety of food products [1]. Ultrasonid is applied to improve positive effects in food processing such as improvement in mass transfer, food preservation, etc. High power (high energy, high intensity) ultrasonid operates at frequencies between 20 and 500 kHz, and intensities higher than $1\text{W}\cdot\text{cm}^{-2}$ which are disruptive and induce effects on the physical, mechanical or chemical (biochemical) properties of foods.

The propagation of ultrasonid through a material induces compressions and decompressions (rarefactions) of the medium particles, which imparts a high amount of energy. High power ultrasonid with frequency higher than 20 kHz has mechanical, chemical and/or biochemical effects, which are used to modify the physicochemical properties and enhance the quality of various food systems during processing. High power ultrasonid can be applied using sonication baths or ultrasonic immersion probes with different lengths, diameters and tip geometries depending on applications. These effects are promising in food processing, preservation and safety. This emerging technology has been used as alternative to conventional food processing operations for facilitating the extraction of various food and bioactive components, accelerated drying and modifying of textural characteristics of starch, fat products (sonocrystallization), emulsification, defoaming, modifying the functional properties of different food proteins, depolymerisation, inactivation or acceleration of enzymatic activity to enhance shelf life and quality of food products, microbial inactivation, freezing, thawing, freeze drying and concentration etc

Bioconversion of ferulic acid attained from pineapple peels and pineapple crown leaves into vanillic acid and vanillin



Tang Pei Ling

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Abstract

This study was conducted to evaluate the potential of pineapple peels (PP) and pineapple crown leaves (PCL) as the substrate for vanillic acid and vanillin production. Initially, ferulic acid was extracted from the PP and PCL respectively by using aq. NaOH. Then, the PP and PCL extracts were fermented by *Aspergillus niger* I-1472 to produce vanillic acid and vanillin. In the preliminary experiment, about 201.89±18.38mg/L and 119.99±11.32mg/L of ferulic acid was extracted from the PP and PCL respectively. By applied response surface methodology, the ferulic acid yield was increased to 1054.81±160.12mg/L and 328.25±23.25mg/L respectively by treating 19.32% of PP and 9.86% of PCL in aq. NaOH solution at 120oC for 76.71 min and 36.11 min separately. In spite of that, this study has also proved that ferulic acid is the main precursor for vanillic acid and vanillin production by *A. niger*. The results obtained revealed that PP extract is better than PCL extract for vanillic acid and vanillin production. Furthermore, the experiment also proved that the yield of vanillic acid and vanillin produced via large volume feeding fermentation was higher than the small volume feeding mode. Through large volume feeding fermentation, about 6.45±1.45mg/L of vanillic acid and 4.62±1.20mg/L of vanillin were successfully produced from PP extract.

Keywords:

Pineapple peel, pineapple crown leaves, vanillic acid, vanillin, ferulic acid

Biography

Dr. Tang Pei Ling is currently a senior lecturer in the Department of Bioscience, Faculty of Applied Sciences, Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia. She received her PhD in Food Science from Universiti Kebangsaan Malaysia, Malaysia in 2016. Her research is situated in the field of biorefineries, with the focus on biotransformation of agricultural residues into biochemicals and

functional food ingredients. Dr. Tang has nearly 9 years research experience in agricultural by-products such as oil palm empty fruit bunch fiber, rice husk, pineapple peels, pineapple crown leaves, kenaf, spent coffee ground, sugarcane leaves, etc. In the year of 2018, Dr. Tang had been elected as one of ASEAN talented young scientists under 'China-ASEAN Talented Young Scientist Guangxi Program'. Under the program, Dr. Tang was worked in the Guangxi Key Laboratory of Efficacy Study on Chinese Materia Medica, Guangxi University of Chinese Medicine for 6 months. In spite of that, Dr. Tang is also engaging with teaching activity in the courses include food chemistry, unit operation in food processing, food analysis, introductory foods, etc. Moreover, she is also a registered food analyst with the Malaysian Food Analyst Council (Ministry of Health Malaysia) and professional member of Malaysian Institute of Food Technologist (MIFT).

Prebiotic activity of Arrowroot (*Maranta arundinacea*) extract and survivability of *Lactobacillus* species in Arrowroot incorporated synbiotic ice-cream



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Abstract

Arrowroot (*Maranta arundinacea*) is a locally available underutilized starchy root which reported to contain considerable amount of Fructooligosaccharides in their extract. This study was performed to evaluate the potential prebiotic activity of arrowroot extract and to evaluate the probiotic cell viability during frozen storage of arrowroot extract incorporated synbiotic ice-cream. The highest prebiotic activity was given by the arrowroot extract compared to inulin and glucose. The prebiotic activity of arrowroot extract and inulin were significantly higher than the prebiotic activity of glucose ($p < 0.05$), but the prebiotic activity of arrowroot extract and inulin were not significantly different from each other ($p > 0.05$). The probiotic cell viability is more or less same in arrowroot (sample) and inulin (reference) ice-creams, the lowest probiotic cell viability was recorded in the control ice-cream, but there is no any significant difference in the probiotic cell viabilities in all three ice-cream types during frozen storage ($p > 0.05$). According to the physiochemical results, there is a significant difference in total soluble solids (TSS) and titratable acidity (TA) between control and reference ice creams ($p < 0.05$), but there is no significant difference in TSS and TA between sample and reference ice-creams ($p > 0.05$). Therefore, the prebiotic activity results concluded that there is no significant difference in prebiotic activities of arrowroot extract and inulin. It shows that arrowroot extract has a potential to replace commercial prebiotics like inulin. Probiotic viability results concluded that the prebiotics incorporated

ice-creams are having higher cell viabilities than control ice-cream. It indicates that the prebiotic substances had helped probiotics to survive during harsh frozen storage conditions.

Keywords:

Arrowroot; Synbiotic; Prebiotic activity; Probiotic viability

Biography:

Charith Priyadarshana is a final year undergraduate student in the Department of Food Science and Technology at Wayamba University of Sri Lanka. His work mainly focused on prebiotics, probiotics and synbiotics. He conducted a research on the prebiotic activity of Arrowroot (*Maranta arundinacea*) extract and the survivability of *Lactobacillus* species in the frozen storage of synbiotic ice-cream. He is keen on conducting research under the discipline of food science and technology.

Enteral Nutrition in Philippine Setting



Miraflor D. Pilpil, RND

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Abstract

Enteral Nutrition generally refers to any method of feeding that uses the gastrointestinal (GI) tract to deliver part or all of a person's caloric requirements. It can include a normal oral diet, the use of liquid supplements or nutritional formula or delivery of part or all of the daily requirements by use of a tube feeding.

Nutrition Support Teams (NST) has been established to be the gold standard when it comes to implementers of the clinical nutrition program in the hospital. The number of Hospitals in the Philippines with more than 600 beds needing an NST is around 83 as assessed by the Philippine Society of Parenteral and Enteral Nutrition in year 2008.

There are 5 Major Classification of Enteral Formula used in Philippine Hospitals – the Standard Polymeric, Blenderized Feeding, Elemental and semi-elemental, Disease Specific and the Modular. In this presentation, the following will be shown:

- a. Practice Recommendations in handling Enteral formulas
- b. EN Additives
- c. Common Tube feeding Problems
- d. Overview of EN Related Complications
- e. Guidelines in transitioning from Enteral to Oral Feeding

Biography

Miraflor D. Pilpil, RND is currently the Chief Dietitian of The First Filipino Saint Hospital (San Lorenzo Ruiz Hospital), with 15 years of Clinical Nutrition experience in Medical Nutrition Therapy and applying the principles of Enteral and Parenteral Nutrition on a daily basis with patients. She is a member of the Philippine Society of Parenteral and Enteral Nutrition, Philippine Association of Diabetes Educator, Philippine Association for the Study of Overweight and Obesity and currently the Vice President for South Luzon of the Nutritionist Dietitian's Association of the Philippines.

Physico-sensory and Textural properties of Composite millet muffin with palm jaggery as a natural sweetener



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Abstract

Millet palm jaggery muffins (MPM) were prepared by replacing the all-purpose flour with composite millet flour at different level (0:100, 50:50, 30:70) and replacing the sugar with palm jaggery at the level of 50-60%. The muffins were analyzed for Physico-sensory and textural properties. Incorporation of composite millet flour with all-purpose flour carried out at different levels. The ratio 70:30 of millet flour and wheat flour resulted acceptable product with good sponginess which is one of the desirable properties of muffins. The moisture content of muffins prepared with palm jaggery was found to be higher (21.81 %) than muffins prepared with sugar (19.56%). The muffins with jaggery had lower pH, overall quality score and higher water activity (*aw*) than muffins with sugar. The palm jaggery muffins showed lower value for lightness, higher values for redness and yellowness than sugar muffins. Sensory evaluation results showed that the jaggery muffins with jaggery flavour were more acceptable than sugar muffins with optimized flour. Both the muffins were found to be

microbiologically safe, as shown by the safe microbial load. Millet muffins with palm jaggery with high nutritional profile have good potential for marketing.

Biography:

Ms. Snehal Jadhav Completed M.Tech in Food Technology, Shivaji University, Kolhapur (Maharashtra State) in March 2017 and having 7 months experience as a Research associate at ICAR-CCRI (Indian Council Agriculture Research Institute- Citrus Research Institute, Nagpur). Currently she is working as a Full Time Ph.D Research scholar at Bannari Amman Institute of Technology, (affiliated to Anna University, Chennai), Sathyamangalam, Tamil Nadu since 01-01-2019.

Biofilm Formation of Foodborne Pathogens and their Control in Food Processing Facilities

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Abstract

Microorganism can form biofilm to adapt various hard-to-live conditions for long-term survival. Foodborne pathogens can seed in the biofilm to escape the regular sanitation practice, especially in floor drains. Food processing facilities generally use chlorine-based, QACs-based, or phenolic-based sanitizers in their sanitation practice. The advantage of these sanitizers is cheap and effective and the disadvantage is its efficacy can be reduced by a lot of factors and easy to produce resistance. New novel bactericide as an alternative is needed when efficacy of these traditional sanitizers is substantially reduced. For control of *Listeria monocytogenes* in floor drain contamination, especially for ready-to-eat processing plant the procedure of biocontrol is needed because floor drain is too deep to reach. The product of biocontrol contains beneficial bacteria and these beneficial bacteria can live in the biofilm at harsh environment and these beneficial bacteria consistently produces various bacteriocins to kill *L. monocytogenes* and ensures floor drain without the contamination of *L. monocytogenes* for long-term.

Biography

Foodborne pathogens; Biofilm; Chemical control; Biocontrol

DPA Release and Germination of Alicyclobacillus acidoterrestris Spores under High Hydrostatic Pressure

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Abstract

High thermoresistance combined with the ability to grow under acidic conditions, which are unique among spore formers, make Alicyclobacillus acidoterrestris one of the most serious problems for the fruit processing industry. Dipicolinic acid (DPA) is an important factor in spore resistance to many environmental stresses, and in spore stability.

The aim of the study was to determine the relationship between DPA release and the germination of A. acidoterrestris spores, initiated by high hydrostatic pressure (HHP). Samples of the spores of two A. acidoterrestris strains suspended in apple juice and pH 4.0 and pH 7.0 McIlvain buffers were treated with pressure of 100-500 MPa, at a temperature of 20-75°C for 15 min. The total amount of DPA in A. acidoterrestris spores was 50.3 µM for the TO-169/06 and 42.7 µM for the TO-117/02 strain. The amount of DPA released in apple juice treated with 300 MPa was 29.3 µM at 50°C and 35.8 µM at 75°C for the TO-169/06 strain, and 24.6 µM at 50°C and 27.8 µM at 75°C for the TO-117/02 strain. DPA release in the pH 7 buffers and at 20°C was inhibited. The amount of DPA released correlated to the amount of the germinated A. acidoterrestris spores.

Keywords:

Alicyclobacillus acidoterrestris; Spore germination; High hydrostatic pressure; Dipicolinic acid

Effectiveness of Groundwater Treatment for Drinking Use and Dairy and Food Processing

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Abstract

Groundwater supplies should undergo comprehensive water quality testing to ensure suitability for drinking water and dairy production purposes. Evaluation of chemical characteristics and microbiological quality as well as treatment processes applied for the removal of contaminants from groundwater extracted from Al-Sag aquifer in Buraydah, Qassim region were investigated. The tested water samples from both well sources and effluents were found to have total dissolved solids, electrical conductivity and turbidity values within the acceptable limits of Saudi standards and WHO guidelines. Of course, the reduction percentages were the same for EC and TDS (58.6-93.6%) while it scored 0.0-100% for turbidity due to the adopted treatment processes. Chemical characteristics such as total alkalinity, chloride, nitrate and hardness were also found to be within the permissible levels of both Saudi standards and WHO guidelines. The effectiveness of the adopted treatment processes led to decrease such chemical parameters percent in the treated groundwater by about 54-82.9, 56.9-82.6, 29.0-95.8 and 7.9-98.2%, respectively. Moreover, mineral contents such as iron and cadmium in both raw and treated groundwater were below the detection limit. Groundwater contained fluorine at low levels than permissible limits set by local and international standards; therefore, fluoridation process must be taken into consideration for drinking use. Zinc content of the treated water was within the allowed concentration required by the Saudi standards and the WHO guidelines. While, nickel and lead contents in three groundwater sources were found to be higher than those postulated and recommended by the Saudi standards and WHO guidelines. However, water treatment at all studied stations was fair enough to remove these hazards and secure water. In regards to microbiological quality, the treated groundwater was found to be totally free from coliform organisms with almost undetectable level of viable count rendering them quite safe for drinking use and dairy-food processing.

Keywords:

Al-Sag aquifer; Groundwater; Treatment; Drinking water; Dairy process

Effect of Different Corn Processing Techniques in the Nutritional Composition of Nixtamalized Corn Tortillas

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Abstract

Maize in the form of tortilla plays an important role in the diet of Mexican population, with a per cápita consumption of 157 g/day. The two main methods for tortilla are the traditional method, which uses maize dough or masa made in the ancient manner; and the industrial method, which uses industrially-processed maize flour. Both methods are based on the alkaline-processing of maize known as nixtamalization. Chemical profiles of maize tortillas were analyzed. Samples were collected between 2012 and 2013 in three lots, one every six months, from four retail shops at 16 municipalities of Mexico City; tortillas made of maize flour were obtained from two supermarkets of four municipalities. Composition changed according to raw materials and production method. Samples made with nixtamal dough showed lower contents of moisture, of about 5%, and absence of thiamine and riboflavin than nixtamal flour. Differences in carbohydrates and iron, 0.5% more in case of iron, may be caused by maize phenotype; while differences in crude fat 1% more, dietary fiber 0.5% more, thiamine, and riboflavin are due to additives added by manufacturers; however, concentration of vitamins and minerals in the final product were below theoretical values. In case of calcium, 100% more in maize dough tortillas is due to lime amount added on each method or amount of broken grain processed. Regarding on effect of sampling, contents of protein and crude fat remained constant on dough tortillas regardless of sample collection and these were consistently higher than maize flour tortillas over time, 0.3% and 1%, respectively, which is due to maize phenotype. On flour-made tortillas, fat and dietary fibers were also constant since maize flour manufacturers add additives and nutrients to obtain certain rheological characteristics and nutritional content on maize flour tortillas.

Keywords:

Maize; Nixtamal; Tortilla; Nixtamal flour; Nixtamal dough; Chemical composition

Effect of Food Processing Industries Effluents on the Environment: A Case Study of MOHA Mekelle Bottling Company, Tigray, Ethiopia

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Abstract

There is an increasing awareness on the problems of environmental pollution not only in developing countries like Ethiopia but worldwide. Among the sources of this problem is effluent discharge from industries, particularly food processing industries. To determine the extent of this problem in moha soft drink company Mekelletigray Ethiopia. The effluents were collected and analyzed for solids, organics, nitrogen, pH and total coliform using standard procedure. The results showed that total solids (TS) varied 440 to 703 mg/L, total suspended solids (TSS) from 0 to 230 mg/L and total volatile solids (TVS) from 223 to 514 mg/L. The pH of the effluents varied from 6 to 8, the COD from 684 to 3,192 mg/L, the TN from 5.6 to 33.6 mg/L and the total coliform from 43 to 150 MPN/100 mL of effluent sample. Compared to the effluent limitation guidelines given by American Environmental Protection Agency, the TSS, and COD for most of the industries are well above the limits while the TKN, pH and coliform count are within the acceptable limit.

Key Words:

Food processing waste; Effluents; Waste characteristics; Environmental pollution

Effect of Processing Methods on the Nutritional Value of Canavalia ensiformis Jack Bean Seed Meal

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Abstract

The present study was undertaken to analyze the effect of various processing methods. Raw, Boiled, Toasted, Soaked and Fermented methods were applied on *Canavalia ensiformis* Jack bean seed meals to determine their nutritional compositions. The applied methods were found to improve the protein content (30%-36.60%), lipid (5.85%-9.23%), fiber (3.25%-6.35%), (2.12 g/100 g) as compared to the raw (0.81 g/100 g). Vitamins A (1425.32-6124.56 IU/100 g), B1 (0.15-0.32 mg/100 g), B3 (0.06-0.21 mg/100 g), B6 (0.03-0.19 mg/100 g), C (7.54-25.65 mg/100 g) and D (0.36-0.53 mg/100 g). There was a reduction in vitamins content from boiled and toasted methods. Fatty acids: Capric (0.002-0.0035 g/100 g), Lauric (0.003-0.004 g/100 g), Myristic (0.004-0.006 g/100 g), Palmitic (0.015-0.023 g/100 g), Stearic (0.013-0.019 g/100 g), Oleic (0.016-0.021 g/100 g), linoleic (0.024-0.039 g/100 g) and Arachidic (0.003-0.006 g/100 g). The toasted and fermented method gave the best processed methods. Knowledge gathering and exploration of nutritionally balanced unconventional legumes would enhance food and nutritional security.

Key Words

Unconventional legumes; *Canavalia ensiformis*, Processing; Nutrients

Effect of Processing on Nutritional Quality and Antioxidant Potentials of Leafy Vegetables

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Abstract

Blanching is a primary step in processing of Green Leafy Vegetables. Despite of its preserving advantage, it leads to partial destruction of some nutrients like vitamin C which is heat liable and sensitive to light, oxygen and oxidizing agents. The study was carried out to identify a suitable blanching temperature, time and chemical media for the green leafy vegetables namely, *Alternanthera sessilis*, *Cardiospermum helicacabum* and *Celosia argentea* that ensures enzyme inactivation and maximum nutrient retention. The leaves were processed by the following methods (i) Blanched at 80°C, 90°C and 100°C for 5 min in distilled water (ii) Blanched in water containing chemical media (potassium metabisulphite (KMS), sodium bicarbonate and sodium chloride) at 80°C for the 1 min, 2 min and 4 min respectively. Blanching time and temperature increased, there is a reduction in the retention of Vitamin C in all the greens. The statistical analysis ($P \leq 0.05$) showed significant retention of vitamin C on blanching the leaves at 80°C for 1 min in potassium metabisulphite. Reduction in the moisture content, fiber, Iron was also found to be statistically significant. Blanching at 80°C for 1 min in potassium metabisulphite was sufficient to inactivate peroxidase in leafy vegetables.

The antioxidant properties of the fresh and blanched green leafy vegetables were subsequently determined. The study revealed the presence of phenolics (gallic acid equivalents 3.89-8.55 mg/g), flavonoids (quercetin equivalents 9.47-37.66 mg/g) and tannins (tannic acid equivalents 10.47-13.58 mg/g). Three of the samples were exhibited remarkable DPPH radical scavenging activities (>70%) with significant IC₅₀ values of 653.10 and 760.34 µg/ml respectively. The result showed that blanching at 80°C for 1 min with potassium metabisulphite as a chemical media had a good retention of Vitamin C and least effect on other nutritional content. Hence it is found that blanching is the best method of preserving GLV without compromising its nutritional quality and antioxidant potentials.

Keywords:

Green leafy vegetables; Blanching; Antioxidant activity; Vitamin C; Nutritional quality

Evaluation of Anti-Nutritional Factor Reduction Techniques for Triticale Improved Utilization System in Amhara Region

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Abstract

Triticale is breed of wheat and rye and can grow in poor soil fertility. The nutritional quality of triticale is similar to that of wheat and rye. But the presence of anti-nutritional factors especially tannin and phytate reduce the nutrient utilization and/or food intake products when used as human foods. Anti-nutritional factors are chemical compounds synthesized in natural food and or feedstuffs by the normal metabolism of plant species or may be formed during heat/alkaline processing of foods. In this study, different anti-nutritional factor reduction techniques (malting and blanching) were evaluated and remarkable reduction in anti-nutritional factor was found. Finally, these techniques (malting and blanching) were demonstrated at triticale potential farmers of the Amhara region in Degadamot and Fareta district.

Keywords:

Triticale; Anti-nutritional factor; Malting; Blanching; Tannin and phytate

Evaluation of Techno Functional, Nutritional and Storage Stability of Wheat Based Crackers Incorporated with Brown Rice Flour and Carboxymethyl Cellulose

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Abstract

A study was conducted at Division of Post-Harvest Technology; SKUAST-Kashmir to develop wheat based crackers incorporated with brown rice flour. Response Surface Methodology (RSM) was used to study the effect of brown rice flour, carboxymethyl cellulose (CMC) and shortening on quality characteristics of crackers. Central composite rotatable design (CCRD) with brown rice flour (10-40%), CMC (1-3%) and shortening (5-12%) as independent variables produced twenty different combinations that were used to investigate the effect of these variables on product responses viz spread ratio, volume index, density, thickness, width and puffiness. The independent responses- Brown rice flour, CMC and shortening significantly ($p \leq 0.05$) affected the product responses. Brown rice flour incorporation had pronounced effect on quality parameters than shortening and CMC. Optimized processing parameters for the preparation of product was brown rice flour (10%), CMC (1.810%) and shortening (5%). Storage studies of the final product revealed that the shelf-life stability of brown rice flour incorporated crackers was maintained up to 3 months in cellophane bags under ambient storage conditions. However, a gradual increase in free fatty acid concentration and decrease in hardness of crackers was reported over a period of 90 days of storage.

Keywords:

Brown rice flour; Cracker; Volume index; Puffiness spread ratio

Non-destructive Analysis of Food Adulteration and Legitimacy by FTIR Technology

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Abstract

Despite of old methods, an emerging technology of Fourier Transform Infrared (FTIR) spectroscopy has been appeared to use as a promising application for the detection of adulteration in food. FTIR method works on the principal of interaction of electromagnetic radiations with the molecules of specific food with defined energy. In this review, the three regions of electromagnetic spectra including near infrared, mid infrared and far infrared are the points of spotlight. For food industry, FTIR method is expedient, automatic, time saving and most importantly, it shows non-destructive analysis of food physically as well as chemically. Moreover, FTIR in collaboration with the authentic commendable data analytical system appeared as a tremendous appeal for descriptive test of food from extremely large quantity to its trivial component level, showing dramatically potential for adulteration analysis with the substantial contrivance for the quality control progressions. A systematic review of literature has been performed to amass the information of FTIR technique as non destructive method for analysis of intentionally added harmful chemicals from existing research publications.

Keywords:

FTIR; Food adulteration; NIR; MIR; FIR; Food safety; Food authenticity

Nutritional and Microbiological Evaluation of Ricebean (*Vigna umbellata*) Based Probiotic Food Multi Mix Using *Lactobacillus plantarum* and *Lactobacillus rhamnosus*

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Abstract

The sustainable developmental goal emphasized a holistic approach to achieve zero hunger, good health and wellbeing till 2030. To achieve such goal, food diversifications like food fortification can be employed to prevent hunger, starvation and micronutrient deficiencies on a long term basis. One of the best food based approach to address these issues is by development of new value added products like Food Multi Mix from local functional ingredients for better affordability, accessibility and availability among vulnerable section of our community and also for reducing the major risk factors for noncommunicable diseases. WHO and FAO also focus on utilization of some underutilized legume or pulses in recent years. The use of microbial food additives in improving productivity of functional foods is currently generating a great deal of interest in scientific food industry. The objective of the study was to standardize ricebean based probiotic FMM and to evaluate its nutritional quality. Two FMM were developed namely FMM I and FMM II. All the ingredients were preprocessed before mixing together. FMM I was formulated based on energy density value between 1512.00-1890.00 kJ (360-450 kcal) per 100 g of sample and further by mixing all the ingredients at appropriate amount. Subsequently FMM II was formulated by inoculating probiotic bacteria viz *Lactobacillus plantarum* and *Lactobacillus rhamnosus* in FMM I both individually and in combination in different test samples. The test sample containing highest microbial viability after 30 days of storage was designated as FMM II. Both the Food Multi mixes had optimum macro and micronutrients. Results showed that probiotification played an important role in enhancing the nutrient content in FMM II. The Food Multi Mixes also had good physical properties in terms of bulk density, viscosity, water holding and fat holding capacity. Thus, the FMM concept had been an effective tool in developing food products from underutilized crops to bridge the gap between protein energy malnutrition in developing countries.

Keywords:

Food multi mix; Probiotification; Underutilized legumes

Nutritional Aspects of Food Toxicology: Mercury Toxicity and Protective Effects of Olive Oil Hydroxytyrosol

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Abstract

Mercury represents one of the main environmental pollutants and human exposure to this heavy metal occurs primarily through nutritional sources, including contaminated fish. This highly toxic compound is known to pose serious threats to human health, including neurological alterations. Moreover, based on its effects on cardiovascular health, mercury exposure is now considered an independent risk factor for cardiovascular diseases. The possibility of reducing heavy metal toxicity through diet has attracted the interest of those responsible for the public health service. In this respect, the use of phytochemicals able to significantly counteract oxidative alterations as an attractive tool for the reduction of mercury toxicity has been proposed. Here we review recent evidence supporting the beneficial role of olive oil hydroxytyrosol in preventing mercury-induced alterations in both human erythrocytes and neuroblastoma cells. This novel biological effect exerted by hydroxytyrosol represents an additional mechanism responsible for the much-claimed health benefits of this dietary phenol. Taken together the reported findings encourage the use of virgin olive oil, characterized by a high hydroxytyrosol content, as an innovative approach in designing combined dietary and/or nutraceutical strategies to contrast mercury toxicity in humans.

Biography

Food toxicology; Mercury toxicity; Olive oil; Cardiovascular diseases

Nutritional Characteristics of Normal, *Apolygus lucorum*-Damaged, and Mechanically Damaged Tender Shoots of Tea (*Camellia sinensis*)

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Abstract

Apolygus lucorum is currently a major pest of tea plantations, affecting the normal growth of tea shoots and reducing yield and quality. This study measured the effect of damage by *A. lucorum* alongside mechanical damage using UV spectrophotometry and high performance liquid chromatography. We found that the nutritional characteristics of tea varied with the level of bug damage, which influenced levels of caffeine, theanine, and tea polyphenols. As damage increased, caffeine content gradually increased. In contrast, theanine levels in highly damaged leaves were reduced compared to other levels of damage. The polyphenol level, like caffeine, increased with increasing damage. The levels of five other substances—Epigallocatechin, Catechin, Epigallocatechin gallate, Epicatechin, and Epicatechin gallate were all higher in tea with higher damage. Damage from *A. lucorum* changed the chemical profile of the tea, caused tea water turbidity, taste bitterness and decreased freshness, leading to the tea quality decline.

Keywords:

Camellia sinensis; Tea quality; *Apolygus lucorum*; Damage; Nutritive substance characteristics

Supercritical Fluid Technology: Application to Food Processing

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Abstract

Global trends show that 'green' products and technologies are needed. Increasing environmental concerns, government measures and population growth drive the search for 'green' processes to replace the conventional ones. One area where 'green' processes can potentially find several applications is the food processing and technology. But, is SFT a promising alternative technology for food industry? Major driving forces for the use of 'green' technologies in the processing of foods are the increasing environmental concerns and increasing health conscious among consumers. Developing alternative 'green' technologies and products is necessary for a sustainable processing, reduced energy use and environmental pollution, and a healthier society. SFT has received growing interest as a 'green' alternative technology in the food industry. Fluids become supercritical by increasing pressure and temperature above their critical point. Supercritical fluids have liquid-like solvent power and gas like diffusivity. These physical properties make them ideal clean solvents for processing of natural materials. Carbon dioxide (CO₂) is the most widely used supercritical fluid due to a lack of toxicity and flammability, low cost, wide availability, tunable solvent properties, and moderate critical temperature and pressure (31.1°C and 7.4MPa). Moreover, separation of CO₂ from the product can easily be achieved by reduction of pressure, because the products do not dissolve in CO₂ at atmospheric pressure. Another unique property of supercritical fluids is their selectivity. Extraction selectivity of supercritical fluids can be changed altering density which is done by adjusting pressure and temperature. Selectivity can also be changed by the addition of a co-solvent such as ethanol, methanol, hexane, acetone, chloroform and water to increase or decrease the polarity. Ethanol is the most preferred co-solvent because it is non-toxic and meets 'green' technology criteria. Processing with SC-CO₂ has many advantages: No thermal degradation, better shelf life due to co-extraction of natural antioxidants, higher purity due to the adjustable selectivity, no residual solvent, selective fractionation, and fewer processing steps. Oxidation of sensitive compounds is also prevented due to absence of oxygen in the medium. SC-CO₂ processing adds value because products obtained may be considered as natural [1]. Extraction is the most common application of SFT in food industry. SC-CO₂ extraction has found application in the industry, and today there are several products in the markets processed with SC-CO₂. Unusual vegetable oils such as wheat germ oil, green coffee oil, rice bran oil or crude palm oil, essential oils, fatty acids, phospholipids and bioactive compounds have been extracted from fruits and vegetables using SC-CO₂. Fractionation and purification are also viable applications of SFT in food industry. Fractionation of fish oils with SC-CO₂ to obtain omega-3 enriched fractions is possible. SCCO₂ with water as co-solvent can be employed to selectively extract caffeine from coffee and green tea while avoiding the extraction of antioxidants. Supercritical extraction has been also widely used to add value to by-products of food industry. Extraction of by-products allows the removal

of valuable compounds. These include extraction of polyphenols from rice wine lees and pomegranate seeds from juice production, and extraction of carotenoids from tomato and Sea buckthorn pomaces . Even though SFT offers clear advantages over traditional ones, high cost of the high pressure equipment can be thought as an obstacle to industrial scale commercialization of supercritical processes. A safety risk due to high pressures is another concern. However, operating the supercritical systems with trained staff decreases the safety risks to a minimum. Processing cost of the process could be decreased to lower levels than that of traditional ones. One of the main aspects that should be considered to decrease the processing cost is the optimization. Optimization of the process variables could significantly increase the yields and shorten the process time. The cost of large capacity supercritical plants with optimized design and operation could be comparable to that of conventional process.

The Brazilian Nutritional Policy of Iodination of Culinary Salt to Control Iodine Deficiency in Population: From the Lack to the Excess

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CIn the 1950's, Brazil adopted the iodination of the cooking salt to defeat chronic iodine deficiency diseases. The Federal government has been performing national inquiries periodically about the occurrence of endemic goiter in schools, adopting the urinary excretion of iodine and the thyroid volume as result indicators. The determination of the iodine concentration in the cooking salt has also been used as a determinant factor in these results analysis. This bibliographic review aims to present the actions taken by the Brazilian government in relation to iodine deficiency since the beginning of iodization policy of culinary salt in the 50's decade, the results achieved and the situation of excess iodine found in the Brazilian population at the present time. These measures systematically adopted by the Brazilian government, supported in laws, ordinances and ministry resolutions, have shown to be efficient instruments in the reduction of endemic goiter. Nowadays, the prevalence of goiter in the Brazilian population is between the parameters established by the World Health Organization, which means less than 5% of the population affected. Nevertheless, the last survey made by the Health Ministry highlighted an excessive ingestion of iodine, exposing the population to other health risks associated to this excess.

Keywords:

Iodized salt; Urinary iodine; Hypothyroidism; Excess of iodine; Public health

Toxins, Malnutrition, Stress, Infections and Electromagnetic Pollution: Looking about New Perspectives in Development of Diseases

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Abstract

This review addresses the effect of ingested toxins, malnutrition, stress, infection, and electromagnetic pollution in development of diseases. Some toxins are transmitted by umbilical cord blood in birth and others are ingested by orally as monosodium glutamate, fructose, soft drinks, gluten, oils, xenoestrogens and heavy metals. Consequently, these toxins if accumulate in the body and overloading the liver, favoring only diseases. Lack of basic nutrients as water, magnesium, iodine, stomach acid, amino acids and fatty acids were strongly linked with achlorhydria, growth of diabetes and cardiovascular disease. Dental infection destroys mitochondria's through of gliotoxins, mercury, thioesters and oral infections can cause many systemic diseases. Root canals contain a significant source of bacteria and fungi in the circulation blood and endodontic treatment can be the cause of anaerobic bacteremia and fungemia predisposing the chronic disease. Sleep deprivation and to sleep with light on, tablets, cell phone next to bed commits the release of melatonin by pineal gland. Electromagnetic pollution contribute for headaches, depression, anxiety, palpitation and these symptoms are linked with electrical hypersensitivity that have been associated with diabetes, multiple sclerosis and attention deficit hyperactivity disorders. Thereby, we believe that is need paradigm change in the medical model for investigate these factors in your patients because currently this is not being done.

Keywords:

Toxins; Malnutrition; Stress; Infections; Electromagnetic pollution

