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Scientific Tracks & Abstracts

Day 1

Food Technology 2016

Conrad O Perera et al., J Food Process Technol 2016, 7:12 (Suppl)
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Electro-spinning as a novel encapsulation method for food applications

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The main objective of this work was to better understand the procedure of electro-spinning as a one-step encapsulation approach to acquire active component loaded nanostructured biopolymeric fibers. The impact of solution and processing parameters to the fabrication of zein electro-spun fibers were investigated. Gallic acid was used as the model active component to determine the performance of loaded fibers using electro-spinning as an encapsulation technique. The fabricated galic acid loaded zein (Ze-GA) fibers were appraised for various physicochemical characterizations including morphology, distribution of gallic acid in the electrospun fibers and thermal analyses. Results obtained indicated that interactions occurred between gallic acid and zein at the molecular level. Nevertheless, gallic acid preserved its phenolic character and antioxidant activity after electrospinning. Evidence for the efficacy and effectiveness of gallic acid in the fiber mat for food contact applications was determined by evaluating its release performance, mechanism of action, cytotoxicity and antimicrobial abilities. The fast release profile of gallic acid from the electro-spun fibers is due to the large surface area and its localization on the fiber surface. The Ze-GA electrospun fibers are not cytotoxic and exhibited antimicrobial properties. Heat-curing improved the morphological stability of Ze-GA fibers to strengthen their structure and physical properties. All the electro-spun fiber mats exhibited characteristic of α–helix rich protein. Overall, electro-spinning has proven to be a versatile and promising approach that is capable of generating functionalized nano-fibers suitable for food applications.

Biography

Conrad O Prera received his PhD from Oregon State University and has many years of work experience in the food industry research institutes and academia. His main research area is Chemistry and Technology of Processing of food products, with special emphasis on dehydration and functional foods. Currently he is working on Vitamin D stability in foods and bioactive peptides from food waste.

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Angela Zinnai et al., J Food Process Technol 2016, 7:12 (Suppl)
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A really innovative trend of the wine market: Wine with no chemicals added (Only wines)

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The way of selling wines has changed dramatically in the last fifty years. If before we depended from the small national markets and from the media, scarcely spread and limited to the specialists, recently the globalization and the arrival of the web have revolutionized everything. Today is possible to share the knowledge (with zero costs through the social media) of the existence of particular products all over the world. All of that has generated the birth of infinite niches, which put together represent considerable volumes. The obligation of differentiate themselves in order to acquire attention from the customers has forced the wine merchants of any country to get wines with a history, an identity or at least some particular or unique characteristic. The clear target of any market is "the wines have to be healthier with less added chemicals". The Only wine project is an experimentation conducted starting from 2013 by the DAFE (University of Pisa) using both white grapes (2013) and repeated using red grapes of Sangiovese (2014), in parallel at University of Pisa and in Fattoria dei Barbi, located in Montalcino. The grapes have been worked in total absence of oxygen, with specific equipment at the University of Pisa and at Fattoria dei Barbi. No addition of any chemical product were carried out, only a light enrichment with MCR (Concentrated Rectified Must) in order to reach the 13% volume in alcohol in Fattoria dei Barbi in 2014. A protocol made by University of Pisa has been followed and all the proceedings and processing were done in vats saturated with CO_2 from natural origin in Montalcino and at the University. The wine from the first vinification of white grapes in 2013 is still stable. The sample of red wine from Sangiovese has been available for whoever is interested, giving the possibility to judge the good quality. This project would like to represent an example of an innovative technology, useful within reasonable costs, which allows substantial reduction of chemistry in every step of the wine making.

Biography

Angela Zinnai has completed her 1st PhD from the Scuola Superiore Sant' Anna, Pisa. She is an Associate Professor of Food Technology at Pisa University. In 2008, she received a "Special Mention" at "Montana Premium" for Food Science Research (with her colleague Venturi F). She published more than 100 papers in journals or volumes and serving as a referee for research projects and papers. She was a scientific responsible for an Original Patent (PT2009A000018), an author of two Original Patents of Pisa University. She was invited speaker and part of the organizing committee for several national and international workshops and conferences.

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Notes:

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Effect of the baking process on artisanal sourdough bread-making: A technological and sensory evaluation

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When used in optimized proportions, sourdough can improve volume, texture, flavor, nutritional value of bread and increase the shelf life by retarding the staling process and protecting bread from mould and bacterial spoilage. In this context, the objective of the paper is twofold: a) to verify the influence of different baking procedures adopted by different artisanal bakerieson the sourdough composition and performance; b) to determine if and how the operating conditions adopted can affect the chemical composition and the sensory characteristics of the bread. The preliminary results obtained indicate that chemical composition of sourdough and bread, as well as sensorial expression of corresponding bread, might be greatly influenced by the operating conditions adopted during baking. In particular, when the activity of hetero lactic bacteria was promoted (Fermentation Ratio FR 3.0), the bread showed the worst sensorial expression in terms of taste and structural characteristics of the crumb.

Biography

Francesca Venturi has completed her 1st PhD from the Scuola Superiore Sant'Anna, Pisa. She is a Researcher in Food Technology of Pisa University. In 2008, she received a "Special Mention" at "Montana Premium" for Food Science Research (with her colleague Zinnai A). She published more than 90 papers in journals or volumes and serving as a referee for ACS journals. She is the author of two original patents of Pisa University. She was invited speaker and part of the Organizing Committee for several conferences organized by OMICS in past years.

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Notes:

Sanaa Ragaee et al., J Food Process Technol 2016, 7:12 (Suppl)
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Structural changes in zein protein during dough formation for developing gluten-free formulas

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The incidence of celiac and other gluten intolerances is growing worldwide. At present the only effective remedy is strict lifetime adherence to a gluten-free diet. However, the quality of gluten-free products available in the market is not comparable to that made from wheat, and the search for gluten alternatives is needed. A major gap in the current knowledge is how to modify proteins from gluten-free grains to mimic functionality of wheat gluten. Zein is a class of prolamins obtained from corn fractionation as a by-product. Zein could hold a potential to replace gluten in gluten-free formulas due to its ability to form a viscoelastic protein network when mixed with water and held above its glass transition temperature (30°C). The objective of this study was to assess protein secondary structure of zein during dough mixing at 40°C. The effect of different additives (hydrocolloids, cross-linking enzymes and proteins) on structure of zein-starch dough was investigated. Dough properties were evaluated by a Farinograph. Secondary structure analysis was conducted by deconvoluting the amide I band (1600-1700 cm-1). Results demonstrated that some additives were able to induce extensive and stable β-turns which resulted in zein-starch dough with similar functionality to a wheat viscoelastic system. More data will be presented and discussed.

Biography

Sanaa Ragaee is an Adjunct Professor and Cereal Program Manager at the Department of Food Science having extensive research experiences working with the grain industry in Canada such as millers, bakers and food developers. She is highly skilled in the fields of Grain Chemistry and Biochemistry. She has been working in the areas of effects of processing on bioactive components in cereal products, functionality of different prebiotics on the shelf life and quality of frozen dough, ingredient interactions and their functionality in different formulas, gluten-free products and developing high fiber functional wheat products for the functional food industry. All research projects in her laboratory are supported by several food industries in Canada.

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Notes:

Cristina A Cortes, J Food Process Technol 2016, 7:12 (Suppl)
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Sensorial acceptability, nutritive value and microbial characteristics of aramang (*Nematopalaemon tenuipes*)-dragon fruit (*Hylocereus undatus*) flavored ice cream

Cristina A Cortes
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The main purpose of the research venture is to develop a new flavor of ice cream, one of universally patronized desserts. It was ventured upon to make a new flavor showcasing the author's place main seafood produce which is aramang (*Nematopalaemon tenuipes*) and the tropical country fruit product mango (*Mangifera indica*); thus, from the research undertaking, the authors presented four aramang-mango flavored ice cream as they let 81 evaluators from diverse age groups to know the most acceptable aramang-mango flavored ice cream formulation. Based on the findings, the ratio of 125 g aramang and 375 g mango is the most preferred mixture to the prospective consumers, as it is most acceptable in terms of taste, appearance, texture, aroma and general acceptability. Female consumers tend to like higher proportions of aramang in the concoctions. For this reason, entrepreneurs should initially produce aramang:mango ice cream with 125:375 ratio, then gradually shift to lesser mango ratio.

Biography

Cristina A Cortes has completed her PhD in Educational Management in the year 2012 at the Cagayan State University, Aparri garnering an outstanding rating in her dissertation presentation. She is presently an Associate Professor IV at the Cagayan State University, Aparri, particularly teaching major subjects at the College of Hospitality Industry Management. She had already received a patent in making the process of aramang-dragon fruit flavored ice cream which was her main inspiration in drafting this research venture.

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Notes:

Sanjay Mukherjee et al., J Food Process Technol 2016, 7:12 (Suppl)
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Waste heat recovery in food & drink industry

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Most baking processes in the food manufacturing sector involve use of gas-fired ovens. Only about one-third of the total energy used in these ovens adds value to the final product. The remaining two-thirds is discharged with the exhaust gases at 150-250°C and thus represents an opportunity for heat recovery. However, the low temperature range, fouling and presence of corrosive materials in the exhaust streams make heat recovery technically challenging and uneconomical. The existing low grade heat recovery technolgies mostly use gas to liquid heat transfer to produce hot water for use in other areas of the manufacturing plant. The performance of these systems is governed by hot water demand in the factory and is therefore not recommended if there are frequent fluctuations in demand or if a more efficient technology, such as combined heat and power, is already in place. This study involves design, manufacturing and testing of a novel low-temperature gas to gas heat recovery system using an array of heat pipe heat exchangers, for industrial-scale baking ovens at a large confectionary manufacturing plant. Unlike gas to liquid heat transfer, a gas to gas heat transfer system provides direct savings in oven fuel consumption, independent of the hot water and other energy demands elsewhere in the plant. The heat recovery potential of the system is estimated using a thermodynamic model developed based on energy and mass balance for the ovens. The design enables recovery of up to 50% of the energy available through the exhaust stack, increasing the energy efficiency of the overall process to 60% and reducing food manufacturing costs by one third.

Biography

Sanjay Mukherjee joined Sheffield Hallam University in 2015 as a Research Associate in an Innovate UK funded project on waste heat recovery. He obtained his PhD in Carbon Capture and Storage from University of Surrey, UK. He has worked in collaboration with leading research groups from Cambridge University, Imperial College and Tsinghua University for an EPSRC funded project and has published papers in reputed journals. He has also worked as a Technical Consultant for Office of Carbon Capture and Storage at Department of Energy and Climate Change (DECC), London after PhD.

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Notes:

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β-cyclodextrin assisted extraction of polyphenols from peach pomace

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Peach byproducts, generated yearly, are disposed as waste despite their content in high-added value molecules. Amongst the latter, polyphenols are bioactive molecules with interesting health-promoting properties. In this study the recovery of polyphenols from peach pomace was conducted by an eco-friendly and cost effective method using a GRAS food additive: β-cyclodextrin (β-CD). The efficiency of β-CD was compared to that of organic solvent (ethanol) extraction at the same concentrations (1%, 2%, 3%, 4% and 5%). Both quantitative and qualitative (antiradical activity) analyses were conducted on the extracted polyphenols. The highest polyphenol (0.72 mg GAE/g DM) and flavonoïd (0.35 mg catechin/g of DM) concentrations so as the maximal antiradical activity (6.82 %) were obtained after 2 hours of diffusion at 50°C with an aqueous β-CD (5%) solvent. At the same ethanol concentration (5%), extracts showed lower yields of polyphenols (0.63 mg GAE/g DM) and an inferior antiradical activity. Polyphenol encapsulation in β-CD was thought to protect them from oxidation and degradation. The results clearly show the competitiveness of β-CD assisted extraction to recover a high quantity and quality of polyphenols from peach pomace. This study suggests a green and GRAS process for biomolecule extraction from food byproducts recommending the use of β-CD as an alternative to organic solvents.

Biography

Nada El Darra obtained her BSc in Life and Earth Sciences from Saint-Joseph University, Lebanon in 2007. She earned her MSc in Food Chemistry with Honors from Saint-Joseph University, Lebanon in 2009. Then, she worked as a Quality Manager at Conserves Moderns Chtaura, Lebanon. In 2013, she obtained a certificate entitled "ISO 22000:2005" Food Safety Management System Lead Auditor from RABQSA. She was subsequently awarded a scholarship to pursue her PhD under a joint program between Saint-Joseph University and University of Technology of Compiègne, France. She obtained a PhD in Food Chemistry from Saint-Joseph University (2013) and a PhD in Industrial Process Engineering and Sustainable Development from University of Technology of Compiègne, France. After completing her PhD, she worked in 2014 as a Quality Manager at Abido Spices, Neemeh, Lebanon. She has a number of publications in peer-reviewed journals. In 2014, she was appointed as an Assistant Professor at Nutrition & Dietetics Department, Faculty of Health Sciences, at Beirut Arab University.

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Notes:

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Effects of nisin and natamycin on microbiological and physiochemical qualities of meatball supplied from Yildizeli, Sivas

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Meatball is known as the most sensitive food product towards microbiological spoilage because of its physical and chemical properties. Meat and meat products have the biggest ratio as 70% among food-borne diseases. Nisin and natamycin are natural compounds that intended of inhibition of microorganisms. Especially natamycin is patented antibiotics for promising to carcass decontamination and an alternative to chemicals like trisodium phosphate and chloride. Farming and meat industry are important daily breads for country public. In these sectors, neglecting of hygiene and standards were suspected and this was determined as research subject and detected. Samples that were included antimicrobials at different ratios were analyzed in 0, 5, 10 and 15 days. Structural changes of samples were examined during storage period. In this project, meatball samples whose quality criteria were defined and which were supplied from Yildizeli the district of Sivas, were analyzed physicochemical and microbiologically after adding nisin and natamycin at different ratios. Both nisin and natamycin were added to meatball samples in concentration to 0 (control group), 2.5 and 5.0 g/kg. Moisture, ash, fat, pH, microbiological analyses and sensory properties of the all samples were evaluated. While any physically or chemically differences were not identified between all samples, sensory property values of control group and nisin added group were the same. Study showed that the results were acceptable for the use of these antimicrobials in meatball and were increased the shelf life of meatballs.

Biography

Emre Hastaoglu has completed his Master's from Hacettepe University and continues his PhD studies at Hacettepe University. Currently, he is a Lecturer in Food Technology program at Cumhuriyet University, Turkey.

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Ahsen Ezel Bildik et al., J Food Process Technol 2016, 7:12 (Suppl)
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Antioxidant activity and strength properties of sumac (*Rhus coriaria* L) coated food contact papers

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Paper is made from cellulose, a natural polymer and has remarkable properties. Hydrogen bonded structure gives the paper strength against their lightweight construction and heat durability without thermal decomposition. Also, porous surface coating color easily applies with papers. Moreover, it is shown that with natural antimicrobial or antioxidant agent coated paper extends the shelf life of food products. *Rhus coriaria* L., commonly known as sumac, grows wild in the region of the Mediterranean coastline in Turkey. Sumac has significant phenolic phytochemical constituents as tannins, flavonoids, anthocyanins, organic acids, flavones, proteins and fiber. Total phenolic (TP) of sumac powder applied was 732 mg of gallic acid/100g while antioxidant activity as effective scavenging concentration (EC50) on DPPH radical was 6.02µg/mL. Sumac is natural bioactive agents that suitable material for coating color due to its anthocyanine components. Also after coating with sumac powder, several fatty products can be protective from oxidation. In this study, wrapping paper, paper board and test liner chosen as base paper. Starch was used as a binder. Sumac was added to the starch solution at 10% (w/w) applied on one side at 4.5 g/m^2. The paper was coated with #0 drawdown bar and then tested the paper strength properties. As a result, sumac coated paper gained antioxidant activity. However; coated paper had lower strength properties comparing to uncoated paper, but this strength lost could be relieved using wet strength agents.

Biography

Ahsen Ezel Bildik completed her bachelor, master and Ph.D. studies at Istanbul University, Faculty of Forestry, Forest Engineering Department (Istanbul). She is currently working as researcher in Istanbul University. She is expert on packaging quality and quantity. Her specific study areas are on nutraceuticals additives of paper making and packaging, paper surface coating applications with antimicrobial materials and corrugated board strength properties evaluation.

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Ranjana Singh, J Food Process Technol 2016, 7:12 (Suppl)
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Development of soy fortified Indian traditional snacks

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Soy foods have long been important in Asian diets, where they are valued for their nutrient content and culinary versatility. For health conscious Indians, soy foods are among the variety of healthful options for meeting protein needs. Soy foods are reported to have lower risk of coronary heart diseases, osteoporosis, and certain cancers and help alleviate menopausal symptoms. Five value added Indian traditional snacks viz. Multigrain soy bar, Soy vermicelli, Soy cookies, Soy chips, Soy phirni & Guava soy bar were developed to prototype form and studied for their sensory acceptability and shelf-life study. These products could be easily formulated using locally available raw materials at a reasonable cost and the good organoleptic characteristics combined with high protein & minerals make these products suitable for common man & especially for school children, adolescents, pregnant & lactating females. Results of the present study showed that these Indian traditional foods under study could be successfully fortified with defatted soy flour (20% level) or soy milk (50% level) to increase their nutritive value in terms of quality proteins, minerals, vitamins and phyto-chemicals without altering their sensory aspects and acceptability. Moreover, these products can help alleviating malnutrition and in improving the nutritional status of millions of impoverished undernourished kinds.

Biography

Ranjana Singh earned her PhD in Food Technology from the G.B. Pant University of Agriculture and Technology, Pantnagar and is currently working as an Associate Professor, Food Technology at University of Delhi, India. During 25 years of tenure, she has participated in the development of the Institute and has successfully fulfilled several responsibilities including the organization of student placements, the re-organization of the curriculum in accordance with University norms and industry demand, and the organization of various workshops & national conference. One of her key achievements is development of value added new product concepts which enhanced the creative & research ability of students, encouraging their entrepreneurship dreams. Her research has been published in reputed international journals and has also been presented in international conferences in the US and South Africa.

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Notes:

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Acoustic emulsifier free emulsions and lecithin emulsions used as delivery system for coenzyme Q10 vectorization

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To improve encapsulation and release of coenzyme Q10 (CoQ10), emulsifier-free-emulsions were developed with a new emulsification process by high frequency ultrasound (HFU) at 1.7 MHz. Nano-emulsions containing CoQ10 were elaborated with or without rapeseed lecithin used as emulsifier. The prepared emulsions with HFU was compared with CoQ10 emulsion containing emulsifier developed with the same emulsification technique and also with low frequency ultrasounds coupled with high pressure homogenization (LFU+HPH). The physico-chemical properties of emulsions were determined by: average droplets size measurement with nano-droplets tracking analysis, droplets surface charge with ζ potential measurement, surface tension and rheological behavior. Emulsions made by LFU+HPH with emulsifier showed lower droplets size due to cavitation generated by HFU process. Surface tension results showed that whatever the preparation process, there was no significant difference between emulsions containing lecithin emulsifier, with or without CoQ10. *In vitro* biocompatibility tests were performed on human mesenchymal stem cells in order to show the cytotoxicity of various formulations and also the efficiency of CoQ10-loaded emulsion. *In vitro* tests proved that the vectors were not toxic for cells. Furthermore, CoQ10 provided high rate of cell proliferation and metabolic activity especially for the formulation without emulsifier.

Biography

Messaouda Kaci has completed her graduation in Food Engineering from Higher National School of Agronomy, Algeria, and then she obtained a Master's degree in Food and Biotechnological Science from Nancy University, France. In 2015, she was awarded a PhD from The University of Lorraine, France. She is currently a post-doctoral student and conducts her research on the Stabilization of Nanoemulsions and Vectorization of Hydrophobic Compounds.

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Scientific Tracks & Abstracts

Day 2

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Novel protein sources for food security

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Novel protein source for food security (ScenoProt) is a project funded by Strategic research program (SRC) in Finland. Our vision is that in 2030 the Finnish consumers will eat tasty, wholesome, sustainably produced and nutritionally sufficient doses of protein, optimized for each age cohort according to Finnish nutrition recommendations. The ScenoProt project will significantly increase the knowledge on health and safety aspects of underutilized plant and novel protein sources. We know how different processing methods affect beneficial and anti-nutritional components. Cost-effective and environmentally acceptable processes will be established and their suitability in different scale will be proved. We will show the role of plant proteins in structural formation of foods through processes such as fermentation, hydrolyzation and emulsification. Developed model products are safe, contain beneficial components, like fibers, vitamins, and have well balanced amino acid composition. This project has great potential in the field of public health. It will add to the current knowledge on the possibly substantial positive health effects and the physiological mechanisms of high plant protein intake. The results may have several implications for future recommendations and nutrition policy, leading to guidelines for diets rich in plant derived protein. Consequently, the findings of this project can give remarkable help in tackling the burden of several chronic diseases, such as type-2 diabetes and colorectal cancer, and thus contribute to desired improvements in public health.

Biography

Anne Pihlanto has completed her PhD from University of Turku. She is managing the Innovative Food Chain research area at Luke. She has over 20 years' experience in food protein research. Her publications with original results within food technology, chemistry and medical science have been presented in scientific international journals, monographies and invited book chapters. Her articles are published in microbial, food and dairy science journals and total amount of scientific papers is about 150.

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Optimization of enzymatic hydrolysis condition of mud crab (*Scylla serrata*) meat to obtain maximum angiotensin-converting enzyme inhibitory (ACEI) activity

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This study reported the optimization of enzymatic protein hydrolysis condition of mud crab meat to obtain maximum angiotensin-converting inhibitory (ACEI) activity. Firstly, screening of commercial food grade enzymes (Alcalase®, Protamex™, Neutrase® and papain) were carried out with hydrolysis time of 1 to 4 hours to select the enzyme with the highest ACEI activity. Then, enzymatic hydrolysis was further optimized by using Response Surface Methodology with a face centered Central Composite Design (CCD). Four variables including temperature (45-65°C), pH (pH 5.5-7.5), hydrolysis time (1-4 hours) and enzyme to substrate (E/S) ratio (1-3%) were employed. It was found that mud crab hydrolysate produced from Protamex™ gave the highest ACEI activity compared to Alcalase®, Neutrase® and papain. Optimization study shows that 2FI model can be used to describe the effect of the four variables on the ACEI activity of mud crab. The optimum condition was at 65°C, pH 5.5, 1% E/S and 4 hours of hydrolysis time. Validation of optimum condition shows that the experimental value of ACEI activity (88.93%) was close to that of predicted value (90.08%). The IC50 of ACEI activity of mudcrab hydrolysate prepared at this optimum condition was 2.64±0.112 mg/ml. In conclusion, mud crab hydrolysate is an alternative source of ACEI peptides. Further study is on going to purify and characterize this bioactive peptide.

Biography

Amiza Mat Amin has completed her Bachelor of Technology (Food Technology) from Universiti Sains Malaysia in 1993 and obtained her PhD from Leeds University, UK in 1998. Currently, she is an Associate Professor and Dean of School of Food Science and Technology, Universiti Malaysia Terengganu, Malaysia. Her main research interest is on food protein.

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Mathematical modeling of the process parameters of a new decanter centrifuge generation

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The performances' process parameters of an innovative horizontal centrifugal decanter were mathematically modelized. The machine belongs to the decanter's pâté generation and the experiments were conducted in a continuous industrial olive oil extraction plant. Two different configurations have been considered: with water added and without. Mathematical models were developed to predict the extraction efficiency and the oil content in the husk, wastewater and pâté, as a function of the olive paste's mass flow rate. Various statistical parameters (mean percentage error, mean bias error, root mean square error, modeling efficiency and chi-square test) have been used to evaluate the mathematical models' suitability. The models developed showed very good generalization capabilities. The decanter's extraction efficiency resulted high. In particular, the extraction efficiency reached values higher than 90% when the decanter worked with water added. Moreover, in both conditions considered it was been obtained dry solids and olive oil clarified by light solids. The decanter was also demonstrated to be able to switch from one configuration to the other without stopping operation.

Biography

Roberto Romaniello is a Contract Researcher in Agricultural Mechanics, Contract Professor in Mathematics at University of Foggia, Department of the Science of Agricultural, Food and Environment. His scientific research concerns the innovation and optimization of agro-food industry equipment and plants, prototyping new food plant's machines, designing of image analysis protocols for food safety and food quality assessment. He has been involved in research projects aimed to design and prototyping new industrial scale machines and new methods to control the food processes by using different measurement chains.

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Inhibition of *Listeria monocytogenes* in hot dogs by surface application of freeze-dried bacteriocin-containing powders from lactic acid bacteria

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Six lactic acid bacteria (LAB) strains, *Lactococcus lactis* BFE 920, *L. lactis* subsp. lactis ATCC 11454, *L. lactis* subsp. cremoris ATCC 14365, *Lactobacillus curvatus* L442, *Lact. curvatus* LTH 1174, and *Lact. bavaricus* MN, were grown in cheddar cheese whey supplemented with complex nutrient sources. Cell-free culture supernatants were freeze-dried and the resulting bacteriocin-containing powders were applied on the surface of hot dogs that were inoculated (~ 4 log cfu/hot dog) with a five-strain Listeria monocytogenes cocktail. Hot dogs were vacuum sealed and stored at 4°C for 4 weeks. *L. monocytogenes* was enumerated, using both Tryptic Soy Agar (TSA) and Oxford Listeria Agar (OXA), on day 0 and at 1, 2, 3, and 4 weeks of the refrigerated storage. In hot dogs containing only the *L. monocytogenes* inoculum, *L. monocytogenes* counts increased from 4 log cfu/hot dog up to 7 log cfu/hot dog. All samples containing freeze-dried bacteriocin-containing powders exhibited significantly lowered ($P < 0.05$) *L. monocytogenes* populations on the surface of hot dogs throughout the 4-week study except for bavaricin MN powder. Bacterial counts on hot dogs packed without any powder were statistically equal on day 0 when enumerated on OXA. Freeze-dried bacteriocin-containing powders from L curvatus L442 and *L. lactis* subsp. cremoris ATCC 14365 decreased *L. monocytogenes* populations on the surface of hot dogs by greater than 2 log cfu/hot dog throughout the 4-week study. For the powdered bacteriocin preparations from *L lactis* BFE 920, *L. lactis* subsp. lactis ATCC 11454, and *L. curvatus* LTH 1174, *L. monocytogenes* populations were determined to be approximately 3-log cfu/hot dog after 4 weeks of storage.

Biography

Gulhan Unlu is an Associate Professor within the School of Food Science at the University of Idaho and Washington State University. Her research interests include food microbiology, dairy microbiology, food biotechnology, microbial food safety, food bio-preservation, bioactive packaging of foods, functional foods, and bioconversion of agricultural and industrial waste into value-added products. She is an alumna (2012-2013) of The Fulbright US Scholar Program. She is an active member of the Institute of Food Technologists (IFT) and served as the Chair for the Biotechnology Division of the IFT (2014-2015). She serves on the Editorial Board of Probiotics and Antimicrobial Proteins.

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Notes:

Banu Soylu et al., J Food Process Technol 2016, 7:12 (Suppl)
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Effects of storage conditions on aflatoxin production and expression levels of some biosynthesis genes of *Aspergillus flavus* in red pepper

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The aim of this study was to determine the relationship between the aflatoxin production of aflatoxigenic *Aspergillus flavus* and expression levels of aflatoxin biosynthetic metabolic pathway genes (aflR, nor-1 andpksA) in red pepper stored under different water activities (aw) (0.80, 0.85, 0.90 and 0.95 aw) and temperature conditions (5, 15, 25 and 35^{0}C). Cultural mould growth, aflatoxin analysis, extraction of total RNA were carried out at 0, 1, 2, 3, 4, 5, 7, 10, 15 and 20th days of incubation. Expression levels of the regulatory gene aflR and two structural genes nor-1 and pksA of the aflatoxin biosynthetic pathway were also assayed by the reverse transcription real-time polymerase chain reaction (RT-PCR). Also, response surface methodology (RSM) was applied to evaluate the effects of aw, temperature, time, genes (aflR, nor-1andpksA) expression on aflatoxin B1 (AFB1) production of *A. flavus* and to predict AFB1 amounts of contaminated red pepper. According to the results, mould counts of samples at 0.80 and 0.85 aw decreased starting from the third day of storage for all tested temperatures, and the lowest mould counts were obtained at 0.80 aw-25^{0}C and 0.80 aw-35^{0}C conditions on the 20th day of storage. AFB1contents of the samples increased with the increment of temperature for all aw levels. The lowest AFB1production was observed under 0.80 aw-5^{0}C conditions in the experiment while the highest AFB1amount (61.56 ppb) was detected at 0.95 aw-35^{0}C on 15th day and highest AFB1 amount was observed at 0.95 aw-25^{0}C on 15th day (57.21 ppb) of storage. In terms of the model, the effects of aw, temperature and pksA gene expression were very significant ($p<0.01$), and the effect of nor-1 gene expression was significant ($p<0.05$), while the aflR gene expression was insignificant ($p>0.05$) in explaining of the AFB1 occurrence in contaminated red pepper stored at 25^{0}C. In conclusion, it can be suggested that the growth of aflatoxigenic A. flavus, amounts of AFB1, gene expression levels of aflR, nor-1andpksA depending on the aw, temperature and time were monitored in red peppers and AFB1 production was modeled with RSM for the first time in this study. Determination of correlations between AFB1 production and aw, temperature, time, aflR, nor-1 and pksA expression levels could be helpful to predict potential risk AFB1 accumulation during storage of red peppers.

Biography

Banu Soylu has completed her PhD from Middle East Technical University, Ankara, Turkey. She is an Associate Professor at the Department of Industrial Engineering in Erciyes University, Kayseri, Turkey. She has been working on the subject of optimization, mathematical modeling and statistical methods of engineering.

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Notes:

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Aerogels of enzymatically oxidized galactomannans from leguminous plants as versatile delivery systems of antimicrobial peptides and enzymes

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New aerogels were obtained from laccase-oxidized galactomannans (GM) of the leguminous plants fenugreek, *Sesbania* and guar and we suggested their potential practical use as delivery systems of actives. Laccase/TEMPO oxidation of GM in aqueous solution causes a viscosity increase up to 15 folds and generates elastic hydrogels. Upon lyophilization of these hydrogels, water-insoluble aerogels are obtained, capable of uptaking water or solvents several times their own initial weight. To test these new materials as delivery systems, the anti-microbial peptide nisin and the enzyme lysozyme were used as models. They were absorbed in the aerogels from aqueous solutions, retained in active form after re-lyophilization of the "loaded" hydrogels, and released in solution as evaluated by biochemical and microbiological assays. The release of nisin from the three aerogels was evidenced by the growth inhibition of the gram positive *Enterococcus faecalis* and *Clostridium tyrobutyricum*, while the activity of lysozyme was confirmed by the halo formation due to cell wall peptidoglycans hydrolysis of *Micrococcus lysodeikticus* and by the growth inhibition of *Cl. tyrobutyricum*. These new biomaterials, composed of enzymatically oxidized plant polysaccharides, might represent versatile, biocompatible delivery systems of active principles in food and packaging materials.

Biography

Tiziana Silvetti has completed her PhD in Technological Innovation for Agricultural, Food and Environmental Sciences from the University of Milan in 2010. Currently, she is a Research Fellow at the Institute of Sciences of Food Production, National Research Council of Italy. Her research activity concerns Food Microbiology and Molecular Biology, with particular regard to fermented products. She has published more than 20 papers in international and national journals.

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Notes:

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Preliminary study of employ of an olive leaf extract on bakery products

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Olive leaves represent a quantitatively significant by-product of olive grove farming, around 10% of the total weight of olive arriving to the mill, they are considered as a cheap and natural source of bioactive compounds. The chemical composition of olive leaves varies according to many factors, the most important are olive cultivar, climatic conditions, stage of crop's cycle, agronomic practices and extraction procedures, that influences the different cultivars' total and specific phenols content as shown in the scientific literature. The olive leaves's secoiridois, flavonoids and phenolic compounds are beneficial for human health and in particular phenolic compounds such as oleuropein, verbascoside, rutin, tyrosol and hydroxytyrosol which biologic activity, including antioxidant, antimicrobial, and antiproliferative properties. Different studies show that many factors influence the olive leaf biocompound extraction efficiency, such as type and volume of solvent, temperature, pH and number of steps. An olive leaves aqueous extract from 'Biancolilla', a Sicilian cultivar rich in oleuropein, was employ for the production of bakery products. The enriched products maintain after a high cooking temperature, higher phenolic content and antioxidant activity, expressed as DPPH, than control. Furthermore, activity water (Aw) and textural properties at different time of storage were determined to evaluate the shelf-life of the product. Olive leaf extract represents a good candidate as functional ingredient for the enrichment of bakery products; it can be associated with improved prevention and control of metabolic diseases.

Biography

Rosa Palmeri has completed her PhD in "Food Science and Technology", at University of Catania. Actually, she is a temporary Researcher in the Food Science and Technology, at the Department of Agriculture Food and Environment at University of Catania. The scientific production is summarized in more than 40 publications, which concerns the development of economic methods of extraction and purification of glycosidases by related activities from vegetables and micro-organisms, in order to determine the best conditions for a possible use for the improvement of organoleptic and sensory characteristics of food; valorization of wastes from agro-food industries for application in nutraceutical food production.

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Notes:

Alessandro Leone et al., J Food Process Technol 2016, 7:12 (Suppl)
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A continuous microwave system for olive paste conditioning in olive oil extraction plant

Alessandro Leone[1], **Antonia Tamborrino**[2] and **Roberto Romaniello**[1]
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A microwave system was developed and applied in an industrial-scale olive oil extraction plant to evaluate the impact of the microwave treatment used to condition the olive paste, to analyze the installation and determine any advantages to improving the process continuity. To this purpose the extraction efficiency of the olive oil plant was investigated for different operating conditions of the microwave system and compared with conventional methods to condition the olive paste. The microwave system was evaluated in terms of extraction yield of the olive, electrical and thermal energy consumption and olive oil quality. The energy consumption evaluation shows that the use of the microwave system requires an additional electric power but non request thermal power with respect to the traditional malaxers machine. The short process time obtained with the microwave treatment resulted in a low peroxide value compared with the conventional method. Using the microwave treatment, a higher concentration of volatile compounds with spicy and bitter notes was obtained. No significant differences were found with extraction yield. The experiments showed the potential of the continuous microwave system to conditioning the olive paste as an alternative technique to effectively condition olive paste.

Biography

Alessandro Leone is an Associate Professor in Agricultural Mechanics and Food Processing Plants, SAFE Department - Engineering Area, University of Foggia, where he teaches “Mechanics and Mechanization in Agricultural”, “Food Engineering” and “Work Safety”. His major research topics includes, food processing plants: agro-food industry plants and process settings, processing logic control, recovery of agro food waste by-products to useful composts in agriculture, as well as waste management and agricultural mechanics: analysis of the vibrations transmission mode from the vibrating heads to the trunk of olive trees, and subsequent optimization; study, design of mobile elevating work platforms; safety devices on tractors and machinery.

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Notes:

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Food stuffs radio contamination by ^{90}Sr: Analytical methods, mean levels in food and contribution to risk assessment

Marco Iammarino, Daniela dell'Oro, Nicola Bortone, Michele Mangiacotti, Rita Damiano and **Antonio Eugenio Chiaravalle**
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^{90}Sr is considered as an important contaminant relating to food supply chains, but comprehensive studies about this type of contamination in food are lacking. In this communication, two radiochemical methods, validated for the determination of radiostrontium in liquid and solid matrices, are described. Moreover, the related control activity, developed in the last 4 years by Italian National Reference Center for the detection of radioactivity in feed and foodstuff, is reported. More in depth, the described radiochemical methods are characterized by high sensitivity (minimal detectable activity equal to 6 $mBqL^{-1}$ and 8 mBqkg-1 for liquid and solid matrices, respectively), linearity (as determination coefficient r^2)=0.999, precision (as CV%) in the range 13%-15%, trueness (as recovery%) in the range 89%-106% and ruggedness. Regarding control activity, 176 liquid and 260 solid foods, were analyzed. Milk samples result were the most important indicator about ^{90}Sr contamination, within liquid matrices (mean 90Sr activity concentration: 0.058 BqL^{-1}). Among other liquid foods, wine/spirits and water were the most contaminated, with mean contamination levels equal to 0.022 and 0.035 BqL^{-1}, respectively. Regarding solid matrices, cheeses produced from sheep's milk showed to be the most contaminated (mean level: 1.237 $Bqkg^{-1}$). Meat products and seafood showed not significant contamination levels. Among vegetables, contamination levels detected in cacao/chocolate and spices resulted comparable with those measured in cheeses obtained from cow's milk. A final interesting aspect was the not negligible mean contamination level detected in animal feeds (raw materials), equal to 1.557 $Bqkg^{-1}$.

Biography

Marco Iammarino is a Food Technologist and a Chemical Surveyor. He is a Researcher of Istituto Zooprofilattico Sperimentale della Puglia e della Basilicata of Foggia (Italy), since 2002. He deals with Food Quality and Safety, Analytical Chemistry applied to Food Analysis, Research & Development and Analytical Method Validation. In particular, he has developed several analytical methods (HPLC, HPIC, CE and LSC) for the determinations of food additives (nitrites, nitrates, sulphites, polyphosphates, organic acids, etc.), radionuclides, mycotoxins and drugs in foods and feed materials. He has published more than 100 articles in peer-reviewed and academic journals, congresses proceedings and books.

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Notes:

Rosaly V Manaois et al., J Food Process Technol 2016, 7:12 (Suppl)
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Antioxidant capacities and total phenolic content of some Philippines vegetables: Effect of boiling

Rosaly V Manaois, John Edward I Zapater and **Amelia V Morales**
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High intake of plant foods has been linked to decreased risk of many chronic diseases. In Philippines, various vegetables are cultivated but have not been thoroughly studied in terms of their antioxidant capacities. This work assessed the antioxidant capacity of vegetables commonly grown and consumed in rice-based farms in the country. Twenty-one raw and boiled vegetables were evaluated for their total phenolic content (TPC) using the Folin-Ciocalteu assay. The antioxidant capacities were determined using the 2,2-diphenypicrylhydrazyl (DPPH) radical scavenging activity and 2,2-azinobis(3-ethylbenzothiazoline-6-sulfonic-acid)-diammonium salt (ABTS) cation-radical scavenging activity techniques. The TPC of the raw vegetables ranged 0.11-31.78 mg gallic acid equivalents/g sample, with the highest values recorded in jute (*Corchorus olitorius*), eggplant (*Solanum melongena*), squash flower (*Cucurbita maxima*), chili (*Capsicum frutescens*), mustard (*Brassica juncea*), Chinese cabbage (*Brassica rapa*) and green pepper (*Capsicum annuum*). DPPH of the raw samples ranged from 1.24-239.32 µmol Trolox equivalents (TE)/g, while ABTS ranged from 2.10-136.84 µmol TE/g. Boiling generally reduced the TPC and antioxidant capacities. Jute, eggplant, water spinach (*Ipomoea aquatica*), green pepper, and ginger (*Zingiber officinale*) consistently displayed the highest antioxidant capacities in both raw and boiled forms as measured by DPPH and ABTS techniques. The TPC of raw and cooked vegetables were highly correlated with their DPPH values (r=0.931** and 0.892**, respectively) and ABTS (r=0.941** and 0.828**, respectively). Increasing the consumption of minimally heated vegetables could help consumers maximize their dietary antioxidant intake.

Biography

Rosaly V Manaois has received her Master's degree in Food Science from Louisiana State University as a Scholar of the Ford Foundation International Fellowship Program. She was a Fellow at the Functional Food Factor Laboratory at the National Food Research Institute, Tsukuba, Ibaraki, Japan in 2014-2015 under the United Nations University-Kirin Fellowship Program. She is currently the Head of the Rice Chemistry and Food Science division of International Rice Research Institute, Philippines. Her research interests include functional foods, rice starch, sensory evaluation, and rice grain quality.

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Notes:

Nada El Darra et al., J Food Process Technol 2016, 7:12 (Suppl)
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Food fraud detection in commercial pomegranate molasses syrups by spectroscopic and HPLC methods

Nada El Darra[1], **Hiba N Rajha**[2], **Nicolas Louka**[3], **Richard G Maroun**[3] and **Fatima Saleh**[1]
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[3]Université Saint-Joseph, Lebanon

Food fraud is a serious ethical and economic problem affecting the food industry everywhere. As pomegranate molasses' consumption continues to increase due to its unique taste and antioxidant activity, its adulteration is taking several forms. Most commercial pomegranate molasses are labeled as containing 100% pomegranate, giving the customer the impression that they are benefitting from the healthful and nutritional effects associated with pomegranate. The purpose of this study was to detect for the first time the adulteration of commercial pomegranate molasses with date molasses, which will be important not only to the regulatory agencies and to manufacturers, but also to consumers who might purchase it for its health-beneficial effects. To differentiate pomegranate molasses from the date syrup, different parameters that could signal adulteration, such as total acidity content, polyphenol yield, anthocyanins concentration, color intensity and antiradical activity were determined. UV-VIS spectroscopy was used as a screening method to detect fraud and high-performance liquid chromatography was conducted for a quantitative analysis. Our findings support the hypothesis that some of the commercialized pomegranate molasses in the Middle East area are adulterated with cheaper date syrup.

Biography

Nada El Darra obtained her BSc in Life and Earth Sciences from Saint-Joseph University, Lebanon in 2007. She earned her MSc in Food Chemistry with Honors from Saint-Joseph University, Lebanon in 2009. Then, she worked as a Quality Manager at Conserves Moderns Chtaura, Lebanon. In 2013, she obtained a certificate entitled "ISO 22000:2005" Food Safety Management System Lead Auditor from RABQSA. She was subsequently awarded a scholarship to pursue her PhD under a joint program between Saint-Joseph University and University of Technology of Compiègne, France. She obtained a PhD in Food Chemistry from Saint-Joseph University (2013) and a PhD in Industrial Process Engineering and Sustainable Development from University of Technology of Compiègne, France. After completing her PhD, she worked in 2014 as a Quality Manager at Abido Spices, Neemeh, Lebanon. She has a number of publications in peer-reviewed journals. In 2014, she was appointed as an Assistant Professor at Nutrition & Dietetics Department, Faculty of Health Sciences, at Beirut Arab University.

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Antonia Tamborrino et al., J Food Process Technol 2016, 7:12 (Suppl)
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Implementation of a new partial destoner machine in an industrial olive oil plant: Evaluation of olive paste's rheology, olive oil yield and quality

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In this scientific paper, an industrial prototype of a partial de-stoner machine was specified, built and implemented in an industrial olive oil extraction plant to evaluate its quantitative and qualitative performance compared to the traditional mechanical crusher. The extraction efficiency of the olive oil extraction plant, olive oil quality, sensory evaluation and rheological aspects were investigated. The research demonstrated that leaving 40% of pits in olive paste (as pits fragments) the extraction efficiency loss at decanter level is avoided. The extraction efficiency measured when partial destoner machine and mechanical crusher were used did not show statistical differences. The oils obtained using partial destoner machine are characterized by higher green fruitiness, flavor and aroma with respect to those produced using traditional processing systems. In addition, the partial destoner machine allows the pits recovery to be used as biomass. It is to be noted that nowadays the goal of environmental sustainability is oriented to the use of renewable energy instead of fossil fuels and the global goal is to increase the use of biomasses for energy-consuming processes.

Biography

Antonia Tamborrino is an Assistant Professor in Agricultural Mechanics and Food Processing Plants at University of Bari, Department of Agricultural and Environmental Science. Her scientific research deals with the innovation and optimization of agro-food industry equipment and plants, design of the food pilot plants and their implementation in the industrial environmental; sensors and real time process for the food industry; processes settings; influence of industrial processes on food quality. She has participated on different national and UE projects to develop innovative processes and prototypes of agro-industry plants.

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Notes:

Emilia Bustos Griffin et al., J Food Process Technol 2016, 7:12 (Suppl)
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International database on commodity tolerance (IDCT)

Emilia Bustos Griffin, Guy Hallman, Abdeljelil Bakri and **Walther Enkerlin**
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An important factor for increasing the commercialization of phytosanitary irradiation (PI) is the adoption of generic doses in international and national regulatory frameworks. A limiting factor to accelerating the use of PI is the availability of information on commodity tolerance for the wide range of horticultural products that might be eligible for treatment with generic doses. The International Database on Insect Disinfestation and Sterilization (IDIDAS) was developed by the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture to provide information on the doses of radiation applied for these purposes to mites and insect pests of crops and veterinary and human importance. It includes data on both the doses required for the (PI) of fresh and durable commodities infested with specific pests, and also the radiation doses used to induce sterility in target pests, mainly for the application of the sterile insect technique. The new IDCT database complements IDIDAS with commodity tolerance data for fresh horticultural commodities including fruit, vegetables, flowers, roots and tubers. Tolerance data were extracted from scientific publications available from 1960 to the present. Specific technical information was selected to identify the maximum doses for acceptable quality, the type of radiation source, the dose rate, dose uniformity ration (DUR), and the optimal conditions for handling, storage, and transportation. The availability of this information in the IDCT database greatly facilitates the process of identifying potential trade opportunities using PI and helps highlight where commodity tolerance research has been done or is needed.

Biography

Emilia Bustos-Griffin has worked over 30 years in research on food irradiation as a phytosanitary treatment. Her work has resulted in irradiation doses that have been globally adopted for fruit pests. Her research on free radicals was important for the evaluation of quality in spices and dried food. She has served as an expert in Dosimetry standards with the American Society for Testing and Materials (ASTM) as well as a member of the national expert committee for the Official Mexican Standard establishing doses for the irradiation of food in Mexico. She has been an expert in working groups for the North American Plant Protection Organization (NAPPO) and the International Plant Protection Convention (IPPC) for the elaboration of regional and international standards for the use of irradiation as a phytosanitary treatment. She represented Mexico for more than 10 years in the International Consultative Group for Food Irradiation with the International Atomic Energy Agency.

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Notes:

Para Dholakia et al., J Food Process Technol 2016, 7:12 (Suppl)
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Effect of microwave and traditional cooking on the quality of food products

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Microwave cooking has emerged as a popular cooking method in past few years. Data on nutritive value along with the sensory characteristics of food cooked in microwave ovens in relation to traditional methods is insufficient. A study was planned to compare the nutrient composition and sensory characteristics of foods cooked by microwave cooking and traditional cooking. Fifteen dishes were selected from different food groups based on a survey done on a small population (N=200). The dishes were prepared by both traditional as well as microwave cooking and analyzed for sensory characteristics and proximate composition using standard procedures. There was no significant ($p<0.05$) difference in fat content and ash content. Nine dishes showed significantly higher retention of vitamin C in microwave cooked foods as compared to traditionally cooked food. Mineral content remained same in both the methods. Thus both the techniques showed similar effects on nutritive value except Vitamin C. Sensory attributes like appearance(browning of crust), texture and flavor were better in traditionally baked, roasted and boiled foods than in microwave cooked ones, however, color of greens did not differ significantly between the two methods. This preliminary study helped to draw the conclusion that both the techniques didn't differ in affecting the nutritive value except vitamin C whereas, sensory characteristics were obtained better with traditional cooking. The study can be extended further to compare the effect of microwave and traditional cooking on vitamin B complex group, fat soluble vitamins, biological value and protein efficiency ratio.

Biography

Para Dholakia is an Assistant Professor in Food Technology for past 13 years. She has done MSc in Food and Nutrition after graduation in Food Technology and currently pursuing PhD from University of Delhi. She has guided MSc dissertations and worked as Nutrition Advisor with industry. She is currently working on a project on development of mobile application to track nutritional intake of people. She has attended various national and international conferences and published papers. She has been the secretary of Association of Food Scientists and Technologists of India, Delhi.

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Notes:

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Ursula Wolwer-Rieck et al., J Food Process Technol 2016, 7:12 (Suppl)
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Naturality and processing of stevia

Ursula Wolwer-Rieck and **Anne Oehme**
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Steviol glycosides, natural sweeteners of the shrub *Stevia rebaudiana* Bertoni, have been authorized in Europe as sweeteners with a purity of more than 95%, since 2011. Their use is widespread worldwide in the food industry and is still growing as they are, in contrast to high intensity artificial sweeteners, of natural origin and stable during food processing. Their manufacturing process is laid down in the EU Regulation 1131/2011 and starts with hot water extraction of the dried leaves, followed by several purification steps to remove further constituents of the plant. After crystallization and spray drying a white powder with a purity of 95% is obtained. The purpose of this work was to show that all processing steps do not affect the chemical identity of steviol glycosides. Three different sample batches provided by PureCircle, each containing the dried leaves, the first water extract and the end product with more than 95% purity of the same production batch were analyzed by UV-HPLC on a RP- and a HILIC-column as well. The USP-standard containing nine steviol glycosides as described by JECFA (2010) was used as reference. It was possible to separate and identify eight steviol glycosides on the RP-phase within seven minutes, while rebaudioside D was clearly detected on the HILIC-column. All of the nine steviol glycosides required by JECFA were detected in the leaves, water extract and the 95% high purity end product of each of the corresponding production batches. These data indicate that steviol glycosides are not affected and their chemical identity modified by the manufacturing process, providing evidence for the naturality of high purity stevia leaf extract sweeteners.

Biography

Ursula Wolwer-Rieck has completed her PhD from Rheinische Friedrich-Wilhelms-Universität Bonn, Germany. She is a Food Chemist and tenured academic Councilor in the Department of Nutrition and Food Sciences, University of Bonn. Her academic research is focused on steviol glycosides, the natural origin sweet compounds of the stevia plant. She has published several papers on the analysis of steviol glycosides and their stability in food. She is also a board member of the European Stevia Association (EUSTAS).

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Notes:

Muyiwa Akintoye et al., J Food Process Technol 2016, 7:12 (Suppl)
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Why we need healthy new proteins with a low environmental impact?

Muyiwa Akintoye and **Tim Finnigan**
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Something is broken in the way we produce and consume our food. Our food and agriculture now contributes to 30% of global greenhouse gas emissions with half associated with production of meat. Land and water use are reported to become the new oil in global politics as food security becomes a more pressing risk for a sustainable food future. Half the world's antibiotics are fed to industrially farmed animals contributing to the rise of deadly superbugs whilst cereals and crops that could be used nourish the world's poorest are increasingly grown as animal fodder and a hugely inefficient conversion of protein and environmental damage. There seems no doubt that our desire for ever cheaper and more plentiful meat is at the heart of issues of food sustainability that threaten our very way of life. Indeed, we can no longer meaningfully separate our dietary choices from their impact on the health of our bodies and of the planet. We need to change the balance by eating less and better quality meat and sometimes none at all. We need new ideas and new and healthy proteins with a low environmental impact to help us achieve this. Biotechnology can be used successfully to deliver this global imperative with foods such as Quorn already available in over 16 countries worldwide and helping consumers transition away from an over dependence on meat – in short, we need a culture change.

Biography

Muyiwa Akintoye is currently Head of a Research and Development with Quorn Foods. He has gained experience over the years in Food Research and Food Manufacture methods in areas as diverse as canning, breakfast cereals, brewing, dairy etc. He studied for a PhD from the University of Leeds between 2003& 2007 and has been with Quorn Foods since 1993. He has responsibility for establishing and driving forward R&D programs and activities that are business value enhancing whilst maintaining and establishing a solid scientific basis for these activities.

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Tim Finnigan is a PhD graduate of the Food and Biosciences Faculty, University of Reading, England and has held innovation roles in UK government food research, Kraft General Foods, APV, RHM, Zeneca and Premier Foods. He has been instrumental in the product and technology innovation programs that have helped to establish Quorn as the world's leading meat free brand. As a holder of many key business patents, he drives a vibrant industrial and academic research and development program within a network of key opinion leaders who help share the current hot topics of nutrition research and biotechnology alongside developing an understanding of a sustainable food future.

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Notes:

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Chemical and toxicological characteristics of bio-activated peanut sprout powder applied as dietary supplements to extend mouse longevity

Robin Y Y Chiou
National Chiayi University, Taiwan

In addition to general names, "peanut also named life longer nut" has been recorded in old Chinese archives and attracted research interest. In this study, wound-stress was applied to enhance biosynthesis of stilbenoids in preparation of bio-activated peanut sprout powder (BPSP). Through medium pressure liquid chromatographic fractionation and followed by semi-preparative HPLC purification, two new stilbenoids, namely, arahypin 16 and arahypin 17 along with 5 known stilbenoids, i.e., resveratrol, arachidin-1, arachidin-3, isopentadienylresveratrol and arahypin 5 were isolated and identified. After subjection of the 7 stilbenoids to antiglycative activity determination, all have exhibited inhibitory activities and varied with structure-activity nature. When BPSP was supplemented with normal diets at doses up to 6.4 g/kg b. w. and used to feed male and female ICR mice for 28 days, changes of the body weights, relative organ weights, blood and biochemical analyses revealed no obvious health hazard or acute toxicity. In longevity assessments, 11-mon-old BALB/c and 12-mon-old ICR mice were respectively fed with BPSP-supplemented diets at doses of 0 (control), 0.1 and 0.5 g BPSP/kg b. w. for 750 and 762 days, based on the resultant survival curves and average lifespans, it is of merit to demonstrate that BPSP was effective to extend mouse longevity by a dose-dependent manner and of potency to be a health enhancing ingredient.

Biography

Robin Y Y Chiou has completed his PhD in 1985 from Department of Food Science, University of Georgia, USA. He is a distinguished Professor with Department of Food Science, National Chiayi University. He has published more than 120 papers in scientific periodicals and 2012 Fellow of American Peanut Research and Education Society.

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Notes:

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Transcription of a bovine collagen gene fragment in yeast (*Pichia pastoris*) cells

Zulal Kesmen[1], **Ayten Gulluce**[2] and **Hasan Yetim**[1]
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[2]Erciyes University, Turkey

Gelatin is a multipurpose food additive widely used in the food industry. It is a hydrolyzed protein that produced through acid and alkaline extraction of collagen from animal tissues such as pig skin, bovine hides and their bones. Consumers may have some hesitations about the animal derived gelatin use in food and pharmacological products. Since in Islamic beliefs, consuming of products derived from non-halal sources is certainly forbidden, instead of animal derived gelatin, alternative gelatin sources must be developed to contribute to the protection of religious precision. Recently, recombinant collagen has been expressed in microbial hosts, and became one of the most popular collagen alternatives especially for medical applications. In this research, a bovine collagen gene fragment was transcribed in a yeast expression system to produce bovine recombinant gelatin for the food industry. For this purpose, a 1000 bp length fragment of bovine (*Bos taurus*) collagen, *COL1A1* gene was transferred to *Pichia pastoris* KM71 yeast strain cells by electroporation, and transcription of the gene fragment was checked by PCR. Approximately, 1000 bp PCR product was obtained as targeted gene fragment, and accuracy of the PCR products was controlled by sequence analysis. When the nucleotide sequence was searched from GenBank database, a 99% alignment was observed with *Bos taurus COL1A1* gene sequence. Consequently, a target bovine collagen gene fragment was successfully transcribed in *P. pastoris* as a one of the most important step of recombinant collagen production but there is more research needed to achieve optimal functional recombinant collagen/gelatin for the industry.

Biography

Zulal Kesmen has received her PhD from Ataturk University, Turkey. She is an Associate Professor at the Department of Food Engineering in Erciyes University, Kayseri, Turkey. She has been working on Food Microbiology and Biotechnology.

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Notes:

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Food quality, food packaging and food waste reduction

Gabriele Di Giacomo, Alberto Gallifuoco, Francesca Scimia and **Luca Taglieri**
University of L'Aquila, Italy

The quality of the ready-to-eat and of the minimally processed food (MPF) is strictly related to the packaging, often made by composite materials, including non-biodegradable ones. This complicates the use of the food waste (FW) as raw materials and, consequently, the possibility of reducing their final amount. To overcome this problem the packaging should be made by only biodegradable (possibly eatable) materials but, at the same time, it should have adequate properties: mechanical resistance, impermeability to oxygen, UV-resistance, porosity, and others depending on the specific food. Actually, in the rural society all these conditions were satisfied when packaging or covering food to be preserved for a given time under specified conditions. Moreover, most of the packages were made using byproducts or waste of primary food productions. The modern and industrialized society should restart from this point, identifying a number of raw materials and proper technologies to develop effective food packaging in order to ensure food quality and safety and to reduce the amount of FW. The purpose of this contribution is to show and to discuss a number of significant cases where surplus, byproducts and waste can be successfully used for the industrial production of edible films and biodegradable food packages having properties predetermined on the base of: a) the nature of the food; b) the properties to be preserved; c) the time of preservation. Significant examples of raw materials are: the collagen derived for the internal membrane of the eggshell and the PHA derived from the lactose of whey.

Biography

Gabriele Di Giacomo is a full Professor of Chemical Engineering at University of L'Aquila (Italy). He is the author of more than 100 scientific papers, conference papers and patents. His research interests include phase equilibria and transfer phenomena; supercritical fluids and applications; food waste management and valorization; sites remediation; seawater desalination; renewable energy and bio-fuels; processing of foods and beverages.

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Notes:

Majid Rahemi et al., J Food Process Technol 2016, 7:12 (Suppl)
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Detection of aflatoxin content in *Ficus carica* L. cv. sabz in Estahban, Fars, Iran

Majid Rahemi and **Sahar Sedaghat**
Shiraz University, Iran

Despite the fact that dried fig is considered as an important export product, it can provide a suitable media for growth of toxic spores. Thus, this study was conducted to evaluate the aflatoxin content in *Ficus carica* L. cv. sabz at different stages of fruit harvest (before abscission from tree, abscission on net, falling on the ground, drying on eshpang and in the cold storage) with HPLC. Aflatoxin was not detected at the mentioned phases. Although, infected aflatoxin was detected in infected samples, the concentration of the toxin was lower than Iranian national standard (6872). Samples infected with given concentration of *Aspergillus parasiticus* and *Aspergillus flavous* revealed the aflatoxin content, which was higher than the standard content. According to the results, it was recommended that the growers were supposed to collect the fig fruits as soon as possible in the late season, in summer for avoiding exposure to percipitation condition. Also, the product ought to be kept in cold storage with controlled temperature and humidity as well as in the disinfected area.

Biography

Majid Rahemi is currently a Professor at the Department of Horticultural Science, College of Agriculture, Shiraz University, Iran. He has earned a PhD degree in Horticulture from Michigan State University. His research emphasises on Plant Physiology, Horticulture and Post-Harvest Technology.

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Notes:

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Investigation on drying kinetic, effective diffusivity coefficient and activation energy in shelled hazelnut (*Corylus avellana*) drying process

Zahra Yousefi[1] **Hamid Reza Gazor**[2], **Kobra Tajadod Talab**[3], **Ahmad Gholiyan**[4] and **Mohammad Younesi**[2]

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[2]Agricultural Engineering Research Institute (AERI), Karaj, Iran

[3]Iran Rice Research Institute (IRRI), Rasht, Iran

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The goal of this research was to study kinetic of shelled hazelnut at temperature range of 40-60°C that beside drawing curve of moisture changes at different temperature and modeling frying process, effective diffusivity coefficient, activation energy, total energy, specific energy required for drying shelled hazelnut was calculated in single-layer form. Result of consideration showed that the duration of drying at 60°C was 34.42 and 20 percent less than 40 and 50°C. In modeling the process of drying hazelnut Midilli et al in 3 temperatures of drying has had the most suitable fitting with data of experiment comparing to other models. Also, effective distribution coefficient in dried hazelnut samples at different temperature changes between 1.26373×10-10 and 1.50064×10-10 m2/s. Activation energy for hazelnut at temperature range of 40-60°C 29.622 KJ/kg and effective penetration constant was obtained 1.1×10-5.

Biography

Zahra Yousefi has completed her PhD from Science and Research Branch, Islamic Azad University. She is the Boss of Roudbar Olive Research Station of Iran. She has published more than 6 papers in reputed journals.

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Probiotic dairy products: A changing outlook from consumer and producer

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Tabriz University of Medical Sciences, Iran

In recent years, the attention of scientific investigators has moved from the primary role of food as the source of energy and nutrients to the action of biologically active food components on human health. On the other hand, the consumer interest about the active role of food in the well-being and life prolongation has been increased. In this way, a novel term-functional food-was introduced which refers to prevention and/or curing effects of food beyond its nutritional value. There is a wide range of functional foods that were developed recently and many of them are being produced in all over the world including probiotic, prebiotic and symbiotic foods as well as foods enriched with antioxidants, isoflavones, phytosterol, anthocyanin and also foods with reduced sucrose, salt and fat content. Among these foods, probiotic functional foods may exert positive effects on the overall health. We can divide the probiotic functional foods into probiotic dairy foods and probiotic non-dairy foods. The market of probiotic dairy foods is increasing annually. An increased demand for dairy probiotic products comes from health promotion effects of probiotic bacteria that are originally initiated from milk products, bioactive compounds of fermented dairy products and prevention of lactose intolerance. Therefore, the development of these products is a key research priority for food design and a challenge for both industry and science sectors. This article presents an overview of functional foods development with emphasizing on probiotic dairy foods.

Biography

Aziz Homayouni Rad has received his PhD in Food Science and Technology Engineering at Tehran University during 2003-2007. Currently, he is working as Associate Professor in Tabriz University of Medical Sciences. He has successfully completed his administrative responsibilities as Vice Chancellor of Education in the Nutrition Faculty. His research has included functional food with emphasis on probiotic, prebiotic and synbiotic dairy foods. Based on this research and fellowship training, he has received several awards and honors, such as "Top Researcher in Nutrition Faculty of Tabriz University of Medical Sciences at 2013" and "*Journal of Dairy Science* Most-cited Award in Dairy Foods in 2014". He is serving as an Editorial Board Member of several reputed journals like *Journal of Food Research* and expert Reviewers for journals like "*Food Chemistry*" and "Nutrition". He has authored more than 80 research articles and more than 8 books. He is a member of Iranian Probiotic Association.

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Special Session

Day 1




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Mohammed Farid

The University of Auckland, New Zealand

Innovation in food sterilization

Food sterilization is a well-established technology and maybe classified into (1) in-can sterilization and (2) ultra high temperature short-time sterilization (UHT). The first is batch while the second is a continuous process. Both techniques require exposing the food to a high temperature (121°C to 140°C), which destroy all types of microorganisms including spoilage microorganism such as spores. However, in-can sterilization destroys most vitamins and other nutrients while UHT is known to change the flavor of food products such as milk, making it unfavorable by many consumers. Demands of consumers for higher quality and fresh tasting products are growing rapidly, which requires development of new processing technologies. Recently, non-conventional sterilization technologies have gained significant attention, since they have the potential to provide products with a better quality, fresh-like taste, and may even require lower energy. This presentation outlines the possibilities of combining one of the well-known methods of non-thermal processing such as pulsed electric field (PEF), high pressure (HPP), UV, ultrasound, irradiation and cold plasma with heat treatment. The main objective of such combinations of treatments is to lower overall treatment temperature/ time in order to produce food products of high quality. We recently have shown that the combination of PEF with heat could lower sterilization temperature of milk and hence reducing thermal damage to the nutrient in it.

Biography

Mohammed Farid has completed his BE in Chemical Engineering from the University of Baghdad, Iraq (1971), ME in Chemical Engineering from University of Swansea, Wales (1975) and PhD in Chemical Reactor Engineering from the University of Swansea, Wales in the UK. He is a Fellow of the Institution of Chemical Engineers, London and an active member of a number of international institutions. He has published more than 360 papers in international journals and refereed international conferences, 6 patents, 5 books, and 11 chapters in books. He has received a number of international awards such as the Matsumae International Fellowship from Japan (1986), the Hisham Hijjawi Award for Outstanding Scientific Achievement in Research in 1993, and the Marie Curie Fellowship, from European Union in 2010. He was invited as a keynote speaker to a large number of international conferences worldwide such as iFOOD2013 in Hannover. He has initiated and established the research in NZ in non-thermal processing of food, including high pressure processing, pulsed electric field and UV, more than 15 years ago. In 2015, he was awarded by the International Association of Engineering and Food (IAEF) the “Lifetime Achievement Award”

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Workshop

Day 1




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Osama O Ibrahim

Bio Innovation, USA

Bio-fuels versus food production: Does current bio-fuels effects food security and price

Continue increasing demand of fossil fuels is causing the concern of global warming due to increasing greenhouse gas remission and increasing energy supply insecurity due to politically unstable countries producing fossil fuels. These concerns are helping the production of bio-fuels as one of alternative approaches to decrease these concerns. Bio-fuels are produced from feed stocks or utilizing lands that could be used to produce foods. United States, Brazil, and Europe are the leading nations for the production of bio-fuels. Carbohydrate crops such as corn, wheat, rice, potato, sugar cane and sugar beets are the major feed stocks for the production of bio ethanol. Oil seed crops such as canola, sunflower, and soy beans are the major feed stocks for the production of bio diesel. As bio-fuels productions continue to compete with food productions, the assumption that this competition will drive up food price volatility and increase hunger in poor countries. The only way to reduce the impact of bio-fuels on food production is to de-link food and bio-fuels production. This can be accomplished through development of new bio-fuels technologies from second generation feed stocks that are not part of food supply. Such approach can be accomplished by utilizing agriculture residues, by-products from bio-process manufacturing, and capturing biomasses that are currently treated as waste, or utilizing non agriculture land that are not suitable to cultivate food crops but only suitable to grow plants or microbes that are dedicated to bio-fuels as feed stocks and not to produce foods. The major problem that did not allow these two approaches as second generation feed stocks technologies to develop on large commercial scale are due to several factors mainly, storage and transportation cost of these feed stocks, low bio-fuels production yield, long manufacturing process and high production costs. More R&D studies and experiments are necessary for the commercialization of bio-fuels from these second generation feed stocks in the near future.

Biography

Osama O Ibrahim is a highly-experienced Principal Research Scientist with particular expertise in the field of Microbiology, Molecular Biology, Food Safety, and Bio-processing for both pharmaceutical and food ingredients. He is knowledgeable in microbial screening/culture improvement; molecular biology and fermentation research for antibiotics, enzymes, therapeutic proteins, organic acids and food flavors; Biochemistry for metabolic pathways and enzymes kinetics, enzymes immobilization, bioconversion, and Analytical Biochemistry. He was external research liaison for Kraft Foods with Universities for research projects related to molecular biology and microbial screening and holds three bio-processing patents. In January 2005, he accepted an early retirement offer from Kraft Foods and in the same year he formed his own biotechnology company providing technical and marketing consultation for new startup biotechnology and food companies.

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OzlemTokusoglu, J Food Process Technol 2016, 7:12 (Suppl)
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Ozlem Tokusoglu

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Black mulberry (*Morus nigra*) phenolics and anti-carcinogenity: Anti-proliferation of black mulberry powder on selected CA lines

Phenolic compounds, ubiquitous in fruits, vegetables and plants, are of considerable interest and have received great attention in recently owing to their bioactive functions. Polyphenols are amongst the most desirable phytochemicals due to their antioxidant activity and those components are known as secondary plant metabolites and possess also antimicrobial, antiviral and anti-inflammatory and anti-carcinogenic properties along with their high antioxidant capacity. Plant phenolics, especially such as flavonoids, phenolic acids lignans and stilbenoids, modulate several important biological processes in mammalian cells and show anti-carcinogenic properties in preclinical PCa models and concerning studies are limited. *Morus nigra* is a deciduous tree growing to 10-13 m tall and it is mulberry type, especially specific to Asian continent. Its edible fruits are dark violet or black color. Anatolia is home of the mulberry fruit and one of the oldest culture area. In many agricultural areas of our country, high quality mulberry fruit is grown owing to the cultivation conditions are so convenient. It is reported that black mulberry fruit have anti-diabetic, anti-oxidative, and anti-inflammatuar effects and it is positive efficient on urinary system. It contains phenolic phytochemicals as intense degree. Black mulberry fruit is rich in carotenoid and flavonoid bioactives, also alkaloids, vitamins, oils (linoleic acid, palmiticacid, oleicacid), sugars (glucose, fructose) and minerals are other constituents. Due to its antioxidant content, the antioxidant activity of black mulberry is high and its bioactive compounds, flavonoids and anthocyanins are in quite wide range. Black mulberries contain rutin, myricetin, quercetin, kaempferol as flavonols; isoquercetin (quercetin 3-O-4C1-B-D-glucoside) as flavonol glycosides; p-coumaric, p-hydroxybenzoic, chlorogenic, ferulic, gallic, vanillicasidler as phenolicacids; (+)-catechin, epicatechin, epigallocateching all at as flavanols; morusin, moracin M2, cyclomorusin, apigenin as flavon structure phenolic compounds; naringenin as flavonon; cyanidin 3-O-glucoside, cyanidin 3-O-rutinoside, pelargonidin 3-O-glucoside, pelargonidin 3-O-rutinoside as anthocyanins and cyanidin, pelargonidin phenolics as aglycon forms of anthocyanins (called as anthocyanidins); resveratrol as stilbens; oxyresveratrol, mulberroside A (Oxyresveratrol-4-O-b-D- glucopyranosyl-3 9 -O-b-D-glucopyranoside or 2, 4, 3 9 , 5 9-tetrahydroxys- tilbene), kuwanon C5, kuwanon C6 as resorsinol type phenolic compounds; β sitosterol-3-O-β-Dglucoside as steroidal saponins; ursolicacid, oleanolicacid as triterpenic acids. The studies of the flavonoid fractions obtained from black mulberry (*Morus nigra*) on anti-proliferation of cancer cell lines and its anti-cancer effects are limited. It is reported that major phenolic substance *Morus inflavon* in *Morus alba* type white mulberries has been inactive the STAT3 signals in prostate cancer cells (PCa) and has been triggered apoptosis (cell death) and no findings could be found belongs to *Morus nigra* (black mulberry). Besides, anti-proliferative effects of the bioactive profiles of white colour mulberries on hepatocarcinoma cell lines (HepG2) was determined and it is reported that white mulberry bioactive compounds are effective on liver cancer and no findings could be found belongs to *Morus nigra* (black mulberry). It is put forwarded that apigenin flavon phenolic in all mulberry types can be blocked human T-24 bladder cancer cells and has been triggered apoptosis.

Biography

Ozlem Tokuşoğlu has completed her PhD from Ege University in the Department of Food Engineering, Izmir, Turkey. She professionally worked at the Ege University Department of Chemistry and Food Engineering. She was a Research Associate at the Food Science and Nutrition Department at the University of Florida, Gainesville, Florida, USA and at the School of Food Science, Washington State University, Pullman, in the State of Washington, USA. She is currently also working as an Associate Professor, faculty member in Department of Food Engineering of Celal Bayar University. Her study focuses on nutrition, food quality control, food chemistry, food safety, toxicology, shelf-life of foods and innovative food processing technologies and functional products. Her specific study areas are phenolics, phytochemicals, bioactive anti-oxidatives and anti-carcinogens components and food toxicants. She has conducted academic research studies, keynote addresses and academic presentations at many countries and meetings. She has published more than 150 studies in journals and conferences. She is the Editor of book of CRC Press Taylor and Francis and has three scientific books. She has been serving as an Editorial Board Member, Associate Editor and Section Editor of scientific journals.

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15th International Conference on

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October 27-29, 2016 Rome, Italy

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Day 2




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Giancarlo Cravotto

University of Turin, Italy

Enabling technologies and green processes for the production of high-value bioactives

Extraction is one of the essential processes in the preparation of key ingredients in food and pharma industry. Choosing the best technology and procedure has a significant impact on the selectivity and product quality. The development of enabling technologies for process intensification is a prerequisite to advancing the biorefinery concept and green extraction. The overall goal is the cost-effective production of high-value ingredients and the recovery of co-products from biomass and food processing wastes which see ultrasound, hydrodynamic cavitation, microwaves and ball milling technology playing a pivotal role. Several naturally occurring compounds have progressively moved from the territory of traditional and folklore medicine to rigorous studies aimed at identifying natural preventive therapies for diseases. It should also be mentioned that phytochemical and antioxidant characteristics of some bioactive substances can also be affected by physico-chemical treatments, which may have either positive or negative impacts in their properties. Recent advances on a laboratory or bench-top scale, demonstrate the big advantages offered by cascade processes with enabling technologies generating reproducible results for scaling-up.

Biography

Giancarlo Cravotto is full Professor of Organic Chemistry at the University of Turin (Italy) and since 2007 he is Director of the Department of Drug Science and Technology and he is the President of the European Society of Sonochemistry. His research activity is documented by more than 300 peer reviewed papers, several book chapters and patents. His group has been partner of several UE projects. Among them ARCADE (FP7), MAPSYN "Highly efficient syntheses using alternative energy forms" (FP7-NMP-2012), "ECOEXTRACTION" (Alcotra 2011) and US4GREENCHEM (Horizon 2020). His research activity is focused on enabling technologies for green chemical processes and extraction from lab scale to industrial applications.

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Notes:

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Farooq Anwar

Prince Sattam bin Abdulaziz University, Saudi Arabia

Moringa oleifera L: A rich source of high-value nutrients and bio-actives for functional foods and nutraceuticals industry

Moringa oleifera (M.oleifera), a well-known plant from the *Moringaceae* family, is very much popular among the rural communities due to its impressive range of nutritious and traditional medicinal benefits. Currently, there has been an increasing interest in exploring the functional food and nutraceutical potential of this multipurpose species due to its wide array of high-value nutrients and medicinally important bioactives such as essential amino acids and minerals, vitamins, high-oleic lipids, bio-peptides and polyphenolics along with a rare and rich combination of β–sitosterol, zeatin and antihypertensive compounds (thiocarbamate and isothiocyanate glycosides).A number of therapeutic and biological activities such as antipyretic, antiulcer, antioxidant, antimicrobial, anti-inflammatory, anti-diabetic and diuretic have been attributed to different parts of this miracle tree. In view of the widespread nutritional, folk medicinal and therapeutic uses of *M. oleifera*, the present lecture is mainly designed to focus and highlight the growing potential of *Moringa* as a rich source of nutritional substances and valuable phytochemicals for the development of functional foods and nutraceuticals. An overview of various *Moringa* derived functional food and cosmo-nutraceutical products, available on shelves, as well as the current market trends and future prospects of *Moringa* industry are also discussed.

Biography

Farooq Anwar obtained his PhD in Analytical Chemistry and has more than 15 years of research and teaching experience at different organizations including employments as Quality Control Executive, Scientific Officer and Post-doctoral Researcher at Canada and Malaysia. He is mainly involved in bio-analytical and phytochemicals research. He is parentally working as Associate Professor at University of Sargodha, Pakistan and is currently serving at the Department of Pharmaceutical Chemistry, Prince Sattam bin Abdulaziz University, Al-Kharj, Saudi Arabia. He has the Honor of being selected as Fellow of the Chemical Society of Pakistan and Productive Scientist of Pakistan. On the basis of scientific achievements, The Academy of Sciences for the Developing World (TWAS) based in Trieste, Italy has granted him Young Affiliate Fellowship-2009. He has also been awarded Dr. Atta-Ur-Rehman Gold Medal/Prize-2010 (Chemistry) by Pakistan Academy of Sciences (PAS). He has supervised 10 PhD and 50 MPhil research students. Overall, he has published 200 research articles bearing cumulative Impact Factor of 300 and Citation over 5000 to his credit.

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Notes:

15th International Conference on

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October 27-29, 2016 Rome, Italy

Workshop

Day 2




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Mirjana Menkovska

Ss. Cyril and Methodius University of Skopje, Macedonia

Mycotoxin contamination of cereals affecting technological quality of cereal-based products and health

Microbial contamination is the most common cause of foodborne illnesses in humans and animals, but it also has an deleterious effect on the technological quality of food products. *Aspergillus* is one of the most important genera of toxigenic molds in the spoilage of foods and animal feeds that produce a variety of aflatoxins. Many other mycotoxins produced by *Aspergillus* are of great significance from the point of view of human health in cancer induction and immunosuppresion. The most important group of mycotoxigenic molds other than *Aspergillus* species that contaminate the human food and animal feeds are species of the genus *Fuzarium*. Cereal grains, beans and oil seeds can be contaminated by these species among which the most commonly contaminated are wheat, corn, barley, rye, triticale, oats and millet. *Fuzarium* toxins, particularly deoxynivalenol and fumonisins, have been detected in finished human food products, while zearalenone has been found naturally occurring in numerous cereal grains, especially in those for animal feed. In addition to their deleterious health effects, *Fuzarium* species worse the technological quality of the products made from cereal grains. Detection, control and prevention for both toxins will be discussed in this presentation.

Biography

Mirjana Menkovska, PhD is a full Professor for Department of Food Technology and Biotechnology at the Institute of Animal Science, Ss. Cyril and Methodius University in Skopje, Macedonia. Her background is Food Technology. She graduated at the Faculty of Technology and Metallurgy in Skopje, took MS degree in Instrumental Analysis in Chemistry and Technology at the same University and PhD degree in Food Technology at the University of Belgrade, Serbia. She has published more than 150 papers in domestic and foreign scientific journals and participated at 90 scientific meetings in the country and abroad. Her bibliography data counts over 200 references. She has also translated scientific books (3) and reviewed scientific books (3) from English into Macedonian language. She has been many years a member of AACC, RACI, ISEKI, National contact person at EUCheMS - Division of Food Chemistry, ICC National Delegate, and member of many Scientific and Organising Committees at many international and domestic scientific meetings and conferences, such as Food Technology Conferences.

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Food Processing & Technology

October 27-29, 2016 Rome, Italy

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Day 3




Lu Yu et al., J Food Process Technol 2016, 7:12 (Suppl)
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New insight into processing of cooked rice through intrinsic measurement of modulus, adhesion and cohesion at the level of individual grains

Lu Yu, M Fitzgerald, R G Gilbert, J R Stokes, T Witt and **M S Turner**
The University of Queensland, Australia

The textural and flavor qualities of packaged pre-cooked rice (PPC) are often considered inferior compared to freshly cooked rice. Our aim is to determine specifically the origin of any physicochemical differences that arise during processing of PPC that ultimately affects quality. To achieve this, it has been necessary to develop techniques to measure the mechanical and surface properties of individual rice grains due to the insensitivity of the commonly used texture profile analysis. Single grains were compressed within the elastic limit, i.e. to a non-destructive small strain deformation. We found wide distributions of modulus and adhesion, whereby the significant differences of their mean are affected by thermal sterilization time and the addition of oil before sterilization. In addition, cohesion in bulk of PPC was measured with a ring-shear tester designed to measure flow properties. Rinsing before thermal sterilization affects the moisture, but not the modulus, adhesion or cohesion of bulk. In conclusion, measuring intrinsic mechanical properties at the individual grain level paves the way towards rational design and evaluation of processing and ingredient variables on the quality of cooked rice. Keeping the thermal processing time to a minimum produces PPC more similar to freshly cooked rice and the addition of oil facilitates the flow ability during handling by reducing grain-grain adhesion.

Biography

Lu Yu is currently pursuing her PhD in the Industry Transformation Training Centre at the University of Queensland, Australia. She received her Bachelor of Science in Nutritional Sciences and Master of Science in Food Technology and Biotechnology at the Technical University Munich, Germany in 2013.

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Notes:

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Identification and determination of some bioactive and allergenic compounds in licorice using LC/ESI-MSMS

Fahriye Seyma Bayraktar[1], **Ahmet Abdullah U S**[2], **Nihat Ozcan**[1] and **Osman Sagdic**[2]
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Roots and rhizomes of *Glycrrhiza* species, commonly known as licorice (liquorice), have been used for medicinal purposes for long years and have also been used as a natural sweetener and a flavor additive in foods and beverages such coke. Licorice has a variety of effects, such as antioxidant, anti-viral, anti-carcinogenic, antitumor, anti-inflammatory, anti-depressant and anti-diabetic etc. *Glycrrhiza glabra L.* has commonly been grown in nearly all regions-especially Mediterranean and Southeast regions- of our country, Turkey. In this study, new LC-MS/MS method for identification and determination of glycyrrhizin, glycrrhitinic acid, liquiritin and carbenoxolone in licorice was developed. This four compounds in licorice extracted by using ultrasonic water bath with 20%, 50%, 80%, 100% ethanol-water and methanol-water mixtures at room temperature for 45 min. Then, extracts obtained in this way, were filtered and diluted before being injected into the LC system. According to average of three replicates of nine samples, max value of glycrrhizin was 696.35±3.31 mg g-1 in 20% methanol-water mixture, min value of glycrrhizin was 176.50±1.05 mg g-1 in 100% methanol; max value of glycrrhitinic acid was 340.24±0.06 µg g-1 in 50% methanol-water mixture, min value of glycrrhitinic acid was under the limits of quantitation in 100% ethanol and in 100% water; max value of liquiritin was 73.53±2.03 µg g-1 in 20% ethanol-water mixture, min value of liquiritin was under the limits of quantitation in 100% ethanol; carbenoxolone was not detected. Consequently, this method is simple, rapid and effective for identification and determination of these bioactive and allergenic compounds.

Biography

Fahriye Seyma Bayraktar is a Researcher at TUBITAK MRC Food Institute. She received her Bachelor's degree from University of Celal Bayar in Department of Food Engineering, Manisa, in 2011 and also received her Master's degree from University of Ankara in Department of Food Engineering, Ankara, in 2014. She is also a Post-graduate in Department of Food Engineering at Yildiz Technical University, Istanbul.

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Characterization and classification of apple cultivars based on triterpenoids acids, phenolic constituents and bioactive properties

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Apple (*Malus domestica* Borkh.), a popular and widely cultivated fruit world-wide, contains active phytochemicals including phenolic compounds and triterpenoids responsible for their health benefits. Here we report the results obtained for the concentration of two major triterpenes (oleanolic and ursolic acids), phenolic, flavan-3-ols, flavonoids and bioactive properties of different apple cultivars from different geographical regions and classification using chemometric analysis. Quantification of bioactive compounds from apples was carried out by HPLC-PDA after an appropriate extraction method. Total polyphenols, total flavonoids and antioxidant activity were recorder by spectrophotometric measurements. Our results demonstrated that the investigated bioactive compounds and bioactive properties vary considerably depending on the apple cultivars. Catechin, epicatechin, chlorogenic acid and rutin were the most important identified phenolic acids in apples (flesh and peel), while ursolic and oleanolic acids were abundant in apple peel. There were significant linear correlations between phenolic content and antioxidant activity of extracts in the reaction with DPPH• (1, 1-diphenyl-2-picrylhydrazyl). A linear discriminant analysis model was constructed to classify apples according to the cultivar and to distinguish between different sample locations. Therefore, the present methodology based on apple active phytochemicals fingerprinting and bioactive properties in conjunction with a comprehensive database and chemometric methods presents a high potential for apple classification.

Biography

Elisabeta-Irina Geana has completed her PhD in 2015 at Bucharest University. Her main current interests are identification and quantification of essential active principles like phenolic compounds, organic acids, amino acids, terpenes, micro and macronutrients in different food matrices (wine, honey, fruits, plants, organic products, functional foods) by highlighting key biomarkers used in authentication, using the main instrumental analytical (HPLC, UV-VIS, ICP-MS). She has published 16 ISI articles, 10 of them as first author and has 145 citations.

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Inhibitory on cell proliferation and apoptosis induction of human breast cancer cells MCF-7 by aqueous leaf extract of *Carica papaya* L.

Fatma Zuhrotun Nisa, Mary Astuti, Sofia Mubarika Haryana and **Agnes Murdiati**
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Breast cancer is the most frequently diagnosed cancer in women. Chemotherapy is the main method of breast cancer treatment but there are side effects. *Carica papaya* leaves is vegetable foods consumed by most people of Indonesia have potential as anticancer. The aim of this study was to investigate anti-proliferative effects and apoptotic induced effect of aqueous papaya leaves extracts on human breast cancer cell lines MCF-7. Inhibitory on cell proliferation was measured by MTT assay while apoptosis induction was measured using Annexin V. The results showed that papaya leaf can inhibit the proliferation of human breast cancer cells MCF-7 with IC50 in 1.319 µg/ml. IC50 values of papaya leaf extract was higher than the IC50 value quercetin and doxorubicin. Papaya leaf extract can also induce apoptosis of breast cancer cells MCF-7 about 22.54% for concentration 659.63µg/ml and about 20.73% for concentration 329.81 µg/ml. The percentage of cell apoptosis of papaya leaf extract lower than doxorubicin but higher than quercetin. This study indicated that papaya leaf extract have potential as anticancer through mechanism anti-proliferation and apoptosis induction.

Biography

Fatma Zuhrotun Nisa is currently a PhD student in the Faculty of Agricultural Technology Gadjah Mada University. She is currently working as a Lecturer in Health and Nutrition Department, Faculty of Medicine, Gadjah Mada University. For approximately 13 years as a Lecturer, she has conducted research and published papers through national and international journals and international conferences in various countries.

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The effect of betacyanins from red pitahaya on the physicochemical, antioxidant and sensory properties of yoghurt and ice cream

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The search for natural colorants has been driven by the growing evidence of the adverse health effects of synthetic colorants. Red pitahaya or red dragon fruit (*Hylocereus polyrhizus*) are well known for their deep purple color pulps due to the abundance of betacyanins and can be exploited as a potential source of natural food colorant. The application of betacyanins from red pitahaya to simulate strawberry-red color in two model food systems (yoghurt and ice cream) was evaluated in comparison to a commercial colorant from red beet, E-162. A greater loss of BC and total color changes was observed yoghurt containing E-162. However, an approximate 0.15% increase of BC was observed in ice cream containing betacyanins from red pitahaya or E-162 on day-21 of storage at -18°C. Throughout the 14-days or 21-days of cold storage, only a small difference ($\Delta E^* < 1.5$) was observed in total color changes of yoghurt or ice cream containing betacyanins from red pitahaya or E-162, respectively. The microbial viability (*Streptococcus thermophilus* and *Lactobacillus bulgaricus*) in yoghurt containing betacyanins was found to be better than that of plain yoghurt (without betacyanins). Yoghurts containing betacyanins (red pitahaya or E-162) were also found to have lower syneresis than that of plain yoghurt. Ice-cream containing betacyanins from red pitahaya was found to have higher overruns compared to those of plain or E-162 containing ice-cream while the apparent viscosity of ice-creams was not affected by the addition of betacyanins from red pitahaya or E-162. The addition of betacyanins from red pitahaya or E-162 was found to enhance the antioxidant properties of yoghurt and ice cream. The sensory evaluation of yoghurt and ice cream containing betacyanins from red pitahaya showed a better color acceptability compared to those containing E-162. Betacyanins from red pitahaya can therefore be used as a potential natural colorant to simulate strawberry-red color in yoghurt and ice cream.

Biography

Ashwini Gengatharan has recently graduated with a PhD majoring in Food Science from Monash University Malaysia. She was under the supervision of Dr. Wee Sim Choo and Professor Gary A Dykes at the School of Science. She has completed her BSc in Biotechnology from AIMST University, Malaysia and has obtained her Master's in Biotechnology from Macquarie University, Australia. Her areas of research interest are mainly on the production of functional foods and application of plant secondary metabolites in food processing to improve consumer food products.

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Development of a novel strategy for the fabrication of LLDPE-OMMT hybrid multilayer films for food packaging

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The purpose of this study is to develop a novel strategy to fabricate linear low density polyethylene (LLDPE)-Organically modified Montmorillonite clay (OMMT) stratified composite films to reinforce the PE packaging materials and improve its functional properties. This strategy consists of assembling OMMT layers on PE surfaces based on solvophobic molecular construction involving hydrophobic interactions between the organic parts of the organoclay tactoids and the PE hydrophobic surfaces and further physical adsorption of LLDPE molecules on the organoclay layers driven by a dip-coating process. The successful preparation of the multilayers was confirmed by the prolfilometry and the scanning electron microscopy characterization results showing a linear growth of repetitive bilayers comprised of 450 nm OMMT and 2.25 μm LLDPE layers on the 160 μm LLDPE substrate film. Moreover, the alternate variation of water contact angles (85° average for OMMT and 107° for LLDPE layers) proved the nature of each layer material. Up to 5 bilayers were deposited on each side of the substrate by successive repeating depositions resulting in robust hybrid multilayer composite films. Further characterization results suggest that the developed self-assembly process can be used as an effective strategy to achieve enhanced barrier effect and that films prepared with such complexes have great potential as food packaging materials.

Biography

Ali Akbar Motedayen is currently a PhD candidate in the University of Montpellier, France. His thesis work is related to the self-assembly of hydrophobic materials for the fabrication of hybrid nano-enabled multilayer food packaging films. He has completed his Msc in the field of food science and industry working on the developpment of novel biodegradable composite films from starch and Kefiran and published a scientific article on that subject in the "Food Chemistry" journal. Nanocomposite and biodegrdable films and their application for extending shelf life of food products are his field of interest.

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Effect of postharvest handling operations of oil palm fruits (*Elaeis guineensis*) on quality of crude palm oil

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In Sri Lanka, palm oil cultivation and processing of palm oil fruits has been operated as a commercial scale since last decade. Effect of postharvest handling operations of palm oil fruits such as transportation, temporary storage at the ramp, damages occurred during the transport and handling of fresh fruit bunches (FFB) were investigated in crude palm oil (CPO). The quality of CPO is mostly determined based on free fatty acid (FFA), moisture and impurities content. FFB of palm oil stored for 6, 12, 18 hours with different percentage of fruit damages (0%, 20%, 40% & 60%) were determined. There was a direct relationship between FFA content and storage period ($r=0.993$). There was no significant effect of fruits received by normal transportation on FFA and moisture content ($p<0.05$). The interactive effect of palm oil fruits damage and storage period on FFA was significant ($p<0.05$). There was a significant effect of fruit damage on FFA content of CPO ($p<0.05$). The FFA and moisture content of CPO is positively correlated with the storage period of palm oil fruits and moisture content is negatively correlated with the damage percentage of oil palm fruit. Harvested palm oil fruits at 0% surface damage can be stored for 57 h which comply with the quality standard (FFA<5%, moisture<0.3% and impurities<0.2%).

Biography

I H R Uthpala has completed her B.Sc at the age of 26 years from University of Peradeniya, Sri Lanka in the stream of Food Science and Technology as well as is reading M.Sc in the same university. This reaserch has been done at AEN Palm Oil Processing (Pvt) Ltd, Baduraliya, Sri Lanka with the advise of Mr. P.C. Arampath and Mr.(Eng) M. S. Bandara. She is the Quality Assurance executive in leading palm oil manufacturing organization, AEN Palm Oil Processing (Pvt) ltd, Sri Lanka. She has written manuscripts, research papers, reviews related to food technology.

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