IUFoST

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22nd World Congress of Food Science and Technology

The future of food is now: development, functionality & sustainability

ABSTRACT BOOK

Welcome message from IUFoST 2024 President

It is with great pleasure and honor to welcome you all to the 22nd World Congress of Food Science and Technology in the beautiful and historic land of Italy. Renowned for its culinary excellence and pioneering advancements in food science, Italy serves as the ideal backdrop for this significant gathering.

We all come together to explore the critical and diverse aspects of food science and technology. Our field spans numerous topics, each essential to advancing our understanding and improving our world. We are here to engage, innovate, and collaborate, addressing the challenges and opportunities that lie ahead. I would like to extend my deepest gratitude to our esteemed IUFoST and AIM convenors: your vision, dedication, and leadership have been instrumental in organizing this conference, providing us with an invaluable platform to share our knowledge and forge new partnerships.

Throughout this conference, we will delve into a range of key topics that are central to the future of food science and technology:

1. **Nutrition**: this theme judging by the number of sessions would undoubtedly appear to be actually the primary topic in the sector. We all know the strategic importance of understanding the real complex relationship between diet and health is more important than ever. We will explore the latest research in nutritional science, examining how dietary patterns affect public health and what strategies can be employed to combat malnutrition and diet-related diseases.
2. **Consumer Science**: only for a limited number of years, above all thanks to the new possibilities of accessing the market, has this discipline been successfully addressed by food technologists; consumer preferences and behaviors significantly influence the food market. By gaining insights into consumer science, we can better understand the factors driving food choices and develop strategies to promote healthier and more sustainable consumption patterns.
3. **Product Development**: innovation is the cornerstone of food science. From creating new food products to enhancing existing ones, product development is vital for meeting diverse consumer needs and preferences. We will discuss cutting-edge techniques and technologies revolutionizing food creation and experience.
4. **Food Safety**: despite it having always been a pre-requisite for products on market ensuring the safety of our food supply is of paramount importance. We will address current challenges in food safety, including contamination prevention, risk assessment, and regulatory frameworks, which are crucial for protecting public health and maintaining consumer trust.
5. **New Processes and Technologies**: advancements in food processing and technology are transforming our industry. We will explore new methodologies that enhance efficiency, quality, and sustainability in food production.
6. **Functional Foods and Meat Analogues**: the boundary between food and medicine no longer exists; the development of functional foods and meat analogues is

reshaping our approach to nutrition and sustainability. We will examine the latest innovations in these areas, exploring their potential health benefits and environmental impacts.

7. **Analytical Methods**: Accurate and advanced analytical methods are essential for food quality and safety. We will discuss recent developments in analytical techniques that ensure the integrity and authenticity of food products.
8. **Sustainability**: probably the most used and abused term in all its declinations, sustainability is a critical consideration in all aspects of food science. We will explore strategies to promote sustainable practices across the food supply chain, addressing environmental challenges and ensuring a resilient food system for future generations.

In addition to these discussions, we will also celebrate excellence through various awards and competitions at all levels: from students to young, and even less young, scientists. These recognitions highlight the outstanding contributions and innovative achievements within our community, inspiring us all to strive for excellence.

This conference brings together a distinguished and diverse group of professionals, researchers, policymakers, and industry leaders. It is an unparalleled opportunity for us to exchange ideas, share our latest findings, and build partnerships that will drive the future of food science and technology. I encourage you all to actively participate in the discussions, attend the presentations, and engage in the workshops. Let us make the most of this opportunity to learn from each other, inspire one another, and work collectively towards a future where food science and technology continue to thrive and make a meaningful impact on society.

In closing, I extend my heartfelt thanks to each of you for your presence and enthusiasm: I will remember you one by one. Together, let us embark on this journey of discovery and innovation, and strive to create a world where everyone has access to safe, nutritious, and sustainable food.

Thank you, and welcome to the 22nd World Congress of Food Science and Technology in Italy: where the future is now.

Sebastiano Porretta
Chairman, Organizing Committee of the 22nd IUFoST World Congress
President, Italian Association of Food Technology (AITA)

4.24.5. P.24.080 | Phenolics Content in Native and Deffated Nut Samples

T. Ilic [1], N. Ivanovic [1], J. Kukic-markovic [2], M. Dodevska [3], B. Djordjevic [1]

[1] Department of Bromatology, Faculty of Pharmacy, University of Belgrade, Belgrade, SERBIA

[2] Department of Pharmacognosy, Faculty of Pharmacy, University of Belgrade, Belgrade, SERBIA

[3] Institute of Public Health of Serbia Dr Milan Jovanovic Batut, Belgrade, SERBIA

Background: Plant-based diet is becoming increasingly popular due to the evidence of their health benefits and contribution to sustainability and planetary health. Edible nuts comprise an essential part of plant-based diet since they are considered to have rich nutrient profile. Beside different macro and micronutrients, nuts are potential sources of biologically active compounds with a positive health effects, such as different phenolics. The aim of this work is to determine total phenolics content (TPC) in selected commercial nut samples from the Serbian market.

Methods: Samples of 10 edible nuts were investigated (peanuts raw, roasted, boiled and marinated, almonds raw, roasted and boiled, hazelnuts raw and roasted, and pistachios roasted). The samples of native nuts and those defatted using dichloromethane (maceration and Soxhlet extraction) were extracted with 80% methanol. Obtained hydromethanol extracts were dried and further analysed using spectrophotometric method for TPC determination using Folin-Ciocalteu (FC) reagent.

Results: Results were expressed as gallic acid equivalents (GAE). TPC values in analysed samples ranged from 1.89 microgram GAE/mg (boiled almonds) to over 60 microgram GAE/mg (roasted peanuts). In general, hydromethanol extracts of samples deffated using maceration had the highest TPC contents compared to native and samples extracted using Soxhlet extraction procedure.

Conclusions: Obtained results confirmed the fact that some defatted nuts, which are usually considered as waste-products in oil production, could be considered as valuable sources of certain secondary plant metabolites, implicating further investigations on their composition and potential in the development of functional foods.

4.24.6. P.24.081 | Physico-Chemical Properties, Bioactivecompounds, and In Vitro Biological Activities of Goji Berry Juice

T. Ilic [1], N. Krgovic [2], M. Milenkovic [3], I. Kodranov [4], B. Vidovic [1]

[1] Department of Bromatology, Faculty of Pharmacy, University of Belgrade, Belgrade, SERBIA

[2] Institute for Medicinal Plant Research Dr. Josif Pancic, Belgrade, SERBIA

[3] Institute of Public Health of Serbia Dr Milan Jovanovic Batut, Center for Hygiene and Human Ecology, Belgrade, SERBIA

[4] Department of Analytical Chemistry, Faculty of Chemistry, University of Belgrade, Belgrade, SERBIA

Background: Goji berry (Lycium barbarum L.) is a rich source of bioactive compounds with long-term use in diet and for medicinal purposes. Fresh fruits contain high water content, and to prevent enzymatic and microbiological degradation, they are mostly used in dried form or to make various products, including juices.

Methods: The aim of the study is to analyze the physico-chemical properties and bioactive compounds of goji berry juice from L. barbarum fruits cultivated in Serbia. In addition, the antioxidant activities were investigated using five different spectrophotometric micro assays (DPPH, ABTS, CUPRAC, FRAP and beta-carotene/linoleic acid bleaching inhibition) and the antidiabetic potential towards two enzymes (alpha-amylase and alpha-glucosidase).

Results: Apart from good sensory acceptability, the results suggest that goji berry juice can be used as a good source of bioactive compounds such as polyphenols (194.5 ± 3.88 mg GAE/100 mL), flavonoids (70.30 ± 5.11 mg CE/100 mL), carotenoids (204.6 ± 0.06

mg/100 mL), polysaccharides (375.2 ± 12.46 mg Gl/100 mL) and minerals, especially potassium and copper. The study showed that juice has good antioxidant activity and a dose-dependent antidiabetic potential.

Conclusions: Obtained results suggest that consumption of goji berry juice can provide natural antioxidant compounds and can be considered as a functional ingredient with good sensory quality, especially for people with diabetes.

4.24.7. P.24.082 | Use of Plant-Based Protein from Agro-Industrial Waste as an Egg Protein Substitute on Textural Improvement of Pound Cake

G. Jayarathne, H.G. Wanigasinghe, C. Jayasinghe
Department of Food Science and Technology, Wayamba University of Sri Lanka, Makandura, Gonawila, SRI LANKA

Background: The annual production of agro-industrial by-products exceeds 250 Mn tons globally. They are rich in valuable nutrients like protein and a sustainable recovery method is needed to use them for growing protein demand. This study assessed the feasibility of recovering proteins from Dhal Skin Waste (DSW), Instant Tea Waste (ITW), and Rice Bran (RB), and used them as an egg protein substitute for texture improvement in pound cake.

Methods: Raw materials were collected from commercial food processors. Proteins were extracted by alkaline extraction. pH, temperature, and time were optimized using 3-factor-3-level Box-Behnken design. Fifteen experimental runs with the combinations of pH (9, 10.5, 12), time (60, 90, 120 min) were used with different temperature conditions (25, 45, 65 °C for DSW/RB waste and 50, 65, 80 °C for ITW) for maximizing the protein extraction without denaturation. The extracted proteins were substituted for egg white in pound cake and compared for the textural properties.

Results: Protein contents of DSW, ITW, and RB were 13.60%, 11.45%, and 14.36%, while the maximum extractable protein from alkaline method were 8.94%, 2.45%, and 8.91% respectively. The empirical linear model developed for the effect of pH, temperature, and time on yield for each was significant with a high coefficient of determination. The optimized pH, time, and temperature combinations were; DSW pH 12, 120 min, 65 °C, ITW pH 12, 120 min, 80 °C, and RB pH 12, 120 min, 65 °C, and optimized yields were 11.13%, 2.70% and 10.96% respectively. Further, the pound cake from ITW protein had no significant difference to control in terms of all tested textural properties: hardness, chewiness, gumminess, and cohesiveness. DSW and RB had hardness and chewiness similar to control.

Conclusions: The optimized process conditions can be used for protein recovery from the DSW, ITW, and RB and that ITW protein, in terms of its binding and foaming properties could be used as an egg protein substitute in food product development.

4.24.8. P.24.083 | Physical Modification Alleviates the Beans Flavour of Soy Protein Isolate

Y. Kai, S.Q. Liu
National University of Singapore, Singapore, SINGAPORE

Background: Recent studies indicated a strong interest on supplying increasing substantial and cheaper protein demand, replacing animal sources protein ingredients, including casein, whey protein, gelatin, egg protein and fibroin. The soy protein isolate demand will continue to grow because it has high biological value, terrific gelation properties which has been regarded as alternative meat ingredient, with fiber texture that is similar to meat. Heat treatment that enables the improvement of soy protein isolate functionality has been studied in decades. The advantages of utilizing heat treatment include the decrease level of toxic compounds and antinutritional factors. One of the simplest ways of improving the absorption of amino acids is to use heating process, which generally appears to be more effective to break down the large protein molecules. However, there is a lack detailed information in the literature about effect of controlling heating