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Poster

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Mannan Hajimahmoodi, J Food Technol Pres, Volume:3
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The proximate, mineral and amino acid composition of spring, autumn leaves and roots of *Eryngium caeruleum M.Bieb*

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Eryngium caeruleum M.Bieb. (Apiaceae family) is found abundantly in northern provinces of Iran as an edible plant. Hundred years ago, *Eryngium* genus known as medicinal herb in Persian medicine books which was named "Qaracaane" and using of the plant's roots was common. The aim of this study is to evaluate nutritional parameters in roots, spring and autumn leaves in *E. caucasicum* for the first time. These parameters include proximate composition (protein, carbohydrate, fat, fiber, ash, moisture and calorie) measured by the standard methods of the AOAC, mineral contents measured by atomic absorption and amino acid contents measured by RP-HPLC. The results showed that both of aerial parts and roots of *Eryngium caeruleum* are good sources of nutritional ingredients in comparison with other plants. So this plant has the capacity for prospective production of new natural medicinal supplements in order to improve body health and prevent or treat diseases.

Speaker Biography

Mannan Hajimahmoodi received Pharmacy Doctorate and PhD of food science and nutrition from Tehran University of Medical Sciences (TUMS). She is manager of Food and Drug Administration, TUMS since 2013. Now she is professor of Drug and Food Control Department, faculty of pharmacy, TUMS. She published more than 100 papers and managed more than 20 projects about food and nutrition. She is skillful in analytical instruments such as HPLC, GC/MS, GC/FID, IR, UV, and NMR and highly interested in analytical methods about food safety and quality.

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Accepted Abstracts

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Application of Microparticulated whey proteins in reduced-fat yogurt through Hot-Extrusion: Influence on Physicochemical and Sensory properties

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Fat reduced dairy products are holding a potential market due to health reason. Due to less creamy and pleasantness, reduced and/or low-fat dairy products are getting less consumer acceptance whereas the fat molecule provides smooth, creamy and a pleasant mouthfeel in dairy products especially yogurt & ice cream. This study was aim to investigate whether the application of microparticulated whey proteins (MWPs) processed by extrusion cooking, the reduced fat yogurt can achieve similar or higher creaminess compared to a whole milk (3.8% fat) and skimmed milk (0.5% fat) yogurt. Full cream and skimmed milk were used to prepare natural stirred yogurt as well as the dry matter content also adjusted up to 16% with skimmed milk powder. Whey protein concentrates (WPC80) were used to produce MWPs in particle size of d50 > 5 µm, d50 3<5 µm and d50 < 3 µm through hot-extrusion process with screw speed of 400, 600 and 1000 rpm respectively. Furthermore, the commercially available microparticulated whey protein called Simplesse® was also applied in order to compare with extruded MWPs. The rheological and sensory properties of yogurt was assessed and data was analyzed statistically. The application of extruded MWPs with 600 and 1000 rpm were achieved significantly ($p < 0.05$) higher creaminess and preference compared to whole and skimmed milk yogurt whereas, 400 rpm got lower preference. On the other hand, Simplesse® obtained lowest creaminess and preference compared to other yogurts, although the contribution of dry matter in yogurt was same as extruded MWPs. The creaminess and viscosities were strongly ($r = 0.62$) correlated, furthermore, the viscosity from sensory evaluation and the dynamic viscosity of yogurt was also significantly ($r = 0.72$) correlated which clarifies that the performance of sensory panelists as well as the quality of the products.

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Inline determination of overrun measurement with Ice-cream

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It is a challenge for ice cream makers to control the right amount of air incorporated in the ice cream at the freezer where inconsistency can result in texture defects, production inefficiencies and time losses. **Krohne** offers an innovative strategy to continually measure overrun right after the freezer in the process line, to automatically optimize the amount of air added. The strategy is based on an on-line density measured generation of Coriolis mass flow meter combined with in-line pressure and temperature measurements. Attendees will learn how to integrate this technology in an ice cream line after a freezer and see some results that correlate in-line predictions with off-line overrun measurements.

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Novel detection protocol for Radical Scavenging and Antioxidant activity of Lipophilic Antioxidants

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Lipophilic antioxidants are an important class of chemical species of natural antioxidants that can increase the oxidative stability of food matrices. Common methods to determine the antioxidant activity or oxidative stress of lipophilic antioxidants require time consuming protocols, although those are not vigorously reliable. This work proposes a fast, simple and direct method based on cyclic voltammetry to monitor oxidation in lipid samples. Methodology & Theoretical Orientation: The oxidative stress during the reaction of AIBN (2, 2´-azobis (20methylpropionitrile)) with lipid soluble antioxidants, such as α-tocopherol, catechin, retinyl acetate, caffeic acid and 3-hydxoxytyrosol was evaluated. 1-propanol was used as a unique solvent, which allowed direct dissolution of a wide range of lipid soluble redox species. Electron transfer (ET) capacity was evaluated by the peak current (ip) and peak potential (E). The kinetic rate of the reactions between laboratory antioxidants and AIBN were measured at 60°C. Finally, same procedure was also applied to measure the antioxidant activity and oxidative stress of different commercial edible oils: extra virgin olive oil (EVOO), virgin olive oil (VOO) and, olive by product; sansa olive oil (SOO). Findings: The methods demonstrated that antioxidant activity was positively correlated with increased concentrations among the laboratory antioxidants and EVOO, VOO and SOO samples. On the other hand, oxidative stresses were negatively correlated with the duration of reaction periods. Conclusion & Significance: This method can be the alternative of traditional methods to test lipid soluble antioxidants in lipid matrices rapidly and straight.

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Valorizations of Antioxidant and Antibacterial activities of selected plant-based fermented foods

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Recently, awareness of the many health benefits of consuming fermented foods has attracted many food industries and researchers to explore and manipulate fermentation variables in establishing fermentation process for the production of fermented foods with claimed health benefits. The health benefit of fermented foods includes ability to enhance immune system function, improve digestion process, lower blood pressure, antimicrobial activity, and antioxidant activity. Lactic acid bacteria metabolites have been reported to be involved in the improvement of human health by modulating the immune system of the consumer. Therefore, this study is carried out to develop fermentation process for plant-based fermented foods using appropriate starter culture and raw materials including garlic (Allium sativum), bitter beans (Parkia speciose) and spider flower (Cleome gynandra). The plant-based raw materials were fermented with several Lactic acid bacteria (LAB) strains to determine the suitable strains. In addition, the biological activities including antioxidant and antibacterial activities were evaluated using standard methods. Metabolomics profiling was carried out to determine the changes for the phytochemicals in the fermented samples using 1H NMR technique. The results demonstrated strong antibacterial and antioxidant activities for the fermented samples in comparison to the raw materials. Moreover, several bioactive phytochemicals were observed in the fermented samples and they showed correlation to the antioxidant and antibacterial activities. Plant-based raw materials fermented with the proper LAB strains have high potential to improve the consumer health due to their biological activities that can reduce the risk of non-communicable (NCD) diseases and infections.

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Survival of *Shigella* and *Salmonella* in ready-to-eat Mediterranean vegetable salads

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Salads form an indispensably healthy part of the Mediterranean diet. Recently, salads have served as a transmission mode for pathogens. This study investigated the growth behavior of *Salmonella* and *Shigella* in different types of salads namely: tomato cucumber (TC) salad without additives, TC with additives (1.0% lemon juice and 0.5% salt), TC with tahini (10% w/w), coleslaw, and toum sauce. Salads were inoculated with ca. 5-6 log10 CFU/g of either a cocktail of 5 serotypes of *Salmonella* or 2 *Shigella* spp. The salads were stored at 4°C, 10°C or 24°C for 5 d. The pathogens were able to grow or survive in the different salad types except for coleslaw and toum sauce, where the numbers in these salads declined sharply at 24°C but slowly at 4 and 10°C. *Shigella* spp. survived in higher numbers in the different salads at low temperatures and low pH salads compared to *Salmonella* spp. This study shows that *Salmonella* and *Shigella* spp. are able to survive and potentially grow in different types of salads. Therefore, proper control of storage temperature, strict hygienic practices, and application of decontaminative washing steps for the food ingredient, utensils and food contact surfaces prior to preparation are crucial.

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Essential Oil Encapsulation at Nano-Scale Level: Formulation, Stability Assessment and Antibacterial Efficiency Monitoring

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This work aimed to nanoencapsulate Thymus capitatus essential oil as natural food preservative. To fix ingredients type and concentrations, preliminary formulations were tested for their droplet size average and distribution. Emulsions stability was investigated for 12 days and the antibacterial activity of bulk and encapsulated essential oil were studied. Results showed that nanoemulsions containing 1% of SDS as emulsifier and 10% of dispersed phase containing 70% of the essential oil have an appropriate droplet diameter average (around 110 nm). Stability tests demonstrated that nanoemulsions, stored at 4°C, showed the highest stability. Moreover, antibacterial activity results exhibited the improvement of encapsulated T. capitatus essential oil efficiencies as compared to bulk one. In fact, nanoemulsion presented higher bacterial growth inhibition, lower minimum inhibitory and bactericidal concentrations, and better time kinetic results, as compared to bulk one. Gathered results provide useful information for designing effective natural preservatives that inhibit food bacterial spoilage.

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The incorporation of Nutraceuticals in strategic reformulation of food products for better health, nutrition and disease prevention: The case studies of LCPUFA, Probiotics, Prebiotics, Phytosterol esters, β-glucan addition

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Nutraceuticals are potentially healthy foods that play a key role in humans wellbeing, health enhancement, disease prevention and treatment. For example, cardiovascular diseases occur in association with risk factors that are amenable to prevention or treatment by nutraceutical interventions. Several ingredients marketed for use in dietary supplements address such risk factors. The ability of nutraceuticals to favorably influence cardiovascular risk factors and atherosclerotic vascular disease should be recognized as a great opportunity for this disease prevention or treatment. There is a pressing need for edible delivery systems to encapsulate, protect, and release bioactive lipids within the food, medical, and pharmaceutical industries. The fact that these delivery systems must be edible puts constraints on the type of ingredients and processing operations that can be used to create them. The major bioactive lipids that need to be delivered within the food industry (for example, ω-3 fatty acids, and phytosterols), highlight the main challenges to their current incorporation into foods. The delivery systems used were produced from food-grade (GRAS) ingredients (for example, lipids, proteins, polysaccharides, surfactants, and minerals) using simple processing operations (for example, dough mixing, homogenizing, extrusion and drying).

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