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Aristotle University of Thessaloniki, Greece

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Technological High School for the Food Industry in Timișoara

Oral Presentation 1

Official controls to ensure the legitimate application of plant protection products

Thomas Nagel*

Center for Agricultural Technology Augustenberg, Nesslerstrasse 25, 76227 Karlsruhe, Germany

*Corresponding author: thomas.nagel@ltz.bwl.de

Abstract

Plant protection products (PPP) are widely used in plant production to prevent plants from several threats and thus ensure the supply with plant based food and animal feed. To minimise adverse effects of PPPs on human and animal health as well as the environment there are strict rules for the authorisation of plant protection, their placing on the market, use and control within the EU.
Article 68 of REGULATION (EC) No 1107/2009 points out that the member states shall carry out official controls in order to enforce compliance with these rules. Official controls can follow different ways. The presentation discuss the method of taking samples of soil, plant material, spray solution, etc. and running chemical analysis to monitor and ensure the legitimate application of plant protection products. Furthermore it shows the results from the control activities in Baden-Wuerttemberg in 2024.

Keywords: GC-MS/MS LC-MS/MS pesticide analysis sample soil

Oral Presentation 2

Fertilizers under governmental watch – protection for consumers and environment

Jellian Jamin*

Center for Agricultural Technology Augustenberg, Department for inorganic analytics, Soil and Fertilizer Analysis, Nesslerstrasse 25, 76227 Karlsruhe, Germany

* Corresponding author: jellian.jamin@ltz.augustenberg.de

Abstract

The employment of fertilizers and manure facilitates the manufacturing of substantial quantities in agriculture, thereby ensuring the provision of food to meet the expanding demands of the population. Over the past century, significant progresses has been witnessed in the field of fertilizers, with the introduction of numerous fertilizers designed for specific applications in the market. Simultaneously, concerns regarding the eutrophication of soils and water bodies, as well as the presence of contaminants, have gained mounting attention. To ensure a sustainable and safe utilization of regulatory measures within the European Union, regulatory measure were adopted in 2003 and renewed in 2019 with regulation 2019/1009. The regulation stipulates the establishment of production function categories (PFCs) to encompass a wide array of fertilizers and analogous products. Additionally, the document outlines clear requirements and strict thresholds for contaminants such as heavy metals and per- and polyflouroalkyl substances (PFAS).

This presentation will demonstrate the actions taken by the state of Baden-Württemberg and provides case illustrations of damage incurred. Furthermore, an array of analytical techniques currently utilized will be presented.

Keywords: ICP-MS, ICP-OES, heavy metals, PFAS, fertilizers

Oral Presentation 3

Plant natural products in hydrogel formulations promoting wound healing

Athanasios Salifoglou*

Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece

*Corresponding author: salif@auth.gr

The process of wound healing involves a number of biochemical processes, collectively contributing to the restoration of skin integrity and repair of damaged tissues [**1**,**2**]. Key to the onset and progression of this physiological response is hemostasis, which encompasses interwoven phases, such as inflammation, proliferation, and remodeling [**3**,**4**]. The composition of the molecular milieu, however, that supports the physiological process is quite complex, thereby necessitating the use of appropriate components that mimic, trigger, emulate, and work along and in parallel with the natural constituents. To that end, the challenge emerges to develop technology through biomolecular engineering that possesses the physical, chemical and biological attributes, which promote sustainable would healing. In an effort to meet such a challenge, natural products of variable molecular mass yet distinctly established biological activity, emerge as reliable components. Aiming to pursue such composite materials technology in our Lab, we launched research targeting hydrogels, containing clearly defined bioactive molecular products of natural origin. To that end, the objectives of the work focused on a) hydrogel synthesis through defined plant molecular components, b) optimization of hydrogel fabrication conditions, c) gel enrichment with biologically active substances, and d) physicochemical characterization (swelling rate, moisture percentage, weight fluctuations, mechanical properties, etc.). Essential in the formulation of wound healing hydrogels was the incorporation of the following reagents: Sodium Alginate (SA) and Methyl Cellulose (MC) as basic materials. Cognizant of the fact the wound healing process should be facilitated and expedited by molecular components of natural origin, allantoin was introduced in the composite formulation, further supported by agarose to promote cell growth. Allantoin, known for its regenerative, wound healing, and antioxidant properties, was retrieved from aloe. The allantoin-enriched hydrogels project clear advantages to a) developing scaffolds (dressings) for biomedical applications, such as tissue regeneration, and b) healing chronic wounds and ulcers, while providing antisepsis. All hydrogels cross-linked with calcium chloride (or not), were characterized by FT-IR Spectroscopy and Thermogravimetric Analysis. The collective results suggest that optimally enriched hydrogels acquire defined profiles commensurate with tissue healing and regeneration principles, thus supporting the use of this naturally emerging molecular technology in sustaining human health.

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Oral Presentation 4

The effect of microwave treatment on polyphenols, flavonoids, antioxidant capacity of colored rice

Cristina Pintilii*, Leonard Mihaly Cozmuta, Camelia Nicula, Anca Peter, Anca Mihaly Cozmuta

Technical University of Cluj Napoca, Chemistry-Biology Department, Faculty of Sciences, Victoriei Str. 76, Baia Mare, Romania

*Corresponding autor: pintiliicristi@yahoo.com

Abstract

Three varieties of pigmented rice flour—brown rice flour, red rice flour, and black rice flour—were analyzed. These were sourced from three different rice varieties purchased online: Nivas Brown Rice (FOB) from Thailand, Whole Red Eco Rice (FOR) from Cambodia, and Whole Black Eco Rice (FON) from Pakistan. The rice samples were milled to a particle size of less than 500 μm.
The proximate analysis indicated that black rice flour exhibited the highest protein content (10.16%) compared to brown rice (8.33%) and red rice (7.41%), as well as the highest lipid content (3.09%) in comparison to red rice (2.80%) and brown rice (2.23%). In contrast, brown rice flour had the highest carbohydrate content (76.8%), followed by red rice (76.2%) and black rice (72.2%).
The variations in the content of free polyphenols (CPL), free flavonoids (CFL), and free antioxidant capacity (CCAL) of the rice varieties were monitored during microwave treatment, which ranged from 0 to 220 seconds, with intervals of 40 seconds.

During microwave treatment, FON exhibited the highest stability, as evidenced by its CPL values ranging from 3265.92 to 3400.98 mg GAE/kg, CFL values from 16745.03 to 16877.47 mg quercetin/kg, and CCAL values from 16.06% to 18.26% DPPH. In contrast, the lowest values were recorded for FOB, with CPL values ranging from 1288.11 to 1394.7 mg GAE/kg, CFL values from 12186.13 to 13039.62 mg quercetin/kg, and CCAL values from 5.19% to 4.92% DPPH, indicating the lowest stability. FOR exhibited intermediate behavior, except for the CFL content, which was lower than that observed in FOB.

Understanding the stability of bioactive compounds like polyphenols, flavonoids, and antioxidants activity during microwave treatment is crucial because it can inform processing techniques to preserve or enhance the nutritional and functional properties of rice flour. Knowing which rice variety maintains higher stability allows for optimized usage in food products, ensuring greater health benefits and longer shelf life.

Keywords: colored rice, polyphenols, flavonoids**,** antioxidants activity, microwave treatment

Oral Presentation 5

Analytical chemistry for public health: Insights from French total diet studies

Djaber Ghaffour, Clément Mazurais, Nathalie Marchond, Rachida Chekri, Axelle Leufroy and Petru Jitaru*

French Agency for Food, Environmental and Occupational Health & Safety (ANSES), Laboratory for Food Safety, Unit Trace Elements and Nanomaterials (TEN), F-94701 Maisons-Alfort, France

*** Corresponding author :** petru.jitaru@anses.fr

Abstract

Total Diet Studies (TDS) are national-level surveys conducted using standardized methods recommended by the World Health Organization (WHO) to assess population exposure to various chemical substances in food. TDSs play an important role in shaping regulatory decisions related to food safety, chemical substances, and consumer protection at both the European Union (EU) and international levels. As such, many countries implement TDS to evaluate potential nutritional and health risks.

By analyzing foods in real-life consumption conditions, TDS provide "background noise" exposure data that are more realistic compared to approaches based solely on food standards. The purpose of TDS is to measure the levels of these substances ingested by the general population, as well as specific demographic groups (e.g., by age, region, or dietary habits), over their lifetime. This comprehensive assessment of dietary exposure to both harmful and beneficial chemicals is crucial for evaluating health risks and ensuring food safety. Additionally, TDS supports the development of evidence-based food safety policies and interventions by offering insights into dietary patterns and their implications for public health.

An overview of the objectives of this contribution are provided below.

The first part provides a comprehensive introduction to TDSs, emphasizing in the risk assessment related to dietary exposure, particularly the French TDSs. It also introduces the three target trace elements, Hg, As and Cr, highlighting their presence in the environment and food, species-specific toxicological profiles, and occurrence in food. The second part presents the development and validation of an analytical method for the speciation analysis of Hg, specifically quantifying MeHg and Hg^{2+}. Given their contrasting toxicity and bioavailability, accurate differentiation is essential for precise risk assessments. The method, employing HPLC-ICP-MS, was optimized for fishery and cereal products, the two main food groups selected in the TDS3.

Further, the contribution focuses on As speciation analysis, covering the major inorganic (As(III), As(V)) and methylated (DMA, MMA) forms in a wide range of food matrices selected for TDS3. The presence of a large number of arsenic species posed significant challenges in ensuring accurate quantification. To address this issue, a rapid, simultaneous separation method using anion-exchange HPLC-ICP-MS was developed. Validation method across multiple matrices confirmed the method's robustness, with low LOQs and high repeatability and reproducibly.

The next part details the development and validation of a Cr speciation method, targeting Cr(III) and Cr(VI), species of a supposed distinct toxicological relevance. The method integrated species specific isotope dilution (SS-ID) with HPLC-ICP-MS, allowing for simultaneous quantification and correction of interconversion between Cr(III) and Cr(VI) during the analytical process. The method validation demonstrated high accuracy and reproducibility in cereal products, dairy products, and beverages. The work done in this chapter is scheduled for publication in the current year.

Finally, the contribution describes the methodology used in the execution of the third French TDS.

Oral Presentation 6

Sensory impact of seaweed-enriched hamburgers: The role of *Alaria esculenta*

Alexandra Uivărășan[1]*, S.Kraan[2], B. Mihalescu[1], Leonard Mihaly Cozmuța[1], Anca Peter[1], Camelia Nicula[1], Anca Mihaly Cozmuța[1]

[1]*Technical University of Cluj Napoca, Department of Chemistry-Biology, Baia Mare, Romania (https://stiinte.utcluj.ro/acasa.html)*
[2]*The Seaweed Company, Netherlands (www.theseaweedcompany.com)*

*Corresponding author: *uivarasanalexandra@yahoo.com*

Abstract

This study examines the effects of incorporating *Alaria esculenta* seaweed into hamburgers on consumer acceptance. Various formulations of hamburgers were developed by modifying their composition with *Alaria esculenta*. Consumer preference analysis indicated that only the samples containing 0% and 1% *Alaria esculenta* received favorable sensory evaluations among the five tested formulations, which included *Alaria* flakes or powder in concentrations of 0%, 1%, 3%, 5%, and 10%, incorporated into meat, buns, sauce, or all components. The overall findings suggest that the reference hamburgers (0% *Alaria esculenta*) achieved the highest consumer appreciation scores. However, among the modified samples, those containing 1% *Alaria esculenta* in the sauce (HS1) were rated highest in terms of color (8.15 out of 9.00), aroma (7.57 out of 9.00), and consistency (7.84 out of 9.00, $p < 0.05$). Among the five tested formulations, HS1 also received the highest overall acceptability rating (8.18, $p > 0.05$) from male participants (26.83% of the respondents), while female participants exhibited a stronger preference for the reference hamburgers. Regarding geographical background, urban participants (65.85% of respondents) awarded the highest general acceptability scores to HS1, while rural participants (34.15% of respondents) similarly expressed the greatest preference for hamburgers containing 1% *Alaria esculenta* in the sauce. When analyzed by age or education level, HS1 received the highest ratings for general acceptability (8.29), taste (7.86), smell (7.86), and consistency (8.29, $p > 0.05$), surpassing the reference samples. However, hamburgers with higher *Alaria esculenta* concentrations (3%, 5%, and 10%) were largely rejected by consumers due to their "unusual hamburger texture" and "overly intense and salty" flavor attributed to the presence of seaweed. These findings suggest that further refinement of the production process is necessary to enhance the sensory characteristics of hamburgers containing higher levels of *Alaria* esculenta

Keywords: Sensory study, functional hamburgers, sustainability, consumer acceptance, Alaria esculenta;

Oral Presentation 7

The influence of beeswax content on the structural and physical-chemical properties of PVA-based films

Lucica Maria Pop*, Anca Mihaly Cozmuta, Camelia Nicula, Leonard Mihaly Cozmuta, Anca Peter

Technical University of Cluj Napoca, Faculty of Sciences, Victoriei 76, 430072 Baia Mare, Romania

* Corresponding author: lucica_pop74@yahoo.it

Abstract

Polyvinyl alcohol (PVA) based films modified with beeswax (BW), in various mass proportions ranging from 3.64 wt % to 21.7 wt % were developed. The influence of BW content on the structural and physical-chemical properties of the obtained films has been studied. The investigation of the films was carried out through the structural analysis of Fourier Transformed Infrared Spectroscopy (FTIR), WVP, fat permeability, opacity, solubility in food simulations, water absorption, as well as tear resistance. The film modified with 18.11 wt % of BW recorded the lowest value of WVP, namely, 1.76 ± 0.3 · 10^{-10} g /s · m · Pa., with about 54% lower than unmodified PVA considered as reference. Compared to the PE film, the WVP of this modified film was 35 times higher, while that of the neat PVA film was 65 times higher. FTIR spectroscopy showed the creation of the new chemical bonds between the polar groups (OH, COOH, ester) of the PVA matrix and of the alcohols from the BW, as well as the hydrogen bonds indicating the cross-link between BW components and PVA network, that leads to a more compact and hydrophobic matrix, in comparison with neat PVA. These results were also confirmed by the lower water absorption values recorded by the modified films, in comparison with the neat PVA. All modified films have proven their very low permeability to grease. Tear resistance decreased in direct proportion with the amount of BW, since BW makes network vulnerable probably due to reduced intermolecular space and increased physical interactions such as intermolecular hydrogen bonds, thus reducing the film flexibility. The modified PVA films showed lower solubilities in all four types of tested food simulants, which recommends them as potential packaging materials for aqueous, acidic and fatty foods.

Keywords: Polyvinyl alcohol, beeswax, Fourier Transformed Infrared Spectroscopy

Oral Presentation 8

Urtica dioica as a Functional Ingredient in Savory Bakery Products

Patricia Tarkanyi, Mihaela Lăcătuș*, Ersilia Alexa, Laura Rădulescu, Georgeta Sofia Popescu, Liana Alda, Luminița Pîrvulescu, Despina-Maria Bordean

University of Life Sciences "King Mihai I" from Timisoara, Aradului Street no. 119, 300645 Timisoara, Romania

*Corresponding author: mihaela.lacatus.fia@usvt.com

Abstract

Functional food products are designed not only to provide basic nutrition but also to deliver health benefits that may reduce the risk of disease or support specific physiological functions. The development of such products often involves the incorporation of natural ingredients rich in bioactive compounds, such as plant extracts, fibers, or micronutrient-rich powders. Among these, green leafy plants have shown significant potential due to their antioxidant, anti-inflammatory, and mineral-boosting properties.

Stinging nettle (*Urtica dioica)* powder offers a valuable source of essential minerals (such as calcium, potassium, and iron), antioxidants, and polyphenols, making it a promising ingredient for the fortification of foods. Its combination into food products can enhance nutritional quality, improve antioxidant capacity, and contribute to clean-label, plant-based formulation trends.

The aim of this study is to develop new functional foods products enriched with stinging nettle powder, with the purpose of increasing calcium, potassium, and iron content, as well as total antioxidant capacity and total polyphenol content.

Four types of savory sponge cake were prepared: CA1 – simple savory cake with nettle powder; CA2 – simple control cake without nettle powder; CA3 – savory cake with mixed ingredients (cheese, vegetables, spices); and CA4 – savory cake with mixed ingredients and nettle powder.

All samples were analyzed for mineral content using an X-ray fluorescence spectrometer (Hitachi X-MET8000), while total antioxidant capacity and total polyphenol content were determined using spectrophotometric methods.

This study highlights the potential of stinging nettle powder to enhance the nutritional and functional quality of bakery products changing the sensory characteristics in a positive way. Further research is ongoing to fully assess its impact on product quality and consumer preferences. These findings support the use of stinging nettle as a natural, multifunctional ingredient in the formulation of clean-label, health-oriented bakery products.

Keywords: nettle powder, micronutrients, food fortification, bakery innovation, herbal enrichment

Oral Presentation 9

Aqueous nutraceutical *Cornus* extracts against ROS-mediated neurodegeneration

Georgios Lazopoulos,* Sevasti Matsia, Athanasios Salifoglou

Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece

Corresponding author: glazopou@cheng.auth.gr

Neurodegenerative diseases belong to a group of chronic progressive disorders, characterized by neuronal dysfunction and cell death. The main symptoms of these disorders include motor function alongside loss of memory and cognitive decline. The most common neurodegenerative diseases are Alzheimer's disease, Parkinson's disease, amyotrophic lateral sclerosis, multiple sclerosis, and Huntington's disease. The molecular analysis of these diseases reveals a plethora of factors affecting the pathogenesis of these diseases, however mounting evidence suggests that oxidative stress plays a critical role in it, while concurrently affecting the cellular and molecular progression of neurodegeneration[1,2] Oxidative damage emerges in the central nervous system, due to high concentration of ROS-vulnerable poly-unsaturated fatty acids, comparatively weak antioxidant defenses, and high energy and oxygen consumption[3]. Being cognizant of the significance of the Mediterranean diet in long term protection against pathological aberrations, natural products emerge as potent nutritional supplements with a significant bioactive profile. One such natural herb that has attracted keen interest from our Laboratory is *Conus mas* L., which is a plant widely used in folk medicine especially in Asia, against various diseases. The bioactive profile of the molecules found in *Cornus* fruit have demonstrated beneficial properties, among others, against inflammation in brain disorders, with anthocyanin being a key compound with notable antioxidant and anti-inflammatory properties[4].

On the basis of the aforementioned grounds, research was launched in our Lab to pursue determination of the *in vitro* bioactive profile of aqueous *Cornus Mas* L. extracts. The model for our *in vitro* evaluation involved sensitive neuronal cell lines, both mouse (N2a) and human (SH-SY5Y), with H_2O_2 as oxidative agent. After the establishment of the (a)toxic profile of the extracts in dose-, time- and cell line-dependent fashion (including the evaluation of the cell viability, morphology and chemotacticity), the viability of the cells under oxidative stress in the presence and absence of the extracts was evaluated. At the same time, supplementation of the extracts with soluble and bioavailable hybrid metal ion complexes (e.g. zinc) was investigated, to delineate any potential synergistic activity with the extracts. Subsequently, the mechanism of action of the antioxidant and anti-inflammatory potency of the extracts (with and without the supplementation) was studied using RT-PCR to quantify specific genes of interest. The results reveal that the extracts are atoxic up to very high concentrations (mM), possess significant antioxidant capacity, which was further enhanced by atoxic bioavailable metal supplementation, thus promoting synergy under specific conditions. The collective *in vitro* findings suggest that the specific aqueous extracts can act as a neutracetical proffering neuroprotection.

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Oral Presentation 10

Design and characterization of lanthanide–flavonoid hybrid systems with promising roles in medical diagnostics and therapy

A. Papadopoulos[1,*], S. Matsia[1], A. Hatzidimitriou[2], A. Salifoglou[1]

[1] *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*
[2] *Laboratory of Inorganic Chemistry, School of Chemistry, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*

*Corresponding author: anastasmp@cheng.auth.gr

A central focus within the field of bioinorganic chemistry is the exploration of metal ions and metallodrugs for their roles in biological systems, particularly in the diagnosis and treatment of various diseases. The chemical versatility of metal ions, manifested through their redox adaptability, variable oxidation states, and capacity to adopt diverse coordination environments, renders them powerful tools in the development of innovative biomedical agents.[1,2] When integrated into targeted organic architectures, these metal centers can be strategically modulated to enhance biological compatibility, direct site-specific interactions, and amplify therapeutic responses.[3] This convergence of inorganic and organic elements forms the foundation for the rational design of multifunctional metallodrugs and diagnostic platforms. The expanding application of metallodrugs in both diagnostics and therapeutics, alongside their diverse physiological activities, underscores the pressing need for the discovery of new metal-based treatment strategies. Among the most promising frontiers is the integration of rare earth elements with biologically active ligands, such as flavonoids, which provides rich potential for innovative drug design. Motivated by this, our research targeted a comprehensive synthetic exploration of ternary complexes comprising La(III), Nd(III), and Eu(III) coordinated with the natural flavonoid chrysin and the aromatic bidentate ligand 1,10-phenanthroline (phen), aiming to elucidate their structural and functional properties. The study resulted in the formation of structurally defined mononuclear crystalline complexes, which were subjected to extensive physicochemical evaluation, incorporating techniques such as bond valence sum (BVS) calculations and Hirshfeld surface analysis to gain insight into their bonding environments and intermolecular interactions. The biomolecular interaction potential of these complexes was further explored through their binding affinity to bovine serum albumin (BSA), assessed via UV-Vis spectroscopy, fluorescence emission analysis, and circular dichroism, revealing critical conformational and electronic changes. Comprehensive characterization of their electronic structures and magnetic behaviors emphasized the importance of structural precision in predicting and correlating optical and magnetic functionalities. In addition, biological screening through in vitro assays confirmed their antimicrobial and anticancer activity, highlighting their potential as dual-purpose therapeutic agents. Collectively, underscores the importance of multifunctional materials in modern theranostics.

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Oral Presentation 11

Applications challanges of Sea buckthorn (*Hippophae rhamnoides* L.) juices: case study Romania

Gabriela Berechet, Andrada Moise, Ionela Enache

University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Animal Production Engineering and Management, 59 Marasti Blvd, District 1, Bucharest, Romania

*Corresponding address: gabriela.berechet@usamv.ro

Abstract

The fruits of *Hippophae rhamnoides* (commonly known as white Sea buckthorn) have been acknowledged since antiquity for their nutritional and therapeutic properties. The species exhibits considerable agricultural potential, and its fruits have remained a consistent component of the human diet for centuries. In recent decades, advancements in analytical techniques for assessing chemical composition have rekindled scientific interest in these fruits, particularly over the last 10 to 15 years. This paper integrates data from the scientific literature, with a focus on the technological challenges encountered in the Romanian food industry related to the preservation of phytonutrient levels during processing în juices and other food applications. The present review substantiates the nutritional potential of sea buckthorn fruits and advocates for a renewed scientific and industrial focus on this historically significant species, emphasizing the implications of its derived products for human health promotion and sustainable food systems.

Keywords: Sea buckthorn, technology, preservation, sustainability

POSTERS

P1

Antioxidant metal complexes of quercetin derivatives: synthesis, characterization, and therapeutic potential

G.Agathangelou[1,*], S. Matsia[1], A. Hatzidimitriou[2], A. Salifoglou[1]

[1] *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*

[2] *Laboratory of Inorganic Chemistry, School of Chemistry, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*

Corresponding author: agathang@cheng.auth.gr

Chronic degenerative diseases, such as cancer, cardiovascular, and neurodegenerative disorders remain major global causes of morbidity and mortality, severely impacting public health and the quality of life. Their emergence is strongly linked to oxidative stress, a state where free radical production exceeds the body's antioxidant defences, leading to damage in vital cellular components, such as lipids, proteins, and DNA, thereby promoting disease initiation and progression.

In response to such health challenges, growing scientific attention has turned to natural compounds with antioxidant and cytoprotective properties. Quercetin, a polyphenolic flavonoid present in many plant-based foods, exhibits important biological activities including antioxidant, anti-inflammatory, anticancer, and cardioprotective effects. Nevertheless, its therapeutic applications are limited by bioavailability and stability under physiological conditions.

To address these limitations, research has focused on forming quercetin metal ion complexes, particularly with lanthanide ions such as lanthanum, cerium, gadolinium, and europium. These ions possess favorable physicochemical features, including large ionic radii and stable oxidation states, which facilitate the formation of stable and bioactive complexes. Furthermore, sulfonation of quercetin, yielding derivatives like quercetin 5'-sulfonic acid (QSA), enhances solubility and chemical stability, thus resulting in improved absorption and biological effectiveness. QSA complexes with select metal ions, especially lanthanides, demonstrate increased antioxidant capacity and stronger free radical scavenging activity, thus offering enhanced cellular protection.

This study focuses on the synthesis and characterization of QSA metal ion complexes and assessment of their *in vitro* biological activity. The ultimate objective is to investigate their therapeutic potential in oxidative stress-related diseases, such as cancer, and contribute to more efficient and targeted pharmacological strategies encompassing natural products.

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P2

Mineral content evaluation of some condiments used for various types of meat

Liana Maria Alda[1], Laura Rădulescu[1], Diana Moigrădean[1], Simion Alda[2*], Mihaela Lăcătuș[1], Patricia Tarkanyi[1], Despina Maria Bordean[1]

[1]University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Calea Aradului no. 119, 300645 Timisoara, Romania
[2]University of Life Sciences "King Mihai I" from Timisoara, Faculty of Engineering and Applied Technologies, Calea Aradului no. 119, 300645 Timisoara, Romania

*Corresponding author: simion_alda@usvt.ro

Abstract

Spices are commonly used to enhance the taste and aroma of food. In this study, we aimed to analyze the mineral content of several spice blends intended for use with fish, pork, chicken, and sausages, available on the Romanian market. These spice mixtures have diverse compositions and may include ingredients such as coriander, garlic, white mustard, carrot, marjoram, juniper, chili, paprika, rosemary, black pepper, cloves, basil, ginger, thyme, parsley leaves, cumin, turmeric, cinnamon, caraway, nutmeg, allspice, salt, and onion.

The mineral content was determined using X-ray fluorescence (XRF) spectroscopy. The results revealed that these plant-based powders are rich in essential minerals such as potassium, calcium, iron, zinc and copper. The average mineral content across spice samples followed the descending order: K > Ca > Fe > Mn > Ba > Zn > Sc > Sr > Ni > Cu > Rb > Mo. Importantly, no traces of toxic metals such as cadmium (Cd) or lead (Pb) were detected.

In conclusion, beyond enhancing the sensory qualities of food, these spices offer additional health benefits due to their significant mineral content.

Keywords: X-ray spectroscopy, health benefits, toxic elements

P3

Balancing sustainability and preservation: how new-generation packaging cuts food waste and environmental impact

Ioana-Alexandra Alexe, Gabriela Elena Stan*, Gratziela-Victoria Bahaciu

University of Agronomic Sciences and Veterinary Medicine of Bucharest. Faculty Animal Productions Engineering and Management, Department Production and Processing Technologies

* Corresponding author: stanelenagabriela@yahoo.ro

Abstract

Food packaging is essential for maintaining food quality and safety, yet its environmental impact requires sustainable innovations. This research examines how packaging can concurrently improve food system sustainability and minimize waste through material innovations and strategic design. We examine innovative alternatives including bio-based polymers, active antimicrobial

packaging, and intelligent indicators that enhance food preservation while reducing environmental impact. A comprehensive examination of lifecycle assessments (LCAs) reveals that sustainable packaging choices must balance environmental trade-offs with the benefits of waste reduction.

Furthermore, innovative designs—such as portion-controlled formats, oxygen-scavenging films, and improved barrier properties—exhibit a significant decrease in spoilage and customer waste. These solutions support overall food supply chain efficiency. The study highlights the incorporation of circular economy principles, promoting cooperative initiatives among material scientists, policymakers, and consumers to convert packaging into a driver for waste minimization. This paper delineates solutions to integrate technological innovation with systemic sustainability to align food packaging with global environmental objectives.

Keywords: barrier technologies, carbon footprint, lifecycle assesment (LCA), supply chain efficiency

P4

Alternative extraction solvents and their protective effect on polyphenols in red grape pomace

Nicoleta Balan*, Silviu Mănțăilă, Gabriela Râpeanu, Nicoleta Stănciuc*

Dunarea de Jos University of Galati, Faculty of Food Science and Engineering, Department of Food Science, Food Engineering, Biotechnology and Aquaculture, Domnească Street 111, Galati, 800201, Romania

* Corresponding authors: nicoleta.balan@ugal.ro; Nicoleta.Stanciuc@ugal.ro

Abstract

Currently, economic and ecological aspects represent the main objectives of the agri-food sector. Thus, the valorization of by-products resulting from processing represents an important solution both for increasing revenue and for reintegrating compounds with bioactive properties into the food matrix.

Red grape pomace (RGP) is a by-product that, due to its high polyphenol content with remarkable health releated properties has attracted growing interest in terms of their recovery and utilization.

The main objective of the present study was to optimize the ultrasound-assisted extraction process of TPC from RGP using the response surface methodology. The independent variables studied for ethanol extraction were temperature, extraction time and ethanol concentration, respectively temperature, extraction time and solvent volume for natural deep eutectic solvents (NaDES) extraction.

The highest total polyphenol content (TPC) obtained in the ethanol-based experiment was 465.81 ± 1.28 mg gallic acid equivalents (GAE) /100 g DW, at 35°C, for 22.5 minutes, and an 70% ethanol. For the NaDES extraction, the highest TPC value was 414.04 ± 0.80 mg GAE /100 g DW, at 60°C, for 60 minutes and 10 mL solvent.

Although the temperature and extraction time were significantly higher for NaDES, the solvent comprising a mixture of choline chloride, lactic acid and water in a 1:2:1 molar ratio, provided superior protection for polyphenols under high thermal conditions. In contrast, in the case of extraction with 70% ethanol at 51.8°C and a short extraction time of 22.5 minutes, the polyphenol content significantly decreased to 300.2 ± 2.60 mg GAE /100 g DW. The results are valuable in terms of establishing the optimum parameters for extraction, in order to enhance the bioactive concentration and extraction yields.

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Keywords: NaDES, recovery, response surface methodology, valorization

P5

Silicon Dioxide: Analytical evaluation and applications in food industry

Alexandra Virginia Bounegru,Veronica Filimon, Simona Butan*

"Dunarea de Jos" University of Galati, Faculty of Food Science and Engineering, Domnească Street 111, Galati, 800201, Romania

*Corresponding author: simona.patriche@ugal.ro

Abstract

Silicon dioxide (SiO_2), which is a natural compound, can be found in various foods and beverages, for example: eggs, fish, bananas, grains, leafy greens, milk and water.
In literature, silicon dioxide is studied under specific forms: amorphous silicon dioxide or colloidal silicon dioxide, being used as a food additive or a pharmaceutical excipient.

Characterization and evaluation of the silicon dioxide content from various foods and pharmaceutical products were performed using different analytical methods including UV-VIS spectrophotometry, atomic absorption spectrometry (AAS), inductively coupled plasma atomic emission spectrometry (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), ion chromatogaphy (IC) or capillary electrophoresis (CE).
Colloidal silicon dioxide is a polymeric form of silicon with certain industrial applications, such as: coating agent for dietary supplements or pharmaceutical products and a freely flowing agent or anticaking ingredient in food products.

In this paper, the analytical control of some dietary supplements based on silicon dioxide is shown. The total silicon content in terms of silicon dioxide was determined using the UV-VIS spectrophotometric method proposed by Nikulin A.V. et al., 2019. In conclusion, following this analytical control all dietary supplements with silicon dioxide are in accordance with the manufacturer's instructions.

Keywords: silicon dioxide, food industry applications, dietary supplements

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P6

Study on the influencing factors of consumer choices regarding pheasant meat

Iuliana Stefania Bordei (Bololoi)[*], Ionela Florentina Toma (Enache)[*], Alina Udroiu, Andrada Elena Moise, Mihaela Geicu-Cristea, Carmen Georgeta Nicolae

University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Animal Production Engineering and Management, Department of Production and Processing Technologies, 59 Mărăști Boulevard – 011464 Bucharest, Romania

*Corresponding author: iulianabordei10@gmail.com; toma.ionela1998@gmail.com

Abstract

Pheasant meat has a balanced nutritional profile, characterized by a high content of high-quality proteins, a low fat content, a moderate caloric intake, and the presence of essential vitamins and minerals. These aspects recommend the meat as a healthy alternative in the human diet, but its popularity among consumers is relatively low. This study proposes to investigate the factors that influence consumer preferences for pheasant meat, through a research based on the application of a questionnaire. The research study aimed to collect data on the socio-demographic profile of the respondents, consumption habits, level of information, perceptions related to the qualities of pheasant meat, as well as the criteria that influence the decision to buy it. The questionnaire also includes questions about the preferred form of product presentation, market availability and attitudes towards sustainability. The information obtained from the analysis will contribute to a better understanding of consumer behaviour and to the development of effective strategies for the promotion and valorisation of pheasant meat.

Keywords: meat origin, nutritional values, purchase intention, sensory attributes.

P7

Evaluation of the food safety in the production of herb butter

Geronimo Răducu Brănescu[1], Ana-Maria Manolică[1,2*], Roxana – Andreea Munteanu – Ichim[1,2], Cristina Maria Canja[1], Florentina Matei[1]

[1]Faculty of Food and Tourism, Transilvania University of Brașov, 148 Castelului Street – 500014 Brașov, Romania,
[2] Faculty of Biotechnologies, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Boulevard – 011464 Bucharest, Romania,

*Corresponding author: anamaria.manolica@unitbv.ro

Abstract

Butter is a widely consumed dairy product traditionally made by churning pasteurised cream to separate butterfat from buttermilk. This study focuses on the evaluation of food safety in the production of herb butter, comparing commercial products with laboratory prepared samples. Two types of butter were produced: plain and herb-infused, according to current technological and

hygiene standards. The samples were analysed for physicochemical, microbiological and organoleptic properties, with particular emphasis on food safety indicators such as microbial load and compliance with hygiene regulations. The results showed that both commercial and laboratory prepared samples complied with national safety standards. In addition, the addition of herbs did not adversely affect safety or quality when proper procedures were followed. These findings support the feasibility of producing safe, high-quality herb butter through controlled processing and highlight the importance of strict food safety practices in the development of value-added dairy products.

Key words: dairy products, herb butter, food safety.

P8

Changes in some quality indices of apples during storage and keeping in cold rooms

Gabriel Bujancă*, Ioan David, Ducu Ștef, Alexandru Rinovetz, Mihaela Cazacu, Laura Rădulescu, Călin Jianu, Corina Megyesi

University of Life Sciences "King Mihai I" from Timisoara,
Faculty of Food Engineering, Calea Aradului 119, Timisoara 300645, Romania

*Corresponding author: gabrielbujanca@usvt.ro

Abstract

Fruit preservation must ensure such conditions that, at the time of their valorization, they meet all the physical, biochemical and organoleptic characteristics that define quality (taste aroma, amount of vitamin C, firmness and dehydration of fruit tissues). The degree of modification of these indices in fruits depends on the applied preservation method. As the object of study, we used the fruits of the Generos apple variety. Apples have an increased preservation capacity and in order to ensure consumption over a longer period of the year, it is necessary to study the peculiarities of regulating their ripening processes, and based on the results obtained - to develop a modern preservation technology. As an alternative to the preservation method in the ordinary atmosphere (AO), the preservation process with the application of the Grand Fresh ethylene synthesis inhibitor was investigated. Under the conditions of the variant with fruit storage in the atmosphere of the cold room, enriched at the initiation of storage with vapors of the Grand Fresh ethylene synthesis inhibitor gas, upon discharge the aforementioned quality indicators proved to be preserved much better than under the conditions of the variant with storage in the usual atmosphere.

Key words: apples, quality, tissue firmness, metabolism, gustatory aroma, common atmosphere, Grand Fresh ethylene synthesis inhibitor.

P9

Long-term storage, quality and flavor of pears

Gabriel Bujancă*, Ioan David, Ducu Ștef, Alexandru Rinovetz, Mihaela Cazacu, Laura Rădulescu, Călin Jianu, Corina Megyesi

University of Life Sciences "King Mihai I" from Timisoara,
Faculty of Food Engineering, Calea Aradului 119, Timisoara 300645, Romania

**Corresponding author: gabrielbujanca@usvt.ro*

Abstract

The metabolism of horticultural products is largely influenced by the applied preservation method. One of the most effective and widely used methods of fruit storage is controlled atmosphere. Regarding the optimal O2 and CO2 content in the experimental boxes, the Napoca, Doina and Adria hair fruit varieties significantly inhibited biochemical processes compared to their storage under ordinary atmospheric conditions, while providing higher quality and greater taste.

Key words: pears, fruit quality, metabolism, controlled atmosphere

P10

Nutritional and organoleptic evaluation of gogonele jam with lime and ginger

Mihaela Cazacu, Bianca Vâlceleanu, Ileana Cocan, Bogdan Radoi, Ramona Heghedus-Mandru, Gabriel Heghedus-Mandru, Diana Radu

University of Life Sciences "King Mihai I" from Timisoara,
Faculty of Food Engineering, Calea Aradului 119, Timisoara 300645, Romania

*Corresponding author: mihaelacazacu@usvt.ro

Abstract

Gogonele jam, an unusual delicacy but with a unique taste, is a rich source of vitamins, nutrients and dietary fiber, offering an inherent organoleptic experience. Lemon and ginger gogonele jam contains a significant amount of vitamin C due to the addition of lime. Vitamin C is a powerful antioxidant that supports the immune system. Ginger also has a high nutritional value, providing bioactive compounds such as polyphenols, which have anti-inflammatory and antioxidant properties. The jam has a dark orange color, specific to ripe peppers, with nuances of lime and ginger, with the sweet-sour taste of peppers with the freshness of lemon and the subtle spiciness of ginger. With a soft texture of homogeneous consistency, with small pieces of gogonele and lime and ginger peel, which contribute to a pleasant sensory experience. The gogonele jam with lime and ginger is appreciated for its balance between sweet, sour and spicy, offering a unique and refined taste experience that can be used as a topping for desserts or as an ingredient in various recipes.

Keywords: gogonele, laim, ginger, sensory analysis, nutritional values.

P11

Synthesis and characterization of chrysin-4'-sulfonic acid: A step toward metal ion coordination complexes of sulfonated flavonoids

G. Charalambous*, S. Matsia, A. Salifoglou

Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece

*Corresponding author: csgeorgia@cheng.auth.gr

Abstract

Chrysin (5,7-dihydroxyflavone) is a naturally occurring flavone, part of a larger group of plant pigments, known for their avid biological activity. Many flavones can form quinones or coordinate metal ions, thus enabling participation in redox reactions within the plant photorespiratory system and providing protection against ultraviolet radiation. These properties support their broad pharmacological use. Flavonoids are recognized for their potent antioxidant properties, validated in both *in vivo* and *in vitro* studies. They are associated with protective effects against bacterial and viral infections, cardiovascular diseases, cancers, and age-related disorders. In plants, they serve as secondary antioxidants under stress conditions, localizing in mesophyll cell nuclei and regions rich in reactive oxygen species, and modulating growth regulators, such as auxins.[1,2]

Among the most studied flavones are chrysin, quercetin, and naringin, including their sulfonated forms. Native flavones typically suffer from poor water solubility, a limitation addressed through sulfonation, which enhances their solubility and potential bioavailability for pharmaceutical use. While sulfonated derivatives of other flavones have been documented, no sulfonated form of chrysin has been previously reported, thus highlighting a gap in the field.[2,3] To address this issue, our Laboratory initiated a research effort focused on synthesizing and studying sulfonated chrysin derivatives,. Chrysin was selected for sulfonation, using concentrated sulfuric acid under reflux conditions (135–145 °C), yielding chrysin-4'-sulfonic acid (chrysin-4'-SO_3H). The product was characterized via FT-IR spectroscopy. Although repeated crystallization attempts did not yield single crystals suitable for X-ray analysis, the reaction was deemed successful from the physicochemical point of view.

Parallel efforts are ongoing to develop metal ion complexes of sulfonated chrysin. While isolation of stable final products is still underway, preliminary findings are quite promising. Overall, flavonoids, like chrysin, represent a highly valuable class of bioactive molecules, with expanding relevance in both pharmaceutical development and synthetic bioinorganic chemistry.

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P12

Partial meat replacement with lentils: effects on nutritional and sensory quality of chicken pâté

Ileana Cocan, Monica Negrea, Ersilia Alexa, Calin Jianu, Daniela Stoin

University of Life Sciences "King Mihai I" from Timisoara,
Faculty of Food Engineering, Calea Aradului 119, Timisoara 300645, Romania

Corresponding author: ileanacocan@usvt.ro

Abstract

This paper aims to valorize lentil (*Lens culinaris*) as a vegetable source of protein in chicken pâté technology. In the current context of the orientation of the food industry towards products with high nutritional value and low costs, the integration of vegetable proteins represents a sustainable and efficient solution. The study is based on the hypothesis that partial substitution of meat with lentils can lead to an organoleptically and qualitatively acceptable end product without compromising food safety or sensory characteristics of the product. Linseed is compositionally characterized as a rich source of protein, fibre, minerals and starch, low in lipids and anti-nutritional factors. The study followed the development and testing of four types of pate: a control (no added lentils) and three variants with 10%, 20% and 30% added lentils. For each variant, physico-chemical (water, protein, fat, fat, salt, carbohydrate, energy content) and sensory analyses were carried out according to standardized methodologies. The results showed that the addition of lentils positively influenced the water and protein content, slightly reducing the lipid content, without negatively affecting the organoleptic characteristics. All samples were within the limits allowed by the legislation in force. The main conclusion is that linseed can be successfully used in the formulation of meat products, contributing to their nutritional and functional diversification.

Keywords: lentil, chicken pâté, physical - chemical composition, organoleptic analysis, sensorial analysis

P13

A theoretical insight on the enhancement of bioavailability and bioaccessibility of some natural stilbene-based lipopolyphenols with bioactivity against cardio-vascular diseases by cyclodextrin nanoencapsulation

Darius-Adrian Costandana[1], Agnes Cupin[2], Marinela Fiţoiu (Voin)[2], Anamaria Pop (Mateuţ)[2], Nicoleta G. Hădărugă[2,3], Daniel I. Hădărugă[1,2*]

[1] Polytechnic University of Timişoara, Faculty of Chemical Engineering, Biotechnology and Environmental Protection, Department of Applied Chemistry, Organic and Natural Compounds Engineering, Vasile Pârvan Bd. 6, 300223-Timişoara, Romania
[2] University of Life Sciences "King Mihai I" from Timişoara, Doctoral School "Engineering of Vegetable and Animal Resources", Calea Aradului 119, 300645-Timişoara, Romania
[3] University of Life Sciences "King Mihai I" from Timişoara, Faculty of Food Engineering, Department of Food Science, Calea Aradului 119, 300645-Timişoara, Romania

* Corresponding author: daniel.hadaruga@upt.ro

Abstract

Natural compounds having stilbene moiety have various biological activities, from antioxidant capacity for resveratrol to non-steroidal antiinflammatory and anticarcinogene colchicine and combretastatin A4, as tubulin polymerization inhibitor [1, 2]. Derivatization of such compounds to the more hydrophobic ester-like stilbene-based lipopolyphenols can enhance their biological activities [3-5]. Moreover, nanoencapsulation of these lipopolyphenols in matrices such as natural cyclodextrins will provide complexes with high bioavailability and bioaccessibility, especially for targeting the intestinal region [6].

The goal of the study was the evaluation of the influence of hydrophobic moiety of natural stilbene-based derivatives on the anticarcinogenic activities (i.e., against human epidermoid carcinoma cell line KB-3-1, human lung cancer cell line NCI-H460, human embryonic kidney cell line HEK293 and human breast adenocarcinoma cell line MCF7). Moreover, the bioavailability and bioaccesibility enhancement of stilbene-based lipopolyphenols by natural cyclodextrin nanoencapsulation was for the first time evaluated.

Eight stilbene-based lipopolyphenols, the corresponding polyphenols and colchicine (positive control) were optimized by MM+ molecular modelling and conformational analysis (HyperChem 7.52 package, StatSoft). Minimum energy conformations were used for determination of more than one thousand molecular descriptors using QSAR Properties (HyperChem package) and PaDEL-Descriptor software. Valuable QSAR models with descriptor properties/constitutional and topological descriptors were obtained. On the other hand, in vacuo and water periodic box docking experiments (MM+ program) for α-, β- and γ-cyclodextrin / lipopolyphenol complexes at 1:1 molecular ratio revealed high stability and possibility to controlled release of the biologically active compounds to the biological target, especially for larger cyclodextrins with *trans*-stilbene-based lipopolyphenols (interaction energies of 24.0 kcal/mol and 32.4 kcal/mol for 1:1 complexes of epi-combretastatin A4-stearic acid lipopolyphenol derivative with β- and γ-cyclodextrin, respectively, Figure 1). As a conclusion, natural stilbene antioxidant compounds from some bushwillow species (*Combretum afrum* (Eckl. & Zeyh.) Kuntze or *C. leprosum* Mart.) and especially from grapes and wines (*Vitis* spp.) can be efficiently derivatized to more hydrophobic bioconjugates using fatty acids and further nanoencapsulated in natural cyclodextrins for obtaining pharmaceutical or food-grade nanomaterials.

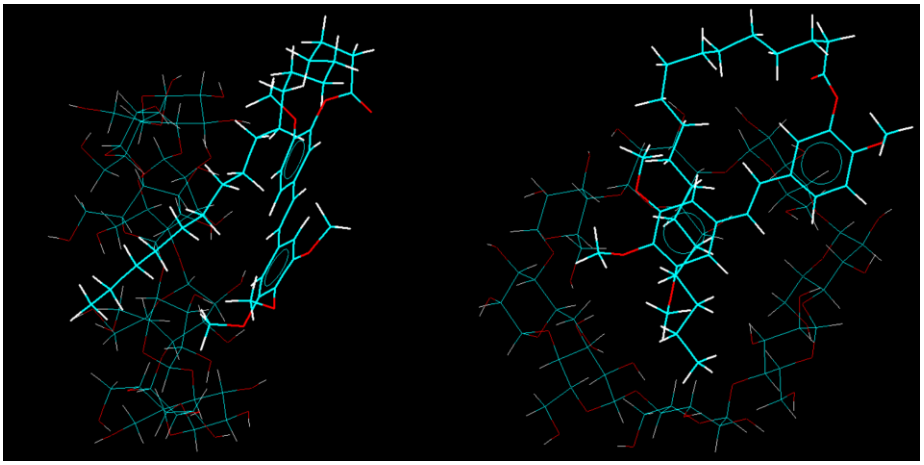

Figure 1. Optimized γ-CD/epi-combretastatin A4-stearic acid lipopolyphenol derivative complex, obtained by MM+ molecular docking (views along *OX* and *OZ* axes; lipopolyphenol bioconjugate is in bold)

Keywords: lipopolyphenol; stilbenoid ester; cyclodextrin; molecular modeling; molecular docking; QSAR

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P14

Bioenzymatic catalysts in biscuit manufacturing: protease and asparaginase enzyme applications

Ioan David, Gabriel Bujancă, Ovidiu Claudiu Ion, Alexandru Adrian Nicolae

University of Life Sciences "King Mihai I" from Timişoara, Faculty of Food Engineering, Department of Food Science, Calea Aradului 119, 300645-Timişoara, Romania

* Corresponding author: neda_university@yahoo.com

Abstract

This study presents the impact of protease and asparaginase enzymes on the rheological properties of dough made from white flour for biscuit production. By using the alveographic and falling number methods, we determined the dough's rheological attributes and evaluated the effects of protease and asparaginase at varying dosages on both the flour and the end products. The addition of these enzymes in the biscuits production process increases health and efficiency by improving dough manageability, as well as the volume and texture of the biscuits. Proteases facilitate the hydrolysis of peptide bonds between amino acids, which weakens the gluten network in the dough. Meanwhile, asparaginase converts asparagine and water into aspartic acid and ammonia, thereby preventing acrylamide formation. Results from the falling number and alveograph tests indicate that

adding protease and asparaginase increases the final product's quality, making the biscuits crisper, more porous, and tender. Proteases also increase dough viscosity while reducing stability and kneading tolerance.

Keywords: protease, asparaginase, alveographic method, falling number method

P15

Novel vanadium-peroxido-bis(2-pyridylcarbonyl)amine compounds as hydrocarbon catalysts

I. Delimpaltadaki[1,*], S. Matsia[1], A. Hatzidimitriou[2], A. Salifoglou[1]

[1] *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*
[2] *Laboratory of Inorganic Chemistry, School of Chemistry, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*

*Corresponding author: irodelmin@cheng.auth.gr

Abstract

Vanadium is an early first-row transition metal, which is abundant in nature, in minerals, and fossil fuel deposits. It has significant properties, with various oxidation states rendering it ideal for redox reactions, the ability to form stable polyoxovanadates (POVs) and organometallic complexes with many molecules of biological importance, as well as flexibility to achieve diverse coordination geometries upon substrate binding. The aforementioned attributes have attracted growing interest from the scientific community in recent years, thus leading to further studies. Therefore, applications of vanadium compounds span a wide array of fields, such as pharmaceutical chemistry, industrial catalysis and biocatalysis, nanotechnology, and various biochemical processes.[1,2]

Known for their catalytic activity - primarily due to vanadium's ability to adopt multiple oxidation states - vanadium compounds are employed as catalysts in industrial processes. A prominent application is sulfuric acid production via the Contact Process, where V(V) oxide catalyzes the oxidation of SO_2 to SO_3. Additional examples include the: (i) oxidation of alcohols to carbonyl compounds (aldehydes or ketones) using hydrogen peroxide as the oxidizing agent, (ii) selective epoxidation of olefines or oxidation of alkenes to epoxides (for pharmaceutical or fine chemical synthesis), and (iii) polymerization of diolefins (in the production of synthetic rubber). The positive outcomes of research have, over the past years, contributed to the increasing utilization of vanadium complexes in catalytic processes. Consequently, significant efforts are being directed toward the synthesis of new vanadium-based compounds in order to enhance the yield of the processes.[3-10]

The recent synthetic exploration of the reactivity of vanadium with 2-pyridyl methyl amine (2-picolyl amine) in the presence of hydrogen peroxide in aqueous media has afforded new mononuclear peroxido species, which were synthetically isolated in crystalline form. The new compounds exhibit profound conformational differences exemplified through pH-specific chemistries. Physicochemical characterization techniques (elemental analysis, FT-IR, Raman, NMR, UV-Visible, cyclic voltammetry, thermogravimetric analysis TGA-DTG and X-ray crystallography) were used for perusal of their properties. In all of the compounds, pH appears to be a crucial factor in the synthesis and isolation. The current research will be further extended to evaluate the efficiency of the two newly synthesized materials in catalytic processes.

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P16

Milk authenticity tests using FTIR coupled with advanced chemometrics

Lamprini Dimitriou[1], Christos S. Pappas[2], Athanasios Manouras[3], Michalis Koureas[4], Eleni Malissiova[1*]

[1] University of Thessaly, Food of Animal Origin Laboratory, Animal Science Department
[2] Agricultural University of Athens, Laboratory of Chemistry, Department of Food Science and Human Nutrition, Greece
[3] University of Thessaly, Laboratory of Food Chemistry, Biochemistry and Technology, Nutrition and Dietetics Department, Greece
[4] University of Thessaly, Laboratory of Hygiene and Epidemiology, Faculty of Medicine, Greece

* Corresponding author: malissiova@uth.gr

Abstract

Milk is a key component of the human diet, and its authentication is essential to ensure quality, safety, and consumer trust. This study explores the application of Fourier Transform Infrared Spectroscopy (FTIR) in combination with multivariate statistical analysis for the classification of milk samples on species level. A total of 193 milk samples derived from cow, goat, and sheep were analyzed in both liquid and freeze-dried forms using the Thermo Scientific Nicolet 6700 FTIR spectrometer. Prior to analysis, all samples were verified as unadulterated using ELISA testing. Spectral data were preprocessed and analyzed using the MixOmics package in R. Partial Least Squares Discriminant Analysis (PLS-DA) was employed to build predictive models, with data split into training (70%) and testing (30%) sets. Model optimization was achieved through repeated five-fold cross-validation. The classification results demonstrated a high level of accuracy, achieving complete discrimination among the three milk types. These findings underscore the potential of FTIR spectroscopy coupled with multivariate analysis as a rapid and reliable tool for food authentication and quality control.

Keywords: FTIR spectroscopy, Milk authentication, Multivariate analysis, PLS-DA, Food quality control, Spectral data analysis

P17

Development of sourdough starter made with lactic bacteria strains isolated from ecologic flour

Alina-Alexandra Dobre, Elena Mirela Cucu, Nastasia Belc

National Research & Development Institute for Food Bioresources - IBA Bucharest, 6 Dinu Vintilă Street, District 2, 021102, Bucharest, Romania

Corresponding author: alina.dobre@bioresurse.ro

Abstract

Microorganisms play an important role in developing cereal flour foods based on the characteristics of sourdough, with numerous reports on the natural microbiota. All the datas in literature indicates that the lactic acid bacteria (LAB) present in sourdough may originate from flour, other dought ingredients, and the environment in which it is produced.

In the present research, eight sourdoughs were obtained and analysed, which differed by the selected LAB, isolated and identified from wheat, rye and corn ecologic flours, used in sourdough preparation. The structure and fermentative capacity of the formed sourdough starters was analysed for pH, total tritrable acidity, viability of lactic acid bacteria and natural yeast. The use of starter culture has a positive effect on the dough obtained in the laboratory, improving the biotechnological properties and the production time. The main independent variables (biotechnological parameters) with influence on the quality of the fermented product were found to be: dough consistency, inoculum, duration of the fermentation process and temperature. Thus, sourdough with superior bioactive properties was obtained under the following optimized fermentation conditions: dough consistency – Dy 180; inoculum volume of starter LAB strains 1%, fermentation temperature – 30 °C; fermentation time – 25 h.

The analysis showed that the use of *L. plantarum LM2, L. brevis LM 6*, L. *bifermentas LM7 și L. coryniformis LM8* as starters did significantly helped to obtain improved sourdoughs, these being characterized by higher microbial growth, higher acidity values and superior fermentation than control samples. These characteristics may be essential to ensure the reproducibility and stability of industrial sourdough bread production.

The results obtained in this experimental study demonstrate that the strains of lactic acid bacteria isolated from spontaneous ecologic flour sourdoughs are promising for the development of starter cultures.

Keywords: sourdough starter, ecologic flours, lactic acid bacteria identification

P18

A comparative assessment of the rheological properties of wild boar and domestic pork meat

Carlo Marius Dragomir[1], Mariana-Atena Poiana[2], Corina Dana Misca[2], Delia-Gabriela Dumbrava[2], Camelia Moldovan[2], Mirela-Viorica Popa[2], Marius Robert Lungu[1], Diana Nicoleta Raba[1*]

[1] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Management and Rural Turism, Calea Aradului 119, Timisoara 300645, Romania*
[2] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Calea Aradului 119, Timisoara 300645, Romania*

* Corresponding author: diana.raba@usvt.ro

Abstract

The purpose of this work was to assess the rheological attributes of wild boar meat as a novel option for meat processing, against commercially produced pork. Uniaxial compression and stress relaxation tests were used to evaluate the rheological properties of wild boar and industrially farmed pork, with measurements taken both parallel and transverse to the muscle fiber direction. Compression testing revealed that the linear region of the stress-strain curves exhibited multiple linear phases with varying slopes, corresponding to substantial differences in compressive modulus.

Analysis of the relaxation curve terminal phase revealed force differentials of 0.8 N (longitudinal compression) and 3 N (transverse compression) for wild boar meat. Domestic pork samples demonstrated superior consistency, displaying minimal variations of merely 0.2 N and 0.8 N for longitudinal and transverse compression, respectively. The final compression phase was significantly easier to achieve in wild boar meat for both longitudinal and perpendicular fiber orientations, which showed similar behavior. Domestic pork exhibited higher final compression modulus values than wild boar, with maximum values observed in perpendicularly sectioned muscle. The highest compression energy requirement was recorded for perpendicularly oriented domestic pork fibers, while the lowest corresponded to longitudinally sectioned wild boar meat. The rheological tests conducted provide clear evidence of the differential textural properties between domestic swine and wild boar muscular tissue.

Keywords: pork, game, compression tests, stress relaxation tests

P19

Gluten-free oatmeal cookie enriched with blueberries (*Vaccinium macrocarpon*) and matcha powder (*Camellia Sinensis*)

Sylvestre Dossa, Alexandru Baltatu, Christine Neagu*, Daniela Stoin, Alexandru Rinovetz, Ersilia Alexa

Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timisoara, Aradului Street No. 119, 300645 Timisoara, Romania

Corresponding author: christine.neagu@usvt.ro

Abstract

In recent years, consumers have increasingly demanded healthy foods with health benefits and high nutritional value. It was in this context that the present study set out to formulate gluten-free biscuits based on enriched oat flour with different levels of matcha powder substitution. Three types of biscuits were formulated with 0% (OC), 5% (OCM1), and 10% (OCM2) matcha powder, respectively. The samples obtained were then analyzed in terms of nutritional value, phenolic compounds and organoleptic properties. The flour, composed of 90% oats and 10% matcha powder (FCOM2), was analyzed from a rheological perspective. The rheological analysis yielded results which indicated that FCOM2 had a stability time of 5.17 minutes. Furthermore, it was observed that the water absorption and mixing indices were within the range predicted by the Mixolab Chopin for cookie production. The study also revealed that the partial enrichment of the biscuits with matcha powder significantly improved their carbohydrate, protein, and fiber composition, while the lipid composition remained unchanged from one sample to another. The results obtained for phenolic compounds demonstrated a positive correlation between the amount of matcha powder in the biscuits and the total polyphenol content, with levels of 992.81, 1093.59, and 1287.50 mg GAE/kg being recorded for OCC, OCM1, and OCM2 respectively. The organoleptic test revealed that the biscuit most appreciated was the one with 10% matcha powder added, because of its taste, color, and more pronounced appearance. In conclusion, matcha powder can enrich flour products such as biscuits by up to 10% to improve their nutritional, phytochemical, and sensory characteristics. The gluten-free biscuits obtained in the present study were also recommended for people with coeliac disease.
Keywords: Gluten-free cookies; celiac disease; rheological perspective, polyphenols; oatmeal, blueberries, matcha powder.

P20

Obtaining and characterizing of some spicy sauces from figs

Mărioara Drugă, Camelia Moldovan, Delia Gabriela Dumbravă, Corina Dana Mișcă, Nicoleta-Gabriela Hădărugă, Mariana Atena Poiană, Ariana Bianca Velciov, Laura Rădulescu

University of Life Sciences „King Mihai I" from Timisoara, Faculty of Food Engineering, Aradului Street no. 119, 300645, Timisoara, Romania

* Corresponding author: marioaradruga@usvt.ro

Abstract

Figs are the most alkaline fruits known and have a complex nutritional profile, being rich in micronutrients and vitamins and relatively low in calories. The aim of the study was to obtain and characterise from sensory, physico-chemical and nutritional point of view the sauces made from figs and other auxiliary materials: onion, ginger, mustard, lemon juice/balsamic vinegar (V1 and V2), brown sugar and spices such as black pepper, cinnamon, chili and cloves. The sauces are well-bound, finely textured, with a well-appreciated taste and aroma. For both variants of sauces some of the physico-chemical parameters were similar (humidity: 38,4%, dry mater 61,6%, salt 0,7%) and some were different (pH 4.2 in V1 and 3.9 in V2). Polyphenols range between 69.5±0.9 (V1) and 71.7±0.2 (V2) mg GAE/100g , antioxidant capacity following the same direction (72.2 – 79.8 mg Trolox/100g). Energy value was 230 cal/100g product.

Key words: fig sauces, sensory, physico-chemical properties.

P21

Essential Oils Impact on Elderberry Jam's Antioxidant and Sensory Profile

Delia-Gabriela Dumbrava[1], Ducu-Sandu Ștef[1], Camelia Moldovan[1], Ersilia Calina Alexa[1], Diana-Nicoleta Raba[2], Viorica-Mirela Popa[1], Corina-Dana Misca[1], Diana-Veronica Radu[1*]

[1] *Faculty of Agrofood Processing Technology, University of Life Sciences "King Mihai I" from Timișoara, Calea Aradului 119A, 300645, Romania*
[2] *Faculty of Management and Rural Turism, University of Life Sciences "King Mihai I" from Timișoara, Calea Aradului 119A, 300645, Romania*

[*]Corresponding author, e-mail: dianadogaru@usvt.ro

Abstract

The utilization of *Sambucus nigra* L. fruits, owing to their complex biochemical profile encompassing a high content of antioxidants and other biologically active substances, is experiencing a notable increase in the food industry, particularly in the context of advanced natural formulations. This study aimed to produce and characterize five distinct elderberry jam formulations: a control sample (EJ) and four experimental samples incorporating essential oils of lemon (EJL), grapefruit (EJG), orange (EJP), and tangerine (EJT). The characterization encompassed the determination of ascorbic acid content (titrimetric analysis), total polyphenol concentration (Folin-Ciocalteu assay), antiradical activity (2,2-diphenyl-1-picrylhydrazyl free radical scavenging assay), proximate composition, and sensory attributes (5-point hedonic scale). The results highlighted that, concerning vitamin C content, there were no significant differences between the control sample and those with essential oils. However, the addition of citrus essential oils resulted in important increases in total polyphenol content and antioxidant activity. Furthermore, the addition of essential oils led to a superior evaluation of the sensory attributes of the elderberry jam by the tasters, with the product containing grapefruit essential oil (EJG) being the most highly rated.

Keywords: elderberry, jam, essential oils, vitamin C, polyphenols, antioxidant activity

P22

Formulation and physicochemical characterization of novel chickpea-based vegan cheese analogues

Delia-Gabriela Dumbrava[1], Ileana Cocan[1], Petru-Bogdan Radoi[1], Corina-Dana Misca[1], Viorica-Mirela Popa[1], Mariana-Atena Poiana[1], Camelia Moldovan[1*], Diana-Nicoleta Raba[2*]

[1] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Calea Aradului 119A, 300645, Romania*
[2] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Management and Rural Tourism, Department of Food Science, Calea Aradului 119A, 300645, Romania*

* Corresponding author: cameliamoldovan@usvt.ro, diana.raba@usvt.ro

Abstract

Driven by increasing consumer awareness regarding health, sustainability, and ethical considerations, plant-based food alternatives are experiencing significant growth. This trend reflects a demand for substitutes to animal-derived products that not only provide nutritional advantages but also possess appealing organoleptic characteristics and contribute to perceived health benefits. The main objective of this study was to develop chickpea-based vegan alternatives to animal-based food products, focusing on the creation of three distinct cheese analogues: one plain (CM), a second with added turmeric and dried oregano (C1) and a third with paprika and dried basil (C2). Another aim of the work was to analyze the products in terms of total polyphenol content, antiradical activity (DPPH method), antioxidant activity (CUPRAC method), proximate composition and sensory attributes. Both C1 and C2 products were characterized by higher total polyphenols, higher antioxidant and antiradical activity, sensory characteristics better appreciated by the panelists, compared to the simple CM product.

Keywords: plant-based products**,** antioxidant activity, polyphenols, proximate composition

P23

Processes for obtaining and recovering whey in the food industry

Diana Fluerasu (Baltatu)*, Ersilia Alexa

University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Calea Aradului 119A, 300645, Romania

*Corresponding author: dianafluerasu93@gmail.com

Abstract

In the context of the circular economy, the capitalization of some by-products from the food industry is an important component of technological production. In the dairy industry, whey is a by-product with important nutritional properties that is not used to its true potential in other industries.

This review aims to analyze the possibilities of capitalizing the whey resulting as a by-product in the dairy industry, in different constituent forms (protein isolate, protein concentrate and hydrolyzed), as functional supplements.

Protein isolate is a purified form of whey protein, obtained through an advanced filtration process. It has the highest protein content (90%) but also the lowest fat, mineral and lactose content and is most commonly found in dietary supplements. It is obtained from whey concentrate, which is filtered to remove lactose, thus making it easily digestible. Protein concentrate is a product obtained by ultrafiltration. Semipermeable membranes with pores are used that allow small molecules to pass through and at the same time retain serum proteins. The result is a concentrated protein solution with a protein concentration that can vary between 35% and 80%. It is used in food supplements, in low-protein diets, in athletes' nutrition, in various formulas for infants and children, it can be added to culinary recipes. Protein hydrolysate - is a form of whey protein that has been processed through a hydrolysis process, which involves breaking down proteins into smaller peptides. This process improves the digestibility and absorption of protein in the body. Whey is treated with enzymes or acids that break down amino acid chains into smaller peptides. It is found in protein supplements, protein bars and shakes, and is popular among those who need a quick and effective protein intake. It can be used in formulas for people with digestive sensitivity or who need an easy-to-absorb protein supplement.

Key words: protein isolate, protein concentrate and hydrolyzed, functional foods

P24

Chemical and sensory evaluation of baked goods enriched with *Capsicum chinense* extracts

Mary Fucile[1], Ludovica Zicarelli[1], Christine Dragomir[2], Filomena Conforti[1], Giancarlo Statti[1], Ersilia Alexa[2*]

[1]Department of Pharmacy, Health and Nutritional Sciences, University of Calabria, Rende (CS) I-87036, Italy
[2]University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering Aradului Street No.119, Code 300645, Timisoara, Romania

*Corresponding author: ersiliaalexa@usvt.ro

Abstract

The purpose of this study was to evaluate the effect of adding a mixture of ethanolic extracts of different Capsicum chinense varieties on some nutritional and sensory properties of baked goods. Two sets of products were prepared by adding the extracts at two different concentrations. The finished products were subjected to chemical analysis to determine the content of phenolic compounds. In particular, the evolution of the phenolic profile of the baked goods following the addition of the extracts was evaluated. In addition, sensory analyses were conducted to assess the acceptability of the products and the intensity of the spicy sensation. Sensory analyses showed a positive correlation between the concentration of the extracts and the intensity of the spicy sensation, while maintaining overall acceptability of the products. The study demonstrated the feasibility of enriching bakery products with C. chinense extracts, resulting in functional foods with increased content of bioactive compounds and potential health benefit due in part to their antioxidant activity.

Keywords: bakery products, chili pepper, polyphenols, capsaicin, sensorial analysis

P25

Valorization of apple pomace for the development of nutraceuticals: extraction techniques, bioactive composition, and functional applications

Alina Gogu[1]*, Liliana Cseh[1], Ersilia Alexa[2]

[1] Romanian Academy. "Coriolan Drăgulescu" Institute of Chemistry, Mihai Viteazu Boulevard, no.24, Timișoara 300223, Romania
[2] University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Aradului Street No.119, Code 300645, Timisoara, Romania

*Corresponding author:alinageorgianagogu@gmail.com

Abstract

Apple pomace (AP), a by-product of apple juice and cider production, represents a significant waste material that can be valorized into nutraceuticals and functional food ingredients. This study explores the potential of apple pomace by focusing on its bioactive composition,

extraction techniques, and functional applications in food products. Apple pomace contains a variety of bioactive compounds that are valuable for health promotion:i) Polyphenols: Includes flavonoids and phenolic acids, which exhibit antioxidant and anti-inflammatory properties (e.g., quercetin, catechins, chlorogenic acid), ii) Dietary Fibers: Both soluble and insoluble fibers, important for digestive health, iii) Essential Fatty Acids: Including omega-3 and omega-6 fatty acids that contribute to anti-inflammatory benefits, iv) Antioxidants: Natural compounds that protect the body from oxidative stress.

In this regard, the objectives of the study were: i) to identify the key bioactive compounds present in apple pomace, ii) to evaluate and compare various extraction techniques for the efficient recovery of bioactive compounds, iii) to assess the functional applications of apple pomace in food and bioplastics. Also, this study compares four extraction techniques: i) Traditional Solvent Extraction: Commonly used for its simplicity and effectiveness, ii) Microwave-Assisted Extraction (MAE): Uses microwave energy to enhance extraction efficiency and reduce processing time, iii) Ultrasound-Assisted Extraction (UAE): Employs ultrasonic waves to improve bioactive recovery, iv) Supercritical Fluid Extraction (SFE): Utilizes supercritical CO2 as a sustainable and high-efficiency method for bioactive recovery.

The incorporation of apple pomace into functional foods provides significant health benefits: i) Bakery Products: Enhanced with fiber and antioxidants, improving their nutritional profile, ii) Beverages: Enriched with polyphenols and dietary fibers for improved digestive health and antioxidant activity, iii) Bioplastics: Apple pomace was tested as a sustainable material for biodegradable plastic production, offering an environmentally friendly alternative to traditional plastics.

In conclusion, apple pomace is a promising resource for the nutraceutical industry, offering numerous bioactive compounds that can be used to enhance the nutritional value of functional foods. The research highlights the importance of circular economy practices in transforming food waste into valuable ingredients for sustainable product development. Future research should focus on optimizing extraction methods, enhancing bioavailability, and addressing regulatory challenges to fully realize the potential of apple pomace.

Keywords: Apple pomace, nutraceuticals, bioactive compounds, extraction techniques, functional foods, sustainability, circular economy, antioxidants, polyphenols.

P26

Studies on obtaining traditional pork salami and its physicochemical evaluation

Ramona Cristina Heghedűș Mîndru, Florin Alexandru Pârvu, Milan Alexandru Ciușdic, Diana Veronica Radu, Bogdan Rădoi, Ducu Sandu Ștef, Gabriel Heghedűș Mîndru*

Faculty of Food Engineering, University of Life Sciences „King Mihai I" from Timisoara, Calea Aradului 119, 300645 Romania

*Corresponding author: e-mail: gabrielheghedus@usvt.ro

Abstract

The production of traditional pork salami involves a complex interaction of technological processes that influence its quality and safety. Understanding these processes is essential for optimizing the final product's sensory attributes, nutritional value, and shelf life. This research aims to evaluate different methods used in the preparation of pork salami. Through comprehensive physicochemical analyses, salt (%), water (%), collagen (%), proteins (%), lipids (%), slightly hydrolyzable nitrogen (mg NH_3/100g), total ash (%) and energy value Kcal/100g, is evaluated how

these factors contribute to the overall quality and consumer acceptance of traditional pork salami. The analysis of the results will allow the identification of the most efficient processing techniques, thus contributing to the improvement of quality and food safety standards in the meat industry. This approach will also facilitate the development of recommendations for manufacturers so that they can adapt their manufacturing processes according to consumer preferences and market requirements.

Keywords: pork salami, technological process, quality indicators

P27

Study of sausage manufacturing technology, evaluation of their qualitative indicators

Gabriel Heghedűș Mîndru[1], Cristian Gottvald[1], Teodor Ioan Trașcă[2], Alexandru Rinovetz[1], Mihaela Cazacu[1], Corina Dana Mișcă[1], Ramona Cristina Heghedűș Mîndru[1*]

[1]*Faculty of Food Engineering, University of Life Sciences „King Mihai I" from Timisoara, Calea Aradului 119, 300645, Romania*
[2]*University of Agronomic Sciences and Veterinary Medicine in Bucharest, 59 Mărăşti Boulevard, District 1, 011464, Romania*

*Corresponding author: ramonaheghedus@usvt.ro

Abstract

Traditional pork sausages are a highly appreciated dish in Romanian cuisine, often being associated with festive meals, winter holidays as well as rural traditions. Pork sausages are an important source of protein, essential for building and repairing tissues, as well as for the production of enzymes and hormones, they contain B vitamins, due to their fat content, they can be a quick source of energy, which is very useful in situations of intense physical exertion. They are prepared from pork, bacon and spices. In this work we have made two assortments of homemade pork sausages. The technological process of obtaining traditional pork sausages follows the technology used for many years. The pork products obtained were physicochemically analyzed in terms of the salt (%), water (%), collagen (%), proteins (%), lipids (%), hydroxyproline (g/100g), slightly hydrolyzable nitrogen (mg NH_3/100g), total ash (%) and their energy value. All the results obtained from the physicochemical analyzes carried out for the two samples of homemade meat sausages were compared with the values given in the literature, European legislation and Romanian standards regarding meat products. The quality indicators obtained did not exceed the limits provided by the rules and legislation in force.

Keywords: sausages, pork meat, traditional technology, physicochemical quality indicators

P28

From 3D print to functional implant: Engineering a PLA-based trachea

D. Iakovou*, S. Matsia, A. Salifoglou

Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece

Corresponding author: iakovoud@cheng.auth.gr

Abstract

Trachea is a vital component of the respiratory system in all air-breathing organisms. Positioned directly in front of the esophagus, it serves as the main conduit that conveys incoming air, while simultaneously warming and filtering it to protect delicate lung tissue. Without a fully functional trachea, the body cannot efficiently exchange gases, turning any disruption to its structure into a potentially life-threatening event.[1] Pathological damage to the trachea can arise in many forms, and two of the most serious ones are tracheomalacia and tracheal stenosis.[2,3] Both conditions have seen a notable rise in incidence over recent years requiring emergency intervention. Traditional surgical repair may involve segmental resection or stenting, but more complex or extensive damage sometimes requires reconstructive surgery to restore airway patency.[4]

In parallel with these clinical challenges, three-dimensional (3D) printing has matured from a rapid-prototyping tool into a powerful method for producing industrial and biomedical components. By depositing material layer by layer directly from digital blueprints, 3D printing can generate highly intricate structures that perfectly match a patient's unique anatomy. This capability is especially valuable in tracheal reconstruction.[5]

Among the various polymers explored for 3D-printed biomedical scaffolds, polylactic acid (PLA) stands out for its exceptional biocompatibility, ability to biodegrade and suitability for 3D printing process.[6] 3D-printed PLA scaffolds provide the necessary mechanical strength and anatomical conformity for tracheal replacement.[7] To enhance the biocompatibility and functionality of a 3D-printed PLA-based tracheal graft, a dual-coating strategy is employed, employing natural biopolymers. Collectively, this dual-coating approach aims to produce a fully biodegradable, bio functional tracheal graft suitable for surgical implantation, offering improved compatibility with host tissues and enhanced potential for successful *in vivo* integration.[8]

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P29

Evaluation of preservation and safety of yogurt produced with various starter cultures

Roxana-Andreea Munteanu-Ichim[1,2], Geronimo Răducu Brănescu[1] , Ana-Maria Manolică[1,2], Alina Maier[1], Florentina Matei[1]

[1]*Faculty of Food and Tourism, Transilvania University of Brasov, Castelului 148, 500014, Braşov, Romania*
[2]*Faculty of Biotechnology, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Boulevard, District 1, 011464, Bucharest, Romania*

* Corresponding author: geronimo.branescu@unitbv.ro

Abstract

This study explores the impact of distinct starter cultures on the preservation characteristics and microbiological safety of yogurt. The research focused on monitoring the evolution of acidity, pH, and microbial stability over time to assess shelf-life and hygienic quality. To this end, yogurt samples were prepared from pasteurized cow's milk using two types of starter cultures: YF-L812 CHR Hansen and MyYo, both containing Streptococcus thermophilus and Lactobacillus delbrueckii subsp. bulgaricus, with the latter also including probiotic strains La-5® and BB-12®. Despite the utilization of identical raw materials and storage conditions (4°C), the yogurt inoculated with YF-L812 demonstrated stability for a duration of six weeks, while the MyYo variant exhibited acceptable parameters only up to four weeks. The evaluation of food safety was conducted by testing for Enterobacteriaceae in accordance with ISO 21528-2. The study found no presence of any pathogenic bacteria in any sample, thereby confirming the efficacy of proper hygienic handling and process control measures. The study underscores the pivotal role of starter culture selection in not only prolonging shelf-life but also in enhancing the microbial safety of fermented dairy products.

The findings support the integration of food safety criteria in the formulation of dairy cultures to ensure consumer protection and compliance with regulatory standards.

Keywords: yogurt, starter culture, shelf-life

P30

Ternary V(V)-peroxido-zwitterion species catalyze aromatic hydrocarbon oxidation under mild reaction conditions

E. Kioseoglou*, S. Matsia, A. Salifoglou

Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece

Corresponding author: efi.kioseoglou@gmail.com

Abstract

Vanadium is encountered in many abiotic as well as biological systems, thereby attracting considerable attention to a wide range of applications, including nanotechnology,[1] biochemical processes,[2] medicinal chemistry,[3-5] industrial catalysis,[6] and biocatalysis.[7] In that capacity, it has long been known that vanadium is an essential bioelement, involved in various catalytic and inhibitory biological processes. In view of the importance of vanadium in catalysis, efforts have been made in our Lab over the years to develop molecular materials targeting vanadium complex systems mimicking the active site(s) of vanadium-dependent enzymes.

Poised to pursue research in the synthesis of catalytic molecular species of vanadium indiscrete oxidation states, a series of dinuclear complexes were synthesized involving vanadium with N-methylglycine and N, N'-dimethylglycine in aqueous media and H_2O_2, capable of exerting catalytic activity. To that end, the ternary complex species $(NH_4)_2[V_2O_2(O_2)_4(CH_3NH_2CH_2COO)]$ (bidentate) (**1**), $(NH_4)_2[V_2O_2(O_2)_4(CH_3NH_2CH_2COO)]$ (symmetric conformer) (**2**), $K_2[V_2O_2(O_2)_4(CH_3NH_2CH_2COO)] \cdot 2H_2O$ (**3**), and $K_2[V_2O_2(O_2)_4\{(CH_3)_2NHCH_2COO)\}] \cdot H_2O$ (**4**) were synthetically isolated in crystalline form. The new materials were characterized by elemental analysis, FT-IR, Raman, NMR, UV-Visible, cyclic voltammetry, TGA-DTG, and X-ray crystallography. In all of the compounds, pH appears to be an important factor in the synthesis and isolation of pure crystalline products. The products of the catalytic reaction systems investigated were identified and quantified by GC-MS-TIC and GC-FID.

The experimental results suggest that the vanadium species exert avid catalytic activity, with aromatic hydrocarbons, such as benzene, transforming it in products with high specificity and yield. The observed activity denotes the importance of such species in catalysis, with vanadium in the oxidation state V(V) bound to both peroxido and betaine ligands being responsible for the occurring oxidative transformations. The structural attributes of such ternary assemblies contribute to the unique activity under mild temperature conditions, thereby exemplifying the global directives for such catalysts, the use of which in industry projects merit.

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P31

From waste to worth: evaluating chestnut flour quality from downgraded chestnut fruits in Greece

Vasiliki Kossyva[1*], Mariastela Vrontaki[2*], Vasileios Manouras[2], Anastasia Tzereme[1], Ermioni Meleti[2], Lamprini Dimitriou[2], Ioannis Maisoglou[1], Maria Alexandraki[2], Michalis Koureas[3], Eleni Malissiova[2], Athanasios Manouras[1]

[1] *University of Thessaly, School of Physical Education, Sport Science and Dietetics, Department of Nutrition and Dietetics, Greece*
[2] *University of Thessaly, School of Agricultural Sciences, Department of Animal Science, Greece*
[3] *University of Thessaly, Faculty of Medicine, Department of Hygiene and Epidemiology, Greece*

* Corresponding authors: vkossyva@uth.gr, svrontaki@uth.gr

Abstract

The European chestnut (*Castanea sativa* Mill.) is a traditional agroforestry species cultivated in mountainous areas of Greece. It is highly valued for its nutritional content and its role in supporting rural economies. However, a significant portion of the annual harvest consists of downgraded or naturally fallen fruits that are typically excluded from the commercial market due to size, appearance, or timing of fall. These fruits are often discarded, despite their potential to be transformed into valuable food ingredients.

This study explores the potential of downgraded chestnuts as raw material for sustainable food production by assessing the physicochemical characteristics of flour derived from such fruits. Chestnut samples were collected from five distinct mountainous regions in Greece and categorized into five groups (Group 1 to Group 5). Three samples per group were processed and analyzed for initial and final moisture content, fat, protein, and ash content using classical analytical methods. Statistical analysis was conducted via one-way ANOVA, followed by Tukey's HSD test ($\alpha = 0.05$).

Results showed statistically significant variation (P=0.000) in initial moisture content across groups, ranging from 36.63 ± 0.44% (Group 5) to 49.88 ± 0.19% (Group 3). Final moisture content after drying did not vary significantly (P=0.058), ranging from 3.63 ± 0.08% (Group 5) to 4.51 ± 0.06% (Group 2). Fat content ranged from 1.16 ± 0.04% (Group 4) to 2.05 ± 0.02% (Group 3) (P=0.000), while protein content varied from 6.63 ± 0.15% (Group 3) to 11.3 ± 0.21% (Group 2) (P=0.000). The highest ash content was observed in Group 4 and Group 1 (3.09 ± 0.01%, and 3.01 ± 0.01, respectively; P=0.000).

The observed variability reflects the influence of environmental, morphological, and possibly genetic factors on chestnut composition. These findings support the valorization of downgraded chestnuts for flour production, promoting waste reduction, circular economy practices, and the development of sustainable, regionally sourced food products.

Keywords: *Castanea sativa*, physicochemical properties, Food sustainability, Agro-industrial by-products

P32

Evaluation of some nutritional parameters of nettle powder under different drying methods

Virgil - Dacian Lalescu, Ariana Bianca Velciov*, Monica Negrea, Ileana Cocan, Ersilia Alexa

University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering
Calea Aradului 119, 300645, Romania

*Corresponding author: arianavelciov@usvt.ro

Abstract

Nettle (*Urtica dioica L.)* leaf powder is a rich source of essential nutrients, including proteins, minerals, fibers, and carbohydrates, as well as bioactive compounds such as terpenoids, carotenoids, fatty acids, polyphenols, essential amino acids, chlorophyll, and vitamins. These components are crucial for maintaining human health, making nettle powder a potential nutritional supplement.

This research investigated the nutritional composition of powdered nettle leaves, specifically examining how different drying techniques affect the final product. The study focused on wild nettle (Urtica dioica L.) leaves collected from natural growth areas. Three distinct drying methods were applied: shade drying (SHD), sun drying (SD), and oven drying (OD). The researchers then analyzed the resulting nettle leaf powder to determine the levels of moisture, ash, protein, fiber, and carbohydrates in each sample. The findings of this experiment demonstrated that nettle leaf powder, regardless of the drying method employed, is a rich source of essential nutrients. Furthermore, the research indicated that processing fresh nettle leaves into powder significantly enhances the concentration of these nutritional compounds compared to their levels in the original fresh leaves.

Keywords: Nettle leaf powder, nutritional parameters, drying methods, statistical comparison

P33

Nutritional and sensory implications of using kale cabbage in pastry

Dacian Lalescu[1]*, Bianca Marescu[1], Monica Negrea[1], Antoanela Cozma[2], Ersilia Alexa[1]

[1] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Aradului Street no. 119, 300645 Timisoara, Romania*
[2] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Agriculture, Aradului Street no. 119, 300645 Timisoara, Romania*

*Corresponding author: lalescu@usvt.ro

Abstract

Kale cabbage (Brassica oleracea var. sabellica) is a cruciferous, a member of the Brassicaceae family, formerly known as the Cruciferae. This family encompasses a wide range of

vegetables, from cabbage and broccoli to turnips and cauliflower. Kale is an ancestral member, dating back thousands of years to Greek times. Kale is recognized for its nutritional properties, especially for its high content of B vitamins.

In this study, the possibilities of using kale as an active ingredient in the technology of obtaining puff pastry were pursued. The nutritional and sensory value of the puff pastry with kale filling was determined, and the values obtained were compared with some puff pastries obtained with the addition of white cabbage and spinach. The results obtained indicated that the obtained product provides fiber in a significant amount due to kale in the composition (1.88 g/100 g product). The energy value of the product is low (147.92 kcal/100 g product) and comes from the low carbohydrate intake (15.84 g/100g product) and protein (2.57 g/100 g product). By comparing the nutritional data of the 3 analyzed products, it is observed that, in relation to 100 g of product, the highest protein content is found in cheese and spinach-based puff pastry (8.79%) followed by puff pastry with white cabbage filling (3.44%) and kale (2.57%). As for fiber intake, it is highest in the case of spinach puff pastry (1.98%), followed by kale puff pastry (1.88%) and white cabbage puff pastry (1.31%). The energy value decreases in order: puff pastry with spinach and mozzarella (167.2kcal), puff pastry with kale (147.92kcal) and puff pastry with white cabbage (126.96 kcal).

The overall sensory analysis of the product highlights the fact that the product was accepted by the tasting participants with an average total score of 16.78 points out of a maximum score of 20. The criteria that registered the most penalties refer to the aspect of the filling, in particular the fact that it was not sufficiently well bound. Based on the study carried out, the sensory and nutritional analysis of the kale puff pastry obtained, and by comparing it with the nutritional data provided by other similar products, it is recommended to use this vegetable matrix in pastries.

Keywords: Sensory study, consumer acceptance, puff pastry, nutritional value

P34

Antibacterial properties of lanthanide metal-organic compounds and variably-structured flavonoids

N. Al Lati*, S. Matsia, A. Salifoglou

Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece

Corresponding author: nalla@ece.auth.gr

Abstract

New antimicrobial medicines with unique modes of action are desperately needed as antibiotic-resistant microorganisms are becoming more prevalent. Because of their special coordination chemistry, redox characteristics and possible interactions with bacterial membranes, metal-based compounds containing lanthanides have become attractive options. Their potential to interfere with enzyme activity, impair bacterial cell activities, and produce reactive oxygen species (ROS), which can result in bacterial cell death, has been investigated over the past decades.[1] They are useful in the quest for novel antibiotics due to their unique chemical activity, especially when it comes to combating drug-resistant infections.

However, compounds containing flavonoids, such as naringin and naringenin, are also being studied for their antibacterial qualities. Plant-derived polyphenolic chemicals, called flavonoids, are well-known for their bioactivity, which includes antibacterial, anti-inflammatory, and antioxidant properties.[2] Their capacity to interact with bacterial cell membranes, block essential enzymes, and interfere with metabolic pathways, is frequently cited as the reason for their

antibacterial activity.[3]

Poised to pursue such materials, research was launched in our Lab on antibacterial properties of newly synthesized complexes and compounds, using the agar disc diffusion method, against Gram-positive *Staphylococcus aureus* and Gram-negative *Escherichia coli* and *Xanthomonas campestris* bacteria. Those compounds are metal-organic ternary complexes as well as naturally-occurring organic flavonoid-containing compounds. The lanthanide metals to be tested included: Lanthanum (La), Neodymium (Nd) and Europium (Eu). Those metal ions chelated with chrysin (a flavonoid) and with 1,10-phenanthroline (an aromatic chelator ligand) will represent the previously mentioned binary and ternary metal-organic complexes to be studied for antibacterial properties. On the other hand, the organic compounds to be tested for antibacterial properties included additional flavonoids, such as naringin and naringenin together with a variety of diamines.

The results for lanthanide metal-organic compounds showed low minimum inhibitory concentration (MIC) values, which indicated a significant inhibitory action against *Escherichia coli*. These compounds, however, showed little to no zone of inhibition against *Staphylococcus aureus*, indicating that their effectiveness against Gram-positive bacteria was low. Flavonoid-containing compounds showed also high inhibitory action against *Escherichia coli*, yet no activity toward Gram-negative *Xanthomonas campestris* and Gram-positive *Staphylococcus aureus*.

The collective results demonstrate the elective antibacterial properties of the investigated compounds and underline the necessity for additional structural alterations to increase their efficacy against a wider variety of bacterial infections.

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P35

In vitro evaluation of hybrid vanadodrugs as hepatocellular carcinoma therapeutics

Georgios Lazopoulos*, Sevasti Matsia, Efrosini Kioseoglou, Athanasios Salifoglou

Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece

Corresponding author: glazopou@cheng.auth.gr

Abstract

Hepatocellular carcinoma, which is the most common form of liver cancer, accounting for roughly 90% of all cases, is the third leading cause of cancer-related deaths worldwide. The high malignancy and aggressiveness leads to late diagnosis, limiting the number and potency of available systemic therapies. The most promising approach to date seems to be T-cell-mediated immunotherapy, although the complex tumor micro-environment plays a critical role in reducing the potency of the treatment.[1] Hence, enhancement of the immunotherapy-based approach may potentially improve the effectiveness and outcome of the hepatocellular carcinoma treatment. Vanadium is a well-known early first-row transition metal of high physiological and medicinal value. Hybrid materials with vanadium in various oxidative states (from V(III) to V(V)), coordinated to physiological organic ligands, have shown significant potency against tumors in-vitro and in-vivo.[2] Furthermore, recent studies has revealed that selected well-defined vanadium

compounds are involved in various immune-driven molecular pathways, regulating key immune responses. At the same time, vanadium hybrid materials can interact with various biomolecular targets, such as B cells, T cells, interleukins, and various transcription factors affecting the potency of the immune microenvironment.[3] On this basis, research was launched in our Laboratory, focusing on the determination of the *in vitro* potency of two well-defined and physicochemically well-characterized hybrid vanadium-peroxido-betaine materials, against two well-known hepatocellular carcinoma cell lines, namely HepG2 and Huh-7. To better evaluate the cytotoxicity profile of these two materials, on addition to the viability assessment (using XTT assay), morphology and chemotacticity was also studied, in a time-, dose- and cell line-dependent fashion. Moreover, to better mimic the complex microenviroment of *in vivo* tumors, which as mentioned previously, affect significantly the outcome of the treatment, 3D spheroids (shown on **Fig. 1**) were cultured using the scaffold-free method. The results reveal high potency of both metallodrugs at short timeframes, while the building blocks of the molecules exhibit limited to no cytotoxicity under the same conditions, hinting toward a synergistic effect of the hybrid material. Finally, the molecules exhibit similar cytotoxicity in 3D spheroids and 2D cultures, thereby enhancing the biological significance of the observed results.

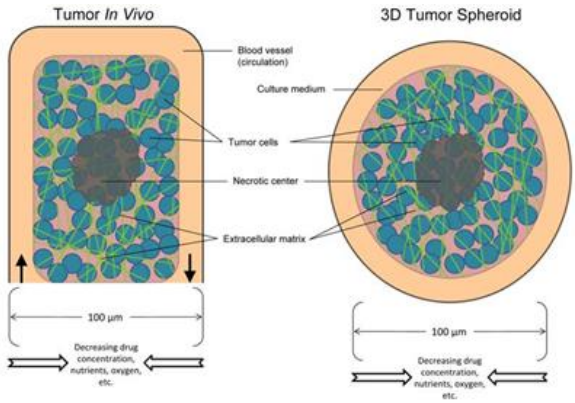

Fig. 1: *In vitro* 3D spheroids vs *in vivo* tumors[4]

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P36

The future of sustainable food: exploiting the nutritive potential of wild plants

Mihaela Lăcătuș[1], Patricia Tarkanyi[1,*], Monica Dragomirescu[2], Aurica Breica- Borozan[3], Mariana-Atena Poiană[1], Diana Moigradean[1], Simion Alda[3], Despina-Maria Bordean[1]

[1]Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timisoara, Aradului Street no. 119, 300645 Timisoara, Romania

[2]*Faculty of Bioengineering of Animal Resources, University of Life Sciences "King Mihai I" from Timisoara, Aradului Street no. 119, 300645 Timisoara, Romania*
[3]*Faculty of Engineering and Applied Technologies, University of Life Sciences "King Mihai I" from Timisoara, Aradului Street no. 119, 300645 Timisoara, Romania*

*Corresponding author: patricia-cristina.tarkanyi.fia@usvt.ro

Abstract

In a context where food security and sustainability are becoming progressively important, edible wild plants offer valuable nutritional choices. *Chenopodium album*, also known traditionally as lambs quarter or bathua, is often ignored because is a wild specie but it can play a significant role in both nutrition and soil regeneration.

Chenopodium album contains a diverse array of essential nutrients, including proteins, dietary fiber, vitamins, and minerals, rendering it a valuable nutritional resource. In addition to its nutrient profile, the presence of bioactive compounds endows the plant with significant antioxidant and anti-inflammatory properties. Furthermore, its cultivation contributes to environmental sustainability by enhancing soil fertility and reducing the risk of soil erosion

In food industry, *Chenopodium album* has a special importance due to its high nutritional content. The plant is rich in proteins, fibers, vitamins (A, C, K) and minerals (calcium, iron, magnesium). The leaves can be used as an alternative to spinach, the seeds can be grounded and use in bakery products or alternatives in gluten-free products. Also, the plant is appreciated for its use in functional foods and gluten-free products.

This study aims to explore the nutritional and ecological benefits of *Chenopodium album*. Bringing wild plants back into our diets can help create more diverse and sustainable food systems. By taking a fresh look at underused natural resources, the research highlights the potential of *Chenopodium album* as a practical, sustainable option for addressing some of today's challenges in food and agriculture.

Keywords: *Chenopodium album*, health benefits, sustainability, unutilized plants

P37

Whey valorization in beer production: A functional and nutritional approach

Mirabela Ioana Lupu*

Transilvania University of Brasov, Food and Tourism Faculty, Castelului 148, 500014, Brașov, Romania

*Corresponding author: lupu.mirabela@unitbv.ro

Abstract

This paper investigates the potential for enhancing the nutritional profile of beer by incorporating whey—a dairy industry by-product—into the brewing process. Given the high per capita beer consumption in Romania, the study explores an innovative strategy for increasing the protein content of beer. This strategy is informed by contemporary consumer trends that favor functional and nutritionally enriched beverages.

The research involved the experimental addition of sweet whey to beer wort at three different concentrations (10%, 15%, and 20%) prior to fermentation. A series of physicochemical

and sensory analyses were conducted on four beer samples, including a control, both on the day of preparation and after a seven-day fermentation period at 18°C. Key parameters assessed included alcohol content, extract concentration, caloric value, density, Brix, cryoscopy point, and protein content.

The results demonstrate a direct correlation between whey concentration and increased protein content, with the highest whey-enriched sample showing a protein increase of 0.5 g/100 ml post-fermentation. It was also observed that the alcohol concentration increased in all samples due to fermentation, and notable improvements in sensory attributes such as foam persistence and mouthfeel were also detected.

This study emphasizes the viability and advantages of whey valorization in the brewing industry, proposing a method for producing a protein-enriched beer with added functional value. The findings contribute to sustainable food processing practices and encourage further exploration into the integration of dairy by-products in non-dairy sectors.

Keywords: beer, whey, protein enrichment, fermentation, functional beverage.

P38

Rheological evaluation of natural sweetener-based caramel formulations

Mirabela Ioana Lupu*

Transilvania Univeristy of Brasov, Food and Tourism Faculty, Castelului 148, 500014, Brașov, Romania

*Corresponding author: lupu.mirabela@unitbv.ro

Abstract

This study investigates the formulation and rheological characterization of caramel candies produced using concentrated grape juice as a natural sweetener, with the objective of developing a healthier alternative to conventional caramels. The impetus for this study stems from the necessity to curtail the addition of sugars in confectionery products while preserving the desirable sensory and physical properties that consumers have come to expect.

The technological process involved the concentration of grape juice, followed by mixing with auxiliary ingredients such as glucose syrup, butter, and citric acid, followed by pouring into molds, cooling, cutting, and packaging. The experimental research was conducted on red grape juice, juice after the first concentration, juice after the second concentration, and caramel candies. Comprehensive physicochemical and rheological analyses were conducted, including measurements of viscosity, moisture content, pH, polyphenol concentration, acidity, and dry matter. Mechanical tests for compressive and cutting resistance were performed using the Zwick Roell system.

The findings indicated a progressive increase in viscosity and dry matter content with each concentration stage, and a corresponding decrease in total polyphenols due to thermal degradation. The caramels exhibited adequate structural integrity and consistent mechanical resistance. Sensory analysis yielded high scores for appearance, texture, and aroma, though lower scores were recorded for taste and color.

The incorporation of grape juice concentrate as a natural sweetener has been demonstrated to enhance both the nutritional profile and shelf life of the final product.

Keywords: caramel candies, grape juice concentrate, rheology, sensory evaluation

P39

In vitro evaluation of flavonoid anti-inflammatory activity

T. Maistrelli[*], A. Tzemalai[*], S. Matsia, A. Salifoglou

Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece

Corresponding authors: theomais@cheng.auth.gr, angelat@cheng.auth.gr

Abstract

Inflammation is a vital immune response to tissue injury or infection. Prolonged or uncontrolled inflammation, however, can cause development or exacerbation of several chronic diseases.[1] Therefore, the discovery and development of anti-inflammatory agents, that will effectively limit inflammation, remain an important area of biomedical research.

In this context, flavonoids, a class of natural polyphenolic compounds, have long been the subject of studies due to the anti-inflammatory activity they appear to have. Their name comes from the Latin word flavus, which means yellow, a name given because of the color they have in their natural form. These are secondary metabolites derived by many fruits, roots, flowers, etc., which impart color and protection to plants.[2] Their mechanism of action involves inhibition of key inflammatory enzymes, such as cyclooxygenase (COX) and lipoxygenase (LOX), as well as downregulation of inflammatory factors, including TNF-α and interleukins.[3]

To evaluate the anti-inflammatory properties of flavonoids *in vitro* and in a cell-free manner, the bovine serum albumin (BSA) heat denaturation assay is often used. This method is based on the principle that protein denaturation caused by heat stress is a measurable indicator of inflammation. The BSA denaturation assay involves incubation of the protein with the test compound, followed by heat treatment for approximately 30 min at 70^{o}C. After heat treatment, the protein is denatured and exhibits increased turbidity, which can be quantified spectrophotometrically. Optical density is usually measured at 595 nm and 660 nm.[4,5] Compounds that exhibit anti-inflammatory activity, reduce the extent of protein denaturation, hence a lower optical density value is observed. The percentage of inhibition of denaturation is calculated and compared with a standard anti-inflammatory drug, such as sodium diclofenac.

Flavonoids, particularly, have consistently demonstrated high inhibition rates in the BSA denaturation assay, suggesting a strong ability to stabilize protein structure under thermal stress. The protection of protein structure is believed to be associated with their ability to form hydrogen bonds and interact with hydrophobic regions of albumin, thus preventing conformational changes that lead to denaturation.[3] This renders flavonoids potential therapeutic tools. Furthermore, due to their low toxicity and natural abundance, flavonoids are particularly attractive as candidates for incorporation into nutritional products or complementary therapies in inflammatory conditions. Continued investigation of structure-activity relationships may further improve their therapeutic value (antioxidant, anti-inflammatory and antiviral activity) and lead to the identification of more potent analogs.

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P40

Unlocking the Potential of Goat Milk: Functional Synergies with Coffee Residues for Sustainable Product Innovation

Ioannis Maisoglou[1], Maria Alexandraki[2*], Eleni Malissiova[2*], Michail Koureas[3], Anastasia Tzereme[1], and Athanasios Manouras[1]

[1] *University of Thessaly, Nutrition and Dietetics Department, Food Chemistry, Biochemistry and Technology Laboratory, Greece*
[2] *University of Thessaly, Animal Science Department, Food of Animal Origin Laboratory, Greece*
[3] *University of Thessaly, Faculty of Medicine, Department of Hygiene and Epidemiology, Greece*

* Corresponding authors: malissiova@uth.gr; alexandraki@uth.gr

Abstract

In response to the rising demand for sustainable and health-promoting food options, recent research has focused on the innovative utilization of agricultural by-products. Coffee processing generates substantial residues that are notably rich in bioactive compounds, particularly antioxidants. Their valorization not only supports environmental sustainability but also enhances the functional profile of food products, in line with bioeconomy principles. This study explores the development of an innovative goat milk yoghurt enriched with coffee residue extracts, as part of the "Ygeiartos" project (Measure 16, Rural Development Program 2014–2020). The product formulation combines goat milk, coffee extract, milk protein concentrates, and fructose, designed to improve both nutritional value and sensory appeal. The final yoghurt exhibits a cohesive structure, smooth texture, pleasant coffee aroma, and a strong espresso-like flavor. Physicochemical analysis recorded a pH of 4.2, with balanced levels of protein and carbohydrates (8.5% each) and a low-fat content (2%).

Microbiological evaluation confirmed product safety, showing minimal yeast, mold, and coliform counts, and no presence of pathogens. Importantly, this research also lays the foundation for the development of a broader range of goat milk-based functional products, such as drinkable yoghurt beverages enriched with coffee extracts. These novel formulations cater to health-conscious consumers seeking nutritious, convenient, and environmentally responsible options. Overall, the study illustrates how upcycling coffee residues into dairy products can support circular economy goals while promoting the consumption of goat milk through innovative, value-added applications.

Keywords: Agricultural Waste Valorization; Antioxidants; Circular Economy; Nutritional Enhancement; Drinkable Yoghurt

P41

Optimization of NaDES extraction parameters of polyphenolic compounds from white grape pomace

Silviu Măntăilă*, Nicoleta Balan, Gabriela Râpeanu, Nicoleta Stănciuc*

Dunarea de Jos University of Galati, Faculty of Food Science and Engineering, Department of Food Science, Food Engineering, Biotechnology and Aquaculture, Domnească Street 111, Galati, 800201, Romania

* Corresponding authors: silviumantaila855@gmail.com, Nicoleta.Stanciuc@ugal.ro

Abstract

Current trends in the food industry merge towards a circular economy, including valorization of the related food processing by-products by extraction of bioactive compounds with nutraceutical and food applications. A modern alternative method used for extracting these compounds with health-promoting properties is the use of a natural deep eutectic solvent (NaDES). The increased interest in these types of solvents is due to its low cost, ease of preparation, extraction yield and protection of compounds from plant material, but also due to its eco-friendly properties.
White grape pomace (WGP) is one of the most abundant by-products generated from vinification, having a rich composition in bioactive compounds, such as phenolic acids, flavon-3-ols, flavonols, and many others. The main aim of this study was to test the efficiency and efficacy of a NaDES, consisting of a 1:2:1 molar ratio of choline chloride, lactic acid and water, respectively, by using the Central Composite Design with 3 independent variables (temperature, extraction time and NaDES volume) in order to optimize the extraction of total phenolic compounds (TFC) and total polyphenolic compounds (TPC) from WGP.

According to the regression equation generated for the TFC shows that the volume of NaDES used for ultrasonic extraction has the greatest positive impact on the extraction of phenols from WGP, with the TFC value ranging from 1.62 to 14.94 mg quercetin equivalent/100 g SU.

The use of NaDES extraction to obtain compounds with bioactive properties from WGP represents one of the optimal alternatives to replace traditional organic solvents such as methanol, contributing to the development of sustainable extraction methods and the future use of the optimized extract to obtain high-value products.

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Keywords: circular economy, by-products, eco-friendly, bioactive compounds

P42

Foam-mat convective and infrared drying of blackthorn berries (*Prunus spinosa* L.) puree

Silviu Măntăilă, Gabriel – Dănuț Mocanu*

Department of Food Science, Food Engineering, Biotechnology and Aquaculture, Food Science and Engineering Faculty, „Dunarea de Jos" University of Galati, Domnească Street 111, Galati, 800201, Romania

Corresponding author: Danut.Mocanu@ugal.ro

Abstract

The aim of this work was to determine the optimal conditions for the drying of blackthorn berries (*Prunus spinosa* L.) puree based on the egg albumin (EA) concentrations and drying temperatures, that will target the maximal decrease of drying time and minimal energy consumption. Response surface methodology (RSM) was used to design the experiment. The effects of independent variables such as the EA concentrations (5 and 10%) used as a foaming agent and the drying air temperature (50, 60, and 70°C) were studied by the means of the response variables. In this research, the drying kinetics was evaluated based on the drying time, drying rate, effective moisture diffusivity (D_{eff}) and activation energy (E_a). After drying, the powders were analyzed in terms of bioactive compounds and color. Effective moisture diffusivity varied between $1.04 \cdot 10^{-8}$ and $8.99 \cdot 10^{-9}$ $m^2 \cdot s^{-1}$, with activation energy of 14.1 and 31.23 $kJ \cdot mol^{-1}$ for EA concentration of 5 and 10%, respectively. The results revealed that foam-mat drying method produced a minimum damage on bioactive compounds content and color parameters. The mathematical model, developed using the RSM, provide a good fit for the current data obtained in the study. The foam-mat drying method allowed to obtain a good-quality blackthorn berries powder that can be used as food ingredient.

Keywords: blackthorn berries puree, foam-mat drying, diffusion coefficient, bioactive compounds, color parameters

P43

Physicochemical and sensory evaluation of oatmeal cookies enriched with fresh mint

Corina I. Megyesi[1], Nicoleta G. Hădărugă[1], Ariana B. Velciov[1], Gabriel Bujancă[2], Alexandru Rinovetz[1], Despina Bordean[2], Laura Rădulescu[1*]

[1]Department of Food Science, University of Life Sciences "King Mihai I" from Timișoara, Calea Aradului 119, 300645 – Timișoara, Romania
[2]Department of Food Control and Expertise, University of Life Sciences "King Mihai I" from Timișoara, Calea Aradului 119, 300645 – Timișoara, Romania

*Corresponding author: laura.radulescu@usvt.ro

Abstract

Cookies are one of the world's most popular pastries. They are ready-to-eat, inexpensive and conventional food. Various types of cookies contain high amounts of fat, sugar and calories. Therefore, they do not fit into the rules of a healthy diet. However, cookies have a long shelf life, a

pleasant taste and are accepted as a snack for all age groups. For this reason, they are considered a good product for nutritional enrichment.

Oatmeal cookies are a healthy and nutritious snack, appreciated both for their pleasant taste and for the multiple benefits they offer to the human body.

Oats (*Avena sativa*) are known for their rich nutritional profile, being an excellent source of soluble fiber, protein, vitamins (especially B-complex) and essential minerals such as iron, magnesium and zinc. Due to the high content of beta-glucans, oats help maintain optimal cholesterol levels and support digestive health.

Peppermint (*Mentha spicata*) is appreciated not only for its invigorating aroma, but also for its antioxidant, antimicrobial and digestive properties. The active compounds in mint, such as menthol and flavonoids, have beneficial effects on gastrointestinal health and contribute to a feeling of freshness and vitality.

Based on these benefits, an innovative product was created – oatmeal cookies enriched with mint, which combine the functional properties of the two ingredients to provide a healthy and balanced dessert. The aim of this study was to analyze the sensory, physicochemical and nutritional characteristics of the proposed cookies and to compare the results with similar products available on the market.

Keywords: oatmeal cookies, peppermint, sensory evaluation, physicochemical analysis of cookies, nutritional profile.

P44

Polyphenolic profile and antioxidant potential of *Salvia officinalis* and *Sideritis raeseri* extracts

Ilir Mërtiri*, Mihaela Turturică, Gabriela Râpeanu, Nicoleta Stănciuc

"Dunărea de Jos" University of Galați, Faculty of Food Science and Engineering

*Corresponding author: ilir_mertiri@yahoo.com

Abstract

Salvia officinalis and *Sideritis raeseri* are medicinal and aromatic plant species that belong to the Lamiaceae family. These plants are widely recognized for their beneficial properties in pharmaceuticals, cosmetics, perfumes, pesticides, and as flavoring agents in food.

In this preliminary study the plants, originating from Albania, were extracted using ultrasound-assisted extraction with ethanol 70% (v/v). The hydroethanolic extracts were then characterized spectrophotometrically to determine their total phenolic content, total flavonoid content, and antioxidant activity using the DPPH and ABTS radical screening assays. Additionally, Reversed-Phase High-Performance Liquid Chromatography (RP-HPLC) was employed to analyze the polyphenolic profiles of the samples.

The spectrophotometric characterization revealed that *S. officinalis* exhibited a higher total phenolic content, with an average of 115.73 ± 3.80 mg GAE/g DW. In contrast, *S. raeseri* showed greater total flavonoid content, averaging 11.60 ± 0.39 mg QE/g DW. Regarding antioxidant activity, both plants demonstrated similar potential. From the identified compounds detected in the RP-HPLC characterization, hesperidin showed the highest content in the *S. officinalis* extract, averaging 403.32 ± 0.95 µg/g DW, followed by epigallocatechin with 316.78 ± 0.00 µg/g DW. In the *S. raeseri* extract, cafestol was identified as the compound with the highest content, averaging 6044.74 ± 29.05 µg/g DW, followed by gallic acid with 82.30 ± 0.00 µg/g DW.

The findings in this work encourage the importance of further investigation and the potential application of these medicinal and aromatic plants as an alternative and sustainable source

of natural extracts in various industrial fields.

Keywords: medicinal and aromatic plants, ultrasound-assisted extraction

P45

Mycological load and mycotoxins content in dayry products from the Banat region – Romania

Corina Dana Misca[1,2], Sylvestre Dossa[1], Ersilia Alexa[1], Delia Dumbrava[1*], Mirela Popa[1], Camelia Moldovan[1], Marioara Druga[1], Diana Raba[3], Aurica Breica Borozan[4], Ana Maria Cacior[2]

[1] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Calea Aradului 119, 300645 Timisoara, Romania*
[2] *Misca Medical Center, Timisoara, Romania*
[3] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Engineering and Applied Technologies, Aradului Street 119, 300645 Timisoara, Romania*
[4] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Management and Rural Turism, Calea Aradului 119, 300645 Timisoara, Romania*

*Corresponding author: deliadumbrava@usvt.ro

Abstract

Globally, contamination of dairy products with aflatoxin M1 is a recognized problem, with significant variations between regions. Countries with hot and humid climates, where conditions favor the development of aflatoxin-producing molds, are at a higher risk of contamination.

The purpose of this paper was to analyze the fungal and mycotoxicogenic load of milk and dairy samples from the western area of Romania in the context of products quality monitoring and food safety. For this purpose, 32 samples from centralized milk processing units, respectively 12 from private households, were analyzed regarding the microbiological load and aflatoxin M1 content.

The results shown that the mycological spectrum of milk and dairy products was represented by species belonging to the genera: *Mucor, Aspergillus, Penicillium, Cladosporium* and *Oidium*. The gap of variation of micologicall charge of milk and milk products from milk factories varied between 70-90 CFU/mL for raw milk, 46-80 for butter CFU/g, 38-50 CFU/g for cheese and 4-6 for milk powder, the technological process acts in the sense of decreasing the mycological load, especially when obtaining powdered milk, but also butter and cheese, when this process takes place in dairy factories. When this process is carried out at home, the reduction of the mycological load exists, but it is greatly attenuated.

The variation gap of micological charge of milk and milk products from local households was higher and varied between 120-300 CFU/mL for milk, 90-120 CFU/g for butter and between 140-280 CFU/g for cheese. As for the level of aflatoxin M1, it was identified in values that did not exceed the maximum allowed limits. It was found that milk samples recorded the highest levels of aflatoxin M1, and the distribution of this mycotoxin in dairy products takes place as follows: most of the mycotoxin in milk passes into whey, then into powdered milk, cheese and butter the smallest amount is distributed.

Keywords: aflatoxin M1, milk, butter, cheese

P46

The influence of storage conditions on the mycological load of cereals from the Banat region – Romania

Corina Dana Misca[1,2], Sylvestre Dossa[1], Ersilia Alexa[1], Delia Dumbrava[1], Mirela Popa[1], Camelia Moldovan[1], Alexandru Erne Rinovetz[1]*, Diana Raba[3], Aurica Breica Borozan[4], Ana Maria Cacior[2]

[1] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Calea Aradului 119, 300645 Timisoara, Romania*
[2] *Misca Medical Center, Timisoara, Romania*
[3] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Engineering and Applied Technologies, Aradului Street 119, 300645 Timisoara, Romania*
[4] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Management and Rural Turism, Calea Aradului 119, 300645 Timisoara, Romania*

*Corresponding author: alexandrurinovetz@usvt.ro

Abstract

Self-heating is generally the cause of damage to freshly harvested grains. With the increase in temperature and humidity of the products, the heat developed by them increases, as a result of their respiration process.

The purpose of this paper was to analyze the influence of grain storage conditions on their mycological load. In this regard, samples of wheat and corn that were stored in different conditions of temperature, relative humidity, in open bulk warehouses or using cooling systems were analyzed from the point of view of mycological charge.

The results indicated that the use of grain cooling systems can keep the air conditions at the entrance to the grain basin practically constant compared to the extreme variations of the environmental environment, while in the case of ordinary storage, without cooling, repeated movements of the products are necessary due to the overheating that occurs, as a direct consequence of the appearance of microorganisms of the class of bacteria and fungi, which leads to important depreciations in the quality of cereals. Preservation by cooling cereals, even at higher than usual humidity values, is useful in cereal processing enterprises. The advantages of applying this method are multiple in these situations and are materialized by: safe storage of sprouted or differently ripe grains, safe storage of feed grains with water content of up to 22%, cooling, in the case of bakery cereals with up to 17.5% humidity.

Keywords: corn, wheat, preservation, cooling, fungi

P47

Study Regarding the Healthy and Sustainable Eating Practices Among Teenagers

Maria Mitrofan (Pleșca)[1,2], Ingrid Nicolaescu[1], Ersilia Alexa[1*]

[1] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Calea Aradului 119, 300645 Timisoara, Romania*
[2] *Technological High School for the Food Industry in Timișoara, Romania*

*Corresponding author: ersiliaalexa@usvt.ro

Abstract

Eating healthy and sustainably means choosing foods that support your long-term health while also being beneficial for the environment and the communities that produce them. It is a concept that combines balanced nutrition with responsibility towards the planet, and education for these values should begin at a young age.

A study conducted at the Technological High School for the Food Industry in Timișoara aimed to analyze and evaluate the eating habits and responsible consumption practices of teenagers. The data was collected based on the responses of 92 students who completed a questionnaire on eating and consumption habits, and 71 students who filled out a dietary intake sheet.

The main findings from the analysis of teenagers' eating and responsible consumption habits are:

- Over 15% of students skip breakfast;
- More than half of the students (56%) choose to snack on high-calorie foods between meals (chips, chocolate, chocolate bars, chocolate-filled pastries, cookies, etc.);
- 75% of students do not eat fruit at all or eat at most one piece of fruit per day;
- Over 50% of students do not consume vegetables—cooked, fresh, or in salads;
- 26% of students do not include dairy products in their meals;
- Half of the students listed fast food items such as pizza, sandwiches, burgers, etc., as their main meals;
- Over 50% of students reported consuming soft drinks and energy drinks;
- Among the favorite sweets of the students are: chocolate, chocolate-filled pastries, cream-filled cookies, chocolate bars, ice cream, etc.;
- More than 50% of the surveyed students do not read or rarely read product labels before purchasing;
- Fewer than one-third of the students said they are concerned with reducing food waste;
- Fewer than one-third of students said they choose a healthier or less polluting product, even if it is more expensive.

In conclusion, for young people and teenagers, eating healthily represents a challenge considering that their food choices are often chaotic due to a fast-paced and frequently disorganized lifestyle. Their food choices are primarily based on emotions, cravings, or pleasures rather than real needs. Additionally, the presence of fast food outlets near schools, the lack of consistent health and sustainability education programs, the abundance of advertisements for sensorially appealing (and cheaper) but nutritionally poor products (that can even cause imbalances in the body), are all sufficient reasons for teenagers to become future subscribers to chronic illnesses—heart disease, strokes, cancer, diabetes, obesity, etc.

Keywords: diet, students, food habits

P48

Sage (*Salvia officinalis* L.)-applications in functional foods

Cristina Liliana Mitroi[1*], Nicoleta Gabriela Hădărugă[1,2]

[1]*Department of Food Science, University of Life Sciences "King Mihai I" from Timisoara, Calea Aradului 119, 300645 –Timisoara, Romania*
[2]*Doctoral School "Engineering of Vegetable and Animal Resources", University of Life Sciences "King Mihai I" from Timisoara, Calea Aradului 119, 300645-Timisoara, Romania*

*Corresponding author: cristina.mitroi@usvt.ro

Abstract

Sage is an aromatic plant widely spread in Europe, used for many years in various food preparations, but also in the treatment of several conditions such as ulcers, hyperglycemia, bronchitis, insomnia, dizziness, etc. Due to its bioactive compounds, sage is a good antioxidant, antimicrobial and preservative. In the food industry, *Salvia officinalis* is used to prepare homemade mayonnaise, to improve olive oil, in the composition of some teas, to obtain some salmon products, to prepare some chinese-style sausages, to prepare some chicken meatballs, etc. Natural sage extracts represent a possible substitute for synthetic antioxidants and antimicrobials in foods.

Keywords: sage, functional food, *Salvia officinalis* L, chemical composition

P49

Lamb's lettuce (*Valerianella locusta* L.)-antioxidant activity

Cristina Liliana Mitroi[1*], Nicoleta Gabriela Hădărugă[1,2]

[1]*Department of Food Science, University of Life Sciences "King Mihai I" from Timisoara, Calea Aradului 119, 300645 –Timisoara, Romania*
[2]*Doctoral School "Engineering of Vegetable and Animal Resources", University of Life Sciences "King Mihai I" from Timisoara, Calea Aradului 119, 300645-Timisoara, Romania*

*Corresponding author: cristina.mitroi@usvt.ro

Abstract

Valerianella locusta is a plant with small green leaves, very resistant, originating from the Mediterranean area and which is found in certain areas of the European continent, the northern part of Africa and in America. In Europe, the largest producer is France, which has a percentage of 75% of the world production. Lamb's lettuce as it is also called *Valerianella locusta* has a high nutritional value due to its content in polyphenolic compounds (flavonoids such as rutin, luteolin, kaempferol-3-o-rutinoside and genistein), fatty acids (α-linolenic acid), sterols, phenolic acids (chlorogenic acid), carotenoids. *Valerianella locusta* is also a rich source of vitamins, especially vitamin C, folic acid (vitamin B9) and minerals such as potassium, iron, calcium, phosphorus, etc.

Keywords: *Valerianella locusta* L., chemical composition, antioxidant activity, lamb's lettuce

P50

Asymmetrical curcumin analogue: A mini-review of structural modifications and their biological applications

Alina Mogosanu*, Liliana Cseh

[1] *Romanian Academy. "Coriolan Drăgulescu" Institute of Chemistry, Mihai Viteazu Boulevard 24, Timisoara 300223, Romania*

* Corresponding author: alina.mogosanu23@gmail.com

Abstract

Curcumin, the primary polyphenol in turmeric (*Curcuma longa*), has been historically used in traditional medicine and as a natural food additive. It has also played a role in ancient Chinese and Indian traditional medicine, used to treat infections, injuries, stress, and skin diseases.

In recent years, curcumin has been studied for its multiple biological activities, including for its potent antioxidant, anti-inflammatory, antimicrobial, and anti-tumoral activities, as well as for various food applications. Despite its potential, its poor solubility and limited bioavailability *in vivo* restrict its practical application.To address these limitations, recent efforts have focused on the design and synthesis of new structural analogues and derivatives. These synthetic compounds offer enhanced oxidative stability, tunable physicochemical properties, and improved radical scavenging capacity through selective molecular modifications.

While natural curcuminoids like demethoxycurcumin and bisdemethoxycurcumin are acknowledged for their biological relevance, their structural variability is limited compared to synthetic compounds. Over the past few years, numerous derivatives and analogues of curcumin, both symmetrical and asymmetrical, have been synthesized and tested mainly *in vitro* for a wide range of applications. The biological activity of these compounds has been demonstrated in comparison to natural curcumin. These structural modifications directly influence their antioxidant, antimicrobial, and anticancer potential.

The synthesis typically involves Claisen–Schmidt condensation, an efficient method for obtaining both symmetrical and asymmetrical curcumin derivatives via sequential base-catalyzed reactions. Therefore, the chemical synthesis of new analogues and derivatives is essential to expand the biological activity with compounds better suited for biological applications.

This mini-review gives an overview in the the design, method of synthesys and their biological proprieties of asymmetrical curcumin analogues.

Keywords: Curcumin analogues, Bioavailability, Green synthesis

P51

Identification of some minerals from medicinal plants by X-ray fluorescence method

Diana Moigradean[1*], Mariana-Atena Poiana[1], Liana-Maria Alda[1], Simion Alda[2], Despina-Maria Bordean[1], Daniela Stoin[1], Florina Radu[1], Camelia Moldovan[1], Laura Radulescu[1]

[1]*University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Calea Aradului no. 119, 300645 Timisoara, Romania*
[2] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Engineering and Applied Technologies, Calea Aradului no. 119, 300645 Timisoara, Romania*

*Corresponding author: dianamoigradean@usvt.ro

Abstract

The analytical technique of X-ray fluorescence (XRF) has the capacity to determine the chemical composition of a wide variety of sample types (solids, liquids, slurries and powders). XRF is a widely utilized technique in the domains of quality control in various manufacturing sectors and process monitoring. The aim of this paper is to identified the total content of main macroelements (Ca, K, Mg, P) and microelements (Fe, Mn, Cu, Zn) in five medicinal plants studied: mint (*Mentha piperita)*, chamomile **(***Matricaria Chamomilla*), linden (*Tilia cordata)***,** marigold **(***Calendula officinalis*) and St. John's wort (*Hypericum perforatum*). *Mentha piperita* and *Matricaria Chamomilla* are known as some of the most common medicinal plants. *Mentha piperita* has been known for its pharmacologic and aromatherapeutic properties since ancient times. Chamomile has antimicrobial, anti-inflammatory and anti-allergy properties. The utilization of linden tea in traditional medicine has a long history, with various cultures employing it to address a wide range of health concerns. The marigold plant is characterized by a high concentration of pharmaceutical active ingredients, including carotenoids, flavonoids, glycosides, steroids and sterols, quinines, volatile oils and amino acids. All the samples of medicinal plants come from the native flora from the western area of Romania. Quantitative analysis of dried and ground plants was performed using X-ray fluorescence spectrometry.(X-MET8000, Hitachi, Japan). The results obtained from this study show that the macroelements analyzed are present in medicinal plants in varying quantities. Thus, the study of the elemental composition of some medicinal plants revealed the presence of potassium (K) in high quantity in marigold, calcium (Ca) in linden, magnesium (Mg) in chamomile and phosphorus (P) in St. John's wort. Mint, chamomile and marigold have the highest levels of iron (Fe), while St. John's wort has the highest levels of manganese (Mn), cooper (Cu) and zinc (Zn) in terms of microelements.

Keywords: medicinal plants, macroelements, microelements, X-ray fluorescence

P52

Contributions to exploring the bioactive potential of tomato processing by-products

Diana Moigradean[*], Daniela Stoin, Florina Radu, Laura Radulescu, Ioana-Alina Pop, Mihaela Lacatus, Patricia Tarkanyi, Mariana-Atena Poiana[1,*]

[1] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Aradului Street 119, 300645 Timisoara, Romania*

[*] Corresponding authors: dianamoigradean@usvt.ro; marianapoiana@usvt.ro

Abstract

The processing of raw materials of plant origin has increased considerably in recent years. More than 130 million tonnes of tomatoes are processed annually, resulting in 8 million tonnes of waste and by-products. Plant origin by-products are a natural source of carbohydrates, polysaccharides, proteins, vitamins, minerals, antioxidants and bioactive compounds. The by-product of tomato (*Solanum lycopersicum*) processing consists of a mixture of skins and seeds and is rich in phytochemicals (carotenoids, phenolic compounds and vitamins, etc.) with multiple health benefits. Given its antioxidant and nutritional properties, numerous approaches have been proposed for its valorisation, either in the direction of recovering bioactive compounds with high value and

subsequent use as natural food additives, or conditioned by dehydration under various technological conditions and incorporated as a powder in other food formulations to design products with improved functionality. Two objectives were proposed in this work, such as (1) conditioning the tomato processing by-product by convective drying at a moderate temperature of 60°C (8 h per day for 2 consecutive days) to ensure microbiological, biochemical and chemical stability and to preserve its bioactive potential and (2) assessing the changes occurring in response to drying on antioxidant activity, total phenolic content, lycopene content and ascorbic acid (vitamin C). The by-product from tomato processing constitutes a sustainable plant material, rich in polyphenolic compounds with high antioxidant activity, resulting in considerable quantities, which has been underutilized so far. Although the conditioning process by convective drying led to a decrease in the content of investigated bioactive compounds and total antioxidant activity, the dried by-product showed still high levels of antioxidant characteristics which justifies its reintegration as powder or natural extracts in the food chain.

Keywords: tomato processing by-product, convective drying, antioxidant activity, bioactive compounds

P53

Optimizing pickled carrot recipes by integrating tropical fruits and aromatic vinegars

Andrada-Elena Moise[1], Minodora Tudorache[1], Ioan Custură[1], Ioan Peț[2], Gabriela Berechet[1], Georgiana Magdalena Pîrlea[1], Teofil Ștefan Vlad[1], Elena Gabriela Stan[1], Ionela-Florentina Toma[1*]

[1]University of Agronomic Sciences and Veterinary Medicine, Animal Production Engineering and Management, Production and processing technologies, Marasti Boulevard, no. 61, 011464 Bucharest, Romania
[2]University of Life Sciences "King Mihai I" from Timisoara, Faculty of Animal Resources Bioengineering, Aradului Street 119, 300645 Timisoara, Romania

*Corresponding author: toma.ionela1998@gmail.com

Abstract

The paper proposes the development of innovative recipes for pickled carrots, enriched with tropical fruits and aromatic vinegars, in response to the growing demand for "clean label" products. Six experimental variants were formulated, varying the type of vinegar (wine and rose) and the proportion of mango or pineapple (10–20%). The research aimed at the sensory characterization of the products, by determining the titratable acidity, pH values and by sensory evaluation carried out by a consumer panel. The results showed that all variants fell below the microbiological safety threshold (pH < 4.5), and those with 15% pineapple and wine vinegar obtained the best sensory scores, indicating an optimal balance between acidity and natural sweetness. Formulations with mango, especially at high concentrations, presented lower scores, being associated with an aromatic and visual imbalance. The study highlights the role of ingredients in defining the sensory profile of preserved acidic products and provides a scientific basis for optimizing artisanal recipes, with potential for exploitation in the sustainable food industry.

Keywords: food innovation, consumer acceptability, valorization, processing.

P54

Environmental impact assessment of cheese production: a systematic review of life cycle assessment studies

Adelina Ioana Moja[1], Cristina Canja[1], Vasile Pădureanu[1], Roxana Andreea Munteanu-Ichim[1]*, Gavrilă Calefariu[2]

[1]*Transilvania University, Faculty of Food and Tourism, Street Castelului, no.148, Brasov, Romania*
[2] *Transilvania University, Faculty of Industrial Engineering and Management, Street Univesitatii, no. 1, Brasov, Romania*

Corresponding author: roxana.ichim@unitbv.ro

Abstract

Life Cycle Assessment (LCA) research on cheese manufacturing is increasingly embracing a wider perspective and standardized approaches. Numerous studies indicate a transition from limited gate-to-gate evaluations to comprehensive life cycle analyses (either cradle-to-grave or cradle-to-retail), particularly highlighting traditional and Protected Designation of Origin (PDO) cheeses in countries like Italy, Brazil, and the United States. The choice of allocation method significantly influences these results, with studies showing climate change impacts varying from 6 to 13 kg CO2 equivalents per kg of cheese depending on the allocation approach. Common allocation methods include dry matter content, economic value, and nutritional content, with some studies showing impact variations of up to 64% between methods. Twenty analyses evaluate the impacts of climate change, with milk production contributing to 93.5-99.6% of total impacts in certain instances. Approximately 28.3% of the climate change impacts arise from processing activities (due to energy consumption), while transport contributes 22.5%. Eutrophication and acidification are also significant factors, along with evaluations of water usage, air quality, toxicity, and resource depletion.

Keywords: Cheese production, Life Cycle Assessment, Environmental hotspots, Allocation methods, Climate change impact.

P55

Polymeric nanoparticles for targeted gene delivery for treating Charcot–Marie–Tooth disease

K. Mparkas*, S. Matsia, G. Lazopoulos, A. Salifoglou

Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece

* Corresponding author: kmparkas@cheng.auth.gr

Abstract

In recent years, nanoparticles have become an extremely attractive choice in the fields of biology and medicine. Their main attribute is the encapsulation and targeted delivery of various

drugs and macromolecules, which collectively render it suitable in our case. Furthermore, by controlling particle size, surface properties, and the release of the pharmacological agent, high specificity toward the target and therapeutically optimal conditions can be achieved. The main requirements for such types of nanocarriers are biocompatibility, drug compatibility, and biodegradability. In our case, taking into consideration the nature of the therapeutic plasmid, an appropriately modified PLGA (poly (lactic-co-glycolic acid)) nanoparticle could achieve all of the requirements. PLGA is one of the most commonly and effectively used biodegradable polymers for the development of nanocarriers. The atoxicity of PLGA polymer nanoparticles is attributed to the hydrolysis of lactic and glycolic acid, both products of the Krebs cycle.[1] Furthermore, to enhance the stability and control the size of the nanoparticles, PVA (polyvinyl alcohol) was added as an emulsifying agent.[2]

To achieve specificity toward the target cells (Schwann cells), a "guiding rod" was attached to the surface of the nanoparticle. To that end, TMPRSS5 (Transmembrane protease serine 5), a protein expressed preferentially in Schwann cells compared to different tissue cells was selected.[3] To target this transmembrane protein, surface modification should provide specificity between the TMPRSS5 protein and the guiding rod. In that respect, two alternatives were found that suited our needs. The first one involved a well-defined peptide. The specific peptide has been shown to bind firmly to the TMPRSS5 protein, in a short timeframe under physiological temperature conditions.[4] The second alternative involved conjugation of the surface of the nanoparticle to an RNA-Aptamer. Aptamers provide a huge range of flexibility towards the targeted protein, since they are specifically engineered to firmly bind to the protein.[5]

Either way, the surface of the nanoparticle should be activated so that the guiding rod can seek and bind to it. To achieve that, EDC (ethyl(dimethylaminopropyl)carbodiimide) – NHS (N-hydroxysuccinimide) coupling was employed. The coupling modification targets binding to the carboxylic acid terminus of the PLGA nanoparticles, and the peptide is bound to the surface-modified nanoparticle through the N-terminus of the protein.[6,7] Following the design of the nanoparticle, the next step included the synthesis and validation of the proposed nanoparticle, using commonly used techniques in nanoparticle research, such as Fourier Transform Infrared Spectroscopy (FT-IR), Dynamic Light Scattering (DLS), particle size and shape analysis using Laser obscuration (Ambi value), Confocal Microscopy, and Transmission Electron Microscopy (TEM). Finally, the produced and characterized nanoparticles were lyophilized and introduced to in vivo evaluation experiments, thereby manifesting their merit and therapeutic potential in neurodegeneration.

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P56

The importance of radish, brocolli and kale sprouts in bakery

Christine Neagu (Dragomir)*, Ersilia Alexa

Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timisoara, Calea Aradului No. 119, 300645 Timisoara, Romania

*Corresponding author: christine.neagu@usvt.ro

Abstract

Cruciferous vegetables, part of the Brassicaceae family, are widely recognized for their health benefits and nutritional richness. These vegetables, including radish, broccoli, and kale, are commonly consumed fresh or cooked, but their sprouts offer an even greater concentration of bioactive compounds. Rich in vitamins, minerals, and antioxidants, sprouts of these cruciferous plants have gained attention for their potential health-promoting properties, such as reducing the risk of chronic diseases.

In recent years, the incorporation of radish, broccoli, and kale sprouts into bakery products has become a promising area of research and development. These sprouts are particularly valued for their ability to enhance the nutritional profile of baked goods while contributing to their flavor and texture. The high content of glucosinolates, fiber, and antioxidants found in these sprouts can provide additional health benefits to bakery products, such as improving digestion, supporting immune function, and offering anti-inflammatory effects.

Studies have shown that the addition of sprouts from cruciferous vegetables to bakery items like bread, muffins, and crackers can not only improve their nutritional value but also introduce unique flavors that appeal to health-conscious consumers. By integrating these nutrient-dense ingredients into everyday baked goods, manufacturers can offer innovative products that meet the growing demand for functional foods.

In conclusion, the use of radish, broccoli, and kale sprouts in bakery products represents an exciting advancement in the food industry, offering enhanced nutritional benefits and novel culinary applications. Further research into the optimal processing and incorporation techniques will help unlock their full potential, providing a valuable addition to modern bakery products.

Keywords: Cruciferous vegetables, Brassicaceae family, bakery

P57

Exploring the nutritional benefits of pome fruits compotes

Monica Negrea*, Calin Jianu, Ileana Cocan, Ersilia Alexa, Daniela Stoin, Mihaela Cazacu

Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timisoara, Calea Aradului No. 119, 300645 Timisoara, Romania

*Corresponding author: monicanegrea@usvt.ro

Abstract

This study presents a comprehensive compositional analysis of apple, quince, and pear compotes, focusing on key physicochemical and nutritional parameters. The research evaluates

moisture content, ash content, sugar concentration, total acidity, vitamin C levels, and total polyphenols using standardized analytical methods. To assess the composition of apple, quince, and pear compotes, the following analytical techniques were employed: Moisture Content: Gravimetric method at 103 ± 2°; Ash Content: Calcination at 550°C; Sugar Content: Refractometric determination; Total Acidity: Titrimetric method; Vitamin C: Volumetric method using 2,6-dichlorophenolindophenol and Total Polyphenols: Folin-Ciocalteu method.

The results revealed significant differences in the composition of the three fruit types. Pear compote exhibited the highest moisture content (83.1%), while quince compote had the lowest (79.8%), which contributed to noticeable textural variations. Quince compote also demonstrated the highest ash content (0.5%) and sugar concentration (14.2%), indicating a richer mineral and carbohydrate profile compared to the other compotes. In terms of acidity, quince compote exhibited the highest citric acid equivalent (0.75 g/L), contributing a distinctive tartness to its flavor profile. Vitamin C content was highest in quince (8.6 mg/100g), emphasizing its potential antioxidant properties. Furthermore, quince compote showed the highest polyphenol concentration (181.48 mg GAE/100g), followed by pear (158.85 mg GAE/100g) and apple compote (120.89 mg GAE/100g), reinforcing quince's superior antioxidant capacity.

The findings align with previous research on pome fruits, which are known for their rich nutrient profiles, including high levels of vitamins, minerals, and dietary fiber. Studies have highlighted the health-promoting properties of pome fruits, particularly their high antioxidant content, which includes polyphenols, flavonoids, and vitamin C (Basu et al., 2010; Chung et al., 2016). The processing of pome fruits into compotes helps preserve these beneficial compounds, which are crucial for combating oxidative stress and supporting immune function (Li et al., 2018). Quince, for example, is often recognized for its high concentrations of polyphenols and vitamin C, making it a particularly potent source of antioxidants (Sadeghi et al., 2020).

These findings underscore the importance of incorporating pome fruit compotes into the diet, as they offer significant health benefits due to their antioxidant and anti-inflammatory properties. This study highlights the nutritional value and potential health benefits of fruit-based preserves, particularly in terms of their antioxidant content, which plays a crucial role in reducing oxidative stress and supporting overall health.

Keywords: apple, quince, pear, compote, physicochemical properties, polyphenols, vitamin C, acidity.

P58

Hybrid dinuclear vanadium complexes with natural substrates as potential therapeutic agents in human pathophysiology

A. Papadopoulos*, S. Matsia, A. Salifoglou

Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece

Corresponding author: anastasmp@cheng.auth.gr

Abstract

The therapeutic versatility of vanadium has rendered it a compelling element in developing metallopharmaceuticals, especially in oncology and metabolic disorders. A diverse array of its binary and ternary complexes has been studied for their multifunctional biological activities, including the catalytic transformation of small molecules and biomimetic behavior in relevance to insulin. Notably, vanadium (IV) species, coordinated to endogenous ligands like α-

hydroxycarboxylic acids, have shown promising hypoglycemic effects by enhancing insulin responsiveness and mitigating hyperglycemia, both key characteristics of Diabetes Mellitus type 2[1-3] Concurrently, vanadium-based compounds exhibit notable cytotoxic effects on cancer cells through diverse mechanisms, such as the induction of DNA damage, disruption of cellular signaling pathways, modulation of xenobiotic-metabolizing enzymes, and apoptosis mediated by oxidative stress. Collectively, these complex biochemical interactions underscore the growing significance of vanadium coordination compounds as potential therapeutic agents in addressing intricate human pathologies[4]

Despite encouraging preclinical results, the development of vanadium-based therapeutics has faced obstacles due to ambiguous mechanistic pathways, safety margins, and pharmacokinetic and pharmacodynamic properties. These gaps in comprehension have restricted their advancement beyond initial clinical evaluations. To tackle this issue and acknowledge the extensive pharmacological potential, inherent in vanadium coordination chemistry, our research group has initiated a systematic exploration of vanadium complexes with α-hydroxycarboxylic acid ligands. This strategy seeks to delineate favorable therapeutic profiles, enhance biological activity, and address essential parameters necessary for clinical viability. In pursuit of novel vanadium-based therapeutics, we synthesized and isolated a series of dinuclear vanadium complexes with mixed-valence V(III,IV) and V(IV,IV) states. The V(III,IV) complex was stabilized through coordination with citric acid via three synthetic approaches, including oxidation and reduction. On the other hand, the V(IV,IV) species contained tartaric acid as a bridging ligand between the vanadium centers. We conducted comprehensive structural and electronic characterization, using X-ray crystallography, FT-IR, UV-Vis spectroscopy, magnetic susceptibility measurements, and EPR spectroscopy. The results reveal distinct speciation patterns across three vanadium oxidation states, with the V(III) component highlighting the potentially synergistic roles of lower-valent vanadium species in biologically active metallodrugs.

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P59

Effect of high-methoxyl pectin dose on the functional properties of strawberry and sour cherry jam

Ioana-Alina Pop[1], Diana Moigradean[1], Delia Dumbrava[1], Camelia Moldovan[1], Mirela Popa[1], Marioara Druga[1], Sofia Popescu[1], Aurica Borozan[2], Diana Raba[3], Laura Radulescu[1], Mariana-Atena Poiana[1,*]

[1] University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Aradului Street 119, 300645 Timisoara, Romania
[2] University of Life Sciences "King Mihai I" from Timisoara, Faculty of Engineering and Applied Technologies, Aradului Street 119, 300645 Timisoara, Romania
[3] University of Life Sciences "King Mihai I" from Timisoara, Faculty of Management and Rural Turism, Calea Aradului 119, 300645 Timisoara, Romania

[*] Corresponding author: marianapoiana@usvt.ro

Abstract

The study presents aspects of the impact of high-methoxyl pectin (HMP) dose on antioxidant properties and bioactive compounds in strawberry and cherry jam stored for 0, 2 and 4 months at 20°C. Jam formulas were prepared with high-methoxyl pectin (Ceampectin MRS 4610) in doses of 0.4%, 0.7% and 1% relative to the quantity of fruit processed, the HMP being indicated for obtaining jam with a total soluble solids content of more than 60°Brix. The antioxidant capacity was determined by FRAP (Ferric Reducing Antioxidant Power) assay, the total polyphenol content by Folin Ciocalteau method and the total monomeric anthocyanin content by the pH differential method. There were considerable differences in the content of the investigated bioactive compounds both as a result of processing and storage. The obtained results show that thermal processing of the fruit had a higher impact of decreasing the content of bioactive compounds compared to jam storage. The values obtained for FRAP did not show a massive decrease, suggesting that the polymeric forms resulting from the polymerization reactions of anthocyanin compounds exhibit antioxidant properties, thus compensating for the loss of antioxidant capacity due to the degradation of monomeric anthocyanin compounds. The investigated items gradually increased with the pectin dose in the jam recipe. Jam samples with the highest pectin level (1%) showed the highest FRAP values and bioactive compounds content. Although some losses of the studied characteristics are observed, our data suggest that the jam obtained by thermal processing of strawberries and sour cherries still represents an important source of bioactive compounds. Through selective processing methods, the jams can preserve to a considerable extent the functional properties of the originating fruit. Knowledge of these changes makes it possible both to predict the functional quality of the jams produced and to assess the impact of the technology applied.

Keywords: strawberry jam, sour cherry jam, high-methoxyl pectin, bioactive compounds, antioxidant properties

P60

Impact of replacing cocoa with carob and rosehip powder on the sensory perception of chocolate

Ioana-Alina Pop, Diana Moigradean, Florina Radu, Daniela Stoin, Despina-Maria Bordean, Ersilia Alexa, Mariana-Atena Poiana*

University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Aradului Street 119, 300645 Timisoara, Romania

* Corresponding author: marianapoiana@usvt.ro

Abstract

A key challenge in today's food industry is the formulation of innovative chocolate products that improve nutritional properties and sensory attributes by incorporating unconventional plant materials rich in high-value phytochemicals, while remaining economically sustainable. This study investigates changes in the sensory perception of chocolate by partially replacing cocoa with carob powder (CP) and rosehip powder (RP) as unconventional plant-derived materials rich in high-value phytochemicals. For this purpose, cocoa was replaced (w/w) by 10%, 20%, 30% and 40% CP, then by a mixture of 30% CP and 10% RP, 20% CP and 20% RP, 10% CP and 30% RP, and 40% RP, respectively. The chocolate formulas were prepared under laboratory conditions according to a manufacturing recipe applied on a small scale. The designed products were rated by twenty (20) trained assessors for sensory characteristics, including appearance, texture (mouthfeel), taste, flavor

and overall acceptability on a 5-point hedonic scale. Changes in sensory attributes were assessed in relation to a control chocolate sample containing unsubstituted cocoa. Results showed that changes in the sensory perception of chocolate, in particular in terms of appearance, taste and texture, are influenced by both the materials used as cocoa substitute and the level of substitution. The highest overall acceptability was recorded for chocolate formula fortified with 30% CP and 10% RP. Our research suggests that the partial replacement of cocoa with unconventional plant-derived materials, such as CP and RP, is a technological option for diversifying the range of chocolate products. This approach could also be an attractive sustainable solution to obtain chocolate formulations with sensory properties appreciated by consumers as well as enriched with high-value phytochemicals.

Keywords: carob powder, rosehip powder, chocolate, cocoa substitutes, sensory attributes

P61

The valorization of some lipid fractions from oleaginous fruit kernels and oilseeds - review

Viorica Mirela Popa[1*], Ersilia Alexa[1], Aurica Breica Borozan[2], Delia Gabriela Dumbrava[1], Corina Dana Misca[1], Camelia Moldovan[1], Mariana Atena Poiana[1], Diana Nicoleta Raba[3], Petru Bogdan Radoi[1], Ducu Sandu Ștef[1]

[1] University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Aradului Street 119, 300645 Timisoara, Romania
[2] University of Life Sciences "King Mihai I" from Timisoara, Faculty of Engineering and Applied Technologies, Aradului Street 119, 300645 Timisoara, Romania
[3] University of Life Sciences "King Mihai I" from Timisoara, Faculty of Management and Rural Turism, Calea Aradului 119, 300645 Timisoara, Romania

* Corresponding author: mirelapopa@usvt.ro

Abstract

The review analyzes in depth the remarkable potential of the valorization of lipid fractions extracted from the oil seeds of different fruits, opening a fascinating horizon for obtaining oils with unique properties. The study explores innovative extraction and refining methods, highlighting their impact on the fatty acid composition, the content of bioactive compounds and, consequently, on the final quality of the oils.

Particular emphasis is placed on the detailed characterization of the lipid profiles specific to each type of kernel, highlighting the impressive diversity of saturated, monounsaturated and polyunsaturated fatty acids, as well as the presence of valuable compounds such as tocopherols, sterols and carotenoids. The review analyzes in detail the potential applications of these oils, from the food and nutraceutical industries to cosmetics and pharmaceuticals, highlighting their nutritional, antioxidant and functional benefits.

In addition, the study addresses the challenges and opportunities related to the sustainability of valorization processes, including waste management issues and environmental impacts. The conclusions of the review underline the importance of continued research to optimize extraction and refining methods in order to obtain high quality oils with significant added value from often underestimated natural resources.

Keywords: vegetable oils, unconventional, fatty acids, extraction methods

P62

Nutritional valorisation of birch sap

Sofia Popescu[1*], Maria Stanciugelu[2,3], Patricia Tarkanyi[1], Mariana Atena Poiana[1], Luminita Pirvulescu[1], Florina Radu[1], Ariana Velciov[1], Lia Rotariu[1], Antoanela Cozma[1], Despina Bordean[1]

[1]*University of Life Sciences "King Mihai I" from Timisoara, 300645, Timisoara, Romania*
[2] *"Lucian Blaga" University of Sibiu, Sibiu, 550012, Romania*
[3] *Brukenthal National Museum, Natural History Museum, Sibiu, Romania*

Corresponding author: sofiapopescu@usvt.ro

This paper explores the nutritional and functional potential of birch sap (Betula pendula), as well as its integration into modern food products. Birch sap is a natural liquid obtained by pricking and perforating the tree trunk in early spring, and it is rich in minerals (such as calcium, potassium, and magnesium), antioxidants, organic acids, and bioactive compounds.

This study highlights both the traditional uses of birch sap—as a spring tonic or natural remedy and current trends in its utilization in innovative products, such as functional beverages, syrups et al.

Integrating birch sap into the food industry represents a sustainable opportunity, offering economic benefits for local communities and the potential to develop healthy, innovative food products.

Keywords: *Betula pendula, birch sap, bioactive compounds, nutritonal valorization*

P63

Valorising birch sap: From tradition to innovation

Sofia Popescu[1*], Maria Stanciugelu[2,3], Patricia Tarkanyi[1], Mihaela Lacatus[1], Lia Rotariu[1], Florina Radu[1], Ariana Velciov[1], Antoanela Cozma[1], Anisoara Ienciu[1] Despina Bordean[1]

[1]*University of Life Sciences "King Mihai I" from Timisoara, 300645, Timisoara, Romania*
[2] *"Lucian Blaga" University of Sibiu, Sibiu, 550012, Romania*
[3] *Brukenthal National Museum, Natural History Museum, Sibiu, Romania*

Corresponding author: sofiapopescu@usvt.ro

Abstract

This paper aims to explore the economic and ecological potential of birch sap (Betula pendula), highlighting its transition from traditional use to applications in modern industries.

In Romania, especially in mountainous and hilly areas, birch is a common species, but the use of its sap remains limited. As traditional forestry practices face increasing criticism, birch sap valorization offers a sustainable economic alternative.

This sap can be processed into syrup or alcoholic beverages, and small-scale production could represent a significant source of income for birch forest owners.

As interest in natural products grows, recent research has explored the use of birch sap in various industries. For example, birch sap has been used as a solvent and a source of bioactive compounds in the preparation of edible films

The paper emphasizes the importance of integrating traditional knowledge with technological innovations to harness the full potential of birch sap. This approach not only supports the economic development of local communities but also contributes to forest conservation and promotes a sustainable lifestyle.

Keywords: Betula pendula, birch sap, bioactive compounds

P64

Ecotoxicological Assessment of Tarragon Aqueous Extract and Essential Oil on Lemna minor

Andrijana Pujicic[1], Bianca-Vanesa Agachi[2], Constantina-Bianca Vulpe[2], Adriana Isvoran[1]

[1]*Department of Biology, West University of Timișoara, 16 Pestalozzi, 300115 Timisoara*
[2]*Department of Chemistry, West University of Timișoara, 16 Pestalozzi, 300115 Timisoara*

*Corresponding author: adriana.isvoran@e-uvt.ro

Abstract

The aquatic ecotoxicity of tarragon (*Artemisia dracunculus*) aqueous extract and commercial essential oil was evaluated on Lemna minor (duckweed) through a growth inhibition test. Culture media served as the negative control (C-), and zinc chloride (0.5%) was used as the positive control (C+). The aqueous extract was tested in six dilutions, alongside the undiluted form. For the essential oil, seven different volumes were tested, with mineral oil (C MO) as the control, where the oil droplets floated on the aqueous medium. The aqueous extract only caused a significant reduction in frond number at the undiluted concentration, suggesting that the absence of culture media may have contributed to the observed effect. In contrast, all tested volumes of the essential oil resulted in a decrease in frond number, with the lowest volume (0.5 µL) inhibiting growth by 50% compared to the negative control. Higher volumes of the essential oil caused a more pronounced reduction in frond number, emphasizing the potential toxicity of tarragon oil. The level of inhibition observed in the highest volumes was comparable to the effect of the mineral oil control. The lowest tested volume (0.5 µL) was also used to assess the biochemical effects on Lemna minor, including chlorophyll content, concentrations of reducing sugars and proteins, and catalase activity as an indicator of oxidative stress. These findings indicate the potential ecotoxicological risks associated with tarragon essential oil in aquatic systems.

Keywords: Tarragon, Lemna minor, Ecotoxicity, Essential oil, Biochemical parameters

P65

Proximate Composition, Antioxidant Activity and Sensory Properties of Fortified Avocado Pulp Yogurt

Florina Radu[1], Mariana-Atena Poiana[1], Iuliana Popescu[2*], Diana Moigradean[1], Bogdan Radoi[1]

[1] *University of Life Sciences King 'Mihai I' from Timisoara, Faculty of Food Engineering, Department of Food Technologies, Calea Aradului 119A, 300645, Romania*
[2] *University of Life Sciences King 'Mihai I' from Timisoara, Faculty of Agriculture, Department of Soil Sciences, Calea Aradului 119A, 300645, Romania*

*Corresponding author: iuliana_popescu@usvt.ro

Abstract

Yogurt is a fermented food obtained by milk culturing with thermophilic starter cultures (*Lactobacillus bulgaricus* and *Streptococcus thermophilus* lactic bacteria). Avocado, a well-known tropical fruit, contains phytochemicals and bioactive compounds, including dietary fiber, phenolic compounds, vitamins B and E, and carotenoids, which positively impact human health. The aim of this research is to study the effect of addition of avocado pulp in yoghurt. The obtained 4 variants coded C (0%), I (5%), II (7.5%) and III (15%) of avocado incorporated yoghurt were manufactured in laboratory. Chemical composition, pH, titrable acidity, syneresis, phenolic estimation, total antioxidant activity and sensory characteristics of yogurt fortified with avocado (*Persea Americana* Mill) pulp were determined in the present study. The yogurt samples with the highest avocado pulp content had approximately 2.5-fold higher total phenolic content determined by the Folin- Ciocalteau method and 3-fold higher antioxidant capacity evaluated as DPPH• and ferric reducing antioxidant power compared to that of the control. Avocado pulp incorporation had significantly increased the ash (0.31- 0.48%), fat (2.49- 4.13%), total solids (12.49- 19.53%), solid no fat content (9.89- 15.33%) ($p < 0.05$) and decreased the values of serum separation. The pH and acidity (%) of control sample C were found to be 4.54; 1.12%, while for the fortified yogurt samples the values varied between 4.60 to 4.67, and 0.70 to 0.95%, respectively. After sensory evaluation, yogurt with 15% avocado pulp added scored highest for overall acceptability, but there was no significant difference for color and texture among 3 treatments (p values>0.05). It was found that consuming fortified yogurt with avocado pulp could contribute to improving the nutritional value, antioxidant capacity of this assortment of dairy product and may enhance polyphenols with the potential to exert synergistic effects on human health.

Keywords: Persea americana Mill pulp, phenolic compounds, antioxidants, proximate composition, overall acceptability, functional dairy product

P66

Hurdle Technology: A Novel Approach for Boosting Food Safety and Shelf-life

Florina Radu[1], Mariana-Atena Poiana[1]*, Iuliana Popescu[2*], Diana Moigradean[1], Daniela Stoin[1*]

[1] *University of Life Sciences King 'Mihai I' from Timisoara, Faculty of Food Engineering, Department of Food Technologies, Calea Aradului 119A, 300645, Romania*

[2] *University of Life Sciences King 'Mihai I' from Timisoara, Faculty of Agriculture, Department of Soil Sciences, Calea Aradului 119A, 300645, Romania*

* Corresponding authors: danielastoin@usvt.ro, marianapoiana@usvt.ro

Abstract

All foods degrade in a longer or shorter period of time from the date of manufacture or preparation, losing their initial characteristics, thus becoming unfit for consumption and even dangerous for human health and life. Food degradation manifests itself on several levels, namely: food aging, a process as a result of which food can lose part of the nutritional value and sensory characteristics it has in its fresh state; food spoilage, the process by which food acquires an abnormal appearance and smell; food contamination, a process caused by external agents, such as: bacteria, molds. The most important causes that cause food degradation are: physical factors (light, heat); chemical factors (the presence of oxygen and water); biological factors (microorganisms and enzymes). In order to prevent food spoilage phenomena caused by biological factors, it is necessary to act on the factors that favor their activity, namely: temperature, pH, presence of water, presence of oxygen. This article discusses the possibility of applying the combined use of several preservation methods, also known as hurdle technology, at optimal levels to inhibit microorganisms without compromising food quality. Also, the article reviews some research studies regarding the application of this technology in fruits, meat, fish and dairy industry Different preservation techniques such as heat treatment, drying, freezing, addition of plant extracts as preservatives, salting, pH lowering can be combine to emerge more synergistic effects, more reduction of pathogens along with increasing shelf life, organoleptic properties and foodstuff qualities. The most known factors (hurdles) used for food preservation are:1. high/low temperature; 2. reduce water activity; 3. Increased acidity; 4. reduced redox potential; 5. additives; 6. competitive flora. The application of hurdle technology is becoming more acceptable in the field of food safety in both developed and developing countries.

Keywords: Hurdle technology, food degradation, food preservation, additives, hurdle factors, food stability

P67

Effects of the quality of commercial organic flours on digestive bakery products obtained through food biotechnologies

Steluța Radu*

University of Life Sciences ``Ion Ionescu de la Brad`` Iași, Mihail Sadoveanu alley no. 3, 700490 Iasi, Romania

*Corresponding author: *stelaradu2010@yahoo.com*

Abstract

In Romania and in the European space, bakery processing companies process organic flours. It can be seen that the business environment tends to adapt to the needs of modern consumers in order to generate bakery products obtained through biotechnologies beneficial to the consumer's health. Thus, this research experiment aimed to identify the sensory, physical, chemical and microbiological characteristics of innovative bakery assortments, obtained from biotechnological recipes that used organic flour certified by the manufacturer as raw materials. Adapting the business environment to modern consumption trends, organic food projects the future of processors in the field of milling and bakery.

The laboratory experiments resulted in four bread recipes, which used white flour T650, black flour T1200, flour obtained from a mix of nutritional flours, and dietary flour, certified organic. The yeasts and probiotic stimulators used to improve the quality of the digestive bread assortments were selected by testing them in the laboratory. The results obtained related to the sensory qualities are significantly better than those found in classic assortments, and the physical characteristics volume had values between 510-650.4 cm^3/100 g, porosity, being 75.6-85.7% in all innovative and studied recipes. Regarding the use of probiotics, their effects were closely related to the organic flour used.

Keywords: organic flours vs digestive bakery products

P68

Extraction of sweetening substances from Iris Germanica white and antioxidant effects

Steluța Radu*

University of Life Sciences ``Ion Ionescu de la Brad`` Iași, Mihail Sadoveanu alley no. 3, 700490 Iasi, Romania

*Corresponding author: stelutaradu2010@yahoo.com

Abstract

The experimental research aimed to extract some sweeteners from Iris Germanica White and establish the sweetening power of the extracts obtained. The extraction was done in water and alcohol, then the extracts were obtained in powder form. The soluble dry matter was determined, as well as the level of antioxidants.

As a result of the experiment, 6 liquid and solid extracts were obtained with a significant sweetening power, with a glucose level ranging between 23-40 mg/100 g glucose and 23-42.7

mg/100 g invert sugar. The importance of the experiment is major for testing the extracts for the glycemic index in the case of food products intended for diabetic diets.
Another nutritional aspect is related to the cumulative digestive effect between sugar that is slowly assimilated and the antioxidant substances by the human metabolism.

Keywords: innovation of sweeteners from Iris Germanica White

P69

Study on the traditionality of the product Diana of Caransebeș Cake

Bogdan Rădoi[1*], Diana Vârtic[1], Mihaela Cazacu[1], Delia Dumbravă[1], Diana Veronica Radu[1], Mădălina Calotă[1], Camelia Moldovan[1], Corina Dana Mișcă[1], Alexandru Rinovetz[1], Viorica-Mirela Popa[1], Ramona Mîndru-Hegheduș[1], Gabriel Mîndru-Hegheduș[1], Teodor Ioan-Trașcă[1,2]

[1] Faculty of Food Engineering, University of Life Sciences" King Mihai I" from Timișoara, Calea Aradului 119A, 300645, Romania
[2]*University of Agronomic Sciences and Veterinary Medicine in Bucharest, 59 Mărăşti Boulevard, District 1, 011464, Romania*

[*]Corresponding author: bogdanradoi@usvt.ro

Abstract

This study on the traditionality of Diana de Caransebeș cake should investigate in detail the history, ingredients, preparation methods, cultural and social context, sensory analysis and documentation of the cake. The goal is to determine the degree of traditionality of the cake and to identify ways to preserve and promote this local value. Key elements of the study are history of the cake, origin, evolution, spread and association with local events, ingredients and preparation methods (traditional ingredients and their origin), traditional versus modern preparation methods, regional or family variations, cultural and social context (cultural significance and role in local traditions), social practices and the role in community assemblies, passing on tradition from one generation to the next, sensory analysis (taste profile and comparison with modern variants), regional or family variations, cultural and social context (cultural significance and role in local traditions, social practices and the role in community assemblies, passing on tradition from one generation to the next. Sensory analysis (taste profile and comparison with modern variants, consumer perception through surveys and interviews). Documentation and preservation (complete documentation of the traditional recipe and identification of local initiatives to preserve the tradition).

Research methods (archival research, interviews with locals and chefs, opinion polls, sensory analyses, observations at local events). This study will contribute to the preservation and promotion of Diana cake as part of the culinary heritage of Caransebeș.

Keywords: traditional ingredients, taste profile, surveys and interviews

P70

Designing the documentation for the traditional product "CheeseCake Miruna of Botoșani"

Bogdan Rădoi[1*], Miruna Pînzariu[1], Mihaela Cazacu[1], Delia Dumbravă[1], Diana Veronica Radu[1], Camelia Moldovan[1], Corina Dana Mișcă[1], Ileana Cocan[1], Mădălina Calotă[1], Viorica-Mirela Popa[1], Ramona Mîndru-Hegheduș[1], Gabriel Mîndru-Hegheduș[1], Teodor Ioan-Trașcă[1,2]

[1] *Faculty of Food Engineering, University of Life Sciences" King Mihai I" from Timişoara, Calea Aradului 119A, 300645, Romania*
[2]*University of Agronomic Sciences and Veterinary Medicine in Bucharest, 59 Mărăşti Boulevard, District 1, 011464, Romania*

[*]Corresponding author: bogdanradoi@usvt.ro

Abstract

Documenting a traditional product such as "CheeseCake Miruna of Botoșani" is essential to preserve its culinary heritage. A summary of the key aspects to consider are main aspects as: regional identity which emphasizes the connection with Botoșani county, highlighting the local traditions of dairy farming and their importance in the quality of the cheesecake, document the specific types of cheese used, if they are local varieties, traditional techniques that captures cooking methods passed down from generation to generation, including baking techniques and specific utensils, document the preparation rituals, if any, explore the role of cheesecake in local celebrations, family gatherings, and everyday life, document associated customs and traditions, origin of ingredients (if the ingredients come from local sources, document their origin). This adds value and authenticity to the product. Recipe documentation that provides a detailed recipe, but protects trade secrets, includes traditional measurements and techniques. Document recipe variations, visual documentary: uses high-quality photos and videos, present the cheesecake in its traditional environment, includes images of the ingredients and the Botosani region. Information for consumers that provides clear instructions for storage, serving and handling. Includes allergen information and nutrition facts. Provides information in romanian and other relevant languages. Preservation and promotion: documents efforts to preserve the traditional recipe and promote cheesecake. Includes participation in local festivals and partnerships with tourism organizations. Practical Considerations: consider the target audience (local consumers, tourists, culinary enthusiasts). Documentation format, options: printed brochures, online articles, video documentaries, digital recipes. Collaboration: collaborate with local historians, chefs, and community members for accuracy and authenticity. By following these guidelines, a comprehensive and valuable documentation of "CheeseCake Miruna of Botoșani" can be created.

Keywords: local consumers, tourists, culinary enthusiasts, traditional product

P71

Sensory and physico-chemical characterization of Brie cheese

Laura Rădulescu, Ersilia Alexa, Ariana Bianca Velciov, Diana Moigrădean, Corina Iuliana Megyesi, Gabriel Bujancă, Patricia Tarkany, Despina-Maria Bordean*

Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timișoara, Calea Aradului 119A, 300645, Romania

*Corresponding author: despina.bordean@gmail.com; despinabordean@usvt.ro

Abstract

This article reports on the comparative analysis of Brie cheese wich was prepared using a different concentration for the starter culture and how this concentration influences the organoleptic and physicho-chemical characteristics of the final product. Brie cheese was prepared using 3.5% fat whole milk, production starter culture, mold spore culture, natural rennet (chymosin), calcium chloride and salt. A starter culture of *Streptococcus lactis* and *Streptococcus diacetylactis* and a sporulated culture of *Penicillium candidum* white mold were used for inoculation, with a 2% yeast concentration. For sensory analysis, the samples were brought to a temperature of 15-20°C and evaluated after 45 days of ripening. The appearance, color, consistency, odor and taste were sensory evaluated for three different samples using with a starter culture in a proportion of: 0.4%, 0.5% and 0.6%. The physico-chemical determinations of Brie cheese samples: moisture, fat content, fat content in dry matter, salt content, titratable acidity and pH were measured to characterize and evaluate the quality of the final product.

Keywords: cheese, mold, ripening cheese, white mold, white mold ripened cheese

P72

Quality study of homemade sausages with rosemary smoked using plum wood.

Laura Rădulescu, Ileana Cocan, Ariana Bianca Velciov, Despina-Maria Bordean, Mariana-Atena Poiană, Maria Drugă, Alexandru Rinovetz, Mihaela Lăcatuș, Corina Iuliana Megyesi[1]*

Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timișoara, Calea Aradului 119A, 300645, Romania

*Corresponding author: corina.megyesi@usvt.ro

Abstract

Homemade smoked sausages are a beloved culinary preparation in Romanian culture, being obtained through a series of technological stages, from choosing the meat, grinding and seasoning it, to filling it into membranes and smoking it. In the present work, the aspects analyzed had as their main purpose the obtaining of an assortment of homemade smoked sausages, using pork (80%) and bacon (20%) as raw materials. The obtained samples were analyzed from a physico-chemical and sensory point of view, following their characteristics and their classification within the standard quality parameters. The particularity of the preparation consists in the addition of rosemary in addition to the classic spices: salt, pepper, paprika and the use of plum wood sawdust for smoking

the sausages. Rosemary is one of the most popular aromatic plants and dominates the list of natural antioxidants used in the food industry, having better performance compared to synthetic antioxidants. Smoking with plum wood gives the sausages a slightly reddish color, very pleasant from an olfactory point of view and increases the shelf life of the product.

Keywords: meat, smoked product, aromatic herbs, antioxidants, culinary preparation

P73

Development of functional bakery products based on sunflower meal

Alexandru Rinovetz[1]*, Christine Neagu[1], Sylvestre Dossa[1], Daniela Stoin[1], Adina Brinzeu[2]

[1] *University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Calea Aradului 119, 300645, Romania*

[2] *S.C.PROSPERO SRL, Luncani 24, Timisoara, Romania*

*Corresponding author: alexandrurinovetz@usvt.ro

Abstract

The purpose of this work was to develop a functional bakery product by capitalizing on sunflower meal obtained as a by-product in the vegetable oil industry. Buns with the addition of 10, 20, 30% sunflower meal (SFM) were obtained, which were characterized from a nutritional, microbiological, physico-chemical and sensory point of view. Sunflower pomace has 10% humidity, 24% proteins, 10% lipids, 3% ash, 53% carbohydrates and the nutritional value 398 kcal/100g. The microbiological analysis confirms the absence of pathogens as Salmonella. The toxic elements/heavy metals as: lead, arsenic, mercury and cadmium were found within acceptable limits for food products.

After baking, the volume, porosity, elasticity, and height/diameter ratio (H/D) were determined for all samples according to SR 91:2007. The results of the evaluation of physical characteristics of the bread formulas indicate that there were significant differences ($p<0.05$) between the control sample (CB) and samples with SFM. The CB registered the lowest values regarding volume (400 cm3/100 g), porosity (65.250 %), elasticity (63.183%) and H/D ratio (0.459) compared to the samples with SFM, which registered high values for these parameters. In the case of bread samples with added BMF, the porosity ranged from 65.434% in sample with 10% SFM to 63.829% for sample with 30%SFM, elasticity varied from 64.597% for sample with 10% SFM to 60.629% for sample with 30% SFM and H/D ratio varied from 0.540 for sample 10% SFM to 0.470 for sample with 30% SFM. From a sensory point of view, there were significant differences between the control sample and the one with the addition of sunflower meal, the least appreciated by consumers being the product with 30%SFM.

Keywords: Sensory study, consumer acceptance, nutritional value

P74

Mead. Trends

Alexandru Rinovetz*, P. Bogdan Rădoi, Corina Dana Mișcă, Gabriel Bujancă, Gabriel Hegheduș-Mîndru

University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Calea Aradului 119, 300645, Romania

*Corresponding author: *alexandrurinovetz@usvt.ro*

Abstract

Mead, possibly the oldest alcoholic beverage *(≈40,000 years old*, Africa). Other sources state that it was prepared by the Babylonians (≈4,000 years ago), others cites the ancient Indians. *Definitions*: 1. folk - alcoholic beverage prepared from honey and water; 2**.** regional: *mursă* - sweet liquid that is prepared by pouring water over the "*honeycombs squeezed*"; **3.** common - slightly alcoholic drink, resulting from the fermentation of honey mixed with water. *Mead* (Sanskrit=*madhu*; French= *mead*), is an alcoholic beverage [3.5÷20% (v/v); maturation (3 months → over 2 years); energy value (80÷100 kcal/100 mL)], depending on recipe, type and time of fermentation (natural or controlled), sweet taste → sour (floral and fruity notes), from sweet to dry, acidic, energizing, cooling effect, also known as "*honey wine*". Mead has organoleptic (taste, aroma, appearance), nutritional and therapeutic properties (especially the artisanal version). Most of the sugar in the fermentation process is derived from honey, a defining characteristic. The product contains a wide range of vitamins (A, B complex, C, D and K, potassium, magnesium, calcium, phosphorus, selenium, chromium), proteins, enzymes, natural antioxidants (depending on the type of honey), natural hormones, which support the body's homeostasis. Therapeutic indications: 1. avitaminosis; 2. immunostimulator (especially unfiltered variants or extracts of therapeutic plants); 3. anemia; 4. vasodilator/cardioprotective; 5. gastrointestinal (constipation, diarrhea, putrefactive colitis, ulcer, gastritis); 6. neuroprotective; 7. fertility; 8. tonic; 9. others [rhinitis, sinusitis, asthma, bronchitis, pneumonia, TB (tuberculosis)]. Contraindications: 1. excessive consumption; 2. diabetes; 3. liver diseases; 4. allergic reactions (pollen/honey). Basic raw materials: natural honey, water, yeast (to enhance fermentation). Typologies: 1. traditional (honey, water, yeast); 2. supplements (fruits, spices (cinnamon, cloves, etc.), aromatic herbs, etc.)); 3. Sparkling (obtained by secondary fermentation, similar to sparkling wine) [1-5]. Claims recommend eating *mead* because of the high-quality *natural compounds*. Thus, it is necessary to optimize the process parameters contributing to the "*strengthening/development*" of new properties. It is *proposed to replace yeast as a fermentation enhancer with white grape must.*

Keywords: honey, mead, white grape must, fermentation process, qualitative evaluation.

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P75

More than just fish: The complex chemistry and quality story of seafood

Halit Furkan Şentürk[1], Nalan Gökoğlu[1,*], Ersilia Alexa[2], Monica Negrea[2], Despina - Maria Bordean[2,*]

[1]*Akdeniz University, Faculty of Fisheries, Turkey*
[2]*University of Life Sciences" King Mihai I" from Timisoara, Calea Aradului 119, 300645, Romania*

*Corresponding authors: ngokoglu@akdeniz.edu.tr; despinabordean@usvt.ro

Abstract

The study dives into the various components that make up seafood meat and the many factors that influence its quality. Seafood is a major source of animal protein around the world, known for its high water, protein, and fat content, which together make up about 98% of its overall composition. The nutritional value, functional characteristics, sensory qualities, and storage stability of fish meat is shaped by a range of biological factors (like species, age, and sex), environmental conditions (such as temperature and habitat), and post-harvest practices (including storage and processing). The research particularly highlights the biochemical composition of seafood (Rainbow Trout and Lake Trout), specifically water content, ash, minerals, proteins, minerals, amino acids and vitamins, and how these can vary from one type of fish to another. Moreover, the study looks into spoilage processes and quality changes that happen after capture, such as microbial growth and chemical breakdown, which are crucial for ensuring food safety and extending shelf life. This thorough overview lays the groundwork for future research and better practices in the handling, processing, and assessment of seafood quality.

Keywords: Fish meat quality, seafood composition, food safety, nutritional value

P76

Social media diet in adolescence: Effects on mental health and eating behaviour

Elena Gabriela Stan, Gratziela Victoria Bahaciu, Alexandra Ioana Alexe, Andrada Elena Moise, Iuliana Ștefania Bololoi

University of Agronomic Science and Medicine Veterinary Bucharest, Faculty of Animal Production Engineering and Management, Department Production and Processing Technologies,

* Corresponding author: alexandraalexe18@yahoo.com

Abstract

In the digital age, adolescents are constantly exposed to viral content promoting unrealistic beauty standards and unhealthy eating habits. This article examines the concept of the "social media diet" defined as the selective or excessive consumption of nutrition-related content, body image trends, and dietary fads on digital platforms (e.g., "What I Eat in a Day" videos, "detox challenges") and its bidirectional impact on teens' mental and physical health. Through a systematic literature review of studies from psychology, nutrition, and digital media, we identify key mechanisms by which social media influences body perception, eating behaviours (e.g., orthorexia, binge eating),

and self-esteem. The findings underscore the need for a multidisciplinary approach to foster healthier social media consumption among adolescents. The analysis reveals that adolescents, due to their developmental vulnerability and heightened sensitivity to peer comparison, are particularly susceptible to internalizing distorted ideals portrayed online. Exposure to idealized body types and restrictive eating patterns may lead to increased anxiety, body dissatisfaction, and the normalization of disordered eating behaviours. Simultaneously, the pursuit of social validation through likes and comments often reinforces harmful behaviours and perpetuates a cycle of comparison and self-criticism. Findings underscore the need for a multidisciplinary approach combining mental health support, media education, and nutritional consulting to foster healthier social media consumption among adolescents.

Keywords: adolescents, body dissatisfaction, digital effect, digital literacy, digital therapeutics, self-esteem

P77

Fortification of pasta: impacts on quality, nutritional value and phytochemical composition

Daniela Stoin*, Calin Jianu, Ersilia Alexa, Mariana-Atena Poiana, Diana Moigradean, Despina-Maria Bordean, Ariana Velciov, Ileana Cocan, Monica Negrea

University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Aradului Street no. 119, 300645 Timisoara, Romania.

* Corresponding author: danielastoin@usvt.ro

Abstract

In response to the growing demand for natural and functional foods, the food industry is implementing innovative strategies that involve the reformulation of conventional recipes by using alternative raw materials from unconventional sources. In recent years, there has been an increased effort to identify and use sustainable natural resources, such as plant powders and unconventional flours, as viable alternatives to traditional ingredients. Nettle leaf powder (NLP) have been identified as a promising functional ingredient due to their notable protein, fiber, mineral, and bioactive compound content, including antioxidants, vitamins, and phenolic compounds. The objective of this study was to develop functional pasta formulations by partial replacement of wheat flour (WF) with NLP. Five pasta samples were prepared with WF:NLP substitution ratios of 100:0% (control), 95:5%, 90:10%, 85:15% and 80:20%. Standard laboratory analyses were then employed to evaluate the proximate composition, cooking properties, sensory characteristics, total phenolic content (TPC) and antioxidant activity (AA) of the obtained pasta. The results indicated that partial substitution of WF with NLP led to improvements in the nutritional profile, evidenced by increases in protein, fiber and mineral content, concomitant with a reduction in carbohydrate. The results obtained in terms of cooking properties showed prolonged cooking time and increased cooking losses, which had a negative effect on the overall acceptability of the pasta. The results of the sensory analysis indicated that the pasta sample with a 10% incorporation of NLF was the most highly regarded by the evaluators. The paste formulations demonstrated significantly superior functional attributes in comparison to the control sample. The addition of NLP to pasta may be a promising option for the development of food products for consumers seeking a healthy and functional diet.

Keywords: nettle leaf powder, functional pasta, sensory evaluation, nutritional profile, antioxidant activity

P78

Effect of the addition of nettle leaf powder on the quality characteristics of crackers

Daniela Stoin*, Calin Jianu, Mariana-Atena Poiana, Ersilia Alexa, Ariana Velciov, Ducu Stef, Diana Moigradean, Florina Radu

University of Life Sciences "King Mihai I" from Timisoara, Faculty of Food Engineering, Aradului Street no. 119, 300645 Timisoara, Romania.

* Corresponding author: danielastoin@usvt.ro

Abstract

Using medicinal plants as functional ingredients for food fortification is a sustainable strategy for developing innovative food matrices. Medicinal plants are rich sources of bioactive compounds (e.g., antioxidants, vitamins, phenolic compounds) that can enhance the nutraceutical properties and health benefits of foods. The main objective of this study was to investigate the bioactive potential of nettle leaf powder (NLP) by incorporating it into cracker formulations to improve their sensory, nutritional, physical, and phytochemical properties. Wheat flour (WF) was partially replaced with NLP at levels of 2%, 4%, 6%, and 8% (*w/w*). Concurrently, a sample was prepared exclusively from WF (control). Standard analytical methods were used to determine the proximate composition, physical and sensory properties, total polyphenol content (TPC), and total antioxidant capacity (AA) of the resulting cracker samples. Proximate composition analysis revealed that all four cracker formulations enriched with NLP exhibited a superior nutritional profile compared to the control sample. These formulations were characterized by significantly higher contents of proteins, minerals, and dietary fiber, alongside a reduced carbohydrate content. The results of the sensory analysis showed that the crackers sample with a 4% NLF incorporation was the most appreciated by the evaluators. Furthermore, the incorporation of up to 8% NLP into the cracker formulations led to significant increases in total phenolic content (TPC) and antioxidant activity (AA) relative to the control sample. These findings support the use of NLP as a partial substitute for WF in the development of functional crackers, highlighting its potential for the creation of innovative food products with enhanced nutritional and functional value.

Keywords: nettle leaf powder, functional crackers, sensory evaluation, nutritional profile, antioxidant activity

P79

Case study on consumer preferences for fish products: Trends and influencing factors

Ionela Florentina Toma (Enache)*, Iuliana Stefania Bololoi*, Cristian Cristea, Gabriela Berechet, Carmen Georgeta Nicolae

University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Animal Production Engineering and Management, Department of Production and Processing Technologies,

*Corresponding author: toma.ionela1998@gmail.com; iulianabordei10@gmail.com

Abstract

The consumption of fish products represents an important segment of the human diet, with significant health benefits due to the high content of proteins, Omega-3 fatty acids, vitamins and essential minerals. The present study analyzes consumer preferences regarding the purchase and consumption of fish products, based on a case study conducted on a representative sample of consumers. The data were collected in July 2024, and 371 respondents answered the questionnaire. The paper investigates the factors that influence purchasing behavior, such as sensory and nutritional characteristics, price, and availability. According to the survey results, the majority of respondents prefer to buy fish products from supermarkets, especially preliminary processed ones, in order to make homemade products. Also, the purchase decision is highly influenced by sensory characteristics, while price and nutritional value are less important. The results of the study provide relevant perspectives for the food industry and decision-makers, highlighting current consumption trends and possible directions for optimizing the market offer.

Keywords: purchasing behavior, price, sensory characteristics, nutritional value

P80

Nanoencapsulation of polyphenols from maritime pine bark (*Pinus pinaster* Aiton) in natural β- and γ-cyclodextrins – molecular docking, encapsulation competitivity, and stability of the food and pharmaceutical grade supramolecular systems

Lavinia-Alexandra Toporîşte[1], Alina Ciobanu (Şibu)[2], Adrian Kis[2], Anişoara Radosavlevici (Georgevici)[2], Nicoleta Hădărugă[2,3*], Daniel Hădărugă[1,2*]

[1] Polytechnic University of Timişoara, Faculty of Chemical Engineering, Biotechnology and Environmental Protection, Department of Applied Chemistry, Organic and Natural Compounds Engineering, Vasile Pârvan Bd. 6, 300223-Timişoara, Romania
[2] University of Life Sciences "King Mihai I" from Timişoara, Doctoral School "Engineering of Vegetable and Animal Resources", Calea Aradului 119, 300645-Timişoara, Romania
[3] University of Life Sciences "King Mihai I" from Timişoara, Faculty of Food Engineering, Department of Food Science, Calea Aradului 119, 300645-Timişoara, Romania

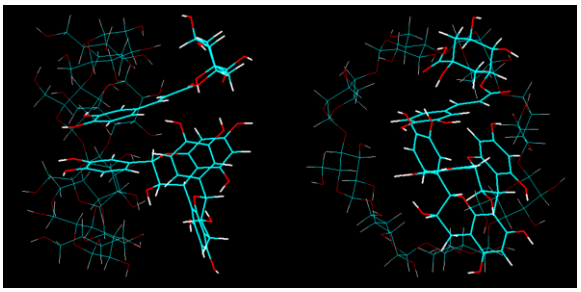
* Corresponding authors: nico_hadaruga@yahoo.com ; daniel.hadaruga@upt.ro

Abstract

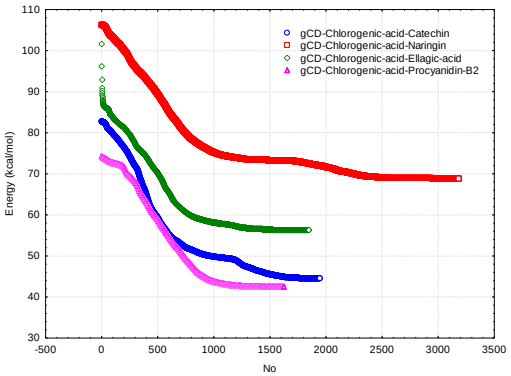
Maritime pine (*Pinus pinaster* Aiton) is a tree growing in Western Europe and Mediterranean coastal regions. Its bark is rich in antioxidant compounds, especially procyanidins, phenolic acids, flavonoids and other polyphenols such as ellagic acid [1-3]. The standardized French maritime pine bark extract is known as Pycnogenol® and is used in dietary supplements or in pharmaceutical formulations against chronic venous insufficiency, as anti-inflammatory and in the treatment of some neurodegenerative diseases [4-6]. However, the stability of such antioxidant compounds are low.

The goal of this study was the enhancement of the oxidative stability of bioactive polyphenols contained by maritime pine bark extracts using β- and γ-cyclodextrin nanoencapsulation. In addition, the cyclodextrin molecular encapsulation competitivity of the main polyphenol compounds from the maritime pine extracts was evaluated. The polyphenol compounds

were grouped in four classes: phenolic acids (chlorogenic, *p*-coumaric or rosmarinic acids), flavonoids (especially catechin and epicatechin, gallocatechin, naringenin and naringin, or taxifolin – one of the most concentrated in flavonoid class), procyanidins with B_1 and B_2 as the main compounds, as well as other polyphenols such as ellagic acid and pinoresinol [1]. All selected polyphenols were subjected to conformational analysis using the appropriate program from the HyperChem 7.52 package (MM+ forcefield and a RMS gradient of 0.01 kcal/mol). The molecular encapsulation capacity of the optimized β- and γ-cyclodextrin was evaluated by molecular docking experiments, using an orientation of the polyphenols with the more hydrophobic moiety towards the secondary face of cyclodextrins, along the OZ axis. The interaction energy of the cyclodextrin:polyphenols at 1:2 molecular ratio was monitored during the optimization up to the same RMS gradient. The ternary interactions were favorable, having energies in the range of 42-69 kcal/mol (Figure 1a). The highest interaction energy was obtained for chlorogenic acid and naringin during the interaction with γ-CD, but the lowest absolute energy of the complex was observed for procyanidin B_2 and catechin (Figure 1b). On the other hand, chlorogenic acid had better interact with the γ-CD cavity in comparison with catechin or naringin (smaller or less flexible molecules). Interestingly, aromatic moieties also interact by van der Waals forces such as in the case of chlorogenic acid/ procyanidin B_2 and chlorogenic acid / ellagic acid pairs. As a conclusion, the all pycnogenol antioxidant compounds (small molecules) well interact with larger natural cyclodextrins providing stable ternary or multiple complexes with possible applications in food and pharmaceutical products.



(a)



(b)

Figure 1. Optimized γ-CD/chlorogenic acid/procyanidin B_2 ternary complex, obtained by MM+ molecular docking (views along *OX* and *OZ* axes; polyphenols are in bold) (a), and the variation of the energy of the ternary complexes of γ-CD and chlorogenic acid in competition with catechin, naringin, ellagic acid and procyanidin B_2 (b)

Keywords: antioxidant activity; pycnogenol; phenolic acids; flavonoids; procyanidins; molecular docking

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P81

Preliminary research on the nutritional composition of baked sweet potato (*ipomoea batatas* l.) pulp

Ariana-Bianca Velciov[1], Maria Rada[2], Georgeta-Sofia Popescu[1], Antoanela Cozma[3], Petculescu Iasmina – Mădălina[4], Daniela Stoin[1], Corina-Iuliana Megyesi[1], Laura Rădulescu[1], Marioara Drugă[1], Virgil-Dacian Lalescu[1*]

[1]University of Life Sciences "King Mihai I" from Timişoara, Faculty of Food Engineering, Food Science Department, 119 Calea Aradului, 300645, Timişoara, Romania
[2]University of Medicine and Pharmacy "Victor Babeş", 2 Eftimie Murgu Sq., 300041
[3]University of Life Sciences "King Mihai I" from Timişoara, Faculty of Agriculture, 119 Calea Aradului, 300645, Timişoara, Romania
[4]Politehnica University of Timişoara, Materials and Manufacturing Engineering Department, 300222, Timişoara, Romania

*Corresponding author:lalescu@usvt.ro

Abstract

Due to its high content of essential nutrients (including carbohydrates, vitamins, minerals, etc.) and bioactive compounds with antioxidant properties (such as phenolics, flavonoids, and carotenoids), which contribute to a range of health benefits, sweet potato (Ipomoea batatas L.) is a valuable food source and a subject of interest in nutritional and medical research. Orange-fleshed sweet potatoes are a distinct variety, characterized not only by the vibrant orange color of their flesh but also by a more consistent sweet taste and a higher concentration of essential nutrients. Previous studies have demonstrated that orange-fleshed sweet potatoes are a valuable source of complex carbohydrates, dietary fiber, certain vitamins, minerals, and antioxidants, while being low in fat and protein content. The aim of the present study is to evaluate the nutritional profile of microwave-baked sweet potato pulp, obtained from locally sourced orange-fleshed varieties, with the potential for incorporation into various food formulations. The results indicate that the analyzed samples contain important amounts of nutritional compounds in different concentration limits (reported on dry weight): 6.17 - 7.04% moisture, 3.93 - 4.78% ash, 4.18 – 5.51% protein, 1.02 - 1.58% fat, 4.02 - 5.18% crude fiber, 75.91 - 80.68% carbohydrate. The nutritional profile, along with its natural sweetness and appealing aroma, positions orange-fleshed sweet potato as an ideal ingredient for the development of value-added food products.

Keywords: Sweet potato, nutritional composition, microwave baked sweet potato pulp

P82

Antibacterial properties of binary Boron-hydroxycarboxylic acid materials

M.P. Zarnavalou*, S. Matsia, A. Salifoglou

Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece

Corresponding author: zarnavam@cheng.auth.gr

Abstract

Antibacterial materials have attracted major interest in the scientific field, as they offer protection against bacterial infections that pose a threat to public health and damage agricultural crops, thus leading to considerable yield losses. Especially nowadays, the increasing resistance of bacteria to conventional antibiotics highlights the urgent need to discover new materials with antiseptic properties.[1]

Black rot is a devastating plant disease caused by the bacterium *Xanthomonas campestris*, which specifically affects crops within the *Brassicaceae* family. This pathogen infects plants at any stage of development, resulting in substantial losses in both yield and crop quality. Presently, prevention and control of black rot have predominantly relied on agricultural practices and a combination of physical and chemical methods. However, these techniques are largely preventive in nature and do not eliminate the pathogen entirely. Furthermore, they frequently involve the use of chemicals that are highly toxic and considered harmful to both human health and the environment.[2]

Driven by the urgent need to discover novel antiseptic materials that are also environmentally friendly and safe for agricultural use, our Lab has launched studies to evaluate the antibacterial activity of binary B(III) complexes with various hydroxycarboxylic acids. Boron-based compounds represent a promising approach, as boron is an essential micronutrient for plants, while at the same time it has been extensively studied for its beneficial effects on biological functions in both humans and animals.[3] Riding on this principle, the synthesis of B(III)-(α-hydroxycarboxylic acid) complexes was carried out following established methodologies based on literature.[4] Subsequently, cultures of *Xanthomonas campestris* and *Staphylococcus aureus* were developed, and antibacterial susceptibility tests were carried out to determine the Minimum Inhibitory Concentration (MIC) of the tested compounds that produces a detectable Zone of Inhibition (ZOI) in bacterial cultures.

The results demonstrate that boron compounds indeed possess antibacterial properties, with a notably stronger effect observed against Gram-positive bacteria (*S. aureus*). Consequently, these findings confirm the conviction that such materials merit further consideration as potential future antibacterial agents in biological applications.

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