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Hye Soon Kang et al., J Food Process Technol 2016, 7:12 (Suppl)
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Simultaneous analysis of diuretic drugs in food and dietary supplements using LC/PDA and LC/MS/MS

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Diuretic drugs such as chlorothiazide, hydrochlorothiazide, hydroflumethiazide, trichloromethiazide and methylchlothiazide are illegal to be included in food and dietary supplements since abuse intake of the drugs via food without medical prescription can be caused life-threatening side effects. Governmental agencies of food and drug safety invest their efforts to screen out food and dietary supplements illegally containing diuretic drugs. We developed an accurate, simple, rapid and simultaneous analysis method of five thiazide diuretic durgs in food and dietary supplements using liquid chromatography coupled with photodiode array detection (LC/PDA). The developed method was fully validated and showed good results with respect to specificity, linearity (r^2>0.99), limit of detection (0.1μg/mL), limit of quantification (0.4μg/mL), precision (RSD<3.3%), recovery (92.1~106.4%), and reproducibility. It also satisfied all standards suggested by AOAC for the analysis of diuretic drugs in food and food supplements. To confirm the detected anti-obesity drugs in food and dietary supplements, we also developed a qualitative analysis method by Liquid chromatography coupled with mass spectrometry (LC/MS). Ninety foods and dietary supplements purchased by internet and local market in Korea were tested with the developed method. Diuretic drugs were not detected in all samples. LC/PDA and LC/MS methods described in this study were simple, rapid and reliable; the methods may be suitable for a rapid and sensitive analysis of chlorothiazide, hydrochlorothiazide, hydroflumethiazide, trichloromethiazide and methylchlothiazide simultaneously in food and dietary supplements.

Biography

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Notes:

Cristina A Cortes et al., J Food Process Technol 2016, 7:12 (Suppl)
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Sensory assessment and consumer acceptability of cabibi/freshwater clam (*Batissa violacea*) sauce

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The main objective of this study is to introduce a cabibi or freshwater clam (*Batissa violacea*) sauce as another option for any other type of condiments. It would provide a generally accepted condiment just like the oyster sauces of the world but makes use of a species of a freshwater clam. The method on gathering data for the study started with the researcher's presentation of coded samples of cabibi/freshwater clam sauce to 30 evaluators from differing age groups. The evaluators assessed the cabibi/freshwater clam sauce formulations as to four dimensions: color, odor, taste and general acceptability. From this methodology, it was found that the highly and generally accepted cabibi/freshwater clam sauce has the ratio of 500 ml cabibi/freshwater clam broth: 125 ml sugar: 125 ml soy sauce. This mixture was also assessed as having a chocolate brown color, slightly fishy odor and slightly sweet taste. Thus, the researcher highly recommends to business persons to initially make use of this cabibi/freshwater clam sauce 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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Evaluation of total content and bioaccessible fractions of Ca, P, K, Na, Mg and Zn in different types of bovine milk

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Bovine milk is a highly consumed food around the world, being present in the composition of various products such as yoghurts, cheeses, chocolate, and butter among others. Currently, Brazil is a great producer of this food, the sixth largest in the world and the first in South America. Due to the complexity of the food matrix, and considering the absorption process of mineral from food, studies of total content and bioaccessible fractions have been performed in order to better understand the interaction between minerals and food matrix in the human body. The aim of this study was to evaluate the total concentration and the bioaccessible fractions of Ca, P, K, Na, Mg and Zn in different types of bovine milk. The determination of total concentration considered samples of whole, semi skimmed and skimmed milk type of two different brands (A and B). Aliquots of samples were treated with HNO3, H2O2 and deionized water and then subjected to microwave oven radiation. After dilution they were analyzed by ICP OES. For the evaluation of bioaccessible fractions, a gastrointestinal digestion method was applied and the chime was analyzed by ICP OES. The results for Ca, P, K, Na, Mg and Zn ranged from 912-1043, 781-853, 1000-1072, 418-505, 87-98 and 3.4-3.7 mg/L, for total concentration, and 59-67, 61-64, 79-90, 90-92, 89-103 and 18-24% for bioaccessible fractions, respectively. Bioaccessibility of zinc was below 50%, showing that milk is not a good source of this nutrient. (CNPq, FAPESP, INCTAA)

Biography

Solange Cadore has completed her PhD from University of Campinas. She is Professor and Researcher of this University since 1986. She served as Graduate Program Coordinator of Chemistry Institute of University of Campinas for 8 years. She has supervised more than 60 students from undergraduate, Master, Doctoral and Post-doctoral levels and published more than 70 papers in reputed journals and has been serving as reviewer for more than 50 journals. She acts as Editor of *the Journal of the Brazilian Chemical Society.*

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Antimicrobial effects of vinegar against norovirus and *Escherichia coli* in the traditional Korean vinegar green laver (*Enteromorpha intestinalis*) salad during refrigerated storage

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This study investigated the antimicrobial effects of 5-15% vinegar on the survival of murine norovirus-1 (MNV-1) and *E. coli* in green lavers during 7-d storage period at 4°C. The MNV-1 were significantly ($p<0.05$) higher in 0% vinegar-containing lavers (3.63 log) than in 5~15% vinegar-containing lavers (3.29~3.04 log) throughout 7 d of storage. A 1-log reduction in MNV-1 was observed in 0~10% vinegar-containing laver after 5 d of storage and 15% vinegar-containing laver after 3 d of storage. The *E. coli* was also significantly decreased in 15% (6.84 log) vinegar-containing lavers than in 10% (7.33 log) and 5% (7.60 log) vinegar-containing lavers. >1-log reduction in *E. coli* was observed in 10~15% vinegar-containing laver after 1 d of storage. 2-log reduction in *E. coli* was also observed in 10~15% vinegar-containing laver after 5 d of storage. Using the Weibull model, the dR-values of MNV-1 were 4.90 d for 0%, 4.28 d for 5%, 3.79 d for 10%, and 2.88 d for 15% vinegar-containing lavers, whereas those for *E. coli* were 1.12 d for 5%, 1.03 d for 10%, and 0.90 d for 15% vinegar-containing lavers. This study suggests that ~1 d of storage is required for 1-log reduction in *E. coli* in vinegar-containing lavers, whereas 3~5 d of storage is adequate for 1-log reduction in MNV-1 in vinegar-containing and non-vinegar-containing lavers.

Biography

Shin Young Park has completed her PhD from Texas A&M University in USA and Post-doctoral studies from Chung-Ang Univeristy (CAU) in Korea. She is the Research Professor in School of Food Science and Technology of CAU. She has published more than 70 research papers including review papers in reputed journals such as Food Microbiology, International Journal of Food Microbiology, Food Research International, and Food Control.

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Tomasz Sawicki et al., J Food Process Technol 2016, 7:12 (Suppl)
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Effect of technological processes on the betalain profile and antioxidant capacity of red beetroot

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Beetroot is one of the most common and frequently consumed vegetables in Poland. It is a rich source of a number of bioactive substances, including betalains exhibiting strong antioxidant, anti-virus and anti-bacterial activity. The aim of the research was to determine the betalain profile and antioxidant capacity in fresh, boiled and fermented red beetroot. Betalains were analyzed using micro-HPLC system (LC200, Eksigent) coupled with TripleTOF 5600+ mass spectrometer (SCIEX, Canada). The antioxidant capacity (AC) was measured by four methods: ACW PCL, ACL PCL, ABTS and DPPH. By means of HPLC-TOF-MS/MS analysis 22 betalains were identified, including 18 betacyanins and 4 betaxanthins. The dominant form of betalains in fresh red beetroot was betanin and isobetanin constituting 60% and 27% of the total betalains content, respectively. The content of betanin and other derivatives decreased in the boiled red beetroot. On the other hand the fermentation process did not cause significant changes in the betalains profail and content of red beetroot. The highest AC was observed for boiled red beetroot measured by ACW PCL, ACL PCL and DPPH. While the highest AC measured by ABTS was observed for fresh red beetroot. The lowest AC values were observed for the fermented red beetroot. The results of this study show that thermal treatment and fermentation affect the betalains profile and antioxidant activity of red beetroot.

Biography

Tomasz Sawicki is currently a PhD student of Doctoral studies at Institute of Animal Reproduction and Food Research of Polish Academy of Sciences in Olsztyn, Poland. He graduated in Food Technology and Nutrition in the Department of Food Science, University of Warmia and Mazury in Olsztyn. He has published 5 papers in reputed journals.

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Comparison of free and bound polyphenols profile in a raw and fermented red beetroot

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Red beetroot is rich in a number of phytochemicals, including flavonoids and phenolic acids. These compounds are classified into the non-nutrients group, which perform several functions in plants, among them protective and signaling activities. On the other hand, flavonoids and phenolic acids, due to their strong antioxidant properties, depending on their chemical structure, after ingestion by humans and animals can play an preventive role against a number of diseases including neurodegenerative disorders and cancer. Therefore, to identify their potential benefits on the human body it is important to establish the polyphenols profile in a fresh and naturally fermented red beetroot. The profile and content of flavonoids and phenolic acids in a fresh and fermented red beetroot were analyzed using micro-HPLC-MS/MS method. The content of phenolic acids and flavonoids in raw red beetroot was high and after application a spontaneous process of lactic acid fermentation caused a decrease in the level of these phytochemicals. In the fresh and fermented beetroot nine phenolic acids (chlorogenic, *trans*-cinnamic, ferulic, isoferulic, caffeic, para-coumaric, protocatechuic, sinapic, syringic) and seven flavonoids (apigenin, epicatechin, kaempferol, quercetin, luteolin, orientin, vitexin) were identified. Among phenolic acids the predominant was isoferulic acid while in the group of flavonoids, epicatechin was a main compound. In a fresh red beetroot phenolic acids and flavonoids occurred mainly in bound form, while the fermentation applied caused an increase of free form of these polyphenols. In conclusion, red beetroot is an attractive source of flavonoids and phenolic acids and the fermentation process may significantly increase the amount of available forms of these phytochemicals.

Biography

Wieslaw Wiczkowski has completed his PhD in Food Chemistry and Human Nutrition at the University of Warmia and Mazury, Olsztyn, Poland. His professional interest is connecting with the relation between nutrition, metabolism of bioactive compounds, oxidative stress and health. He has published 39 papers in reputed journals.

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Change of polyphenols composition during fermentation of buckwheat flour by lactic acid bacteria

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Common buckwheat (*Fagopyrum esculentum*) is an important crop in some areas of the world. There is some evidence indicating that consumption of buckwheat is associated with a wide range of biological functions, including hypocholesterolemic, hypoglycemic, anticancer, anti-inflammatory and anti-glycation effects. These properties are related to polyphenols that are present in buckwheat at a high level, increasing an interest in buckwheat products as a substitute for wheat flour in the production of gluten-free products. The aim of this study was to investigate the effects of fermentation using lactic acid bacteria on the profile of phenolic acids and flavonoids. Material for the study was buckwheat flours are whole meal and thermally treated flours. The fermentation using 14 selected lactic acid bacteria was performed in a 5% buckwheat flour suspension at 37°C for 24 hours. Qualitative and quantitative analysis of phenolic acids and flavonoids in buckwheat flours before and after fermentation were determined by micro-HPLC system equipped with QTRAP 5500 mass spectrometer (SCIEX, Canada). In buckwheat flours before and after fermentation eight flavonoids (quercetin, isorhamnetin, kaempferol, epicatechin, apigenin, luteolin, orientin and vitexin) and 10 phenolic acids (ferulic, caffeic, sinapic, *para*-coumaric, *meta*-coumaric, chlorogenic, *trans*-cinnamic, protocatechuic, vanillic, syringic) were analyzed. Among flavonoids, epicatechin was a main compound while in the group of phenolic acids, ferulic acid was predominant. Generally, fermentation process decreased the concentration of polyphenols studied but on the other hand caused an increase of the polyphenols concentration in a free forms. Moreover, the applied lactic acid bacteria significantly changed polyphenols profile in the fermented buckwheat flours.

Biography

Wieslaw Wiczkowski has completed his PhD in Food Chemistry and Human Nutrition from the University of Warmia and Mazury, Olsztyn, Poland. His professional interest is connecting with the relation between nutrition, metabolism of bioactive compounds, oxidative stress and health. He has published 39 papers in reputed journals.

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Evaluation of hardness and color of model cakes prepared from buckwheat flours fermented by selected lactic acid bacteria

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Background: Fermentation of buckwheat flour by selected species of lactic acid bacteria could lead to some physico-chemical and functional changes in obtained products.

Aim: The aim of this study was evaluation of hardness and color of model cakes prepared from buckwheat flours fermented by selected lactic acid bacteria.

Materials & Methods: The material used in this study was freeze-dried buckwheat flour (*Fagopyrum esculentum* Moench) fermented by six selected lactic acid bacteria: *L. acidophilus* (145, La5, V); L. casei (LcY); L. plantarum (W42, IB). Fermentation of 5% buckwheat flour suspension was carried out at 37°C for 24 hours. Baking process was carried out at 220°C for 30 min acc. procedure by Hidalgo and Brandolini (Food Chem, 18, 2011). The texture of model buckwheat cake was determined by a biscuite penetration, using a TA.HDplus Texture Analyser. The instrumental measurement of the cake colour was carried out with a ColorFlex (HunterLab, USA).

Results: The hardness of freshly prepared cakes was not significantly dependent on used lactic acid bacteria. But after 24 h of storage the highest value of hardness was found for cake obtained from buckwheat flour fermented by *L. acidophilus* V, and the lowest for *L. acidophilus* La5 and *L. casei* LcY. Generally, the cake obtained from fermented flour is lighter compared to the control sample. Only for the cake prepared from buckwheat flour fermented by *L. plantarum* IB lower values of L^* and ΔE were noticed.

Conclusion: The obtained results indicate the possibility of selection of lactic acid bacteria for fermentation of buckwheat flour focusing on functional properties of obtained model cakes.

Biography

Małgorzata Wronkowska focused on rheological and technological properties of different types of dough and bread, buckwheat flour as a component of gluten-free bread or fermented products. She has managed two projects and co-operated in different projects connected with different types of starch fractions and their biological activity, furthermore with technological and nutritional properties of different type of bread products. In this area, she received 12 research fellowships and training courses abroad at relevant scientific institutes. She is the author and co-author of 60 scientific publications.

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Krupa Kozak Urszula et al., J Food Process Technol 2016, 7:12 (Suppl)
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Broccoli leaves powder as a novel component of gluten-free muffins

Krupa Kozak Urszula, Natalia Drabińska, Natalia Bączek, Grzegorz Lamparski, Tomasz Jeliński and **Henryk Zieliński**
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Broccoli florets are characterized by a high content of dietary fiber, bioactive phytochemicals (glucosinolates, isothiocyanates, phenolic compounds), vitamins and minerals. Until now, studies were focused mainly on the edible parts of broccoli. However, broccoli leaves are characterized by a composition similar to the broccoli florets, thus they may be considered as a valuable food supplement. The aim of the studies was to evaluate the influence of addition of broccoli leaves into a gluten-free formulation on the technological and sensory quality of gluten-free muffins. Freeze-dried broccoli leaves powder (BL) was added (5%) to a model gluten-free muffin formulation. Compared with a control gluten-free muffin (GFM-C), gluten-free muffins containing BL (GFM-B) were characterized by a higher proteins and minerals content. Moreover, the BL affected the GFM-B color, making them vividly green. The muffin compression test was carried out in a fresh (2h after cooling to RT) and stored (24 and 72h) muffins using texture analyzer TA.HD Plus. Fresh GFM-B were softer and more springy than GFM-C, however after a longer storage (24h and 72h), both experimental muffins were similarly hard and springy. Although a green color as well as a cabbage taste and flavor were the distinctive attributes of GFM-B but according to sensory panel their overall quality and palatability was high. The study demonstrated that the incorporation of BL into a confectionery product like muffin could be a valuable and beneficial.

Biography

Krupa Kozak Urszula is a Biologist/Biochemist and is working as an Assistant Professor in the Department of Chemistry and Biodynamics of Food of IAR&FR PAS. Her fields of interest are gluten-free diet, as well as coeliac disease (CD) and its associations with nutritional deficits, related disorders and gut microbiota dysbiosis. Recently, she evaluated a long-term effect of a prebiotics-supplemented gluten-free diet on calcium metabolism, intestinal permeability and microbiota profile in CD children. She has skills in Biochemistry, Food Science and Molecular Biology. Her research activity is reflected in several high-rated publications, oral presentations at international conferences, and 2 patents.

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The inhibitory activity of buckwheat flours fermented with selected lactic acid bacteria on the formation of advanced glycation products

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The functional properties of buckwheat flour fermented with selected lactic acid bacteria have received increasing attention due to the suggested reduction of coronary heart disease, diabetes and cancer incidence in humans. Advanced glycation end products (AGEs) are a complex group of compounds formed in a non-enzymatic way when reducing sugars react with amino acids of proteins and other protein-derived molecules. Protein glycation in human is believed to be implicated in the development of chronic degenerative diseases. The potential non-pharmacologic prevention of fermented buckwheat flours against formation of AGEs was addressed. In this study the inhibitory activity of buckwheat flours fermented with selected lactic acid bacteria on the formation of AGEs was addressed. Fermentation of 2 types of buckwheat flours (whole meal and thermally treated flours) with selected lactic acid bacteria (*L. acidophilus* (145, La5, V), *L. casei* (LcY, 2K), *L. delbrucki* subsp. *bulgaricus* (151, K), *L. plantarum* (W42, IB), *L. rhamnosus* (GG, 8/4, K), *L. salivarius* AWH, *Streptococcus thermophilus* Mk-10) was performed in 5% suspension at 37°C during 24 h. The inhibitory activity of methanol-water (67%) extracts obtained from freeze-dried fermented flours was studied in a bovine serum albumin (BSA)/glucose and BSA/methylglyoxal (MGO) model systems whereas aminoquanidine (AG), a commonly used inhibitor of glycation process, has served as a reference compound. The extracts from whole meal and thermally treated buckwheat flours showed inhibitory activity (40% and 31%) as compared to AG (86%) in BSA/glucose system. Fermentation with lactic acid bacteria caused no changes or slight decrease in the inhibitory activity with exception made to *L. rhamnosus* GG and *L. casei* 2K where inhibitory activity of fermented whole meal flour was higher by 20 an 10% as compared to non-fermented one. These findings were not confirmed in BSA/MGO system. Fermentation of thermally treated buckwheat flours caused decrease in the inhibitory activity measured in both model systems.

Biography

Szawara Nowak Dorota has completed her PhD in Food and Nutrition at Institute of Animal Reproduction and Food Research of Polish Academy of Sciences. She has published 29 papers in reputed journals.

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Comparison of anti-oxidant effects of *Platycodon grandiflorum* extract by extract processes

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Oxidative stress due to excessive accumulation of reactive oxygen species is one of the risk factors for the development of diverse diseases such as aging, inflammation, cancer, and skin diseases. *Platycodon grandiflorum* (called as "Doragi" in Korean) has been widely used as an important herb in Korean traditional medicine as well as food intake. In this study, we investigated the antioxidant effects of *Platycodon grandiflorum* according to the three extract methods including water extract (WE), 25% ethanol extract (25EE), and 50% ethanol extract (50EE). 50EE showed the highest antioxidant activities in 2, 2-diphenyl-1-picrylhydrazyl radical, 2, 2'-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) radical and ferric reducing antioxidant power assay. Moreover, 50EE exhibited the highest total phenolic contents (TPC), suggesting that the relative antioxidant activities of these extracts were correlated with TPC. Therefore, these results indicate that 50EE is a viable therapeutic agent against oxidative stress associated diseases and ethanol extraction is the better method to improve the antioxidant properties.

Biography

Suhyun Hong has completed her PhD and Post-doctoral studies from Dongeui University College of Korean Medicine. She is the Professor of Dongeui University College of Korean Medicine. She has published more than 30 papers in journals. She is named as the Marquis Who's Who Publication Board 2016.

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Ambra Ariani et al., J Food Process Technol 2016, 7:12 (Suppl)
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Study of the table olive processing technology in order to improve the Italian cultivar "Piantone di Mogliano" production using *Lactobacillus plantarum* 319 and SYNBIO® as innovative technique

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Table olives are a fermented product and recently, this process has been investigated and subjected to more control. Oleuropein, main phenolic compound, is responsible for the olive bitter taste. For this purpose, several processes, mainly based on alkaline hydrolysis or fermentation in brine, are employed in order to degradation oleuropein. Understanding the oleuropein characteristics for table olive processing helps manufacturer to produce high quality table olives and to develop innovative methods for its production. This study was aimed to enhance the Italian cultivar "Piantone di Mogliano" in the table olive production. The olives were harvested in the period when they have finished the stage of enlargement and veraison has not begun, obtaining a type of fruit class "green". The olives were processed with two different traditional methods, Sevillan and Natural system, developing innovative techniques in order to obtain a food variety which maintains as much as possible the organoleptic and qualitative characteristics. The use of specific inoculum of *Lactobacillus plantarum* 319 and SYNBIO® combination (*Lactobacillus rhamnosus* IMC501® and *Lactobacillus paracasei* IMC502®) in brine helped to drive, improve and speed up the fermentation. These strains play an important role during table olive fermentation; in fact they are able to enhance the olive preservation due to a progressive acidification of the fermenting brine with a consequent pH decrease and the production of antimicrobial substances and bacteriocins. Moreover, they also improve the aroma and flavor characteristics of the product. Therefore, a correct inoculum of selected strains allows improving the product quality.d

Biography

Ambra Ariani was graduated in 2013 in Animal Production Science and Technology at the Camerino University and in 2014, completed Post-graduate stage. Now, she is enrolled in a PhD program in Life and Health Sciences - Molecular Biology and Cellular Biotechnology with the project "Study for the improvement of the Marchigiana cultivar "Piantone di Mogliano", aimed at the production of table olives, with use of methods for food traceability". She was involved in several research projects, focusing the interest on the bioactive molecules in food and she has 4 publications in international journals.

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The influence of the operating conditions adopted during the extraction on the qualitative and typical characteristics of Tuscan mono-varietal oils (Moraiolo, Leccino, Frantoio)

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In the last years, many studies have been performed to remark and describe the safety and nutritional quality of extra-virgin olive oil, with particular attention to the role ascribed to its wealth of bioactive compounds (polyphenols, tocopherols, etc.) in preventing oxidation of the lipid components and, therefore, the formation of free radical damaging for human health. The chemical and organoleptic quality highlighted by an extra-virgin olive oil is a function of several factors such as the geographical location of the olive grove, the evolution of the climatic conditions during fruit ripening, the extraction process adopted etc. Thus, the utilization of suitable working conditions could potentially offer the real possibility to plan the concentration of phenolic and volatile components in this product and also to modulate its nutraceutical properties as well as the sensorial perception produced. Within this context, the aim of this research was to describe the influence of the operating conditions adopted during harvesting (i.e. climate trends, water regime (irrigated or non-irrigated)) on the qualitative and typical characteristics showed by Tuscan mono-varietal extra-virgin olive oils (Moraiolo, Leccino, Frantoio) during two different crop seasons (2014 vs. 2015). The experimental data obtained show the suitability of the adopted operational decisions to the different conditions (cultivar, climate, water regime) allowing to obtain oils with more favorable compositional indices (free acidity, peroxide number, spectrophotometric indices, total phenols content) than those provided by extra virgin olive oil according to the regulation for "Tuscan Protected Geographical Indication" (PGI Toscano).

Biography

Chiara Sanmartin has completed her graduation in Food Biotechnologies, with a PhD in Science of Plant Productions. She is a Researcher at DAFE UNIPI with 7 years of experience. She conducts R&D activities, development and validation of analytical methods for food quality of raw materials and products, qualification, characterization and monitoring of food technologies. She is the author of 30 scientific publications and presentations at national and international conferences. She is also tutor for graduation and international fellowships.

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The impact of refreshment procedures adopted on the chemical and sensory quality of sourdough obtained by different raw materials: Mexican pulque vs. Tuscan sourdough

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One of the oldest biotechnological processes in traditional cereal food production is the use of sourdough as biological leavening agent. When used in optimized proportions, the sourdough can improve volume, texture, flavor, nutritional value of bread and increase its shelf life by retarding the staling process and by protecting it from microbial spoilage. The main purpose of the experimental work was to show how the production technology affects the sourdough characteristics and then the final product. In particular, three different Mexican sourdoughs obtained from pulque's sediment (xaxtle), kindly provided by Instituto Politécnico Nacional - Mexico City were analyzed as a function of their technological attitude for bread making. The best of them has been selected and stored according to the protocol traditionally used for the production of the Tuscan Sourdough Bread PDO (protected designation of origin). After a period of five weeks of back-slopping, the breads obtained by applying the same baking procedure to both starter doughs (Mexican vs. Tuscan) were compared. Despite the initial differences showed by the Mexican sourdough and the Tuscan one, chemical indexes obtained after the period of five weeks of back-slopping became similar confirming the role of the technology on the composition of the microflora in the leavening agent. Moreover the obtained breads did not show statistically significant differences from compositional chemical and sensory point of view and this shows the importance of the adopted operating conditions (back-slopping, stored and bakery protocols) for the quality of bread.

Biography

Isabella Taglieri has obtained her degree in Chemistry at the University of Rome. After an experience in Indoor Risk Chemical Assessment and Forensic Toxicology, she is currently working in the laboratory of Food Technology at the Department of Agriculture, Food and Environment of the University of Pisa. She has practice in chemical, microbiological and sensory analysis of food matrices and is currently engaged in various research projects, with particular reference to Food Technology.

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Notes:

Xiaoguo Ying et al., J Food Process Technol 2016, 7:12 (Suppl)
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The influence of different packaging solutions on red wine evolution during storage

Xiaoguo Ying, Zinnai A, Sanmartin C, Taglieri I, Andrich G and **Venturi F**
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As the global wine market expanding from traditional areas to new places, an increasing demand is expected in the coming years. Wine has a unique and complex nature compared with other fast moving consumption goods and there is a specific wine production cycle. Storage conditions (kind of packaging, storage temperature, light exposure, etc.) and duration have a considerable influence on wine quality. In order to ensure customers get the best consuming experience, it is necessary to individuate the proper storage conditions for each kind of wine. To investigate the global effect of storage on wine quality, the chemical and sensory evolution of a red wine stored in different kinds of packaging (glass bottle, bag in box and tetrabrick) and closures (natural cork, polymeric cap, crown cap) and different volumes (2 volumes for each packaging) were evaluated. For each packaging solutions two different temperature levels (4° and 20°C) were also maintained throughout the storage period (2 years). Sampling of wine was carried out at fixed time starting from the bottling/packaging. The preliminary results obtained indicate that wine evolvement might be greatly influenced by the packaging characteristics (i.e. packaging material and volume). Furthermore, also the temperature used during the storage period plays a key role on the evolution of wine since it can directly affect the oxygen permeability of the system "wine + package".

Biography

Xiaoguo Ying graduated from Zhejiang Ocean University in 2014 with a Master's degree in Food Science and Technology. There after he started his PhD studies at University of Pisa, Italy, where he currently works for the Department of Agriculture, Food and Environment (DAFE). His work is focused on Food Technology. In this field, he has major expertise on wine storage.

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Notes:

Diego Morales et al., J Food Process Technol 2016, 7:12 (Suppl)
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Screening of edible mushrooms to obtain eritadenine, a hypocholesterolemic and hypotensive compound with potential food applications as functional ingredient

Diego Morales, Alicia Gil-Ramírez, Fhernanda Ribeiro Smiderle and **Cristina Soler-Rivas**
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Eritadenine (2(R),3(R)-dihydroxy-4-(9-adenyl)butanoic acid) is an alkaloid derived from the secondary metabolism of edible mushrooms. It was initially isolated from shiitake mushrooms (*Lentinus edodes*) although, later on was also found in the common button mushroom (*Agaricus bisporus*). This compound showed hypocholesterolemic and hypotensive properties *in vitro* and *in vivo* as it was able to inhibit the S-adenosyl-L-homocysteine hydrolase in animal studies and the angiotensin converting enzyme (*in vitro*). The objective of this work was to carry out a screening of several mushroom species as a preliminary step to find a potentially interesting eritadenine source to design novel functional foods. Therefore, two different experimental methods were followed to compare them and to determine the levels of this biologically active metabolite within the different edible mushroom species. Results indicated that eritadenine was not an exclusive compound from *L. edodes* or *A. bisporus*, but it was also present in other species belonging to the same *Marasmiaceae family* (such as *Marasmius oreades*). Other mushrooms from closely related families (belonging to the Agaricales order too) also contained eritadenine in lower concentrations. Eritadenine concentrations within the Agaricales order ranged from 0.2 up to 1.4 mg/g DW, although these levels were depended on their varieties and developmental stages. Eritadenine can be properly detected using the two selected experimental methods. However, the method followed by Afrin et al. (2016) detected higher concentrations than those proposed by Enman et al. (2007), although it induced larger experimental deviations.

Biography

Diego Morales is doing his PhD at CIAL (Department of Production and Characterization of New Food), a Food Research Institute belonging to UAM (Universidad Autonoma de Madrid). He has graduated in Biotechnology from Universidad de Salamanca and has obtained a Master of Science degree from UAM. Currently, he is performing research activity at CIAL (Instituto de Investigacion en Ciencias de la Alimentacion), related to extraction and characterization of bioactive compounds from edible mushrooms; the study of their hypocholesterolemic activities and the formulation of ingredients beneficial for human health using environment-friendly techniques to include them into food matrices to design functional food.

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Application of chitosan-based coating with *Trachyspermum ammi* essential oil in silver carp fillets

Mohammadreza Rezaeigolestani and **Mohammadreza Mohammadian**
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Seafood products like silver carp are valuable nutritious products which usually has limited shelf life due to various chemical and microbiological deteriorative reactions threat on their shelf life during storage at 4°C. Different concentration of *Trachyspermum ammi* essential oil (TE) (0.3, 0.45, and 0.6%) as an antibacterial agent were added to chitosan solution (2 w/v %). Totally, 60 silver carp fillets were (including treatments and controls) given a dip treatment in the chitosan solutions, and after packing into PE ziplock bags holding 250 g/packs, kept for 15 days at 4°C. Shelf life evaluation was based on microbial counts (enterobacteriaceae, total viable count (TVC), lactic acid bacteria (LAB) and psychrotrophic bacteria (PSY)), pH, and thiobarbituric reactive substance (TBARS) formation. There was positive correlation between TE concentrations and microbiological quality of carp fillets, but in terms of the TBARs formation coating with the chitosan solutions had slight antioxidant effects during storage. Results demonstrated that the combination of chitosan and *Trachyspermum ammi* essential oil extended the shelf life of silver carp in refrigerated storage. Nevertheless, further research is necessary to study the release of TE from chitosan into the foods during storage.

Biography

Mohammadreza Rezaeigolestani is a PhD candidate in Food Hygiene and Quality Control, Department of Food Hygiene, Faculty of Veterinary Medicine, University of Tehran. He has graduated in Veterinary Medicine and his DVM thesis was about Herbal Antibacterial Agents. Natural Antimicrobial and Food Preservative compounds are his field of interest and also his PhD thesis was about development of antimicrobial-biodegradable food packaging films and their application for extending shelf life of meat products.

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The Biotappo: A new tool for food safety

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In Europe, the EU Regulation No. 1935/2004 and the EU Regulation No. 10/2011 set out general principles of safety and inertness for all Food Contact Materials (FCMs) and rules on the composition of plastic FCMs, respectively. Among the plastics commonly used for bottled water, polyethylene terephthalate (PET) is the most favorable packaging material. Nonetheless, non-intentionally added substances (NIAS) which may be cancerogenic or toxic or which may have potential estrogenic and/or anti-androgenic activities can be found in the final plastic material, due to storage. High temperature and sunlight influence the rate and magnitude of leaching of NIAS from PET bottles. Monitoring of the temperatures to which bottled waters are exposed during transportation and/or storage may be crucial in predicting the migration of NIAS from PET to water or other beverages. To this aim, a special bottle cap was produced. The top of the cap is covered with a special paint which, when left outdoors in the sun or exposed to high temperatures (>75°C) for at least 1 h, turns color from pink to lilac. The HACCP System requires that biological, chemical or physical potential hazards are identified and controlled at specific points in the process. Any company involved in the manufacturing, processing or handling of food products can use HACCP to minimize or eliminate food safety hazards in their product. For PET bottled waters, high temperature is a critical limit for the CCP. If this limit is exceeded corrective actions must be taken. In some countries, the summer season is really hot and the storing of bottled water out of markets under sunlight is a very common practice. Moreover, generally trucks that transport water bottles are not refrigerated. The Biotappo could be a useful tool for identifying the CCP in order to eliminate the hazards.

Biography

Maria Anna Coniglio is a Medical Doctor and a Researcher of Hygiene and Preventive Medicine at the University of Catania. She has her expertise in improving public health. She has published in the field of plasmid-mediated multiple antibiotic resistance of pathogens in wastewater used in agriculture and in ready-to-it-salads.

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Cristian Fioriglio is a Doctor in Biology and a Police Officer working in a special task force aimed at preventing risks and hazards. He is also a Food Technologist interested in Food Safety. He has his expertise in HACCP.

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W A J P Wijesinghe et al., J Food Process Technol 2016, 7:12 (Suppl)
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Bio-processing of tomato (*Lycopersicon esculentum*) into value-added product

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[2]Food Research Unit, Sri Lanka

Tomato (*Lycopersicon esculentum*) is a highly perishable fresh commodity with high postharvest loss. Value addition is one of the solutions in order to minimize the post harvest loss of fresh commodities. In this study, a tomato topping was developed using dehydrated tomato. Just ripen stage of tomato variety 'Pathma' was selected for the study. Selected tomato samples were treated with concentration series of salt and assigned for the pre-dehydration processes. Treatments were arranged into a Complete Randomized Design (CRD). Dehydrated tomato samples were evaluated for microbial counts, moisture content and physical appearances to select the best dehydrated tomato sample. Selected best tomato sample was used to develop tomato topping. Three recipies were evaluated using sensory analysis and the tomato topping with brix value of 25 was selected as the most preferable sample with highest overall acceptability. Selected sample was checked for physicochemical properties, microbial counts and proximate composition. The product was checked for the organoleptic properties for a period of three weeks using a sensory evaluation test. During 21 days of storage at 4°C, microbial counts, acidity and pH were within the standards specified by the Sri Lankan Standard Institute and the organoleptic qualities were not deteriorated within the storage period. Therefore, the developed product could be stored safely for 21 days at refrigerated temperature (4°C). The Dehydrated tomato topping with brix value of 25 could be recommended as a fat free vegetarian product for future needs.

Biography

W A J P Wijesinghe is working as a Senior Lecturer at Uva Wellassa University. At present, she teaches several subjects including principles of food science, agro-food process technology, postharvest technology, food and biochemical engineering, advanced food science, grain product technology and value addition and new product development. He completed his PhD in Jeju National University, South Korea. He has obtained MSc at Post Graduate Institute of Science, University of Peradeniya, Sri Lanka in the field of Postharvest Technology of Fruits and Vegetables. His basic degree is Food Science and Technology from the Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka.

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Influence of different starches in sensorial, physical and chemical properties of freeze dried snacks

Africa Jimenez and **Marta Arroyo Lavado**
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Freeze dried process is a technique that consist in removing water from the product by sublimation, which cause it changes directly from solid phase to vapor phase without changing to liquid form. This technique allows to obtain high quality products, because they keep their molecular structure intact, avoiding nutritional and organoleptical losses. Starches are often used in freeze dried technique, to improve the organoleptic, physical and chemical properties of the final products. In this sense, it is very important to select the right starch for each product. In this work, we have developed five different fruit formulas for snack, one of them without starch and the others with different origins starches: maize, potatoes, rice and tapioca. We analyzed water activity and pH of the formulas, and we made organoleptic evaluation with professional tasters. The results of the evaluation of texture attribute showed that the analytical and organoleptic results are related. Statistical analysis proves meaningful differences between the formulas. Hence, starches used in freeze dried fruit formulas reduce acid taste and improve the texture. The origin of the starch is not relevant in the valuation of these two parameters.

Biography

Africa Jimenez obtained a degree in Chemistry from Extremadura University, Spain in 2001. She has a Master's in Clinical Nutrition from Food Technology and Nutrition Institute in Granada University, Spain in 2006. Her academic research has been focused in enteral nutrition, specially the influence of omega 3 fatty acids in elderly diets and oral bioavailability of taurine and leucine in enteral standards diets, with several published articles in this matter. She has been working at the R&D Department in Vegenat, S.A. since 2001, in the design and development of dehydrated mixes, modified texture foods, and clinical nutrition products, and also improving different food technologies (air dried, freeze dried, pasteurization, UHT). At present, she continues working in new projects, and she is in charge of the R&D Department.

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Notes:

Nadiya Rashid Malik, J Food Process Technol 2016, 7:12 (Suppl)
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Extraction of thyme essential oil using two different solvents and its effect to enhance shelf life and quality of masala tikki and tomato paste

Nadiya Rashid Malik
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Thyme (*Thymus vulgaris* L.), an aromatic plant of the Labiatae family, has been long used in foods for culinary purposes. The aim of this study was to evaluate the feasibility of replacing n-hexane with methanol for the extraction of oil from Thymus vulgaris. Thyme essential oil contains more than 60 constituents, most of which possess important antioxidant and antimicrobial properties. The most important compounds of thyme essential oil are the phenols like thymol and carvacrol which constitute the major and more active constituents, as well as the monoterpene hydrocarbons p-cymene and C-terpinene. These compounds possess antimicrobial activity against a broad spectrum of microbes. Therefore, the present study aimed to investigate the effect of addition of different concentrations (0.25%, 0.50%, 0.75% and 1%) of essential oil of thyme on the quality and stability of tomato paste and masala tikki. The obtained results indicated that the masala tikki and tomato paste containing 0.25% and 0.5% thyme oil, respectively were of acceptable quality as compared to control samples. Furthermore, the storage time significantly increased with increase in concentration of thyme oil. Various analytical techniques (UV-Vis and ATR-FTIR) were performed to check the quality and composition of thyme essential oil extracted from two different solvents. Analytical results envisaged that essential oil from both solvents have same features.

Biography

Nadiya Rashid Malik has completed her MTech from Sam Higginbottom Institute of Agriculture, Sciences and Technology, Allahabad. Currently, she is working as an Assistant Professor (Food Engineering) at Lovely Professional University, Phagwara, India.

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Effects of whey protein coating containing of *Zataria multiflora* Boiss., essential oil on shelf life of silver carp during chilled storage

Mohammadreza Mohammadian and **Mohammadreza Rezae Gholestani**
University of Tehran, Iran

The aim of this study was to evaluate the effects of whey protein coating containing *Zataria multiflora* Boiss., essential oil (ZMEO) on shelf life of silver carp fillet during chilled storage. Silver carp fillet coated by dipping in whey protein solution with different concentrations of ZMEO (0, 0.3, 0.45 and 0.6%) for 1 h. Then, after being packed in polyethylene dishes, they were stored at 4°C for 15 days. There were 168 testing and control packages, each of them weight 250 grams. Microbiological (total viable count (TVC), psychrotrophic bacteria count (PTC), lactic acid bacteria count (LAB) and enterobacteriaceae count (EBC)), chemical (pH, total volatile basic nitrogen (TVB-N) and thiobarbituric acid (TBA)) and sensory changes periodically were determined during chilled storage. The results indicated that the coating treatments have scientific effect on TVC, PTC, LAB and EBC, reduce chemical spoilage and extend the shelf life of silver carp fillets during chilled storage, which was supported by the results of microbiological, chemical, and sensory evaluation analyses. The results of this study show that whey protein coating containing *Z. multiflora* can be a promising candidate for extending the shelf life of silver carp during chilled storage.

Biography

Mohammadreza Mohammadian is a PhD student of Food Hygiene Department, Faculty of Veterinary Medicine, University of Tehran, Iran. The thesis of his PhD course is on edible packaging to extend the shelf life of most spoilage foods such as fish. The edible coating that he was interested in is "Whey Protein Isolate" and "Chitosan" incorporated with essential oils of *Zataria multiflora* and *Cumminum cyminum*.

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Notes:

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PAOT Scan® Technology: Non-destructive new method for determination of oxidative stress degree of biological tissues and fluids

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In recent years, interest in antioxidants is becoming increasingly common. This can be explained from the relationship found between oxidative stress and certain diseases such as cancer, Alzheimer's disease, Parkinson's disease, diabetes, rheumatoid arthritis, neurodegeneration, inflammation, and hearth diseases, in addition to aging. Although there are several methods known for the indirect determination of oxidative stress degree, unfortunately, none reaches the ideal situation, where all influencing factors are taken into account. And therefore, the best method appropriate today for clinical application's, is one that takes into account the maximum variation factors with low time and money. By its simplicity and reliability, PAOT Scan® Technology can be a great alternative for future applications in the field of health, research and others. The PAOT Scan® Technology is an exclusive approach, non-invasive, non-lesional to know and monitor the oxidative stress state degree of body. Using a handheld device, evaluates in real time the content of antioxidants and oxidants (free radicals) and their bioavailability from measurements taken at the skin (all parts of the body: face, hand, thigh, back, etc.). The use of PAOT Scan® Technology can detect the exact content and deficiencies in antioxidants and overload of free radicals (oxidants) in the body to provide an adapted treatment of detoxification. This work describes a new approach to assess the oxidative stress degree (antioxidant/oxidant balance) on body tissues and biological fluids.

Biography

Smail Meziane has completed his PhD in Biotechnology (Lorraine University). He taught at Medicine Faculty, University at Nancy and served as Head of the Health Engineering license option "Human Nutrition". He is an Invited Professor at Congo - Brazzaville (Unesco-MarienNgouabi University) and Kazakhstan (University of Shimkent Kazakhstan). He has made several research trips to Russia and Japan, Argentina for collaboration. He is Lecturer and member of the International Society of Orthomolecular Medicine (ISOM). His research concerns in particular are the evaluation of antioxidant activity and influence processes (extraction, production, manufacturing, etc.) on the properties organic food matrices, cosmetics and nutraceuticals. These works have been published in international journals and several papers rank A at international conferences. Since 2013, he is the Director and Co-founder of the European Institute of Antioxidants (EIA).

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I Benamar et al., J Food Process Technol 2016, 7:12 (Suppl)
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Quantitative risk assessment of thermophilic *Campylobacter* related to the consumption of Doner kebab in Tlemcen, Algeria

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Campylobacteriosis is an emerging foodborne illness of high relevance and implication for public health and is frequently linked to the consumption of inadequately prepared poultry. The purpose of this study was to assess the effect of different mitigation strategies on the number of human cases as a first step in Tlemcen city (Algeria) associated with thermophilic *Campylobacter spp*. in Doner kebab. To estimate the human exposure to *Campylobacter* from a Doner kebab meal and the number of human cases associated with this exposure, a mathematical risk model was developed, covering the whole food pathway. The model details the spread and transfer of *Campylobacter* in Doner kebab from slaughter to consumption and the relationship between ingested dose and the probability of developing campylobacteriosis. Information and data for the development of the risk model were obtained from our. Whenever possible, the data were represented by probabilistic distributions rather than single point estimates, as they were to be integrated in a probabilistic estimation of the risk using Monte Carlo simulation. The @RISK software was used to run the simulations. We found that one person per sixty seven (01person/67) can get a campylobacteriosis by eating a Doner kebab meal. The QMRA approach allows for an overall scenario analysis. It was found that intervention during slaughter is probably more efficient to reduce *Campylobacter* health risks than intervention at the consumer stage. Furthermore, important data gaps could be identified.

Biography

I Benamar is a PhD student from Tlemcen University. He is a skilled Microbiologist keen to prepare his PhD and very motivated to be a specialist in microbiological risk assessment. He is a member in the laboratory of Food and Environment Microbiology (LAMAABE). He is an author in four international publications.

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e-Poster




Food Technology 2016

Yesim Altunoglu et al., J Food Process Technol 2016, 7:12 (Suppl)
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Obtaining fortificated product by adding flaxseed and soya flour to hazelnut paste

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In this study, the effects on the sensory, textural properties and oxidative stability of the addition of soya and flaxseed which are admitted as functional food due to their potential health benefits were investigated. For this purpose, non-fat soya flour and milled flaxseed were added to hazelnut paste samples in ratios of 5%, 10% and 15% percent and then the mixtures were stored at 21±2°C for a period of 3 months. The changes in the physicochemical and sensorial properties of the samples were then analyzed. According to the results of the research, while the instrumental texture parameters of paste samples were not affected by the ratio of addition, significant differences were observed between samples in the sensorial textural parameters like spread ability, graininess and stickiness. The paste samples which were the most favorite in flavor and overall acceptability were the ones containing 5% soya and 5% flaxseed and the control sample. Compared to others a distinct decrease has been especially determined in the induction period for samples with 10 and 15% flaxseed addition. At the end of storage period, paste sample containing 5% soya was revealed the minimum peroxide and free fatty acid values. Due to its potential health benefits, addition of soya and flaxseed to hazelnut paste at the ratio of 5% which is one of the important nutrition consumed at breakfast, will increase this nutrition consumption and help them become part of daily diet.

Biography

Yesim Altunoglu is currently pursuing a PhD at Ege University in Izmir, Turkey. She has been working as a Researcher about Olive Oil Science and Technology since 2009 in Olive Research Institute which is a governmental organization. She has few publications in some national journals.

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Accepted Abstracts




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Green extraction: An innovative technology to obtain bioactives with high-value added market

Farid Chemat
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This presentation will introduce a new and innovative area in the frontiers of chemistry, biology and processing: Green extraction with special emphasis on natural products. Green extraction is a part of the sustainable development concept; its history, concept, principles and fundamentals will be described. We will pay special attention to the strategies and the tools available to make biorefinery greener. The representation will present the innovative research in this area these past five years in term of innovative techniques (microwave, ultrasound, pulse electric field, etc.) and alternative solvents (ionic liquids, sub and supercritical fluid, agro-solvents, water, etc.) applied to this new area green extraction of natural products with special examples applied to biorefinery concept.

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Food waste reduction in the dairy industry by recovering food ingredients, energy and water with advanced technologies

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Traditionally, the dairy industry has to face with a serious problem related to the huge amount (more than 90% of the processed milk) of highly polluting and quickly perishable whey and other solid and liquid food waste (FW) resulting from washing, commercialization, packaging, food safety assurance, and others. At present, in order to overcome this problem, the large companies use the whey as raw material for producing concentrated protein powders (WPI) for human consumption, and/or single cell proteins (SCP) by lactose fermentation, thus eliminating/reducing the waste management costs. However, for small and medium dairy firms, localized in orographically difficult areas, environmental problems often conflict with the firm profit. In this contribution, the results obtained by applying two innovative technologies for recovering high quality products and biofuel are reported and discussed in detail. In particular, the feasibility of applying supercritical anti-solvent (SAS) to obtain a high value infant formula ingredient, and hydrothermal carbonization (HTC) for making energy intensive solid fuel, was investigated. The integration of SAS and HTC with membrane filtration based processes, allows to: a) reduce drastically the volume of concentrated whey to be collected in the facility devoted to the production of the food ingredients; b) produce a net amount of high quality water (about 60% of the milk); c) easily destroy all the solid and liquid FW still remaining after the whey management and, at the same time, produce a valuable solid biofuel.

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Production technology of wood apple (*Feronia limonia*) juice

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For commercial exploitation of underutilized wood apple fruit (*"Feronia Limonia"*), a production technology for wood apple fruit juice was developed in College of Food Processing Technology and Bio-energy, Anand Agricultural University, Anand (Gujarat) India. The effect of steaming treatment and enzyme added juice extraction as pretreatments and different juice extraction techniques on juice yield and total soluble solids of wood apple (*"Feronia Limonia"*) juice were studied. Pretreatments i.e. steaming for 2, 4, 6 and 8 minutes and enzymatic treatment (pectinase enzyme) at different concentration (10, 20 and 30 mg/100g), different incubation time (2, 4 and 6 hrs.) and incubation temperature 40°C as well as combined treatments (steaming and enzyme) followed by three juice extraction techniques i.e. basket centrifuge, screw type juice extractor and fruit pulper at different rpm was studied for juice extraction from wood apple (*Feronia limonia*) fruit pulp and evaluated for juice recovery (%) and total soluble solid (TSS) content of juice. Combined pretreatment (steaming and enzyme) i.e. 6 min of steaming, 30 mg/100g enzymatic concentration, 6 hrs of incubation time at 40°C incubation temperature obtained maximum juice recovery (82.36 %) and TSS content (5.3oBx) from wood apple pulp. The screw type juice extractor obtained highest juice recovery (85.62 %) and TSS (5.6 °Bx) at 150 rpm followed by Basket centrifuge and fruit pulper. The data was statistically analyzed by using completely randomized design (CRD).

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Banana peel (*Musa sapientum*): A potential natural antioxidant for food preservation

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The study aimed to evaluate and compare the phytochemical content and antioxidant activity of banana peel. The conventional extraction technique and the enzyme-assisted extraction were carried out. In enzyme assisted extraction, pre-treatment of banana peel with enzymes; celluclast BG, ultraflo XL and Alcalase 2.4 L FG followed by extraction with ethanol was undertaken. The banana peel extracts were subjected to *in vitro* free radical scavenging activity assay like DPPH. The total phenolic content and flavonoid content in the solvent extracts of banana peel ranged from 1.35 mg/g of extracts-41.86 mg/g of extracts and 4.38 mg/g of extract-28.97 mg/g of extracts, respectively. While the DPPH radical activities for solvent banana peel extract ranged from 2.2-36.2%. The ethanolic extract obtained from the pre-treatment of banana peel with enzyme followed by extraction showed total phenolics in range of 344 mg/ml of extract-1235 mg/ml of extract and flavonoid content in range of 94.6 mg/ml of extract-686 mg/ml of extract. The DPPH% inhibition for the enzyme pre-treated banana peel followed by extraction varied from 13.7% to 79.33%. The temperature played an important role in extracting the bioactive compounds from the banana peel extracts. The enzyme assisted extraction yielded the extract with higher antioxidant activity than the solvent extracts. The oxidation properties of banana peel oleoresin in sunflower and soybean oil were compared to other synthetic antioxidants such as TBHQ and BHA. It has been observed that banana peel oleoresin showed thermal stability equivalent to that of BHA but lower than that of TBHQ.

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How does manipulation of the glutenin composition of durum wheat impact pasta and bread making quality and starch digestibility?

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Durum wheat is typically used to produce pasta, while in some parts of the world, durum is also used to make bread but with inferior loaf volume and texture compared to common wheat bread. This study describes the effect on technological properties of pasta and bread made from durum wheat cultivar Svevo (S) and derived lines carrying translocated segments of chromosome 1D from bread wheat, containing the genes encoding the pair of high molecular weight glutenin subunits (HMW-GS) subunits 5+10 or 2+12. Svevo partial and full waxy (Swx) with and without the HMW-GS 5+10 were also evaluated. Data from two season is available. The semolina was used to make pasta or re-ground to flour to prepare loaves in various combinations with good quality baking flour. The S5+10 line dough properties were markedly different to Svevo having over-strong, stable dough, low wet gluten and elasticity whereas S2+12 also displayed stronger dough than Svevo. Pasta prepared from these lines showed lower cooked firmness than Svevo, but higher than Swx. There were no other significant differences in pasta cooking quality. Bread, loaf volume and loaf score was decreased as more baker's flour was replaced by durum flour but the decline varied with the genetic material and dosage. The best loaf was made using Svevo. The more recent results of the full set of lines will be described in addition to the influence of glutenin composition on starch digestion of the pasta. This work shows that it is possible to manipulate the processing properties of pasta and durum-bread wheat blends by altering the glutenin subunit composition and represents an efficient tool to finely manipulate gluten quality in durum wheat.

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Study of continuous ultrasonication to improve total phenolic content and antioxidant activity in sorghum flour and its comparison with batch ultrasonication

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Ultrasonic technology was applied to release the phenolics bound with starch and protein matrix in order to enhance total phenolic content (TPC) and antioxidant activity (AA) of sorghum flour. Both continuous and batch ultrasonication were implied with independent variables such as flour to water ratio (FWR), ultrasonication intensity (UI), and ultrasonication time (UT) with an additional variable as flow rate (FR) in continuous ultrasonication. All the process variables showed a significant effect on the corresponding ultrasonication process. The Box–Behnken Design provided satisfactory mathematical models which accurately explain the behavior of both the systems; allowing predicting TPC and AA of the sorghum flour. The optimal conditions for continuous ultrasonication were a FWR of 10% w/v, an UI of 20 W/cm2, a FR of 15 ml/s, and 130 s UT which predicted a maximum value of 70.88 mg GAE/100g dry matter (d. m.) for TPC and 143.98μmol TE/100g d. m. for AA. Regarding batch ultrasonication, the maximum predicted values were 65.61 mg GAE/100g d. m. and 141.04μmol TE/100g d. m. for TPC and AA, respectively at optimum conditions of 10% w/v FWR, 30 W/cm2 UI, and 200s UT. When comparing with batch ultrasonication, continuous process saved 35% time and 33 % of energy consumption to obtain comparatively higher TPC and AA of sorghum flour. Ultrasonication improved the free phenolic acid content by releasing the bound phenolics in sorghum flour.

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Effect of grinding action on the flow ability of rice flour

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Rice (*Oryza sativa* L.) is an important food crop in the world. Broken rice, either basmati or non-basmati rice varieties, is used to produce rice flour by milling. The effect of grinding action on the flowability of rice flour was evaluated using flow indicators viz., bulk density, aerated bulk density, angle of repose, frictional co-efficient, Carr's index and Hausner's ratio; and powder flow analysis viz., cohesive index, caking strength and powder flow stability. Fine rice flours ground in cyclotec mill were more cohesive and coarse flour (basmati rice flour) ground in super mill was free-flowing. Flours ground using hammer mill was highly irregular in particle shape than the other flours, thus was found less flowable than flours milled in stone mill, despite of being larger in size.

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