



3rd International Traditional Foods and Sustainable Nutrition Symposium

Oct 3-4, 2024
Mersin - Türkiye



Abstract Proceeding Book

Bildiri Özet Kitabı

food24.toros.edu.tr

3rd International Traditional Foods and Sustainable Nutrition Symposium

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Kapak Tasarımı - Tasarım - Dizgi:

İbrahim Özgür KUTLAY

Toros Üniversitesi Kurumsal İletişim ve Tanıtım Müdürlüğü

Cover Design - Design - Typesetting:

İbrahim Özgür KUTLAY

Toros University Corporate Communication and Promotion
Directorate

3rd International Symposium on Traditional Foods and Sustainable Nutrition (TFSN)
3. Uluslararası Geleneksel Gıdalar ve Sürdürülebilir Beslenme Sempozyumu

Editors

Asst. Prof. Gonca Yıldırım

Asst. Prof. Başak Öncel

E-ISBN: E-80706068-824-55686

The responsibility for the papers included in this book rests with the authors.

Toros University, Mersin

October, 2024

Our symposium saw participation from 13 countries, with 30 presentations from Türkiye and 59 international presentations.

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Dr. Agnieszka Piekara, Wrocław University of Economics and Business Institute of Chemistry and Food Technology
Asst. Prof. PhD Ozbekova Zhyldyzai, Kyrgyz-Turkish Manas University Department of Food Engineering

Dear participants, distinguished researchers, and academics,

It is my great pleasure to welcome you all to the 3rd International Symposium on Traditional Foods and Sustainable Nutrition, organized by Toros University. We are honored to bring together experts and researchers from various fields to discuss the vital topics of traditional foods, sustainable nutrition, and gastronomy systems.

We are living in an era where the world is facing numerous pressing challenges, such as climate change, resource depletion, food scarcity, poverty, and global health crises. These global challenges demand urgent solutions, and as a society, it is clear that we must take responsibility to protect our ecosystems and work toward a sustainable future. Sustainability is not just an environmental concept but also a social and economic one. The protection of our limited resources and ensuring their availability for future generations are crucial.

That's why traditional foods and sustainable nutrition are more important than ever before. They not only play a key role in nourishing populations but also in preserving cultural heritage and supporting sustainable food systems. The purpose of this symposium is to explore the innovative ways in which traditional food systems can address these pressing global issues.

Over the next two days, this symposium will serve as a platform for sharing cutting-edge research findings in the areas of food, nutrition, and gastronomy, while also promoting the exchange of innovative ideas and solutions to help combat the challenges of sustainability. We aim to highlight the significance of traditional foods in creating more sustainable food systems and in promoting environmental stewardship.

Our hope is that the discussions and collaborations fostered here will lead to practical solutions that not only preserve traditional food practices but also transform them to fit the needs of a modern and sustainable world. We believe that by working together and exchanging knowledge, we can shape a more sustainable future.

I would like to extend my deepest gratitude to all of you for your participation and valuable contributions. I am confident that your insights and expertise will greatly enrich the discussions at this symposium.

Thank you, and I wish you all a productive and inspiring symposium.

Asst. Prof. Başak Öncel
Symposium Co-chair

Our dear rector, distinguished guests, dear participants, dear academic staff and students of Toros University, Welcome to toros university's 3rd international traditional foods and sustainable nutrition symposium organized by nutrition-dietetics, gastronomy and culinary arts, and cooking departments. We are living in a world that gets older and older with diminishing resources. there is a long list of scarcities that we struggle with such as inadequate food and high food prices, increasing poverty as a result of this, energy becoming more and more expensive, increasing pollution in all aspects, land, water and air pollutions, access to reliable food being more and more difficult, increasing threats to world peace through ongoing wars in various regions and so on.

Among these issues, scarcity of food, especially reliable food, is the most critical one since it is directly connected to lots of lost lives driven by global hunger. There are several interrelated factors behind the food crisis and global hunger that can be summarized as climate change, global warming, melting of glaciers, floods, reduction in the quantity of fertile lands, draught and the decrease in harvest levels, the harmful effect of greenhouse gases, increase in epidemic diseases, increasing migration from poor countries to rich ones in search of better lives, and tragic incidents experienced such as lost lives, broken families, etc.

In the face of all these negativities, there is an urgent need to see the big picture and gain insight into the relationships behind it. In a nutshell the issue that should be explored in detail to solve the problems in the big picture can be stated as follows:

How can we restore the equilibrium in a world that resources are being depleted at a rate quicker than they are replenished? Or what is the address for a peaceful world where nobody fights for food and sustainability in food is achieved in all aspects? Or how can we achieve social sustainability besides environmental sustainability?

It is my belief that answers to these vital questions will be clarified through the scientific work presented in our symposium.

Finally, I would like to say a few words about Toros University's Journal of Food, Nutrition and Gastronomy. JFNG is a multidisciplinary journal, the product of the joint, diligent work of Toros University's three departments: Nutrition-Dietetics Department of The Faculty of Health Sciences, Gastronomy and Culinary Arts Department of The Faculty of Fine Arts, Design and Architecture and Cooking Department of The Vocational School. JFNG is in the third year of its publication and sustainable food systems is one of the popular areas of the journal.

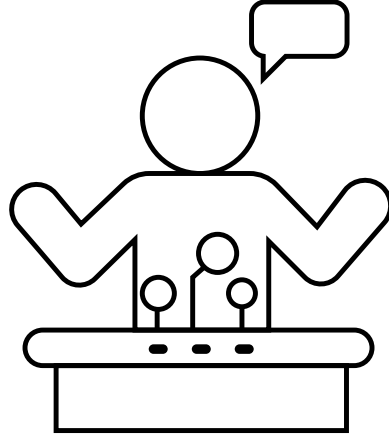
As I conclude my speech, I thank all participants: keynote speakers, academicians who submit articles and present them, symposium committee and dear audience for their precious supports.

I wish our symposium to be a productive scientific gathering by all means and hope to be together in the 4th traditional foods and sustainable nutrition symposium next year.

Thank you all and best regards.

Prof. Dr. Bahar Taner

Editor of Toros University Journal of Food, Nutrition and Gastronomy



Keynote Speeches

Upcycling Towards New Ingredients and Sustainable Food Options

Agnieszka Piekara 

Wroclaw University of Economics and Business, ul Komandorska 118-120 Wroclaw Poland
Author's e-mail: agnieszka.piekara@ue.wroc.pl

As the global demand for sustainable solutions increases, upcycling offers a promising approach to reducing food waste while creating innovative and nutritious food products. This paper explores the potential of upcycling by-products and surplus materials from food processing into new, high-value ingredients. Examples include repurposing spent grains from brewing into protein-rich flours, transforming fruit and vegetable peels into natural sweeteners or fiber-rich powders, and converting coffee grounds into baking ingredients.

Upcycling not only addresses environmental concerns by reducing waste but also enhances the nutritional profile of new food products. By leveraging the rich nutrient content found in these by-products—such as antioxidants, fiber, and plant-based proteins—manufacturers can create a diverse range of food options that cater to health-conscious consumers.

Furthermore, the paper discusses the environmental and economic benefits of upcycling, showcasing successful examples of products such as snacks, alternative flours, and plant-based alternatives currently emerging in the market. This research underscores the potential for upcycling to revolutionize the food industry by offering sustainable, healthy, and innovative solutions for the future of food production.

Keywords: Upcycling, food waste, sustainable food production, plant-based ingredients, functional foods, circular economy.

The Thin Line Between Social Disparity and Obesity In Children

Ines Banjari 

Josip Juraj Strossmayer University of Osijek, Faculty of Food Technology, Franje Kuhača 18, 31000 Osijek, Croatia
Author's e-mail: ibanjari@ptfos.hr

Social inequality, especially poverty has the most severe consequences for children. It affects child's nutritional and overall health status, and if prolonged to adulthood reduces quality of life and life expectancy. Children from low-socioeconomic countries are more prone to malnutrition, both undernourishment and obesity, with health consequences that extend far beyond individual, they affect the whole society. The most worrying trend is that of childhood obesity which skyrocketed and projections for the near future are not bright. Still, both extremes in nutritional status of children are related to inadequate intake of nutrients, i.e. unbalanced diet. Nutrition quality directly depends on income, deteriorating greatly with limited finances or access to fresh produce, especially fruits and vegetables. Food insecurity is a worldwide problem, with more so-called food deserts in areas where people live in poverty or are at risk of poverty. The trend is especially pronounced in some of the most developed countries in the world including the US and Great Britain. Foods packed with nutrients are the first ones cut off one's diet in times of income reduction, and children are especially susceptible to lack of nutrients given their intense growth and development.

Keywords: Childhood obesity, malnutrition, poverty, social inequality, nutrition quality.

Polycyclic Aromatic Hydrocarbons (PAHs) in Cooked Meat: Public Concern and Mitigation Strategies

Sanije Zejnelhoxha 

Agricultural University of Tirana Faculty of Biotechnology and Food
Author's e-mail: zejnelhoxhas@gmail.com

It is well known the effort of the worldwide scientific community to study the relationship of diet and nutrition to cancer. In the last decades, the presence of mutagenic/carcinogenic substances in foods has become a major concern for consumers. In particular, has gained great interest the study of polycyclic aromatic hydrocarbons (PAHs), well-known carcinogens, presenting different pathways of contamination among food, such as meat. These toxic substances can be generated during man-made processing involving cooking processes undergoing high-temperature, such as grilling. In the light of the health risk issue from exposure to PAHs, effective strategies to inhibit or reduce their formation, such as the use of antioxidants, has drawn the attention of the scientific community. Among antioxidants, vitamin E has been pointed out as a principal natural antioxidant. The focus of our research activities is the study of the effect of vitamin E on PAHs formation through meat model systems, by adding directly different concentrations of vitamin E to meat prior cooking and animal model system, by intramuscularly injecting it to broiler chickens in order to study how endogenous tissues levels of vitamin E could affect PAHs formation. Our findings report that although the cooking did not generate high PAHs in the meat model high PAHs amount, the effectiveness of vitamin E in inhibiting PAHs formation depends on the concentration used and on fat content and fatty acid profile of meat. Although PAH4 and BaP contents, the most appropriate indicators for occurrence and toxicity of PAHs in foods, were well below the maximum levels of 30 ng/g and 5 ng/g respectively defined by EU legislations, vitamin E significantly reduced their content in beef and chicken meat models. Intramuscular levels of vitamin E such as those found in treated chickens were not effective in reducing the formation of PAHs in grilled meat. Ongoing research is centered on the use of a higher number of samples and with a wider range of doses of vitamin E and a different timeline to better understand the pharmacokinetics of vitamin E in relation to its role on formation PAHs in grilled meat.

Keywords: Polycyclic Aromatic Hydrocarbons, meat, antioxidants, vitamin E.

Gastronomy 4.0

Seden Doğan 

University of South Florida School of Hospitality and Tourism Management
Author's e-mail: sedendgn@gmail.com

In the year 2045, Chef Elena runs a high-tech industrial kitchen, where robotic arms, 3D food printers, IoT appliances, and AI assistants work together to craft intricate dishes with precision. Elena oversees the kitchen like a conductor, using technology to enhance efficiency while focusing on creativity and flavor. Despite the advanced machinery, she ensures the human element remains central, adding the warmth and soul that transforms food into a memorable experience. The future of cooking blends technological mastery with the timeless art of cuisine, creating a culinary journey that is both advanced and heartfelt.

Augmented Reality (AR) technology is used in dining experiences to add a layer of interactive visual content that enhances both the presentation and storytelling aspects of a meal. For instance, AR menus allow guests to view 3D models of dishes, helping them visualize their order before making a decision. This not only makes ordering more engaging but also reduces uncertainty about the food. In immersive dining experiences, AR projections on the table can tell stories about the origin of ingredients, showcase the preparation process, or transport diners to virtual environments that match the theme of the meal, creating an emotional connection.

The rise of robotic kitchens, like Moley and Flippy, is transforming the culinary industry by automating repetitive cooking tasks and optimizing kitchen operations. **Moley**, the world's first fully robotic kitchen, features robotic arms capable of executing complex recipes with remarkable precision, emulating the movements of a professional chef. By handling tasks such as stirring, chopping, and even cooking entire meals, Moley reduces the need for multiple kitchen staff, thereby cutting labor costs. This allows restaurants to operate more efficiently, especially during labor shortages or peak hours.

Flippy, developed by Miso Robotics, is another example, primarily designed to operate fryers and grills in fast food settings. Flippy's ability to work consistently, without breaks or errors, ensures that every burger is cooked to perfection and fries are prepared uniformly. This consistency is crucial for chain restaurants where maintaining a standardized quality across all locations is key to customer satisfaction.

These robotic systems not only improve operational efficiency and reduce labor costs but also **free up chefs for more creative tasks**. By automating mundane, repetitive processes, chefs can focus on areas that require a human touch—such as recipe innovation, creative plating, and crafting new dining experiences. This shift allows for greater emphasis on culinary artistry and the development of unique flavors, rather than spending time on routine cooking duties. Additionally, robotic kitchens can enhance safety by minimizing the risk of burns and other common kitchen injuries, further supporting a more sustainable and creative kitchen environment.

AI and IoT technologies in kitchens help reduce food waste, increase efficiency, and enhance both cooking and dining experiences. AI-driven inventory management minimizes waste by predicting ingredient needs and suggesting optimal use, while smart sensors track spoilage and expiration dates. IoT integration allows connected appliances to communicate, optimizing workflows and synchronizing cooking processes. Smart kitchen appliances automate routine tasks, allowing chefs to focus on creativity and improving consistency. This efficiency leads to faster meal preparation, reduced errors, and a more personalized dining experience, ensuring higher customer satisfaction and more sustainable kitchen practices.

3D printing technology allows chefs to experiment with food presentation and texture in innovative ways, enhancing personalization and sustainability in the culinary industry. By creating intricate, customizable shapes, chefs can craft visually stunning, personalized dining experiences, meeting the growing demand for unique dishes. The precise layering capabilities also allow chefs to manipulate food textures, offering diverse sensory experiences. Additionally, 3D printing supports sustainability by minimizing ingredient waste through exact portion control and utilizing alternative ingredients creatively. This technology enables chefs to push the boundaries of gastronomy, combining aesthetics, customization, and eco-friendly practices.

Benefits

- Competitive Edge:** Stand out by adopting cutting-edge innovations.
- Unforgettable Experiences:** Delight customers with technologies like 3D food printing, AR/VR dining, and AI-driven personalization.
- Sustainability:** Reduce waste and enhance energy efficiency with AI and smart kitchen systems.

Challenges & Concerns

- High Investment Costs:** Initial tech adoption can be financially demanding.
- Training Needs:** Workforce upskilling is essential for smooth implementation.
- Customer Concerns:** Balancing high-tech with personal touch.
- Data Privacy:** Protecting customer data as personalized tech becomes more prevalent.

Keywords: Gastronomy, artificial intelligence, robotics.

Modern Advances in Technological Aspects of Fruit and Berry Jelly Production

Stepanova Tetiana 

PhD, Associate Professor,
Deputy Dean of Food Technology Faculty Sumy National Agrarian University, Ukraine
Author's e-mail: eshkina97@gmail.com

Conceptual changes in nutrition become the basis of technological developments. There is a need to create new food systems that are balanced in terms of micro and macronutrients and that can be adapted to different tastes of consumers. Food products based on gelling agents are very popular and jelly sweet dishes as a culinary product are among of them. Their popularity is growing significantly.

In the modern human nutrition, a special place is given to sweet dishes. Due to the balanced taste properties due to the content of a significant amount of sugar, fruit and berry components (fresh berries and fruits, fruit and berry juices, mashed potatoes, syrups, jam), mainly delicate consistency and attractive appearance, they are quite popular among the population. Sweet dishes complete the meal, so it should be emphasized, the expediency of their easy assimilation by the human body.

The use of fruit and berry raw materials in the recipe composition significantly reduces the energy and increases the nutritional value of the finished product due to the high content of vitamins, organic acids, biologically active substances, macro- and microelements.

It has a scientific interest to use a low-esterified amidated pectin in the technology of jelly sweet dishes not only for technological, but also for functional purposes. It is advisable to use eggshell powder as a source of calcium in the technology of jelly sweet dishes. Presented ovocalcium has a high level of digestibility and good structure-forming properties with pectin in the technology of jelly sweet dishes.

Keywords: Jelly production, gelling agents, fruit and berry components

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Food Science



Evaluation of Eleven Accessions of Groundnut (*Arachis hypogaea* L.) in Nsukka Derived Savannah Agro Ecology of Nigeria

**Adeyuyi S. O¹ , Ezema, C. J.², Ukwu, U. N.³ ,
Dauda N.⁴ , Baiyeri, K.P.⁵, Fadoju, A.B⁶**

¹ Department of Crop Science, Faculty of Agriculture, University of Nigeria, Nsukka, Enugu State, 1 Author's e-mail: solomon.adeyuyi@unn.edu.ng,
² Department of Crop Science, Faculty of Agriculture, University of Nigeria, Nsukka, Enugu State 2 Author's e-mail: joysylva100@gmail.com,
³ Department of Crop Science, Faculty of Agriculture, University of Nigeria, Nsukka, Enugu State 3 Author's e-mail: uchenna.ukwu@unn.edu.ng,
⁴ Department of Crop Science, Faculty of Agriculture, University of Nigeria, Nsukka, Enugu State, 4 Author's e-mail: nathaniel.dauda@unn.edu.ng,
⁵ Department of Crop Science, Faculty of Agriculture, University of Nigeria, Nsukka, Enugu State, 5 Author's e-mail: paul.baiyeri@unn.edu.ng,
⁶ Department of Microbiology, Obafemi Awolowo Teaching Hospital Complex, Ile ife, Osun State. 6 Author's e-mail: adebisolafadoju@gmail.com









Abstract

This study evaluated the performance of 11 groundnut (*Arachis hypogaea* L.) accessions for various phenological, morphological, and yield-related traits. The experiment was conducted at the Teaching and Research Farm of the Department of Crop Science, University of Nigeria, Nsukka between September to December, 2024. Nsukka is located on latitude 06° 52' N, longitude 07° using a Randomized Complete Block Design (RCBD) with four replications. Significant variations were observed among the accessions for phenological traits like days to seedling emergence, percentage emergence and days to anthesis. Substantial differences were found for morphological traits, including canopy spread, leaf area, number of branches, number of leaves, and plant height, at different growth stages (5th, 7th, 9th, and 11th weeks after planting). The accessions exhibited significant variations in yield components such as number of pods, number of seeds, shelling percentage, total pod weight (kg), and weight per 100 seeds(kg).

Samnut 25A recorded significantly higher values for canopy spread, plant height, and leaf area, which are desirable traits for better light interception, nutrient uptake, and yield potential. TAH 152 exhibited significantly higher values for the number of branches, number of leaves, leaf area, and shelling percentage, important for yield and seed quality. The accessions Samnut 25B and Samnut 10 gave the best yield and pod weight. The observed variations highlight the genetic diversity among the accessions, providing opportunities for selecting desirable traits and developing improved cultivars with enhanced yield potential, adaptation to specific environmental conditions, and resistance to biotic and abiotic stresses. The study underscores the importance of evaluating genetic resources for identifying promising accessions and their subsequent utilization in groundnut breeding programs aimed at developing high-yielding and locally adapted varieties.

Keywords: Climate resilient, accessions, agronomic trait, crop improvement, yield-related traits, genetic diversity, breeding programs.

Valorizing A Typical Italian Extra Virgin Olive Oil: Bioactive Compounds and Sensory Attributes

Enrico Casadei^{1,2} , Enrico Valli^{1,2} ,
Alessandra Bendini^{1,2} , Sara Barbieri¹ ,
Rosalba Tucci¹ , Mario Guida¹ , Ferioli Federico¹ ,
Tullia Gallina Toschi^{1,2} 

¹Alma Mater Studiorum - Università di Bologna, Department of Agricultural and Food Sciences, Cesena and Bologna, Italy.

²Alma Mater Studiorum - Università di Bologna, Interdepartmental Centre of Industrial Agrifood Research, Cesena, Italy.

Author's e-mail: enrico.casadei15@unibo.it , Author's e-mail: enrico.valli4@unibo.it , Author's e-mail: alessandra.bendini@unibo.it , Authors's e-mail: sara.barbieri@unibo.it , Author's e-mail: rosalba.tucci2@unibo.it , Auththor's e-mail: mario.guida2@unibo.it , Author's e-mail: federico.ferioli@unibo.it , Author's e-mail: tullia.gallinatoschi@unibo.it

Abstract

Introduction and Aim: The valorization of sustainable, healthy, traditional and high-value local food products (e.g., PDO, PGI, organic) during their shelf-life represent relevant issues. This research is focused on the study of the volatile profile, phenolic compounds and sensory attributes of typical extra virgin olive oils (EVOOs) during a 12-month storage. The oils were obtained from olives grown in different agronomic systems (organic farming vs integrated pest management) and collected in four subsequent weeks.

Method: Eight EVOOs were produced from Nostrana di Brisighella cv. olives in Emilia-Romagna region (Italy) and analyzed using different methods, including SPME-GC-MS for volatile compounds, HPLC-UV for the phenolic fraction after hydrolysis (health claim), and the sensory evaluation (Panel test). Analyses were carried out on samples over a 12-month storage.

Results: The agronomic variables influenced the compositional and sensory characteristics of the EVOOs, with differences that likely derived from the agronomic system adopted, i.e., integrated pest management or organic farming. Significant differences in phenolic amounts, observed among oil samples, were related to the ripeness index of the olives, with the highest content at the first stage of ripening and in EVOOs from integrated pest management farming. Despite a general decrease in the intensities of fruity, bitter and pungent attributes over time, such positive properties were maintained along the EVOOs storage. Only a sample stored for 12 months resulted virgin due to rancid attribute. Such a decline of bitterness and pungency during storage agreed with that of phenolics content due to the depletion of these antioxidant compounds. An increase in the concentration of volatile markers of oxidation and a decrease in fruity was highlighted during the storage.

Conclusion: This study highlights how different agronomical practices and proper oil storage conditions may maximize and preserve along time the content of healthy compounds and the positive sensory attributes in the EVOOs, thus contributing to their valorization.

This research is developed within the project funded under the PSR 2014–2020 program – Type of Operation 16.2 “INPRO-OLIO”. Enrico Casadei’s research activity is financed within the Italian National Recovery and Resilience Plan – NextGenerationEU “ONFOODS (<https://onfoods.it/>).

Keywords: Extra virgin olive oil, valorization, organic farming, phenolic compounds, volatile compounds, sensory attributes.

Studies on the Technologies Involved in Street Food Vending in Osun State, Nigeria

Titilayo Olubunmi Olaposi¹ ,
Sunday Soladoye Asa² ,
Kehinde Adekunbi Taiwo³ 

¹African Institute for Science Policy and Innovation, Obafemi Awolowo University, Ile-Ife, Nigeria. 1Author's e-mail: drtitilaposi@gmail.com
²Department of Demography and Social Statistics, Obafemi Awolowo University, Ile-Ife, Nigeria. Author's e-mail: solaasa2000@yahoo.com ,
³Department of Food Science and Technology, Obafemi Awolowo University, Ile-Ife, Nigeria. 3Author's e-mail: kehindetaiwo3@gmail.com

Abstract

Introduction and Aim: The subject of street food has been widely researched into on issues such as microbial quality/safety of street vended foods, hygienic practice of vendors, legal issues relevant to food vending and food risks. However, the issue of vending technologies and facilities have not attracted much attention from researchers. This study aimed at investigating the appropriateness of the technologies/facilities deployed in street food vending and their environmental and health implications.








Method: The cross-sectional study was carried out in three cities, Ede, Osogbo and Ilesha, in Osun State Nigeria. A questionnaire was developed and tested for validity in Ile-Ife. Data were collected at major junctions of the cities. Pictures of food items on display for sale and also the technologies/facilities employed were taken. Vendors were selected randomly and interviews were conducted. Different periods enumerating the vendors were 7:00 am – 9:00 am (school/office rush hour), 12:00 pm – 2:00 pm and 6:00 pm – 8:00 pm.

Results: The study found that vended foods range from snacks to full meals, fruits/vegetables, raw food items and drinks. The vending tools include trays and containers made of metal, plastic and wood. Vending technologies include: Metal trays, covered plastic bucket/container, metal bowls padded with cardboard, wooden tray, basket, wheel barrow, plastic crate, cooler on wheel barrow, plastic bowl, wooden platform on wheels and wooden box on motor cycle. Some vendors used polythene bags to wrap the foods before putting them in containers and some used cardboards to pad the vended food items. Some of these vending tools and materials have potential implications on the health of vended food, the consumers, the vendors and the vending environment. The benefits and challenges of vending tools are discussed in the paper.

Conclusion: The study makes recommendations to mitigate the impacts of food exposure and food vendors to be adequately educated on food vending guidelines. The study concluded that the current food vending technologies/facilities need to be improved upon to prevent health and environmental hazards.

Keywords: Food vending, implications, Nigeria, Osun State, technologies.

Evaluation of Carotenoid Stability During Bio Fortified Cassava Fermentation and Associated Bacterial Community

Lateefah Oyafajo¹ , Lateef Sanni² ,
Taofik Shittu³ , Sarafadeen Kareem⁴ ,
Wasiu Awoyale⁵ , Harun Aremu⁶ ,
Omotayo Oyedara⁷ , Luqman Azeez⁸ 

¹ Osun State University, Osogbo, Nigeria ¹ Author's e-mail: lateefah.oyafajo@uniosun.edu.ng , ² Nigerian Stored Products Research Institute, Ilorin, Nigeria ² Author's e-mail: Sannilateef5@gmail.com , ³ Federal University of Agriculture, Abeokuta, Nigeria ³ Author's e-mail: staofeek0904@yahoo.com , ⁴ Federal University of Agriculture, Abeokuta, Nigeria ⁴ Author's e-mail kareemso@funaab.edu.ng , ⁵ Kwara State University, Malet, Nigeria ⁵ Author's e-mail: wawoyale0101@gmail.com ⁶ Osun State University, Osogbo, Nigeria ⁶ Author's e-mail: harunaremu@gmail.com , ⁷ Osun State University, Osogbo, Nigeria ⁷ Author's e-mail: omotayo.oyedara@uniosun.edu.ng , ⁸ Osun State University, Osogbo, Nigeria ⁸ Author's e-mail: luqman.azeez@uniosun.edu.ng

Abstract

Introduction and Aim: Carotenoids are synthesized during cereal and vegetable fermentation. it is vulnerable to degradation due to light exposure and unit operations during the conversion of β -carotene biofortified cassava to different shelf-stable products. However, information on carotenoid stability and bacterial community composition during the fermentation of β -carotene biofortified cassava variety to garri is limited. The study investigated carotenoids stability in biofortified cassava root solid fermentation under light and dark conditions, and monitored bacterial diversity using 16S rRNA sequencing technology.

Results: The study found that β -carotene (BC) lost in the first 24 hours of fermentation, but increased steadily afterward. The study also found a 95% correlation between Total β -carotene (TBC) and yellowness. The operational taxonomic unit (OTU) spanned 6 phyla and 68 species, with Firmicutes dominating fermented samples and Cyanobacteria abundant in unfermented samples. *Leuconostoc fallax* was the most abundant in the 24 h fermented sample while *Lactobacillus paralimentarius* was the most abundant in the 48, 72, 96, and 120 h fermented samples.

Conclusion, Carotenogenesis occurred in bio fortified cassava fermentation, with unclassified bacteria species contributing to final product properties. *Leuconostoc fallax* and *Lactobacillus paralimentarius* can be explored for organic carotenoid synthesis and be included in starter culture for solid state fermentation of biofortified cassava.

Keywords: Cassava, fermentation, carotenogenesis, garri processing, bacteria diversity.

Enzymatic extraction of total sugars from olive leaves

Maja Dent¹ 
Jelena Buha²

¹University of Zagreb, Faculty of Food Technology and Biotechnology, Department of Chemistry and Biochemistry, Zagreb, Croatia. Author's e-mail: maja.dent@pbf.unizg.hr, ²University of Zagreb, Faculty of Food Technology and Biotechnology, Department of Chemistry and Biochemistry, Zagreb, Croatia. Author's e-mail: jbuha@pbf.hr

Abstract

Introduction and Aim: The olive leaf is the largest waste product from cutting and picking olives and contains a high proportion of bioactive compounds and sugars. One of the possible and reasonable solutions to this waste problem is the use of enzyme-assisted extraction of olive leaves with optimal process parameters as an environmentally friendly extraction method for total sugars. The aim of the work was to obtain the maximum yield of total sugars from olive leaves by enzymatic extraction with the enzyme cellulase.

Method: The extraction assisted by the enzyme cellulase was carried out with purified water and citrate buffer (pH=5) with the addition of cellulase in a mass fraction of 0.5 to 2.5% for 120 minutes at 50 °C. The total sugars in the extracts obtained were determined spectrophotometrically.

Results: In cellulase-assisted extraction, total sugars were extracted from 8.12 to 11.67% in purified water and from 5.85 to 9.58% in citrate buffer with the addition of cellulase. The use of cellulase enzymes resulted in higher mass fractions of total sugars compared to extraction without cellulase. The highest mass fraction of total sugar was obtained with the enzymatic extraction of a mass fraction of cellulase of 2 % (w/v) in purified water (11.67 %) and in a citrate buffer with a mass fraction of cellulase of 2.5 % (w/v) (9.58 %). The extraction carried out with the same process parameters, but without the addition of cellulase, resulted in significantly lower sugar contents of 7.41 % in purified water and 2.75 % in citrate buffer.

Conclusion: This indicates that the olive leaf is a good source of total sugars. With purified water as an environmentally friendly solvent and the addition of 2% (w/v) cellulase, the yield of isolation of total sugars from the olive leaf increases by up to 63 %.

Keywords: Cellulase, enzyme-assisted extraction, olive leaf, total sugars.

Food Irradiation for Food Security: Trends in Malaysia and South East Asia Countries

Nur Sumirah Mohd Dom¹ ,
Nor Khaizura Mahmud Ab Rashid² ,
Zainah Adam³ 

1University of Putra Malaysia, Institute of Tropical Agriculture and Food Security, UPM Serdang 43400, Selangor, Malaysia. 1 Author's e-mail: n_sumirah@upm.edu.my , 2University of Putra Malaysia, Institute of Tropical Agriculture and Food Security, UPM Serdang 43400, Selangor, Malaysia. 2 Author's e-mail: norkhaizura@upm.edu.my , 3Malaysian Nuclear Agency, Medical Technology Division, Bangi 43000 Kajang, Selangor, Malaysia. 3 Author's e-mail: zainah@nuclearmalaysia.gov.my

Abstract

The utilization of nuclear science and technology in agriculture has grown through national agricultural policies, which emphasize enhancing food production via plant breeding and improving food quality and safety through irradiation. Food irradiation employs ionizing radiation, utilizing X-rays, gamma rays, or high-energy electron beams. This study covers the usage and implementation of radiation in food products in Malaysia and neighbouring Southeast Asian countries. The allowed dose of radiation varies from 0.15 to 10 kGy. Mostly, the irradiation treatment for the respected countries is purposefully regulated to extend the shelf-life of the products, prevent sprouting, delay the ripening process, for quarantine control, as an insect disinfestation method, and to reduce the pathogenic microbial loads. Food products that can be irradiated have been classified into a few groups, such as bulbs, roots, and tubers; fresh fruits and vegetables; spices and herbs; cereals and legume products; poultry and livestock; cocoa and cocoa products; and finally, dried food of animal origin. This study also reviews the issues and limitations of using the food irradiation technique. Furthermore, each country's commitment to promote and regulate the food irradiation process for food security is also being discussed. In conclusion, the significance of food irradiation in improving food safety, agricultural export quality, and public health in Southeast Asia is becoming increasingly evident. Food irradiation techniques support global efforts in food security by reducing hunger and ensuring a sufficient supply of food.

Keywords: Food irradiation, food security, food safety.

Chitosan As a Tool for The Production of Sulfite-Free Wines: A Focus On Its Antioxidant Properties

Fabio Chinnici 

University of Bologna, Department of Agricultural and Food Sciences, Bologna, Italy. Centro Interdipartimentale di Ricerca Industriale Agroalimentare (CIRI-AGRO), Cesena, Italy Author's e-mail:fabio.chinnici@unibo.it

Abstract

Chitosan is a polysaccharide obtained from natural sources whose utilization in enology has been admitted in Europe since 2011 for must and wine clarification, the diminution of mold-derived toxins (e.g. ochratoxin A) and for controlling the development of some unwanted microbial populations including lactic acid bacteria and *Dekkera/Brettanomyces* yeasts.

However, scientific literature consistently reported additional antioxidant and antiradical features for this polysaccharide when used as food adjuvant, even if virtually all of the research was referred to matrixes different from wine for composition, pH and way of utilization.

Indeed, the confirmation of such antioxidant activities in a “wine-like” environment would be highly interesting in view of finding a technological tool suitable to vicariate sulfur dioxide as an additive and boost the research toward the production of wines with low or nil level of allergenic sulfites.

This presentation will illustrate, hence, the main results coming from the research carried out by our group at the University of Bologna in the last 6 years, dealing with the evaluation of the antioxidant features of fungoid chitosans in model solution and wines, together with the underlying mechanisms involved in these activities.

A short overview of the main antimicrobial properties of chitosan will introduce the main subject of the presentation, focused on the physical-chemical mechanisms which govern the antioxidant/antiradical/antibrowning properties of chitosan. The impact of the addition of the polysaccharides on the composition and sensory characteristics of both red and white wines will be also discussed at the light of the technological trials performed at laboratory and industrial scale.

Keywords: Chitosan, antioxidant activity, wine, sulfites, browning, antimicrobial.

Effect of Transglutaminase and Cellulase on the Technological Properties of Gluten-Free Brown Rice Steamed Cake

Nor Afizah Mustapha¹ ,
Ayesha Azli²

¹Department of Food Technology, Faculty of Food Science and Technology, University of Putra Malaysia, 43400, Serdang, Selangor, Malaysia. 1
Authors' e-mail: nor_afizah@upm.edu.my, ²Department of Food Technology, Faculty of Food Science and Technology, University of Putra Malaysia, 43400, Serdang, Selangor, Malaysia. 2 Authors' e-mail: 200644@student.upm.edu.my

Abstract

The market for gluten-free bakery product is experiencing strong growth due to the growing popularity of special dietary lifestyles. However, the absence of gluten has led to technological challenges in producing gluten-free products of acceptable quality. Rice is one of the most commonly used grains for the production of gluten-free products due to its mild flavour and hypoallergenic properties. The use of brown rice in bakery product could increase the nutritional value but compromise product quality. Enzymes have been associated with an improvement in bakery product properties due to their specificity. The aim of this study is to determine the effect of the enzymes transglutaminase (TG) and cellulase (CS) and their concentrations in single (0.1 %) and mixed combination (TG:CS 0.1 %:0.1 % and 0.05 %:0.05) on the physico-chemical properties of brown rice steamed cakes. The addition of enzymes led to a significantly lower batter viscosity. The brown rice steamed cake produced with the addition of enzymes had a significantly higher volume, whereby the combination TG:CS at 0.05% resulted in a higher specific volume and a lower product hardness. The enzyme-added cake showed a lower weight loss after baking, indicating higher water retention and therefore a moister product, as shown by the higher moisture content in the steamed cake. The L* and b* values were higher in the combined TS:CS samples, indicating that the enzyme addition results in a lighter colored product. This study demonstrated that both transglutaminase and cellulase can be used to improve the properties of high-fiber rice cakes. The enhanced technological properties of the brown rice steamed cake could be due to the depolymerization of fiber molecules by cellulase and the cross-linking of protein molecules by transglutaminase, which strengthen the product structure during the baking process.

Keywords: Brown rice, transglutaminase, cellulase, specific volume, batter viscosity.

Development Village Chicken Production in Malaysia

Aida Zakaria¹ ,
Mamat Hamidi Kamalludin^{1,2}

¹Institute of Tropical Agriculture and Food Security, UPM ²Department of Animal Science, Faculty of Agriculture, UPM | Authors' e-mail: aidazakaria@upm.edu.my , 2Authors' e-mail: mamath@upm.edu.my

Abstract

Food security is a national global concern and a hot topic among Malaysians. According to the United Nations Report, in 2022, between 691 and 783 million people around the world will experience hunger, and the majority will be Asian residents. Although Malaysia is one of the highest producers of palm oil and rice in Asia, our country still shows an unstable trend in food security. The government with initiative reviews current food security policies and consider how import, export and urban high-tech systems can help. The government has taken several steps to overcome this problem including subsequently introduced two policies, namely the National Food Security Policy 2021-2025 and the National Agro-Food Policy 2021- 2030. The first strategy is to reduce food imports on selected products, for example, chicken products.

The village chicken industry in this country is still not comparable to the broiler chicken industry which has such a complete chain that includes breeding chicken farms, broiler farms, hatcheries, food factories, slaughter centres and a network of contract breeders and market chains. For fans of village chicken, although the price is expensive, they still try to get this chicken. In addition to being nutritious, it also tastes better even though the meat is tougher, it depends on the technique or tips used by the 'cook' to soften the meat of this village chicken. Reported show that the retail price of village chicken is over RM16 per kilogram. Most village chicken farming is done on a small or medium scale. Department of Veterinary Services (DVS) Malaysia reported there are a total of 162 village chicken farmers with a population of 34,587 meanwhile a total of 494 broiler breeders with a population of 12,429,791. The difference is due to the maturity period of village chickens after 60 days each cycle with a weight of 1.5 to 2 kilograms each, compared to broiler chickens which have a maturity of 28 days with a weight of 1.8 kilograms. Keeping village chickens is exposed to many factors that can affect the profitability and viability of breeders. The states of Selangor and Terengganu are the most village chicken farmers. Village chickens are kept free in villages. Usually, these village chickens are kept only for subsistence and as a source of food for the family. Only a few business transactions took place. Its conservation is also unorganized and the breeding program is also independent. There is a research effort from Universiti Putra Malaysia (UPM) and MARDI in the genetic development of village chickens that have produced village chickens that grow quickly and are of good quality. The studies carried out have used several types of village chickens and crossbred with chicken breeds from abroad to obtain fast-growing genetics. It aims to reduce the period of keeping village chickens to less than 4 months. The use of chicken breeds from abroad and raised freely and dubbed as village chickens has caused concern among chicken farmers who recognize their chickens as original village chickens. Farmers who keep native village chickens feel that the chickens brought from abroad affects their market. A study needs to be done to overcome this problem in order to outline and streamline the current classification of chickens so that there is no suppression and market fraud.

Keywords: Global concern, market chains, genetic development, breeding program, market chains.

Production of Functional Muffins Using Natural Ingredients (Okra, Mango Leaves, and Ribes Rubrum)

Sara Gashtasbi¹ ,
Zahra Emamdjomeh² 

¹Tehran University, Faculty of Agriculture Engineering, Department of Food Science, Technology and Engineering, Karaj, Iran. 1Author's e-mail:sara-gashtasbi@yahoo.com , ²Tehran University, Faculty of Agriculture Engineering, Department of Food Science, Technology and Engineering, Karaj, Iran. 2 Author's e-mail:emamj@ut.ac.ir

Abstract

Over the past ten years, lifestyle and dietary habits alternations such as increased consumption of food higher in sodium and hydrogenated fats, reduced fiber intake, and decreased physical activity have contributed to a significant rise in non-communicable chronic diseases (NCDs). These conditions impact individuals across all demographics. According to reports from the World Health Organization, the percentage of global deaths attributed to NCDs rose from 61% (approximately 31 million) in 2000 to 74% (41 million) in 2019. the excessive increase in administering chemical drugs and their side effects, such as gastrointestinal problems and drug resistance, leads to an enhancement in the attention and consumption of natural compounds. Among the snacks, Muffins are popular due to their low price, ease of use, and extended shelf life. Incorporating phytomedicine with healthy properties into muffins can significantly affect the prevention and treatment of disease and increase the consumer's health.

This study aimed to determine the function of muffins enriched with natural products. Mango leaves(0,5,10%), okra(10,20,30%), and ribes rubrum(0,7.5,15%) were incorporated into muffins in 3 levels.The effects of physicochemical, biological activity, texture properties, antioxidant activity, and sensory evaluation were evaluated. Results demonstrate that higher polyphenol and flavonoid levels were observed with an increasing percentage of ingredients. Moreover, samples exhibit a higher antioxidant activity (ABTS, DPPH, and FRAP) than control muffins. Adding herb medicine (mango leaves, okra, and ribes rubrum) inhibits a-amylase and lipase pancreatic enzymes as well as eradicates Helicobacter pylori. In conclusion, using phytomedicine in muffins can benefit health and exhibit great anti-diabetic and anti-obesity potential.

Keywords: Phenolic compounds, flavonoids, antioxidant, anti-obesity, anti-diabetic.

Effectiveness Of Different Types Of Sanitizer On The Co-Aggregation Of *Staphylococcus Aureus* And *Escherichia Coli* On Cutting Board

Pawitra Ramu¹ ,
Nor Ainy Mahyudin² ,
Nur Amira binti Rosli³ 

¹Universiti Putra Malaysia, Faculty of Food Science and Technology, Department of Food Service and Management, Serdang, Selangor. 1Authors e-mail: pawitraramu@yahoo.com.my , ²Universiti Putra Malaysia, Faculty of Food Science and Technology, Department of Food Service and Management, Serdang, Selangor. 2Author's e-mail: norainy@upm.edu.my , ³Universiti Putra Malaysia, Faculty of Food Science and Technology, Department of Food Service and Management, Serdang, Selangor. Author's e-mail: emira.rosli@gmail.com

Abstract

One significant factor contributing to foodborne illnesses is the inadequate cleaning and sanitization of food contact surfaces. Inadequate cleaning or sanitization can provide a breeding ground for pathogens to persist on the surfaces, leading to potential cross-contamination of food during preparation. This study aimed to identify the auto-aggregation of *Staphylococcus aureus* (*S. aureus*) and *Escherichia coli* (*E. coli*), the co-aggregation between the microorganisms, and the effectiveness of several sanitizers on the co-aggregation. A total of 3 strains of *S. aureus* and *E. coli* were obtained from the Microbiology Lab, Faculty of Food Science and Technology, Universiti Putra Malaysia. Auto-aggregation was performed for each isolate and the isolates were ranked according to their auto-aggregation value. Co-aggregation between all 6 strains was conducted with a total of 9 combinations of strains. Based on the findings, 3 out of 9 combinations of strains showed the highest strength of co-aggregation. These combinations of strains were then aggregated on a cutting board and treated with three different sanitizers; benzalkonium chloride, peracetic acid and sodium hypochlorite solution at different times; 3 minutes, 5 minutes and 10 minutes for sanitizing efficacy evaluation. As a result, sanitization with benzalkonium chloride proved to be the most effective, with peracetic acid and sodium hypochlorite solution being less effective in comparison. Sanitizing for 10 minutes is found to be optimal as none of the strains survived after this duration with any of the sanitizers. The selection of an effective sanitizer is important for ensuring food safety and reducing the risk of cross-contamination from food contact surfaces and the occurrence of foodborne diseases.

Keywords: *Staphylococcus aureus*, *escherichia coli*, sanitizers, benzalkonium chloride, peracetic acid and sodium hypochlorite solution.

Transfer Rate of Antibiotic-Resistant *Escherichia coli* Isolates From High-Density Polyethylene Cutting Board Surface To Fresh-Cut Pineapple

Nur E'zzaty@ Nawal Jauza Binti Mohd Azurin¹ ,
Nur Amira binti Rosli² ,
Nor Ainy Mahyudin³ 

¹Universiti Putra Malaysia, Faculty of Food Science and Technology, Department of Food Service and Management, Serdang, Selangor. 1 nawalazurin@gmail.com , ²Universiti Putra Malaysia, Faculty of Food Science and Technology, Department of Food Service and Management, Serdang, Selangor. 2 emira.rosli@gmail.com , ³Universiti Putra Malaysia, Faculty of Food Science and Technology, Department of Food Service and Management, Serdang, Selangor. 3 norainy @upm.edu.my

Abstract

Cross-contamination of bacteria between food and contact surfaces has always been a main contributing factor towards foodborne disease. Bacteria, such as *Escherichia coli* (*E. coli*) have been reportedly found to harbour on cutting boards due to a lack of hygiene practices by food handlers. This study focused mainly on the cross-contamination of fresh-cut pineapple on a cutting board, aimed (i) to determine the physicochemical properties of water activity (a_w) and pH of pineapple fruit and (ii) to examine the transfer rate of *E. coli* isolates from cutting board to the selected fruits. The inoculum of three *E. coli* isolates with a concentration of log 8 CFU/ml was inoculated on the high polyethylene cutting board. Each selected fruit was then dropped from a height of 12.5 cm onto the cutting board and left for three different time intervals (<3, 30 and 300 s). The percentage transfer between bacteria and the contact surface was then determined. The a_w of pineapple was 0.96 ± 0.01 with acidity pH of 3.57 ± 0.03 . From the findings, all the *E. coli* isolates show a decreasing pattern of bacteria transfer rate from inoculated cutting board to pineapple at the longer contact time (300 s), with the values of 0.94 (8.7%), 0.56 (3.6%) and 1.36 (22.9%), respectively. This provides a fundamental understanding of cross-contamination from cutting boards to fresh-cut pineapple. Understanding transfer rates to fresh-cut fruits will allow for better risk assessment and management of microbial food safety risks related to the product.

Keywords: Cross-contamination, fresh-cut pineapple, cutting boards, *Escherichia coli*, and transfer rate.

Aptamer-based Biosensor for Rapid Detection of *Escherichia coli* O157:H7 in Water

Noordiana Nordin 

University of Putra Malaysia, Institute of Tropical Agriculture and Food Security,
Laboratory of Food Safety and Food Integrity, 43400 UPM Serdang, Selangor, Malaysia.
Author's e-mail: noordiana@upm.edu.my

Abstract

Access to safe water free from chemical and microbial contaminants for use and consumption is a basic human right. Most countries have strict regulations, standards and guidelines for managing water sources and water distribution systems to supply high-quality water. In recent years, several studies have shown that many water-associated deaths and illnesses are due to water-borne pathogens such as *Escherichia coli* O157:H7. Consequently, specific and robust detection methods are needed to ensure monitoring and surveillance of safe water from the source to the point of use. However, the current standard tests (i.e. screening and confirmatory) generally detect *E. coli*, but not specifically *E. coli* O157:H7. These analytical methods are time-consuming, extensive materials, and trained personnel with tedious sample-preparation procedures. Biosensor technologies are one of the options of a user-friendly rapid method which offers simplicity, easy-to-use, fast and portable features. Biosensor is a device that involves integration of bioactive material with transducing element for identifying the concentration or action of analyte present in the sample. Aptamers are single-stranded deoxyribonucleic acid (DNA) or ribonucleic acid (RNA) oligonucleotides that fold into specific complex structures and interact with their targets via shape complementarity, hydrogen bonding, electrostatic interactions and stacking interactions. Besides having high affinities and selectivity, they can bind to a wide range of targets from small non-immunogenic compounds to whole cells. Therefore, aptamer-based biosensors are potentially a sensitive but inexpensive method of detection. Furthermore, it can be design into a miniature size to be portable and practical for on-site application, thus creating a promising technology for miniaturisation and commercialisation.

Keywords: Aptamer, biosensor, detection, *Escherichia coli* O157:H7, water.

Evaluation of Protein Extraction Procedures for Gel-Based Proteomic Studies of *Caulerpa lentillifera*

Fisal Ahmad^{1,2} ,
Azwan Awang³ 

¹Faculty of Fisheries and Food Science, University of Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia.

²Functional Food RIG, Food Security in a Changing Climate SIG, Food Security Research Cluster, University of Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia. 1,2Author's e-mail: fisal@umt.edu.my ,

³School of Sustainable Agriculture, University of Malaysia Sabah Kampus Sandakan, Batu 10, Jalan Sungai Batang, 90000 Sandakan, Sabah, Malaysia.

³Author's e-mail: azwang@ums.edu.my

Abstract

Proteomic provides vital information on biological function at the protein level. Protein extraction from plant, particularly in seaweeds (*Caulerpa lentillifera*), is difficult due to the high level of non-protein compounds. To establish a compatible protein extraction method for two-dimensional gel electrophoresis (2-DE) analysis in *Caulerpa lentillifera*, we compared four (4) extraction methods: no precipitation and fractionation, TCA-acetone precipitation and fractionation, TCA-acetone precipitation and phenol extraction and methanol-ammonium acetate precipitation. We found that the phenol extraction method gives a higher protein yield and number of protein spots resolved with a satisfactory 2-DE image quality than the other methods. We conclude that the phenol extraction method is the best protein extraction procedures for proteomic studies of *Caulerpa lentillifera* proteins.

Keywords: Seaweed, protein extraction, phenol method, proteome, two-dimensional gel electrophoresis.

The Potential of Potato as Starch Source in Juvenile African Catfish (*Clarias gariepinus*) Feed Formulation

Mohd Shaiful Azman Abdul Rahim¹ , Lee Seong Wei² 
Kon Yeu Hooi³ , Martina Irwan Khoo⁴ ,
Mohamad Nor Azra⁵ , Wendy Wee⁶ 

¹Department of Agricultural Sciences, Faculty of Agro-Based Industry, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia. 1email: azman.ar@umk.edu.my 2email: leeseong@umk.edu.my , ³Department of Johor State Fisheries Complex, Pendas Laut Road, 81550, Gelang Patah, Johor, Malaysia. 3email: yeuhooi@dof.gov.my , ⁴Department of Chemical Pathology, School of Medical Sciences, Universiti Sains Malaysia, Health Campus, Kubang Kerian 16150, Malaysia. 4email: msirwankhoo@gmail.com ⁵Research Center for Marine and Land Bioindustry, Earth Sciences and Maritime Organization, National Research and Innovation Agency (BRIN), Pemenang 83352, Indonesia. 5email: azramn@umt.edu.my , ⁶Center for Fundamental and Continuing Education, Universiti Malaysia Terengganu, 21030, Kuala Nerus, Terengganu, Malaysia. 6Authors' e-mail: wendy@umt.edu.my

Abstract

This study evaluated the effects of potato, wheat, rice, and corn starch on growth performance of African catfish, *Clarias gariepinus*. A control diet (a commercial fish diet) and four different starch (potato, PO; wheat, WH; corn, CO; rice, RC) formulations were fed to African catfish with average weight 10.5g (n=30) for eight weeks. The experiment was conducted in triplicate. At the end of the feeding trial, the growth performance of African catfish fed with potato starch (PO) was significantly higher than other treatment groups. Furthermore, this group recorded significant and lowest feed conversion ratio (FCR) values compared to other groups. In addition, this group demonstrated substantially lower viscerosomatic index (VSI) and hepatosomatic index (HSI) than other groups indicating the fish has more meat on its body. Therefore, the dietary PO diet potentially improves African catfish's growth performance and health status.

Keywords: Growth performance, potato starch, African catfish.

Characterization of Soursop Fruit Tablets: A Study on Physicochemical, Antioxidant Properties, and Sensory Attributes

Engku Alya Najihah¹ ,
Norizah Mhd Sarbon² ,
Mannur Ismail Shaik³ 

¹ University of Malaysia Terengganu Author's e-mail: s58077@ocean.umt.edu.my ,
² University of Malaysia Terengganu 2Author's e-mail: norizah@umt.edu.my
³ Faculty of Fisheries & Food Science, University of Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia.
³ Author's email: mannurismail@umt.edu.my

Abstract

Introduction and Aim: The soursop plant (*Annona muricata* Lin.), a member of the Annonaceae family, is known for its diverse pharmacologically active substances. The edible part of soursop fruit is its white flesh, which offers a unique blend of sour and sweet flavors as it ripens. The pulp of the mature fruit is nutritionally rich, particularly in phenolic compounds and ascorbic acid, both act as antioxidants. However, soursop fruit and juice have a limited shelf life and require refrigeration to maintain their quality attributes. The current study was designed to develop the soursop fruit tablets and evaluate their physicochemical, antioxidant properties, and sensory attributes.

Method: Three different formulations of soursop fruit tablets were prepared, containing 40%, 50%, and 60% soursop fruit powder, respectively. The physicochemical characteristics, including colour, pH, moisture, dissolution, ash, fat, protein, fibre, carbohydrate content, and Vitamin C content were analysed using standard protocols. The antioxidant properties of soursop fruit tablets were evaluated through DPPH assay, total phenolic content (TPC), and total flavonoid content (TFC) assay. The sensory attributes of three formulations analysed using a 9-point hedonic scale.

Results: Formulation-1 exhibited highest levels of moisture, ash, fat, protein, fibre, and carbohydrate content. Vitamin C levels elevated with increasing concentration of soursop fruit powder, with formulation-3 showing highest levels. Formulation-1 also demonstrated the highest antioxidant activity as measured by the DPPH assay, while TPC and TFC levels were higher in formulation-3. Sensory evaluation of soursop tablets revealed that formulation-1 achieved the highest acceptability compared to formulations-2 and 3.

Conclusion: In conclusion, soursop tablets can be introduced as a “ready-to-drink” product in food marketing platforms, offering significant health benefits.

Keywords: Soursop fruit, fruit tablet, physicochemical properties, antioxidants, vitamin C.

Enhancing Protein Quality with Acha, Pigeon Pea, Oyster Mushroom Breakfast Cereals: Benefits for Diabetic Patients

Rita Nwankwegu¹ ,
Ifeoma Mbaeyi-Nwaoha² 

Faculty of Agricultural and management science, Department of Food Science and Technology, EBSU, Nigeria.

1Author's e-mail: rita.nwankwegu@ebsu.edu.ng

Faculty of Agricultural and management science, Department of Food Science and Technology, UNN, Nigeria

2Author's e-mail: ifeoma.mbaeyi-nwaoha@unn.edu.ng

Abstract

Diabetic patients often experience muscle loss, metabolic issues, and weakened immunity due to inadequate or low-quality protein intake. This study focuses on enhancing the protein quality with acha (*Digitaria exilis*), pigeon pea (*Cajanus cajan*) and oyster mushroom (*Pleurotus ostreatus*). Amino acids score, concentration of essential amino acids, amino acid score based on hen's whole egg amino acid and essential amino acid score based on FAO/WHO standard and protein quality were determined, all expressed in mg/L, with means and standard deviations for each blend. A completely randomized design (CRD) was used for this analysis and the significant difference between means were determined using (ANOVA), the means were separated using the Duncan multiple range test and significance was accepted at $p < 0.05$. For amino acids score, leucine levels increased from 7.910 ± 0.005 mg/L in Sample 102 to 9.310 ± 0.005 mg/L in Sample 104 with significant ($p < 0.05$) differences. Concentration of essential amino acid, and essential amino acid score, increased as pigeon pea and oyster mushroom were increased with threonine ranging from 0.720 ± 0.005 mg/L in Sample 102 to 0.940 ± 0.005 mg/L in Sample 104, showing significant ($p < 0.05$) differences. The protein quality improved, ranging from 2.820 ± 0.005 mg/L (Sample 102) to 3.290 ± 0.005 mg/L (Sample 104) for protein efficiency ratio, with higher proportions of pigeon peas and oyster mushrooms better in all parameters. This suggests improved protein utilization, enhanced glycemic control for diabetic patients, to optimize nutritional quality and diabetes management.

Keywords: Protein quality, acha, oyster mushroom, pigeon pea.

Application of Transglutaminase Enzyme As a Substitute of Phosphates in Meat Processing Technology

Vilma Gurazi¹ , Xhuljana Sula² ,
Kapllan Sulaj³ , Suela Lulollari⁴ 

¹Agricultural University of Tirana , Faculty of Biotechnology and Food, Department of Food Science and Biotechnology, Tirana, Albania.

¹Author's e-mail: vgurazi@ubt.edu.al ,

²Agricultural University of Tirana , Faculty of Biotechnology and Food, Department of Food Science and Biotechnology, Tirana, Albania.

² Author's e-mail: xh.sula@yahoo.com

³Agricultural University of Tirana , Faculty of Biotechnology and Food, Department of Food Science and Biotechnology, Tirana, Albania.

³ Author's e-mail: ksulaj@ubt.edu.al , ⁴Author's e-mail suela.lulollari@yahoo.com

Abstract

Phosphates are commonly used in meat processing to improve water retention, texture and flavor. However, concerns have been raised about the health and environmental impacts of phosphates. Transglutaminase, a natural enzyme, has been proposed as an alternative to phosphates in meat processing. This study aims to investigate the feasibility and effectiveness of replacing phosphates with transglutaminase in meat processing.

Previous studies have highlighted potential health risks associated with consuming phosphates in processed meats, including cardiovascular disease and kidney problems. Transglutaminase has been identified as a safe and natural enzyme that can improve the functional properties of meat products without the negative health implications of phosphates. Research has shown that transglutaminase can improve the texture, water-binding capacity and overall quality of meat products. Consumer studies have also shown a positive perception of meat products treated with transglutaminase.

The main purpose of the study is to determine how the addition of transglutaminase instead of phosphates affects the quality characteristics of processed meat products. Also, the physico-chemical characteristics of these products will be examined.

In conclusion, this comprehensive study on the replacement of phosphates with transglutaminase in meat processing recommends the replacement of phosphates with the commercial enzyme transglutaminase because it results in a positive impact on the structure of the meat by increasing its ability to hold fat, increasing protein cohesion and minimizing water loss and increasing protein density. structure, which helps to stabilize the structure of the product.

Keywords: Transglutaminase, phosphate, protein, water retention, sustainability.

Anti-*Salmonella* Activity Of Thymol-Based Deep Eutectic Solvents

Teodora Kukrić¹ ,
Boris Popović² 

¹University of Novi Sad, Faculty of Agriculture, Department of Field and Vegetable Crops, Novi Sad, Republic of Serbia

¹Author's e-mail: teodora.dpb@gmail.com

²Author's e-mail: boris.popovic@polj.uns.ac.rs

Abstract

Addressing *Salmonella enterica* contamination and the associated risks of foodborne illness is a critical focus in food safety and microbiology. Today's food industry, with traditional approaches focuses on improving hygiene, better cooking practices, and the use of synthetic antimicrobials. However, concerns over antibiotic resistance and chemical residues in food have driven the search for alternative methods. Natural Deep Eutectic Solvents (NADES), mainly hydrophobic ones (HDES) based on thymol, have emerged as promising candidates. NADES are a class of solvents formed by the combination of natural compounds, often derived from plants, which are safe, biodegradable, and can dissolve a wide range of bioactive substances. Thymol, a phenolic compound found in thyme, has well-documented antimicrobial properties. When used as the basis for hydrophobic deep eutectic solvents, it may enhance the solubility and bioavailability of other natural antimicrobials, thus providing a synergistic effect against pathogens like *Salmonella enterica*. These solvents can be explored as novel antibacterial agents, offering a natural and effective strategy to reduce the incidence of foodborne illnesses while addressing consumer demands for cleaner, safer food preservation techniques. Our study aimed to investigate the anti-*Salmonella* activity of two HDES based on thymol. The results were presented as minimum inhibitory concentration (MIC) and minimum fungicidal concentration (MFC) values. A total of 16 concentrations were tested, and both HDES demonstrated the same activity, with MIC and MFC values of 0.32%. These findings suggest the potential for using thymol-based HDES as an effective antibacterial agent against *Salmonella enterica*. However, further research is needed to explore their efficacy against other bacterial species.

Keywords: HDES, NADES, *Salmonella enterica*.

Natural Plant Compounds as Effective Antifungal Agents Against *Botrytis Cinerea* In Postharvest Disease Management

Teodora Kukrić¹ ,
Boris Popović² 

¹University of Novi Sad, Faculty of Agriculture, Department of Field and Vegetable Crops, Novi Sad, Republic of Serbia

¹Author's e-mail: teodora.dpb@gmail.com



²Author's e-mail: boris.popovic@polj.uns.ac.rs

Abstract

Controlling the spread of *Botrytis cinerea* and mitigating its impact on food security and crop yields is a major challenge in agriculture and food safety. *B. cinerea*, the causative agent of grey mould, is a pervasive fungal pathogen that affects a wide range of crops, mainly fruits and vegetables, leading to significant post-harvest losses and reduced food quality. Traditional methods of controlling *Botrytis* involve synthetic fungicides. Still, these approaches have been met with increasing concerns due to the development of fungicide resistance, environmental impact, and consumer demand for cleaner, residue-free produce. As a result, there is a growing interest in exploring natural and sustainable alternatives. Those alternatives include the utilisation of natural plant compounds. Natural Deep Eutectic Solvents (NADES), especially hydrophobic ones (HDES) based on thymol, have emerged as promising candidates. HDES are formed by combining two or more natural compounds. The aim of our study was to investigate the antifungal activity of two thymol-based HDES against *B. cinerea*. The experiment was conducted in hermetically sealed containers, where artificially inoculated cherries were used to assess the antifungal efficacy of the HDES. Three concentrations (25, 50 and 100%) of each thymol-based HDES were tested. The results were presented as the percentage of inhibition, and both HDES demonstrated a 100% inhibition rate against *B. cinerea*. These findings highlight the potential of thymol-based HDES as an effective antifungal agent in food preservation and post-harvest treatment. However, further research is needed to evaluate their efficacy against other fungal pathogens and their practical applications in different food systems.

Keywords: Nades, cherry, thymol, bio fungicide, decay.

Newbouldia laevis, And *Icacina trichantha* Leaves Influenced Chemical and Microbiological Quality of Fermented Melon Condiments

Oladeji, Oluwatoyin Ajoke¹ ,
Clement.Olusola Ogidi² ,
Akinde Folake Ruth³,
Okunowo, Omowumi A.⁴

1,2,3,4 Department of Food Science and Technology, School of Agriculture Food and Natural Resources, Olusegun Agagu University of Science and Technology, Okitipupa, Nigeria ,
1 Author's e-mail: oa.oladeji@oaustech.edu.ng ,
2 Author's e-mail: co.ogidi@oaustech.edu.ng
3 akindefolake05@gmail.com
4 okunowoomowunm@gmail.com

Abstract

Introduction and Aim: *Newbouldia Laevis* (*Ns*), and *Icacina trichantha* (*It*) are leaves commonly used in production of fermented melon condiments in the Southern part of Nigeria. The influence of boiling these leaves with fermented melon condiments before fermentation and using different wrapping materials for fermentation on the quality of the resulting condiment were studied.

Method: The leaves were boiled separately with melon seeds after removing the seed's pericarp and wrapped together with the boiled leaves in *Thaumatococcus daniellii* (*Td*). Some other portions that were not boiled with the leaves were wrapped in *Td* leaves, foil paper and kept plastic container. The wrapped melon seeds were allowed to ferment for 120 h. The proximate, mineral, antioxidants, amino acids, microbiological, and physicochemical properties of the condiment samples were determined following standard methods.

Results: Protein, ash, fat, and glutamic acid contents of the samples ranged from 25.20-34.57%, 2.14-3.10%, 14.61-28.65%, and 12.74-13.80 g/100g protein respectively with *I.trichantha* leaves having the least value and that of *N.laevis* leaves having the highest value for protein and fat. The highest ($p \leq 0.05$) glutamic acid (13.80) was obtained in condiment wrapped with *T.daniellii* leaves. Condiment wrapped with *I.trichantha* leaves was observed to contain the highest values of 18.91, 5.99, 2.86 and 4.08 mg/100g for Na, K, Ca, and Fe, respectively. The pH and Titratable acidity of the samples ranged from 7.03-7.53 and 1.16-1.71 respectively. The microbial load of 1.6×10^5 to 8.0×10^5 cfu/mL and occurrence of *Bacillus* species, *Corynebacterium* specie, *Lactobacillus acidophilus* and *Staphylococcus aureus* in condiments fermented with leaves supported the fermentation processes than in foil paper and airtight plastic container. Prebiotic activity of the condiments supported the growth of Lactic acid bacteria with values of 1.79 to 2.77×10^5 cfu/mL.

Conclusion: Condiments fermented with leaves gives a better microbiological quality with enhanced nutrients.

Keywords: Amino acid profile, antioxidant activities, biochemical properties, microbial load, minerals, proximate.

Food, Nutrition and Food Sustainability: Ethically Where to Start?

Tatiana Silva¹ ,
Bruno Sousa² 

¹ Health Service of the Autonomous Region of Madeira, 1Author's e-mail: tatianasilva2611@hotmail.com
Universidade Lusófona; CBIOS – Universidade Lusófona's Research Center for Biosciences & Health Technologies
²Author's e-mail: bruno.sousa@mail.com

Abstract

Introduction and Aim: All individuals should have access to safe and nutritious food to meet their daily needs and food preferences for an active and healthy life. However, bioethical principles are presupposed that challenge their application, making it crucial to understand the ethical issues associated with food, particularly with regard to food sustainability. To carry out a literature review aimed at understanding the ethical issues associated with food and consequently the need to maintain food sustainability.


Method: A literature review was carried out in two databases, Google Scholar® and PubMed®, analysing several scientific articles dating from the last five years that focused their themes on the terms “food”, “nutrition”, “sustainability” and “ethics”.

Results: It was found that the practice of environmental and food education is fundamental to promoting consumer awareness about the effects of their consumption decisions and the need to change habits to preserve the environment, suggesting, in practical terms, the guaranteeing the needs of the present without affecting future generations, highlighting that sustainability goes far beyond environmental issues, encompassing other elements, such as social, economic and cultural development. Some authors consider that, at the school level, this education has significant importance, being an excellent starting point, enabling the preparation of citizens as transformative agents, through the development of skills and competencies and the formation of attitudes based on ethical components leading to the exercise of citizenship and the production of more sustainable and healthier food.

Conclusion: More socially responsible attitudes and the union of different institutions and disciplines must be encouraged in the search for solutions for a more sustainable world, with a higher quality of life and integrating people's ability to think, evaluate, act and participate that goes far beyond the basic supply of your needs.

Keywords: Ethics, food, nutrition, sustainability.

The Potential of *Curcuma longa* L. Leaf as Feed Additive in African Catfish (*Clarias gariepinus*) Farming

Wendy Wee¹ , Kon Yeu Hooi² ,
Martina Irwan Khoo³ , Mohamad Nor Azra^{4,5} ,
Lee Seong Wei⁶ 

1Centre for Fundamental and Continuing Education, University of Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia.

1Authors' e-mail: wendy@umt.edu.my , 2Johor State Department of Fisheries, 81550 Gelang Patah, Johor, Malaysia.

2Authors' e-mail: yeuhooi@dof.gov.my , 3Department of Chemical Pathology, School of Medical Sciences, University of Sains Malaysia, Health Campus, 16150 Kubang Kerian, Kelantan, Malaysia. 3Authors' e-mail: msirwankhoo@gmail.com , 4Institute of Climate Adaptation and Marine Biotechnology (ICAMB), University of Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia.

5Research Center for Marine and Land Bioindustry, Earth Sciences and Maritime Organization, National Research and Innovation Agency (BRIN), Pemenang 83352, Indonesia. 4,5Authors' e-mail: azramn@umt.edu.my ,






6Department of Agricultural Sciences, Faculty of Agro-Based Industry, University of Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia. 6Authors' e-mail: leeseong@umk.edu.my

Abstract

The development and use of sustainable feed additive from plant origin has emerged as a promising strategy to provide health benefits and improved growth performance on farmed fish. In this study, the effect of turmeric, *Curcuma longa* L. leaf as feed additive on growth performance of African catfish was evaluated. A control diet and three experimental diets supplemented with powdered *Curcuma longa* L. leaf at 0.5, 1.0, and 1.5% were prepared for the feeding trial. After eight weeks, results showed that growth performance of African catfish receiving dietary powdered *Curcuma longa* L. leaf improved significantly ($p < 0.05$), with the highest being in the group receiving 1.5% of feed additive. Likewise, feed conversion ratio (FCR) reduced in the same pattern for the treatment groups, with the lowest FCR in the group receiving 1.5% of feed additive. Based on the findings, powdered *Curcuma longa* L. leaf is best supplemented in the diet of farmed African catfish at 1.5% to improve their growth performance.

Keywords: *Curcuma longa* L. leaf, African catfish, growth performance.

The Potential of Black Fungus, *Auricularia auricula*, as a Feed Additive in African Catfish, *Clarias gariepinus*, Farming

Alvin Amos Adrian Susin^{1*} , Lee Seong Wei¹ ,
Albaris B Tahliluddin^{2,3} , Liew Vui Kien⁴ ,
Wendy Wee^{5*} 

¹Department of Agricultural Sciences, Faculty of Agro-Based Industry, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia. 1email:alvinamos@gmail.com , ²Department of Agricultural Sciences, Faculty of Agro-Based Industry, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia. , 2email: leeseong@umk.edu.my , ³College of Fisheries, Mindanao State University-Tawi-Tawi College of Technology and Oceanography, Sanga-Sanga Bongao, Tawi-Tawi 7500 Philippines.
³Department of Aquaculture, Institute of Science, Kastamonu University, Kastamonu 37200, Türkiye. , 3email: albaristahliluddin@msutawi-tawi.edu.ph,
⁴Department of Johor State Fisheries Complex, Pendas Laut Road, 81550, Gelang Patah, Johor, Malaysia , 4email: vkliew@dof.gov.my
⁵Center for Fundamental and Continuing Education, Universiti Malaysia Terengganu, 21030, Kuala Nerus, Terengganu, Malaysia.
5email: wendy@umt.edu.my

Abstract

This study explores the beneficial effects of *Auricularia auricula* (AA) as a feed additive in promoting growth of African catfish (*Clarias gariepinus*) farming. The application of feed additives is a hot topic in recent aquaculture studies aimed at promoting the growth of aquaculture species. After 8 weeks of feeding trial, the results of the present study revealed that fish-fed AA diets performed significantly better ($p<0.05$) compared to the control group in growth performances, including final weight, weight gain, and specific growth rate. The highest performances were observed in the fish-fed AA at 3 and 4%. A similar trend was also observed in the values of feed conversion ratio, hepatosomatic index, and visceral somatic index, with the lowest values ($p<0.05$) in the fish-fed AA at 3 and 4%. The findings of the current study suggest that AA has huge potential as a feed additive in African catfish farming.

Keywords: *Clarias gariepinus*; *Auricularia auricula*; growth performance.

In Vitro Anti-Inflammatory Activity of Green Extracts From Plant Species Belonging to Lamiaceae Family

Ružica Ždero Pavlović¹ ,
Tatjana Jurić² ,
Boris Popović³ 

¹University of Novi Sad, Faculty of Agriculture, Department of Field and Vegetable Crops, Novi Sad, Serbia.

¹Author's e-mail: ruzica.zdero@polj.uns.ac.rs , ²University of Novi Sad, Faculty of Agriculture, Department of Field and Vegetable Crops, Novi Sad, Serbia. ²Author's e-mail: tatjana.juric@polj.uns.ac.rs , ³University of Novi Sad, Faculty of Agriculture, Department of Field and Vegetable Crops, Novi Sad, Serbia. , ³Author's e-mail: boris.popovic@polj.uns.ac.rs

Abstract

Introduction and Aim: Inflammation is a well-known symptom of many diseases. It is the body's non-specific response to injury or infection. Phenolic compounds, abundant in Lamiaceae plants, exhibit strong antioxidant properties that protect the body from oxidative stress and inflammation. The main objective of this work was to evaluate new greener solvents for the extraction of bioactive compounds from *Melissa officinalis* L., *Thymus serpyllum* L., *Origanum vulgare* L., *Salvia officinalis* L., *Ocimum basilicum* L. and *Lavandula* sp. L. plants, and compare their antioxidant and anti-inflammatory potential.

Method: Modern ultrasonic extraction and four natural deep eutectic solvents (NADES) were used for the extraction of biologically active compounds. Also, 70% ethanol was used for extraction as a conventional green solvent. The antioxidant activity of extract was measured by ORAC method. The potential anti-inflammatory activity of extracts was evaluated by inhibition of heat-induced protein denaturation of egg albumin model and ability of extracts to protect the membrane of erythrocytes from lyses.

Results: The results showed that choline chloride: urea and choline chloride: 1, 2-propanediol were the most suitable NADES for the extraction of bioactive compound. Apparently, extract of *Melissa officinalis* L. has the highest Oxygen Radical Absorbance Capacity (ORAC) value. The best inhibitory effect on egg protein denaturation had extracts obtained using NADES with choline chloride: citric acid, while *Salvia officinalis* extracts has the best effect on the stabilization of erythrocyte membrane.

Conclusion: Plant extracts with the highest anti-inflammatory potential can be used for further biomedical research to obtain preparations that could potentially be used in the pharmaceutical or food industry. This research was funded by the Provincial Secretariat for Higher Education and Science, Autonomous Province Vojvodina, Republic of Serbia, grant number 000874870 2024 O9418 003 000 000 001 04 003.

Keywords: Green extracts, inflammation, Lamiaceae plants.

Anti-Oxidant Composition of Breakfast Cereals from acha (*Digitaria exilis*), Pigeon Pea (*Cajanus cajan*) and Oyster Mushroom (*Pleurotus ostreatus*) Flour

Rita Ogodo Nwankwegu 

Faculty of Agricultural and management science, Department of Food Science and Technology, EBSU, Nigeria
Author's e-mail: rita.nwankwegu@ebsu.edu.ng

Abstract

Functional foods as a food category are on the rise, and hence the search for new and improved breakfast cereals containing more antioxidants. The research work aims at determining the antioxidants in the acha, pigeon pea, and mushroom formulated breakfast cereals. Four cereal formulations were prepared: pigeon pea and oyster mushroom with 101% Acha; 75% Acha, 20% Pigeon pea, and 20% oyster mushrooms (102); 70% acha, 20% Pigeon pea, and 10% oyster Mushrooms (103); and 65% Acha, 20% Pigeon pea, with 15% oyster mushrooms (104). Completely randomized design (CRD) was used, the significant difference between means were determined using (ANOVA) and accepted at $p < 0.05$, and separated using the Duncan multiple range test. The flavonoid content was higher in formulation 104 containing $1.24\% \pm 0.02$, followed by 103 containing $0.97\% \pm 0.04$, 102 having $0.77\% \pm 0.01$, and the lowest 101 ($0.38\% \pm 0.23$). Formulation 104 contained the highest ($2.54\% \pm 0.00$) and significantly ($p < 0.05$) lower in 102 ($1.37\% \pm 0.19$). Ascorbic acid content ranged from $7.85 \text{ mg} \pm 0.02$ in 101 to $10.68 \text{ mg} \pm 0.16$ in 104, indicating a significant increase with the incorporation of pigeon pea and mushroom flours. Beta-carotene content was also highest in 104 ($5.42\% \pm 0.01$), demonstrating a marked enhancement compared to the other formulations. The results raise their antioxidant potential in aspects such as flavonoid, phenolic, ascorbic acid and beta-carotene. Sample (104) consequently had the highest antioxidant content thereby giving it a great potential for functional-food application that would help increase consumption of bioactive compounds, improve the quality of life, and treating oxidative stress ailments.

Keywords: Antioxidant, pigeon pea, oyster mushrooms, acha.

Traditional Alcoholic Beverages of Himachal Pradesh, India

Ashwani Kumar 

Institute of Food Technology, Bundelkhand University, Jhansi, Uttar Pradesh, 284128
Department of Food Science and Technology, Dr. Y. S. Parmar University of Horticulture and Forestry, Nauni, Solan, Himachal Pradesh, 173210
Author's e-mail: ashwanichandel480@gmail.com

Abstract

Himachal Pradesh is a hilly state of India that is located in western Himalayas between 30°22'N and 33°12'N latitude and 75°47'E and 79°04'E longitude. This hilly state has low population compared to the other states of India and contributes to only 0.57% of the total Indian population. However, a great diversity in the culture, especially, among the food habits, clothing and lifestyle is observed in this state. The consumption of traditional alcoholic beverages is also very common in many parts of the state. The process for the production of alcoholic beverages varies among various communities and regions. The most common type of alcoholic beverages produced and consumed by local people are '*Lugri/Jhol*' in district Kangra, '*Sur*' in district Kullu, Mandi and upper regions of Kangra, and '*Angoori*' in district Kinnaur. *Lugri/jhol* is produced from the broken rice, and the various steps used in its production are cooking of rice, cooling, addition of traditional culture '*phab*', filling into heat sterilized earthen pots (up to 1/3rd of their volume), sealing, fermentation at room temperature for 3-5 days, addition of water, sealing, secondary fermentation at room temperature for 6-7 days, filtration and use for consumption. *Sur* is a finger millet based alcoholic beverage that is produced by the addition of a barley based traditional starter culture known as '*dhaeli*' to the mixture of broken baked finger millet *rotis*, jaggery and water in an earthen pot, followed by fermentation for 7-10 days. The *dhaeli* also contains 36-360 local herbs along with barley. It is believed to have several health benefits and is consumed as a tonic by the people of both the gender and all age groups. *Angoori* is prepared from the local red grapes variety of Kinnaur known as '*Dakhangrakht*'. Among these *lugri* and *sur* are non-distilled alcoholic beverages, while, *angoori* is a distilled beverage. The lowest (3-6%) alcohol content is found in *lugri*, followed by *sur* (4-15%) and *angoori* (30-50%). The other popular alcoholic beverages are *moori*, *chaang*, and *ghanti*, etc.

Keywords: Traditional alcoholic beverages, *Sur*, *Lugri*, *Angoori*, *Dhaeli*, *Phab*.

Biochemical Studies of Carrot for Its Nutritional and Antioxidant Properties

Navjot Sharma¹ , Shilpa Gupta² ,
Usha Nara³ , Harshneet Singh Sran⁴ 

1Department of Biochemistry, Punjab Agricultural University, Ludhiana-141004, India 1Author's e-mail: navjotsharma18052000@gmail.com
2Department of Biochemistry, Punjab Agricultural University, Ludhiana-141004, India 2Author's e-mail: shilpagupta@pau.edu
3 Department of Plant Breeding and Genetics, Punjab Agricultural University, Ludhiana-141004, India 3Author's e-mail: ushanara@pau.edu
4Krishi Vigyan Kendra, Punjab Agricultural University, Ludhiana (Samrala) Author's e-mail: harshneet@pau.edu

Abstract

Introduction and Aim: Carrots are potentially rich source of vitamins, minerals and antioxidants. The human body requires vitamins and minerals for its metabolic processes. Carotenoids are the major phytochemicals in carrots which provide health benefits to humans. The main objective of our study was to unravel the biochemical composition of carrot which may help in improvement of carrot breeding programs.

Methods: The carrot variety (Kudrat) was procured from the fields of Krishi Vigyan Kendra, Punjab Agricultural University, Ludhiana (Samrala). The samples were biochemically investigated for two years (2022-23 and 2023-24) for various biochemical attributes viz. moisture, ash, chlorophyll a & b, total carotenoids, total carbohydrates, total soluble sugars, ascorbic acid, total phenols, total antioxidant activity (DPPH & FRAP) and tocopherols using standardized methods. The data from two years were pooled and variability was determined using ANOVA.

Results: During both years, chl a, chl b and total carotenoid content were at par with each other. Total antioxidant activity was assessed via FRAP and DPPH assay. FRAP activity (0.517 mg/g AAE FW) was found to be more in the second year than in the first year. The contents of all the studied parameters i.e. DPPH (0.320 % DPPH radical scavenge), ash (0.020 %), moisture (0.130 %), total phenols (7.530 µg/g FW), total carbohydrates (69.11 mg/g FW), ascorbic acid (0.485 mg/g FW), total sugars (36.305 mg/g FW) and tocopherols (0.221 mg/g FW) were found to be more in the first year. On comparing data for two years and pooled analysis, it was found that there was non-significant variation in all studied biochemical parameters except DPPH, FRAP, ascorbic acid and total sugars at $p \leq 0.05$. Conclusion: Among various biochemical parameters studied, chlorophyll, carotenoids, total phenols, total carbohydrates and tocopherols being stable parameters could be selected as significant biochemical markers which can be utilized for further improvement in carrot breeding programs.

Keywords: Antioxidant, carotenoids, carrot, nutritional attributes, tocopherols.

Sensory Evaluations on Consumer Acceptance of Fish Gelatin in Food Products

Cemile Buse Çopur¹ ,
Edibe Seda Erten² 

1Aydın Adnan Menderes Üniversitesi, Fen bilimleri Enstitüsü, Gıda Mühendisliği Programı, Aydın, Türkiye.

1Yazarın e-maili: buusecopur@gmail.com

2Aydın Adnan Menderes Üniversitesi, Mühendislik Fakültesi, Gıda Mühendisliği Bölümü, Aydın, Türkiye.

2 Yazarın e-maili: eserten@adu.edu.tr

Abstract

Gelatin is a water-soluble, high molecular weight polypeptide obtained from the partial hydrolysis of collagen with a triple helix structure. It is widely used as a thickening, stabilizing, foaming and gelling agent in many food and medical products. Industrially, gelatin is obtained from the skin, bone and connective tissues of animals such as cattle, pigs and fish. Consumption of pork gelatin is contrary to Islam and carries the risk of contracting python diseases (especially spongiform encephalopathy). Furthermore, pork and bovine gelatins are avoided by semi-vegetarians and pescatarians. For these reasons, fish gelatin has the potential to provide additional sources of gelatin, both religiously and socially. Furthermore, fish skin is an important by-product of the fish processing industry, causing waste and pollution, and can provide a valuable source of gelatin. The production of fish gelatin therefore results in value-added products by reducing processing waste materials. Unlike other types of gelatin, fish gelatin has a lower content of pyrrolidine and hydroxyproline, amino acids responsible for the stabilization of collagen-like triple helices, as well as a lower molecular weight. Fish gelatin therefore has lower gelling and melting temperatures, reduced gel strength and higher consumption in the production of structured food products. Usage of fish gelatin is divided into two categories: use in foods and use as food coating material. Fish gelatin has been studied in foods such as confectionery gels, noodles and ice cream, and its application as an edible coating in some foods such as chicken and apples has also been investigated. Considering the previous reviews, there are no studies on consumer acceptance of the sensory properties of fish gelatin. Therefore; the aim of this study was to investigate sensory evaluations on consumer acceptability of fish gelatin in food products and food coatings in recent years.

Keywords: Sensory analysis, consumer acceptance, fish gelatin.

Türkiye'nin Geleneksel Bir Tahıl Ürünü: Kars Kavılca Bulguru

A Traditional Cereal Product of Turkey: Kars Kavılca Bulguru

Asya Çetinkaya¹ , Güven Gülbaz² 

1,2 Kafkas Üniversitesi Mühendislik-Mimarlık Fakültesi, Gıda Mühendisliği Bölümü, Kars, Türkiye
1Yazarın e- maili: a_cetinkaya36@hotmail.com
2Yazarın e- maili: gulbaz68@hotmail.com

Özet

Ülkemizde kavuzlu diploid ve tetraploid buğdaylar birlikte kaplıca buğdaylar olarak bilinmektedir. Triticum dicoccum (emmer) Anadolu'da asırlardır yetiştirilen antik bir buğday türüdür. Kavılca buğdayı Türkiye'de daha çok Kars ili çevresinde yetiştirilmekte olup, yöresel olarak, kavılca=kablucu=yaban buğdayı gibi isimlerde verilmektedir. Köylerde ve küçük aile tipi işletmelerde un ve kavılca bulguruna işlenmektedir. Kavılca bulguru; Kars ili ve çevresinde bir buğday türü olarak yetiştirilen kavılca buğdayından elde edilerek tüketilen bir tahıl ürünüdür. Kavılca buğdayı yüksek besin değeri sebebiyle bulgur üretimi yanında, diğer unlu mamullere karıştırılarak kullanılabilir. Kavılca buğdayının yörede yaygınlaşması için özellikle tanıtım, pazarlama ve besinsel öğelerinin bilinmesi ve belirlenmesi önem taşımaktadır. Kars ilinde ev koşullarında, aile tipi işletmelerde ve yalnızca kavılca buğdayının öğütülme işlemini gerçekleştiren küçük çaplı değirmenlerde geleneksel yöntemlerle üretilerek, şarküteri, market ve pasajlarda satılan kavılca bulgurunun geleneksel üretim yöntemi, mikrobiyal ve fizikokimyasal özellikleri ve kullanım alanları hakkında bilgi vermek amacıyla yapılan bir derleme çalışmasıdır. Bazı fizikokimyasal ve mikrobiyolojik özellikleri yönünden besleyici değeri yüksek olan ve farklı şekillerde değerlendirilebilen kavılca buğdayının yetiştiriciliğinin geliştirilmesi ve desteklenmesinin önemli olduğunu ifade edebiliriz.

Anahtar Kelimeler: Kars, Kavılca, kavılca buğdayı, Kavılca bulguru.

Abstract

Hulled diploid and tetraploid wheats are collectively known as einkorn wheat in our country Triticum dicoccum (emmer) is an ancient wheat type that has been cultivated in Anatolia for centuries. Kavılca Bulguru is mostly grown around Kars province and is known as kavılca = kablucu = wild wheat. Due to its high nutritional value, Kavılca wheat can be used in the production of bulgur, as well as mixed with other bakery products. In order for Kavılca wheat to become widespread in the region, it is important to know and determine its promotion, marketing and nutritional elements. This is a compilation study conducted to provide information about the traditional production method, microbial and physicochemical properties and usage areas of Kavılca bulgur, which is produced with traditional methods in home conditions, family-type businesses and small-scale mills that only grind Kavılca wheat in Kars province and sold in delicatessens, markets and arcades. We can say that it is important to develop and support the cultivation of Kavılca wheat, which has high nutritional value in terms of some physicochemical and microbiological properties and can be evaluated in different ways.

Keywords: Kars, Kavılca, Kavılca wheat, Kavılca bulguru

Microbiological Safety Assessment of Food Wastes: Their Potential Use In Functional Foods

Aysegul Kirmizigul Peker¹ ,
Ilkin Sengun² 

1Ege University, Engineering Faculty, Food Engineering Department, Izmir, Türkiye

1Author's e-mail: aysegul.kirmizigul.peker@ege.edu.tr

2Ege University, Engineering Faculty, Food Engineering Department, Izmir, Türkiye

2Author's e-mail: ilkin.sengun@ege.edu.tr

Abstract

Food is an essential human need, but food waste has become a major problem on a global scale. The effective management, treatment and recovery of food waste is key to addressing this issue. Food waste is typically incinerated or thrown away, thereby polluting air, water and soil. There is now considerable interest in recycling and upgrading food waste. In this context, a variety of methods have been developed to effectively control and utilise these wastes, including the extraction of bioactive compounds from the waste for reintroduction into the food chain. Food wastes from many food industries (vegetables, fruit, beverages, sugar, meat, fish, etc.) considered a cheap source of functional or bioactive compounds. Value-added products from fruit and vegetable wastes mainly include sugars, proteins, lipids, fibers, vitamins, minerals, fatty acids and pigments. Animal wastes contain bioactive peptides from meat and dairy products. These components can be reintroduced into the food chain as natural food additives or into foods for producing functional food and nutraceuticals. These natural compounds could have the potential to enhance the safety and palatability of foods, while simultaneously addressing any underlying nutritional deficiencies. However, the reintroduction of food wastes into the food chain or food matrices requires a comprehensive assessment of the optimal recycling and manufacturing processes to ensure their suitability and safety. Microbiological safety in food is a major concern, especially when the waste is used for food production. According to the literature, many food wastes are valorised, but few studies included research on microbiological safety assessment. This review aims to provide an overview of the potential of food waste for use in the production of functional foods, focusing on the microbiological safety of food waste.

Keywords: Food safety, food waste, by-products, functional foods.

Geleneksel Yolla Üretilmiş Turşuların Probiyotik Potansiyelinin İncelenmesi

Investigation of the Probiotic Potential of Traditionally Produced Pickles

Özlem Yalçınçiray ^{ID}

İstanbul Arel Üniversitesi, Güzel Sanatlar Fakültesi, Gastronomi ve Mutfak Sanatları Bölümü, İstanbul, Türkiye.
Yazarın e-maili: ozlemyalcinciray@arel.edu.tr

Özet

Giriş ve Amaç: Çeşitli meyve ve sebzelerin dayanıklı hale getirilmesi amacı ile modern yöntemde hazır sirke eklenerek veya geleneksel yöntemde fermentasyonun gerçekleştirilmesi ile kurulan turşular gerek yemeklere tat katmak, gerekse aperatif olarak veya sandviçlerin ve salataların yanında garnitür olarak çeşitli şekillerde tüketilebilen turşular mutfak kültürünün önemli bir parçasını oluşturmaktadır.

Geleneksel olarak laktik asit fermentasyonunun gerçekleştirilmesi ile yapılan turşular, hem gastronomik hem de sağlık açısından özellikle probiyotik kaynağı olma özellikleri ile gün geçtikçe daha da popüler hale gelmektedir. Bu sözlü sunumun amacı meyve sebzeler için en faydalı ve geleneksel değerlendirme ve koruma yöntemlerinden biri olan turşuların probiyotik potansiyellerinin ve sağlık etkileri hakkında katılımcılara bilgi vermektir.

Yöntem: Bu çalışma geleneksel fermentasyon ile üretilmiş turşular hakkında yapılan çalışmalara ait bir literatür taraması sonucunda oluşturulmuştur.

Bulgular: Hem ülkemiz hem de Dünya'daki beslenme trendlerine bağlı olarak sağlığa faydalı fonksiyonel gıdaların özellikle de doğal fermente ürünlerin tüketimi gün geçtikçe ciddi ölçüde önem kazanmakta ve artmaktadır. Bitkisel ürünler açısından son derece zengin kaynaklara sahip olan ülkemizde turşu kurmak uzun geleneksel bir geçmişe sahiptir ve bu geleneksel yöntemler, kültürel mirası yansıtmakta ve özel tarifler ve yöntemler geleneksel yemek kültürünün bir parçasını oluşturmaktadır.

Geleneksel fermentasyon yöntemi ile kurulan turşularda Laktik Asit Bakterileri (LAB) kullanılmakla birlikte, hammaddede bulunan ve spontan olarak üretilen gelişen türlerin suşları da turşu üretiminde kullanılmaktadır. Laktik asit bakterileri, sindirim sistemi sağlığından bağımsızlık desteğine, inflamasyonun azaltılmasından metabolizma düzenlemeye kadar birçok probiyotik fayda sunmaktadır. Bu faydaların başında sindirim sorunlarının azaltılması, bağırsak florasının dengelenmesi ve desteklenmesi sayılabileceği gibi bağımsızlık sistemini destekleme anti enflamatuvar etki göstermek de sayılabilmektedir. Lactobacillus türleri, laktozu sindirmeye yardımcı olarak laktoz intoleransı olan bireyler için rahatlatma sağlayabilmektedir. Laktik asit bakterileri ayrıca metabolizmayı düzenlemeye yardımcı olabilmekte, yağ metabolizmasını etkileyebilmekte ve vücutta yağ birikimini azaltarak, obeziteyi önlemeye ve kilo kontrolünü desteklemeye yardımcı olabilmektedir. Bunlara ek olarak probiyotik bakteriler ruhsal durumu destekleme, vitamin ve mineral sentezine de destek olarak pek çok fayda da sağlayabilmektedir.

Sonuç: Turşular gerek fonksiyonel özellikleri ile insan sağlığına etkileriyle, gerekse lezzet, kültürel ve ekonomik açıdan birçok avantaj sunmaktadır. Turşular probiyotik içerikleri, uzun süre saklama özellikleri ve gastronomik katkıları sayesinde hem beslenme alışkanlıklarını zenginleştiren hem de sağlığı destekleyen değerli bir gıda maddesidir. Turşularda temel olarak probiyotik özellikteki bakterilerin düzenli olarak tüketilmesi, genel sağlık ve refah üzerinde olumlu etkiler sağlayabilmektedir.

Anahtar Kelimeler: Turşu, fonksiyonel gıda, probiyotik, fermentasyon.

Abstract

Introduction and Aim: Pickles, which are formed by adding ready-made vinegar in the modern method or by fermentation in the traditional method to make various fruits and vegetables durable, are an important part of the culinary culture, which can be consumed in various ways, either as a flavouring for meals, as an aperitif or as a garnish with sandwiches and salads. Pickles, which are traditionally made by lactic acid fermentation, are becoming more and more popular day by day, both gastronomically and in terms of health, especially as a source of probiotics. The aim of this oral presentation is to inform the participants about the probiotic potential and health effects of pickles, which are one of the most useful and traditional preservation and preservation methods for fruits and vegetables.

Method: This study was based on a literature review of studies on pickles produced by traditional fermentation.







Results: Depending on the nutritional trends both in our country and in the world, the consumption of functional foods beneficial for health, especially natural fermented products, is gaining importance and increasing day by day. In our country, which has extremely rich resources in terms of herbal products, pickling has a long traditional history, and these traditional methods reflect the cultural heritage and special recipes and methods form a part of traditional food culture.

Although Lactic Acid Bacteria (LAB) are used in pickles made by traditional fermentation method, strains of species found in the raw material and spontaneously developed in the product are also used in pickle production. Lactic acid bacteria offer many probiotic benefits from digestive system health to immune support, from reducing inflammation to metabolism regulation. These benefits include reducing digestive problems, balancing and supporting the intestinal flora, as well as supporting the immune system and showing anti-inflammatory effects. Lactobacillus species can provide relief for individuals with lactose intolerance by helping to digest lactose. Lactic acid bacteria can also help regulate metabolism, affect fat metabolism and reduce fat accumulation in the body, helping to prevent obesity and support weight control. In addition to these, probiotic bacteria can also provide many benefits by supporting the mental state and supporting vitamin and mineral synthesis.

Conclusion: Pickles offer many advantages both in terms of their functional properties and their effects on human health, flavour, cultural and economic aspects. Pickles are a valuable foodstuff that both enriches eating habits and supports health thanks to their probiotic content, long-term storage properties and gastronomic contributions. Regular consumption of probiotic bacteria in pickles can have positive effects on general health and well-being.

Keywords: Pickles, functional food, probiotics, fermentation.

The Potential of Ginger, *Zingiber Officinale* Rosc, Leaf Powder As Feed Additive in African Catfish Farming

Lee Seong Wei¹ , Zulhisyam Abdul Kari² ,
Muhammad Anamul Kabir³ , Martina Irwan Khoo⁴ ,
Mohamad Nor Azra^{5,6} , Wendy Wee⁷ 

1Department of Agricultural Sciences, Faculty of Agro-Based Industry, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia. 1Mail: leeseong@umk.edu.my , 2Department of Agricultural Sciences, Faculty of Agro-Based Industry, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia. 2Mail: zulhisyam.a@umk.edu.my , 3Department of Aquaculture, Faculty of Fisheries, Sylhet Agricultural University, Sylhet 3100, Bangladesh. , 3Mail: anamul.aq@sau.ac.bd , 4Department of Chemical Pathology, School of Medical Sciences, Universiti Sains Malaysia, Health Campus, Kubang Kerian 16150, Malaysia. . 4Mail: msirwankhoo@gmail.com , 5Institute of Climate Adaptation and Marine Biotechnology (ICAMB), Universiti Malaysia Terengganu (UMT), Kuala Nerus 21030, Terengganu, Malaysia.
6Research Center for Marine and Land Bioindustry, Earth Sciences and Maritime Organization, National Research and Innovation Agency (BRIN), Pemenang 83352, Indonesia. 5,6Mail: azramn@umt.edu.my ,
7Center of Fundamental and Continuing Education, Universiti Malaysia Terengganu, 21030, Kuala Nerus, Terengganu, Malaysia.
7Mail: wendy@umt.edu.my

Abstract

This study evaluated the impacts of ginger (*Zingiber officinale*) leaf powder on the growth performance of African catfish. Control and four diets were supplemented with ginger leaf powder at 1, 2, 3, and 4%. After 8 weeks, the growth performance of African catfish fed dietary ginger leaf powder was significantly increased than control, with the highest being in the fish received 2 and 3% ($p < 0.05$). Whereas, fish fed 1 and 4% ginger leaf powder shared similar result of growth performance. However, the feed conversion rate was decreased following the same trend, with the lowest being in the fish fed 2 and 3% ginger leaf powder diets. Fish fed 1 and 4% ginger leaf powder had significantly lower feed conversion rate than control ($p < 0.05$). The findings in the present study revealed the dietary ginger leaf powder diets can boost African catfish production, with the recommended doses 2 and 3% should added in the diet.

Keywords: Growth performance, African catfish, ginger leaf.

Gastronomy



Siyah ve Beyaz Nohut, Mercimek ve Pirinç Unlarından Yapılan Glutensiz Kek ve Kurabiyelerin Duyusal Olarak Karşılaştırılması

Sensory comparison of gluten-free cakes and cookies made from black and white chickpea, lentil and rice flours

Zeliha Duyar¹ , Kerem İlaslan² ,
Zehra Dilistan Shipman³ 

1,2,3 Bahçeşehir Üniversitesi, Uygulamalı Bilimler Yüksekokulu, Gastronomi ve Mutfak Sanatları Bölümü,

1 Yazarın e-maili: zelihaa.tatlicii@gmail.com , 2 Yazarın e-maili: ilaslankerem@gmail.com , 3 Yazarın e-maili: dilistan.shipman@bau.edu.tr

Özet

Giriş ve Amaç: Siyah nohut (*Cicer arietinum* var. Kala chana) Mardin yöresinin yüksek kesimlerinde yetişen bir baklagil türüdür. Siyah mercimek (*Lens culinaris*), diğer adıyla beluga mercimek, özellikle Ege ve Güney Anadolu bölgelerinde yetişen diğer bir baklagil türüdür. Mor pirinç olarak da bilinen siyah pirinç (*Oryza sativa*) ise başlıca Trakya ve Düzce bölgelerinde yetişen, kendine özgü renge sahip olan ve beyaz pirince göre daha az işlenen bir tahıl çeşididir. Bu üç tanenin ortak özellikleri ise daha koyu renge sahip olması, gluten içermemesi, antioksidan içeriğinin fazla olması ve besin değerinin yüksek olmasıdır. Bu çalışmada, ülkemizde yetişen fakat bilinirliği az olan siyah tanelerden üretilen unlardan yapılmış kek ve kurabiyelerin beyaz olan varyasyonları ile duyusal olarak karşılaştırılması amaçlanmıştır.

Yöntem: Yapılan bu duyusal analiz çalışmasında lezzet profili analizi yöntemi kullanılmıştır. Önceden eğitilmiş 10 paneliste siyah ve beyaz nohut, mercimek ve pirinç unlarından aynı ölçülerde ve aynı yöntemle yapılmış olan kek ve kurabiyeler sırası ile verilerek tadım yaptırılmıştır. Elde edilen bulgular doğrultusunda grafikler oluşturularak sonuçlar değerlendirilmiştir.

Bulgular ve Sonuç: Yapılan bu duyusal analiz çalışmasında çalışmaya katılan panelistler siyah nohut unu ile yapılmış kurabiyeleri koku, renk, tatlılık ve genel aroma beğenisi açısından daha başarılı bulmuştur, ancak beyaz mercimek ve pirinç unlarından yapılan kurabiye örnekleri duyusal kriterlerde siyah versiyonlarına göre daha yüksek puan almıştır. Siyah nohut, mercimek ve pirinç unlarından yapılmış kek örnekleri ise koku, renk, tatlılık ve genel aroma beğenisi açısından beyaz versiyonlarına göre daha yüksek puanlar almıştır. Bu sonuçlar bize beyaz tanelerden elde edilen unlara bir alternatif olarak çalışılan siyah versiyonlarının özellikle pastacılık alanında kullanılabileceğini göstermektedir. Türkiye’de tarımı kısıtlı olarak yapılan siyah baklagillerin ve tahılların popülerliği arttıkça bu konuda yapılan zirai ve gastronomik çalışmalar da artacaktır.

Anahtar Kelimeler: Siyah un, beyaz un, duyusal analiz, glutensiz.

Abstract

Introduction and Aim: Black chickpea (*Cicer arietinum* var. Kala chana) is a type of legume that grows in the high parts of the Mardin region. Black lentil (*Lens culinaris*), also known as beluga lentil, is another type of legume that grows especially in the Aegean and Southern Anatolia regions. Black rice (*Oryza sativa*), also known as purple rice, is a type of grain that grows mainly in the Thrace and Duzce regions, has a unique color and is less processed than white rice. The common features of these three grains are that they have a darker color, do not contain gluten, have high antioxidant content and high nutritional value. In this study, it was aimed to sensory compare the cakes and cookies made from flour produced from black grains, which grow in our country but are little known, with their white variations.

Method: In this sensory analysis study, the flavor profile analysis method was used. Cakes and cookies made from black and white chickpea, lentil and rice flours in the same amounts and with the same method were given to 10 pre-trained panelists and they were tasted, respectively. The results were evaluated by making graphs in line with the findings obtained.

Results and Conclusion: In this sensory analysis, the panelists who participated in the study found the cookies made with black chickpea flour to be more successful in terms of smell, color, sweetness and general aroma perception, but the cookie samples made from white lentil and rice flours received higher scores in sensory criteria than the black versions. Cake samples made from black chickpea, lentil and rice flours received higher scores than the white versions in terms of smell, color, sweetness and general aroma perception. These results show us that the black versions studied as an alternative to flour obtained from white grains can be used especially in the field of pastry. As the popularity of black legumes and grains, which are cultivated on a limited basis in Turkey, increases, agricultural and gastronomic studies on this subject will also increase.

Keywords: Black flour, white flour, sensory analysis, gluten-free.

Türkiye’de Şarap Turizminin Sürdürülebilirliği; Mevcut Durum ve Geleceğe Yönelik Öneriler

Sustainability of Wine Tourism in Türkiye; Current Situation and Suggestions for the Future

Bahar Bayındır

Kırklareli Üniversitesi, Turizm Fakültesi, Gastronomi ve Mutfak Sanatları Bölümü, Kırklareli, Türkiye
Yazarn e-maili: bbayindir@klu.edu.tr

Özet

Türkiye, zengin bağcılık geçmişi ve sahip olduğu yerel üzüm çeşitleri sayesinde şarap turizmi açısından büyük bir potansiyele sahip bir ülke olarak öne çıkmaktadır. Bu bağlamda, Türkiye’de şarap turizminin sürdürülebilir bir şekilde gelişim gösterebilmesi için sektördeki mevcut durumun ve zorlukların anlaşılması büyük önem taşımaktadır. Bu çalışma da Türkiye’deki şarap turizminin mevcut durumunu inceleyerek sektördeki sürdürülebilirliği sağlamak için uygulamaya yönelik stratejik öneriler sunmayı amaçlamaktadır. Belirtilen bu amaç çerçevesinde; literatür taraması, saha araştırmaları ve butik şarap üreticileriyle yapılan görüşmeler gibi tekniklerle veriler toplanmıştır. Elde edilen veriler ile gerçekleştirilen analizler sonucunda sürdürülebilir şarap turizmi uygulamalarına yönelik stratejiler ve öneriler sunulmuştur. Çalışma, yerel üzüm çeşitlerinin korunması, sürdürülebilir tarım uygulamalarının teşvik edilmesi ve şarap turizmi altyapısının geliştirilmesi gibi stratejilerin, Türkiye’de şarap turizminin sürdürülebilirliğini artırmada kritik öneme sahip olduğunu göstermektedir. Ayrıca, butik şarap üreticilerinin, yerel kaynakların daha verimli kullanılmasını sağlayan inovatif üretim teknikleri ve kişiselleştirilmiş müşteri deneyimleri sunarak, sürdürülebilir şarap turizmine önemli katkılarda bulunduğunu ortaya koymaktadır. Sonuç olarak bu çalışma, Türkiye’de şarap turizminin mevcut fırsatlarını ve zorluklarını detaylandırarak sektördeki sürdürülebilir gelişimi destekleyecek stratejik öneriler sunmaktadır.

Anahtar Kelimeler: Şarap turizmi, sürdürülebilirlik, şarap, turizm, Türkiye.

Abstract

Turkiye stands out as a country with a great potential for wine tourism thanks to its rich viticultural history and local grape varieties. In this context, it is of great importance to understand the current situation and challenges in the sector for the sustainable development of wine tourism in Türkiye. This study aims to analyse the current situation of wine tourism in Türkiye and to provide practical strategic recommendations to ensure sustainability in the sector. Within the framework of this purpose; data were collected through techniques such as literature review, field research and interviews with boutique wine producers. As a result of the analyses carried out with the data obtained, strategies and recommendations for sustainable wine tourism practices are presented. The study shows that strategies such as preserving local grape varieties, promoting sustainable agricultural practices and developing wine tourism infrastructure are critical in increasing the sustainability of wine tourism in Türkiye. It also reveals that boutique wine producers make significant contributions to sustainable wine tourism by offering innovative production techniques and personalised customer experiences that enable more efficient use of local resources. In conclusion, this study details the current opportunities and challenges of wine tourism in Türkiye and provides strategic recommendations to support sustainable development in the sector.

Keywords: Wine tourism, sustainability, wine, tourism, Türkiye.

Malakan Peyniri: Tarihi Kökler ve Üretim Sanatı Malakan Cheese: Historical Roots and Art of Production

Aleyna Mutlu¹ , Ahmet Emirmustafaoglu² 

1,2 Bolu Abant İzzet Baysal Üniversitesi, Lisansüstü Eğitim Enstitüsü, Gastronomi ve Mutfak Sanatları, Bolu, Türkiye.

1Yazarın e-maili: aleynmumlu@gmail.com

2Yazarın e-maili ahmetemir@ibu.edu.tr

Özet

Malakan Peyniri, 19. yüzyılın sonlarında Rusya'dan Kafkasya'ya, oradan da Anadolu'ya göç eden Malakan topluluğunun Anadolu'ya kazandırdığı özel bir peynir türüdür. Malakan adı Rusça "Moloko" yani süttten gelmektedir. Malakanlar, Rusya'daki politik ve dini baskılardan kaçarak Türkiye'ye yerleşmiş ve beraberlerinde geleneksel peynir yapım tekniklerini de getirmişlerdir. Ortadoks kilisesinin haftada iki günden fazla süt içmesini yasaklamasına karşın süt içmeye devam ettikleri için afaroz edilen bu topluluk süt ürünleri üretimindeki ustalıkları ve peynir yapımındaki geleneksel yöntemleriyle tanınır. Bu peynirin kültürel değeri, sadece bir besin maddesi olmasının ötesinde, toplumsal ve kültürel kimliğin bir parçası olarak görülmesindedir. Malakan peyniri, nesiller boyu aktarılan bir miras olarak önemini korur. Aynı zamanda, Malakan topluluğunun Anadolu kültürüne katkılarının bir sembolüdür. Kars'ta Malakan Peyniri üreticileri ile yapılan görüşmelerde ürünün yapım teknikleri ve çeşitli varyasyonları hakkında bilgiler alınmıştır. Malakan Peyniri, geleneksel üretim yöntemlerine sadık kalınarak üretilmektedir. Yağ oranı ayarlanan süt 35 °C'ye getirilip şirden mayası ile mayalanır, pıhtı kesim olgunluğuna eriştikten sonra kırılarak peynir suyu ayrılır. Bez içerisinde üzerine ağırlık konularak süzdürülür ve telenme doğandıktan sonra 72-80°C'deki tuzlu suda haşlanır. Kalıplara koyulup şekil verildikten sonra olgunlaşması 40, tüketime hazır hale gelmesi ise 60 günü bulmaktadır. Geleneksel yöntemlerle yapılan bu üretim süreci, peynirin kendine has aroması ve dokusunu korumasını sağlar. Türk mutfağı, tarih boyunca birçok farklı kültürden etkilenmiş ve zenginleşmiştir. Malakan Peyniri, bu zenginliğe önemli bir katkı sağlar. Türk mutfağına eklenen bu özel peynir hem yerel peynir çeşitliliğini artırmakta hem de Türk mutfak kültürüne yeni tatlar ve lezzetler kazandırmaktadır. Bu çalışma Malakan peynirini tarihsel ve kültürel açıdan ele alarak üretim tekniklerini açıklamayı amaçlamaktadır.

Anahtar Kelimeler: Malakan, peynir, kültür mirası, moloko.

Abstract

Malakan Cheese is a special type of cheese introduced to Anatolia by the Malakan community who immigrated from Russia to the Caucasus and then to Anatolia in the late 19th century. The name Malakan comes from the Russian "Moloko", meaning milk. The Malakans fled political and religious oppression in Russia and settled in Turkey, bringing traditional cheese-making techniques with them. Excommunicated for continuing to drink milk despite the Orthodox Church's prohibition against drinking milk more than two days a week, they are known for their mastery of dairy production and traditional methods of cheese making. The cultural value of this cheese lies in the fact that it is seen as part of social and cultural identity, not just a food item. Malakan cheese, a cultural heritage passed down through generations, symbolizes the Malakan community's contribution to Anatolian culture. Interviews with Kars cheese producers revealed traditional production techniques and variations. The process involves heating fat-adjusted milk to 35 °C, fermenting with shirden yeast, cutting the curd, and separating the whey. The curds are then weighted in a cloth, chopped, and boiled in salty water at 72-80 °C. After molding and shaping, the cheese matures for 40 days and is ready for consumption after 60 days. This traditional method ensures the cheese's unique flavor and texture. Turkish cuisine has been influenced and enriched by many different cultures throughout history. Malakan Cheese makes an important contribution to this richness. This special cheese added to Turkish cuisine both increases the variety of local cheeses and brings new tastes and flavors to the Turkish culinary culture. This study aims to explain the production techniques of Malakan cheese from a historical and cultural perspective.

Keywords: Malakan, cheese, cultural heritage, moloko.

Development and Characterization of Indian Traditional Low Alcoholic Beverage

Prem Narayan Mishra¹ ,
Roji Waghmare² 

¹Department of Food Engineering and Technology, Institute of Chemical Technology, Mumbai, India

¹Author's e-mail: fbt23pn.mishra@pg.ictmumbai.edu.in

²Department of Food Engineering and Technology, Institute of Chemical Technology, Mumbai, India

²Author's e-mail: rb.waghmare@ictmumbai.edu.in

Abstract

This project focuses on optimizing the production process and conducting a biochemical analysis of Indian traditional low-alcohol beverages made from rice, a staple ingredient in various regional brewing practices. The main goal is to refine the production process while preserving the cultural heritage of these drinks, enhancing their quality and consistency. By experimenting with different fermentation techniques and fine-tuning parameters like temperature (30°C), pH, and fermentation time (15 days), the project aims to improve the yield and shelf life of these beverages. Additionally, the project will carry out a biochemical analysis of the optimized beverages to assess their nutritional content, alcohol levels (approximately 0.5-8% ABV), and the presence of bioactive compounds. This analysis will offer insights into the potential health benefits of these traditional drinks, which are often valued for their mild alcoholic content and possible probiotic properties. By combining process optimization with biochemical evaluation, this project not only deepens the understanding and appreciation of Indian traditional brewing methods but also promotes sustainable practices in the production of low-alcohol beverages. The findings are expected to benefit local tribal communities and the broader beverage industry, encouraging a renewed interest in traditional fermentation methods and their role in India's culinary heritage.

Keywords: Traditional low-alcoholic beverages, fermented rice, optimization, biochemical analysis, cultural heritage.

Consumer Knowledge, Perception of Food Imagery, and Acceptance of Food Heritage in State of Kelantan, Malaysia

Rahijan Abdul Wahab¹ ,
Nasha Alyssa Ab Ghani²

¹ University of Malaysia Terengganu | Author's e-mail: rahijan@umt.edu.my
² University of Malaysia Terengganu | Author's e-mail: nashaalyssa31@gmail.com

Abstract

Heritage food plays a crucial role in the eating habits of consumers, rooted in original recipes passed down through generations. However, the younger generation's knowledge of heritage food is declining, and its popularity is waning due to changing lifestyles. Additionally, research on food imagery and food tourism has been largely overlooked by scholars. This study aims to evaluate consumer knowledge, perception of food imagery, and acceptance of Kelantan's heritage food. Traditional food is deeply intertwined with food heritage, symbolizing societal and individual identity. Social transitions and the proliferation of information technology are believed to influence changes in food consumption and practices. Convenience sampling was used to gather data in selected areas of Kelantan, with questionnaires distributed to the public. The results indicated that respondents possessed a high level of knowledge about Kelantan's heritage food, with 92.3% demonstrating good knowledge. Additionally, there was a positive perception of food imagery, with a mean score of 4.81 ± 0.59 . Acceptance of heritage food was also favourable across various attributes, including tradition and culture, appearance, taste, quality, and healthiness, with all mean scores exceeding 4. There was a significant relationship between consumer knowledge, perception of food imagery, and acceptance of heritage food. However, the relationship between consumer knowledge and both perception of food imagery and acceptance was weak, while the relationship between perception of food imagery and acceptance was moderate.

Keywords: Heritage food, consumer knowledge, food imagery, perception, acceptance.

Exploring the Influence of Social Media Marketing Activities on Customer Satisfaction at Mid-Scale Restaurants in Penang, Malaysia.

Teow Jin Zhe¹ ,
Aziz Bin Yusof² ,
Asma' Binti Ali³ 

1, 2, 3 Universiti Malaysia Terengganu, Faculty of Fisheries and Food Science, Kuala Terengganu, Malaysia.

1Author's e-mail: teowjinzhe@gmail.com

2Author's e-mail: azizyusof2003@umt.edu.my

3Author's e-mail: asma.ali@umt.edu.my

Abstract

Introduction and Aim: The growing popularity and widespread use of social media platforms, in mid-scale restaurants, have encouraged restaurateurs to adopt social media marketing strategies in engaging and promoting products and services to customers. However, limited research works still persist on how social media marketing specifically affects customers' satisfaction in the context of mid-scale restaurants while the extensive adoption of social media has intensified competition within the restaurant industry. The study is aimed to investigate the relationship between social media marketing activities (SMMAs), including customization (CUST), entertainment (ENTR), trendiness (TRND), and interaction (INTR), with customer satisfaction (CS) in the context of mid-scale restaurants. The study also seeks to examine the effect of social media marketing activities (SMMAs) towards customer satisfaction (CS).

Method: To achieve the objectives of this study, an online survey using Google Form was designed to gather data from a convenience samples of 200 social media followers of selected mid-scale restaurants in George Town, Penang.

Results: The findings of the study show that there is a significant relationship between social media marketing activities (CUST, ENTR, TRND, INTR) with customer satisfaction. Consequently, interaction exhibits the strongest positive correlation with customer satisfaction. The results also indicate that interaction is the most significant in influencing customer satisfaction.

Conclusion: The variables associated with social media marketing activities (customization, entertainment, trendiness, and interaction) display a significant relationship with customer satisfaction. The study reveals that among the investigated SMMAs, (CUST, ENTR, TRND, INTR), the strongest and significant relationship exists with interaction (INTR), demonstrating the highest positive correlations towards customer satisfaction. Notably, interaction (INTR) also emerges as the most influential factor affecting customer satisfaction. The primary factor influencing both customer satisfaction is the level of interaction, emphasizing its crucial role in shaping customer satisfaction.

Keywords: Customer satisfaction, social media marketing activities, mid-scale restaurants, Malaysia.

Kırklareli Ürnlü Köyü Sütü Kahve Festivalinin Kültürel Miras Açısından Değerlendirilmesi

Evaluation of Kırklareli Ürnlü Village Milk Coffee Festival in terms of Cultural Heritage

Mehmet Selman Bayındır 

Kırklareli Üniversitesi, Pınarhisar MYO, Aşçılık Programı, Kırklareli, Türkiye.
Yazarın e-maili: msbayindirakademik@gmail.com

Özet

Kırklareli'nin Ürnlü Köyü'nde düzenlenen Ürnlü Köyü Sütü Kahve Festivali, yörenin kültürel mirasını yaşatmada önemli bir etkinliktir. Çalışmanın amacı, Kırklareli'nin Ürnlü Köyü'nde düzenlenen Ürnlü Köyü Sütü Kahve Festivali'nin kültürel miras açısından önemini incelemektir. Ayrıca bu festivalin, geleneklerin korunması ve tanıtımı açısından sağladığı katkılar ile köyün kültürel kimliğinin güçlendirilmesine nasıl hizmet ettiğini araştırmak amaçlanmıştır. Bu araştırmada, Ürnlü Köyü Sütü Kahve Festivali'nin kültürel miras üzerindeki etkilerini anlamak için nitel araştırma yöntemlerinden yarı yapılandırılmış görüşmeler ile festival günü ve saatinde köy halkına yapılan derinlemesine görüşmeler ve festivali gözlemleme yoluyla veriler elde edilmiştir. Araştırmanın bulguları, Ürnlü Köyü Sütü Kahve Festivali'nin, köyün kültürel mirasını yaşatmada ve geleneksel sütü kahve kültürünü sürdürmede merkezi bir rol oynadığını göstermektedir. Resmi olarak 2024 yılında üçüncüsü düzenlenen festival, geçmiş yıllarda da bir festival olarak adlandırılmasa da kutlanmıştır. Festival köyün düğün alanında akşam saatlerinde akşam ezanında sonra kutlanmaktadır. Festivalde önce Hıdırellez ateşi yakılarak ateş üzerinden atlanmaktadır. Festivalde Türk kahvesiyle bölgede yetişen ineklerin sütünden elde edilen sütü pişirilen sütü kahve, bölgede yetişen buğdaydan elde edilip yine bölgede yetişen ayçiçeğinden (gündöndü) elde edilen sıvıyağ ile pişirilen kalabak (pişiye benzer bir hamur işi) ikram edilmektedir. Bunun yanında yöreye özgü manileri yörenin yaşlı ve önde gelen kadınları genç kızlarla birlikte köyün düğün yerinde kurulan özel alanda okumaktadır. Katılanların bir kısmı yöresel kıyafetleri giyerek yöresel halk oyunları oynamaktadır. Festivalde erkek ya da kadın ayrımı olmaksızın tüm köylü bir arada festivali kutlamaktadır. Bu yönüyle, festivalin, yerel halkın kültürel aidiyet duygusunu güçlendirdiği belirlenmiştir. Festival, aynı zamanda köyün kültürel mirasının dış dünyaya tanıtılmasını sağlayarak, ziyaretçiler arasında kültürel etkileşimi ve farkındalığı artırmıştır. Genel olarak, Ürnlü Köyü Sütü Kahve Festivali, geleneksel kültürel uygulamaların korunması ve teşvik edilmesi açısından önemli bir araç olarak öne çıkmaktadır. Festival, yörenin kültürel mirasını güçlendirmekte, ekonomik fırsatlar sunmakta ve kültürel çeşitliliği artırarak toplumsal etkileşimi teşvik etmektedir.

Anahtar Kelimeler: Festival, kültürel miras, sütü kahve, Kırklareli, Ürnlü.

Abstract

The Ürnlü Village Milk Coffee Festival organised in Ürnlü Village of Kırklareli is an important event in keeping the cultural heritage of the region alive. The aim of the study is to examine the importance of Ürnlü Village Milk Coffee Festival organised in Ürnlü Village of Kırklareli in terms of cultural heritage. In addition, it is aimed to investigate how this festival serves to strengthen the cultural identity of the village with its contributions to the preservation and promotion of traditions. In this research, in order to understand the effects of Ürnlü Village Milk Coffee Festival on cultural heritage, data were obtained through semi-structured interviews, in-depth interviews with the village people on the day and time of the festival and observation of the festival. The findings of the study show that Ürnlü Village Milk Coffee Festival plays a central role in keeping the cultural heritage of the village alive and sustaining the traditional milk coffee culture. The festival, which was officially organised for the third time in 2024, was celebrated in previous years, although it was not called a festival. The festival is celebrated in the evening in the wedding area of the village after the evening prayer. During the festival, the Hıdırellez fire is lit and jumped over the fire. At the festival, Turkish coffee and coffee with milk cooked with milk obtained from the milk of cows grown in the region, kalabak (a pastry similar to pişi) cooked with oil obtained from wheat grown in the region and sunflower (sunflower) grown in the region are served. In addition to this, the old and prominent women of the region recite local mani (rhymes) together with young girls in a special area set up in the wedding venue of the village. Some of the participants wear local clothes and play local folk dances. In the festival, the whole village celebrates the festival together without discrimination of men or women. In this respect, it has been determined that the festival strengthens the sense of cultural belonging of the local people. The festival has also increased cultural interaction and awareness among visitors by introducing the cultural heritage of the village to the outside world. In general, Ürnlü Village Milk Coffee Festival stands out as an important tool for the protection and promotion of traditional cultural practices. The festival strengthens the cultural heritage of the region, provides economic opportunities and promotes social interaction by increasing cultural diversity.

Keywords: Festival, cultural heritage, coffee with milk, Kırklareli, Ürnlü.

Organic Roses and Traditional Food in Sustainable Tourism: Boosting Community Tourism in Khon Kaen

Donruetai Kovathanakul 

Director, Centre of Excellence in MICE and Business Events Industry (CEMBEI), Faculty of Business Administration and Accountancy, Khon Kaen University, 123 Mittraparp Rd., Muang District, Nai-Muang Sub-District, Khon Kaen 40002 Thailand ,
Author's e-mail: kdonru@kku.ac.th

Abstract

This research examines the management and potential growth of cultural gastronomy tourism in Pha Nam Thieng Village, located in the Si Chomphu District of Khon Kaen Province. This community is renowned for its organic rose cultivation and traditional Isan (Northeastern of Thailand) cuisine, which presents a unique opportunity to blend natural beauty with culinary heritage. The study involved comprehensive data collection from local residents, stakeholders, and tourism operators, aimed at analyzing existing marketing strategies while identifying new avenues for integrating local food culture and tourism.

A particularly noteworthy finding is that while roses have not yet been significantly incorporated into culinary practices, the community is exploring the creation of innovative rose-based products. Options under consideration include rose jelly, salads, and tea, which not only highlight the community's agricultural strengths but also have the potential to captivate the interest of tourists seeking unique culinary experiences. Moreover, the integration of traditional Isan dishes can further enrich the cultural gastronomy landscape, providing visitors with a deeper understanding of local customs and flavors.

The study emphasizes the necessity of leveraging online media to promote these initiatives effectively, as well as fostering collaboration between local producers and various agencies to enhance the overall tourism experience. By developing rose-related products alongside traditional Isan foods, the village aims to create a distinctive gastronomic identity that appeals to both domestic and international tourists. These concerted efforts are viewed as vital for enhancing the value of tourism in Pha Nam Thieng Village, ultimately contributing to sustainable development and the preservation of local culture in the contemporary tourism market.

Keywords: Cultural gastronomy tourism, organic roses, food processing, community development, Khon Kaen.

From Standardized Commodity to Assetization. A Sociohistorical Approach to The Transformation of Olive Oil in Greece

Vasiliki Karantzavelou¹ ,
Stathis Arapostathis² 

1, 2 National and Kapodistrian University of Athens, School of Science, Faculty of Department of History and Philosophy of Science, Athens, Greece.

1Author's e-mail: vaskarantz@phs.uoa.gr ,






2Author's e-mail: arapost@phs.uoa.gr

Abstract

During the past years, olive oil has been facing a transition towards niche markets and novel categories that transcend the existing categorization. The paper studies the transitions of the olive oil regime from 1990 to this day and most importantly how regime actors redefine and reconceptualize “quality” during the past 34 years. Methodologically, the paper is based on an extensive review of the literature, regulatory and corporate publications, sectoral press and a series of stakeholders’ interviews and focus groups. We argue that while the state and corporate actors from the 1950s to mid-1980s prioritized global competitiveness and productivity, a shift led by the EEC occurred in the mid-1980s towards a production system emphasizing higher quality and pro-environmental measures in response to emerging environmental challenges. Following, a quest for quality started in the early 1990s by the Greek state through strengthening standardization, limiting the circulation of bulk product and enhancing pro-environmental modes of production, such as organic and integrated farming. Such directives were influenced by the EU legislations, establishing stricter acidity limits and subsidies for the adoption of organic and integrated farming. Overall, the incumbent regime actors responded through new categories that were constructed to maintain commodity elements while addressing environmental risks. In the second transition, there was an emphasis on establishing added value for olive oil, through enhancing olive oil’s health protective aspects, geographical indications and locality. During this time frame of 14 years, scientific research worked on the creation of added value through the calculation of phenolic compounds in olive oil and the genetical characterization of olive varieties, which could further assist in authenticity determinations and work synergistically with geographical indications. To conclude, this emerging transition can create added value for farmers, scientific labs and the market, however it might not address potential injustices for the environment, cultivators and consumers.

Keywords: Olive oil, olive production, agrifood systems, assetization, high phenolic olive oil.

Effects of Fruit Stage on Nutritional Value of Guava

Kuldeep¹ , Gagandeep Kaur² ,
Kirandeep Kaur Kang³ , Naresh Kumar Arora⁴ ,
Jaswinder Singh Brar⁵ 

1,2,3,4,5 Department of Fruit Science, Punjab Agricultural University, Ludhiana, Pb, India

¹ Author's e-mail: kuldeepkamboj46@gmail.com

² Author's e-mail: gagandeep-kpr@pau.edu

³ Author's e-mail: drkirankang@pau.edu

⁴ Author's e-mail: naresh_arora@pau.edu

⁵ Author's e-mail: jsbrar74@pau.edu

Abstract

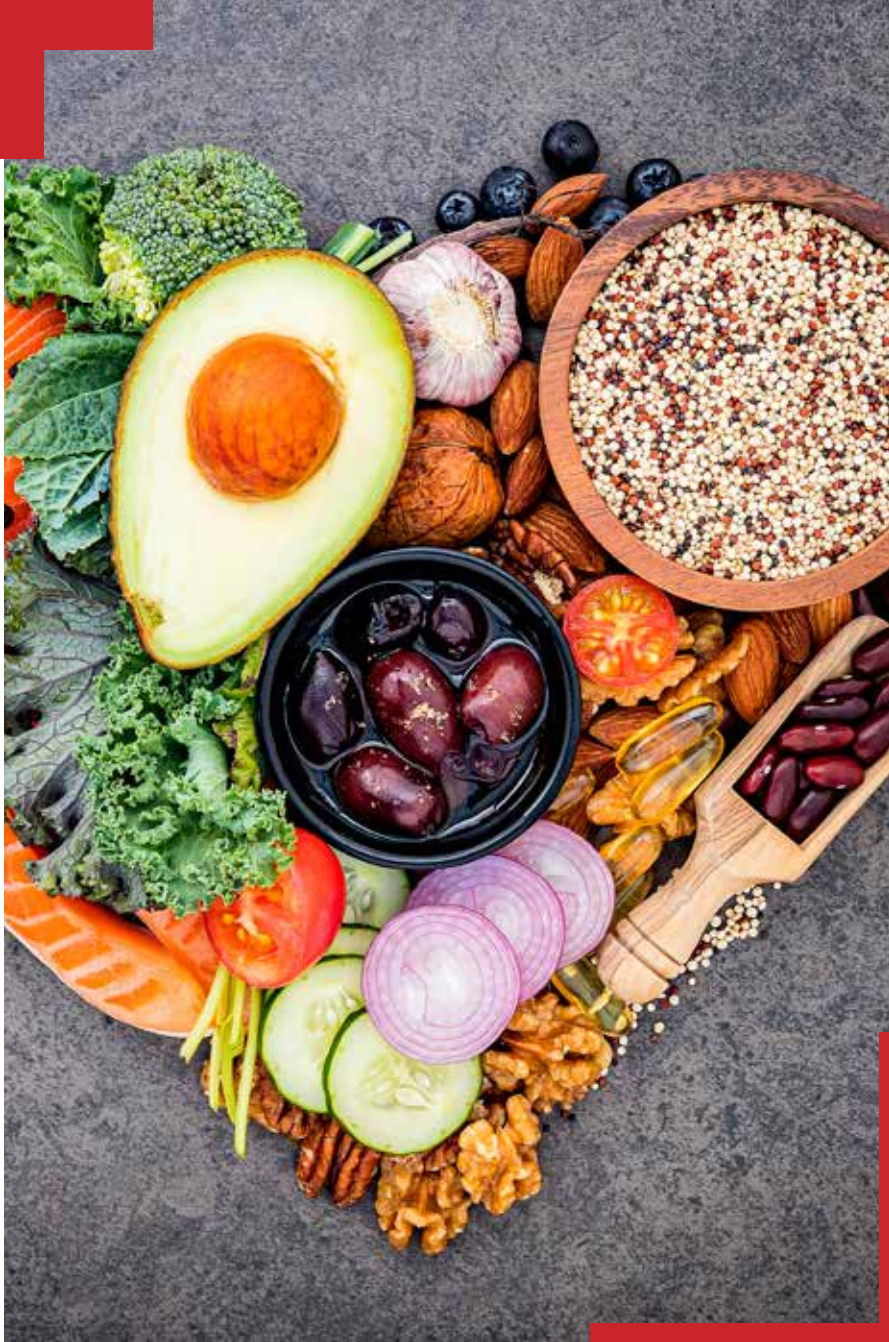
Introduction and Aim: Guava, a super fruit, contains high levels of bioactive compounds such as carotenoids, phenolic compounds, and ascorbic acid, which are 4-5 times higher than citrus fruits. Its bark, leaves, roots, fruits, stem, and flowers are known for their medicinal use due to their antioxidant properties. Fruit cultivars can be distinguished by their biochemical, nutraceutical, and physicochemical characteristics to assess their potential health benefits. Guava can be utilized at different stages of fruit development for various purposes, such as antioxidant properties, anti-inflammatory effects, antimicrobial activity, combat oxidative stress, and anti-cancer potential. Thus, a study was planned to study physico-chemical changes during fruit development in three selected colored and white fleshed guava genotypes.

Method: The physical and chemical characteristics of three genotypes of guavas that were chosen for their color and white flesh, namely Shweta (white pulp), Punjab Kiran (pink pulp), and Punjab Apple Guava (cream fleshed and red skinned), were measured on a weekly basis beginning 30 days after fruit set and ending 127 days and 140 days (maturity time) during rainy and winter season respectively.

Results and conclusion: Results showed a significant effect of fruit stage on different parameters affecting the nutritional value of the fruit. Total and reducing sugar increased linearly with fruit growth, while Vitamin C gradually increased in all three varieties. Bioactive contents varied significantly, with anthocyanin and carotenoid content initially not detected in all three varieties. Total phenol and flavonoid content increased up to 90 days after fruit set, but degraded as it reached maturity. Bioactive compounds were highest in the colored variety, Punjab Apple Guava, during the winter season. The study suggests that guava fruits at various growth stages can be strategically utilized for processing into products or consumed directly to maximize nutritional benefits, depending on their specific bioactive compound profiles.

Keywords: Guava, bioactive compounds, total phenol, antioxidants, punjab apple guava.

Nutrition and Dietetics



The Effect of the Dietary Approaches to Stop Hypertension (DASH) Diet on Sleep, Mental Health, and Hormonal Changes: A Randomized Clinical Trial in Women With Type 2 Diabetes

Elnaz Daneshzad 

Non-Communicable Diseases Research Center, Alborz University of Medical Sciences, Karaj, Iran
Author's e-mail: daneshzad@gmail.com

Abstract

Introduction and Aim: Some dietary patterns may improve diabetes complications through scavenging oxidants and anti-inflammatory properties. This study evaluated the effect of the Dietary Approaches to Stop Hypertension (DASH) diet on sleep status, mental health, and hormonal changes among Iranian women with type 2 diabetes.

Methods: This randomized controlled trial (RCT) included 66 diabetic women. Participants were randomly divided into the two different diet groups (the DASH diet and control diet; 33 patients in each group) for 3 months. The Pittsburgh Sleep Quality Index and the Depression, Anxiety, and Stress Scale-21 items were used to assess sleep and mental disorders, respectively. Fasting blood sugar, hemoglobin A1c (HbA1c), advanced glycation end products (AGEs), as well as several sex hormones were evaluated at the beginning and the end of the trial.

Results: Anthropometric indices, HbA1c (control: 8.77 ± 0.82 vs. 8.04 ± 1.03 ; the DASH diet 8.70 ± 1.05 vs. 7.41 ± 1.03), and follicle-stimulating hormone (FSH) (control: 72.16 ± 26.02 vs. 68.12 ± 27.63 ; the DASH diet: 72.99 ± 25.19 vs. 67.43 ± 27.63) significantly decreased over 12 weeks in both the groups ($P < .0001$). Testosterone, 2-h postprandial glucose (2hPPG), and AGEs significantly decreased over 12 weeks in the DASH diet group. Sleep, depression, and anxiety scores significantly decreased over 12 weeks in the DASH diet group. Night sleep duration significantly increased over 12 weeks in the DASH diet group ($P < 0.0001$).

Conclusion: A 12-week DASH diet significantly decreases testosterone, 2hPPG, AGEs level, as well as sleep, depression, and anxiety scores in women with type 2 diabetes. However, more RCTs are needed to confirm these findings.

Keywords: Anxiety, depression, diabetes, dietary approaches to stop hypertension, sleep.

Toplu Beslenme Kuruluşlarında Çalışan Personelde Sürdürülebilirlik Bilincinin Değerlendirilmesi

Evaluation of Sustainability Awareness Among Personnel Working In Mass Feeding Institutions

Elif Güner¹, Sıla Söylemez², Sefa Merve Aydın³,
Dilan Yıldırım⁴, Sevede Neslişah Çambel⁵

1,2,3,4,5 İstinye University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Istanbul, Türkiye.

1Author's e-mail: dyt.elifmiroglu@gmail.com , 2Author's e-mail: s_sylmz_@hotmail.com , 3Author's e-mail: 2002074@stu.istinye.edu.tr ,

4Author's e-mail: dilanyildirim2012@gmail.com , 5Author's e-mail: sneslisah88@gmail.com

Özet

Giriş ve Amaç: Dünya nüfusunun artması ve iklim krizinin besin kaynakları üzerinde tehdit oluşturmasıyla beslenme büyük bir sorun haline gelmeye başlamış ve sürdürülebilir beslenme, sürdürülebilir gıda okuryazarlığı gibi kavramlar ortaya çıkmıştır. Bu araştırma toplu beslenme sistemleri çalışanlarında sürdürülebilir gıda okuryazarlığı ve sürdürülebilir beslenme davranışlarını incelemek amacıyla yürütülmüştür.

Yöntem: Bu kesitsel çalışma, İstanbul'da toplu beslenme hizmeti sunan 4 farklı kurumda çalışan toplam 122 yetişkin bireyin (68 kadın, 54 erkek) katılımı ile Mart-Haziran 2024 tarihleri arasında gerçekleştirilmiştir. Katılımcılara internet tabanlı gönderilen ankette kişilerin sosyodemografik özellikleri ve çalışma hayatına ilişkin sorular yer almakta olup, bireylerin sürdürülebilir gıda okuryazarlığı düzeyini ölçmek için "Sürdürülebilir Gıda Okuryazarlığı Ölçeği", sürdürülebilir beslenmeye yönelik davranışlarını ölçmek için ise "Sürdürülebilir Beslenmeye Yönelik Davranış Ölçeği" kullanılmıştır. Verilerin istatistiksel olarak değerlendirilmesinde IBM SPSS paket programı kullanılmış tüm analizlerde $p < 0,05$ değeri istatistiksel olarak anlamlı kabul edilmiştir. Araştırma için, İstinye Üniversitesi Sosyal ve Beşerî Araştırma Etik Kurulu'ndan (25.12.2023 tarihli, 2023/11 toplantı sayılı, 113 karar numaralı) etik kurul onayı alınmıştır.

Bulgular: Kadınların sürdürülebilir beslenme davranışı puanları ve sürdürülebilir gıda okuryazarlığı düzeyi erkeklerden yüksektir. Sürdürülebilir gıda okuryazarlığı eğitim düzeyine göre değişiklik göstermekte olup, üniversite mezunlarının sürdürülebilir gıda okuryazarlığı düzeyi en yüksek, ilkökul mezunlarının ise en düşüktür. Sürdürülebilir beslenme davranışı puanları ise; eğitim durumuna, mutfaktaki pozisyona, görev yapılan kuruma, çalışma yılına göre değişiklik göstermemektedir. Sürdürülebilirlik konusunda daha önce bir eğitim almış olan katılımcıların, sürdürülebilir beslenme davranışı puanları ve sürdürülebilir gıda okuryazarlığı almayanlardan yüksektir. Yaşın sürdürülebilir gıda okuryazarlığı ve sürdürülebilir beslenme davranışı puanları ile ilişkisi bulunmamıştır. Sürdürülebilir gıda okuryazarlığı düzeyi arttıkça sürdürülebilir beslenme davranışı puanları da artmaktadır.

Sonuç: Bu çalışma, toplu beslenme hizmeti sunan kurumlarda çalışanlarda sürdürülebilirlik konusundaki bilgi ve davranış yetersizliğini bildirmekte olup, sürdürülebilirlik bilincini artırmaya yönelik verilecek hizmet içi eğitimlere dikkat çekmektedir.

Anahtar Kelimeler: Sürdürülebilir kalkınma, beslenme davranışı, okuryazarlık, çevre.

Abstract

Introduction and Aim: As the world population increases and the climate crisis poses a threat to food resources, nutrition has become a major problem and concepts such as sustainable nutrition and sustainable food literacy have emerged. The purpose of this study was to evaluate the sustainable food literacy and nutrition behaviors of mass feeding system employees.

Method: This cross-sectional study was conducted between March and June 2024 with the participation of a total of 122 adults (68 women, 54 men) working in 4 different institutions providing mass nutrition services in Istanbul. The internet-based survey sent to the participants included questions about people's sociodemographic characteristics and working life, and the "Sustainable Food Literacy Scale" was used to measure the sustainable food literacy level of individuals, and the "Behavior Scale for Sustainable Nutrition" was used to measure their behavior towards sustainable nutrition. IBM SPSS package program was used to statistically evaluate the data. A p value of < 0.05 was considered statistically significant in all analyses. Ethics committee approval was received for the research from İstinye University Social and Human Research Ethics Committee (dated 25.12.2023, meeting number 2023/11, decision number 113).



Results: Women's sustainable nutrition behavior scores and sustainable food literacy levels are higher than men. Sustainable food literacy varies according to education level, with university graduates having the highest sustainable food literacy level and primary school graduates having the lowest. Sustainable nutrition behavior scores do not vary depending on educational status, position in the kitchen, institution where one works, or year of employment. Participants who have previously received training on sustainability have higher sustainable eating behavior scores and sustainable food literacy than those who have not received training. Age was not found to be associated with sustainable food literacy and sustainable nutrition behavior scores. As the level of sustainable food literacy increases, sustainable nutrition behavior scores also increase.

Conclusions: This study reports the lack of knowledge and behavior regarding sustainability among employees in institutions providing mass nutrition services, and draws attention to in-service training to be given to increase sustainability awareness.

Keywords: Sustainable development, nutritional behavior, literacy, environment

Sporcular için Sürdürülebilir Beslenme

Sustainable Nutrition for Athletes

Hande Seven Avuk¹ , Esengül Özkan^{1,2} 

İstanbul Bilgi Üniversitesi, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik Bölümü, İstanbul, Türkiye.

1 Yazarın e-maili: hande.seven@bilgi.edu.tr İstanbul Bilgi Üniversitesi,

Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik Bölümü, İstanbul, Türkiye.

2 T.C. Sağlık Bakanlığı, Sarıyer İlçe Sağlık Müdürlüğü, İstanbul, Türkiye.

2 Yazarın e-maili: esengul.ozkan@saglik.gov.tr

Özet

Küresel ısınmanın etkileri, tarım alanlarının daralması, içilebilir su kaynaklarının azalması ve biyoçeşitliliğin kaybı, insanlığın geleceğini tehdit eden kritik bir süreç başlatmıştır. Bu süreçte, küresel besin üretim sistemleri ve sürdürülebilir beslenme yaklaşımları akademik çalışmaların odak noktası olmuştur. Sürdürülebilir beslenme, çevresel etkileri en aza indirirken sağlıklı yaşama katkı sağlayan ve şimdiki ve gelecek nesillerin beslenme ihtiyaçlarını karşılayan diyetler olarak tanımlanmaktadır. Sporcu beslenmesi ise sürdürülebilir beslenme yaklaşımlarının henüz yeterince incelenmediği bir alandır.

Sporcuların optimal performansı ve istenen vücut kompozisyonunu koruyabilmeleri için yüksek miktarda enerji ve besin öğelerine, özellikle de proteine ihtiyaçları vardır. Ancak mevcut beslenme eğilimleri, genellikle hayvansal protein kaynaklarına dayanmaktadır ve bu durum sürdürülebilir beslenme önerileri ile çelişmektedir. Alternatif protein kaynakları arasında bitki bazlı gıdalar, böcekler, tek hücreli proteinler (mikoproteinler) ve sentetik et gibi seçenekler bulunmaktadır. Bu alternatifler, çevresel etkileri azaltma potansiyeline sahip olsalar da, sporcu beslenmesi üzerindeki etkileri konusunda daha fazla araştırmaya ihtiyaç duyulmaktadır.

Sonuç olarak, sporcular için sürdürülebilir beslenme rehberleri oluşturulması ve bu alanda daha fazla çalışma yapılması gerekmektedir. Aynı zamanda, sporcuların sürdürülebilir beslenme konusunda bilinçlendirilmesi de önemli bir konudur. Sürdürülebilir beslenme yaklaşımları sporcu diyetlerine entegre edilerek hem performansın korunması hem de çevresel etkilerin azaltılması hedeflenmelidir. Bu alandaki araştırmalar, gelecekte sporcular için daha çevre dostu beslenme planlarının geliştirilmesine katkı sağlayacaktır.

Anahtar Kelimeler: Bitki-bazlı, spor, sporcu beslenmesi, sürdürülebilir beslenme.

Abstract





The effects of global warming, shrinkage of agricultural areas, decrease in potable water resources, and loss of biodiversity have initiated a critical process that threatens the future of humanity. In this process, global food production systems and sustainable nutrition approaches have become the focus of academic studies. Sustainable nutrition is defined as diets that contribute to healthy living and meet the nutritional needs of current and future generations while minimizing environmental impacts. Sports nutrition is an area where sustainable nutrition approaches have not yet been adequately examined.

Athletes need high energy and nutrients, especially protein, to maintain optimal performance and desired body composition. However, current dietary trends often rely on animal protein sources, which conflicts with sustainable nutrition recommendations. Alternative protein sources include plant-based foods, insects, single-cell proteins (mycoproteins), and synthetic meat. Although these alternatives can potentially reduce environmental impacts, more research is needed on their impact on sports nutrition.

As a result, sustainable nutrition guidelines for athletes need to be created, and more studies need to be conducted in this area. At the same time, raising awareness among athletes about sustainable nutrition is also an important issue. Sustainable nutrition approaches should be integrated into athlete diets to maintain performance and reduce environmental impacts. Research in this area will contribute to developing more environmentally friendly nutrition plans for athletes in the future.

Keywords: Plant-based, sports, sports nutrition, sustainable nutrition.

Dose-Dependent Effect of Tart Cherry on Blood Pressure And Selected Inflammation Biomarkers: A GRADE-Assessed Systematic Review and Meta-Analysis of Randomized Controlled Trials

Seyedeh Tayebbeh Rahideh¹ , Mostafa Norouzzadeh² ,
Minoo Hasan Rashedi³ , Hossein Shahinfar⁴ 

1,2,3,4,Iran University of Medical Sciences, School of Public Health, Department of Nutrition, Tehran, Iran

1Author's e-mail: rahide.t@iums.ac.ir

2Author's e-mail: mononutrition77@gmail.com

3Author's e-mail: minoohrs98@gmail.com

4Author's e-mail: hossein.shahinfar74@yahoo.com

Abstract

Introduction and Aim: As a nutritious food, Tart cherries (*Prunus cerasus* L) benefit cardiovascular health. This study aims to clarify the effectiveness of Tart cherry in controlling blood pressure, heart rate, and inflammatory biomarkers, the appropriate dosage for this effect, and suggest directions for future studies.

Methods: PubMed, Scopus, and Web of Science were searched (up to May 2022), to identify eligible randomized controlled trials. It measured publication bias and was assessed for all outcomes. Evidence quality was evaluated using the Cochrane risk of bias tool and GRADE (Grades of Recommendations, Assessment, Development, and Evaluations).

Results: Regarding the 21 included trials, Tart cherry didn't affect blood pressure, heart rate, high-sensitive C-reactive protein, and interleukin-6 ($P > 0.05$). In contrast, with moderate certainty, it can reduce serum C-reactive protein (WMD: - 0.39 mg/l; 95% CI: - 0.74, - 0.05; $P = 0.024$) and with very low certainty can decrease tumor necrosis factor-alpha (WMD: - 0.14 pg/ml; 95% CI: - 0.27, - 0.02; $P = 0.026$). In addition, dose-response analysis implies that with each 30 ml elevation in dose, CRP reduces by 0.19 mg/l (95% CI: - 0.37, - 0.01).

Conclusions: Tart cherry can control inflammation by administering the proper dose. Even though tart cherry generally doesn't affect blood pressure and heart rate, further high-quality studies are needed to determine its effect.

Keywords: Tart cherry, blood pressure, inflammation, dose-response, meta-analysis, systematic review, natural product.

Sporcu Beslenmesinde Sürdürülebilir Diyetler

Sustainable Diets in Sports Nutrition

Ahmet Serhat Afşar¹ , Muttalip Ayar² 

¹Hittit Üniversitesi, Sağlık Bilimleri Fakülte, Beslenme ve Diyetetik Bölümü, Çorum, Türkiye

1 Yazarın e-maili: ahmetserht19@gmail.com

²Beykent Üniversite, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik Bölümü, İstanbul, Türkiye

2 Yazarın e-maili: muttalipayar@beykent.edu.tr

Özet

Giriş ve Amaç: Sporcular yaptıkları egzersizin türü, şiddeti, sıklığı ve yoğunluğuna bağlı olarak yüksek enerji ve besin ögesi ihtiyaçlarına sahip olabilmektedirler. Güncel sporcu beslenme rehberleri, sporcuların genel olarak 3-12 g/kg karbonhidrat ve 1,2-2,0 g/kg protein tüketimini önermektedir. Bu durum sporcuların yeterli protein alabilmek için hayvansal gıdalara yönelmesine ve bu gıdaların fazla tüketiminin ekolojik dengeyi bozmasına neden olabilmektedir. Bu çalışmanın amacı sürdürülebilir diyetlerin sporcu beslenmesi üzerindeki rolünü incelemektir.

Yöntem: Bu çalışma, mevcut sporcu beslenme rehberlerini ve literatürde yer alan beslenme modellerini inceleyerek, sporcu beslenmesinde sürdürülebilirlik ve çevresel etki konularını ele almaktadır. Akdeniz tipi beslenme, gezegen sağlığı diyeti, vegan-vegetaryen beslenme ve çift piramit beslenme modeli gibi sürdürülebilir beslenme modelleri incelenmiştir. Bu diyet modellerinin hayvansal ve işlenmiş gıda tüketimini azaltmada etkili olduğu, mevsimsel, yerel ve organik besinlerin tüketiminin artırılmasını önerdiği bilinmektedir.

Bulgular: Sporcu beslenmesi rehberlerinde, kas gelişimini artırmak için yüksek kaliteli hayvansal protein kaynaklarının tüketimine odaklanıldığı, ancak bitkisel protein kaynaklarının tüketiminin de önemli olduğu belirtilmiştir. Protein alımı için bitkisel kaynaklar tercih edilecekse 2.7-2.8 g/kg tüketim önerilmektedir. Sürdürülebilir beslenme modelleri ile ekolojik ayak izi, karbon ayak izi ve su ayak izinde düşüşler sağlanabilmektedir. Sporculara yönelik sürdürülebilir beslenme kapsamında bitkisel protein kaynakları, mevsiminde, yerel ve organik besinler, geri dönüştürülebilir ambalajlı besinler önerilirken; hayvansal protein kaynakları, ithal besinler, paketlenmiş yiyecekler içecekler ise önerilmemektedir. Ayrıca sporcu performansında devamlılık sağlanabilmesi adına esnek bitki bazlı diyetlerin tüketimi de önerilebilir. Daha düşük çevresel etkiye sahip olduğu bilinen et ve et ürünlerinin azaltıldığı, süt, yumurta ve peynir gibi ürünlerin tüketilebildiği fleksiteryan diyet modeli örnek olarak verilebilir.

Sonuç: Sporcu performansının artırılmasında yeterli ve dengeli beslenme uygulamaları ön plana çıkmaktadır. Doğru miktar ve zamanda tüketilen karbonhidrat ve protein kaynakları performans artışında doğrudan rol oynamaktadır. Özellikle protein tüketiminde bitkisel kaynaklara daha fazla yer verilmesi sürdürülebilir çevre ve sağlık açısından önemlidir. Ayrıca dondurulmuş, mevsiminde olmayan ve paketlenmiş gıda tüketiminin sınırlandırılması ve israfın önlenmesi de sürdürülebilir çevre için önemlidir.

Anahtar Kelimeler: Beslenme, sürdürülebilir diyet, sporcu beslenmesi.

Abstract

Introduction and Aim: Athletes may have high energy and nutrient needs depending on the type, intensity, frequency and density of the exercise they perform. Current sports nutrition guidelines recommend that athletes generally consume 3-12 g/kg carbohydrate and 1.2-2.0 g/kg protein. This situation may cause athletes to turn to animal foods to get enough protein and excessive consumption of these foods may disrupt the ecological balance. The aim of this study is to examine the role of sustainable diets on sports nutrition.

Method: This study examines the sustainability and environmental impact issues in sports nutrition by examining current sports nutrition guidelines and nutritional models in the literature. Sustainable nutritional models such as the Mediterranean diet, planetary health diet, vegan-vegetarian diet and double pyramid nutritional model were examined. It is known that these dietary models are effective in reducing animal and processed food consumption and recommend increasing the consumption of seasonal, local and organic foods.

Results: It is stated in sports nutrition guidelines that the focus is on the consumption of high-quality animal protein sources to increase muscle development, but the consumption of plant protein sources is also important. If plant sources are to be preferred for protein intake, a consumption of 2.7-2.8 g/kg is recommended. Sustainable nutrition models can reduce ecological footprint, carbon footprint and water footprint. Within the scope of sustainable nutrition for athletes, plant protein sources, seasonal, local and organic foods, and foods with recyclable packaging are recommended, while animal protein sources, imported foods, packaged foods and drinks are not recommended. In addition, the consumption of flexible plant-based diets can be recommended in order to ensure continuity in athlete performance. The flexitarian diet model, where meat and meat products known to have a lower environmental impact are reduced and products such as milk, eggs and cheese can be consumed, can be given as an example.

Conclusion: Adequate and balanced nutrition practices come to the forefront in increasing athlete performance. Carbohydrate and protein sources consumed in the right amount and at the right time play a direct role in increasing performance. In particular, giving more place to plant sources in protein consumption is important for a sustainable environment and health. In addition, limiting the consumption of frozen, out-of-season and packaged foods and preventing waste are also important for a sustainable environment.

Keywords: Nutrition, sustainable diet, sports nutrition.

Bilişsel Fonksiyonda Antioksidanların Rolü

The Role of Antioxidants in Cognitive Function

Ahmet Serhat Afşar¹ , Vahibe Uluçay Kestane² 

¹Hittit Üniversitesi, Sağlık Bilimleri Fakülte, Beslenme ve Diyetetik Bölümü, Çorum, Türkiye

1 Yazarın e-maili: ahmetserht19@gmail.com

²Galata Üniversite, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik Bölümü, İstanbul, Türkiye

2 Yazarın e-maili:vahibe.ulucaykestane@galata.edu.tr

Özet

Giriş ve amaç: Antioksidanlar, serbest radikallerin etkilerini azaltarak bilişsel işlevlerin korunmasına katkıda bulunabilmektedir. Bu çalışmada antioksidanların bilişsel fonksiyonlar üzerindeki rolü ve uygun beslenme önerilerinin paylaşılması amaçlanmaktadır.

Yöntem: Araştırma kapsamına son 5 yılda yayınlanmış çalışmaların dâhil edilmesi ve ‘Antioksidanlar’, ‘Bilişsel Fonksiyon’, ‘Antioksidan Beslenme’ ‘Antioksidan ve Sağlık’ ‘Antioksidan Kaynakları’ anahtar kelimeleri ile *Pubmed*, *Science Direct* ve *Cochrane* veri tabanları taranmıştır.

Bulgular: Beyindeki yoğun oksijen tüketimi reaktif oksijen türlerinin (ROS) oluşumuna ve oksidatif stresin artmasına neden olmaktadır. Bu durum proteinlerin glikozilasyonuna ve oksidasyonuna, ileri glikasyon ürünlerinin oluşmasına; guanin bazlarının oksidasyonu veya nitrasyonundan kaynaklanan DNA hasarına; membran akışkanlığının azalması ve hücre geçirgenliğinin artmasıyla birlikte lipid peroksidasyonuna yol açar ve tüm bu faktörler bilişsel fonksiyonun azalmasına ve nörodegeneratif bozuklukların gelişimine neden olur. Non-enzimatik antioksidan grupta yer alan ve beyin hücrelerinde bulunan glutatyon, A, E ve C vitaminleri, selenyum, retinoik asit, karotenoidler ve flavonoidler besinlerde doğal olarak bulunan önemli bileşenlerdir ve ROS’ları azaltarak beyin sağlığını destekleme potansiyeline sahiptir. Özellikle meyve, sebze, tam tahıllar ve kuruyemişler antioksidan açısından zengin besinlerdir. Antioksidanların bilişsel fonksiyonlar üzerindeki etkilerini değerlendiren araştırmaların çoğu olumlu sonuçlar sunmaktadır. Hafif bilişsel bozukluk (MCI) ve Alzheimer hastalarında hipokampal bölgelerde glutatyon konsantrasyonunun azaldığı tespit edilmiştir. Klinik çalışmalar, yaşlı bireylerde E ve C vitamini alımı ile gecikmiş Alzheimer başlangıcı arasındaki ilişkiyi vurgulamaktadır. Bu vitaminlerin beyin omurilik sıvısındaki daha yüksek konsantrasyonlarının lipid oksidasyonunu önleyebildiği gösterilmiştir. Glutatyon peroksidin yapısında bulunan selenyumun senil plaklarda ve nörofibriler yumaklarda olumlu etkiler yarattığı bildirilmiştir. Literatürde bu araştırmaların yanı sıra olumlu yanıtlar alınamayan araştırmalar da bulunmaktadır.

Sonuç: Antioksidanların beyin sağlığı üzerindeki etkilerini anlamak, bilişsel fonksiyonun gelişimi; nörodegeneratif hastalıkların önlenmesi ve tedavisi için önemli bir adım olacaktır. Konu ile ilgili geniş örneklemli randomize kontrollü araştırmalara ihtiyaç vardır.

Anahtar Kelimeler: Beslenme, bilişsel fonksiyon, antioksidanlar.

Abstract

Introduction and Aim: Antioxidants can contribute to the protection of cognitive functions by reducing the effects of free radicals. This study aims to share the role of antioxidants on cognitive functions and appropriate nutrition recommendations.

Method: The research included studies published in the last 5 years and Pubmed, Science Direct and Cochrane databases were scanned with the keywords ‘Antioxidants’, ‘Cognitive Function’, ‘Antioxidant Nutrition’, ‘Antioxidant and Health’, ‘Antioxidant Sources’.

Results: Intensive oxygen consumption in the brain causes the formation of reactive oxygen species (ROS) and increased oxidative stress. This situation causes glycosylation and oxidation of proteins, formation of advanced glycation products; DNA damage caused by oxidation or nitration of guanine bases; It leads to lipid peroxidation with decreased membrane fluidity and increased cell permeability, and all these factors lead to decreased cognitive function and the development of neurodegenerative disorders. Glutathione, vitamins A, E and C, selenium, retinoic acid, carotenoids and flavonoids, which are in the non-enzymatic antioxidant group and found in brain cells, are important components naturally found in foods and have the potential to support brain health by reducing ROS. Especially fruits, vegetables, whole grains and nuts are foods rich in antioxidants. Most studies evaluating the effects of antioxidants on cognitive functions present positive results. It has been determined that glutathione concentration is reduced in the hippocampal regions in patients with mild cognitive impairment (MCI) and Alzheimer’s disease. Clinical studies highlight the association between vitamin E and C intake and delayed onset of Alzheimer’s in older individuals. It has been shown that higher concentrations of these vitamins in cerebrospinal fluid can prevent lipid oxidation. It has been reported that selenium, found in the structure of glutathione peroxide, has positive effects on senile plaques and neurofibrillary tangles. In addition to these studies in the literature, there are also studies that did not receive positive responses.

Conclusion: Understanding the effects of antioxidants on brain health, development of cognitive function; It will be an important step for the prevention and treatment of neurodegenerative diseases. There is a need for large-sample randomized controlled studies on the subject.

Keywords: Nutrition, cognitive function, antioxidants.

Soybean As a Sustainable Solution to Combat Protein Energy Malnutrition: A Systematic Review

Madiha Rafique¹ , Muhammad Aqib² 
Mubarra Saeed³ , Muhammad Naem⁴ 

¹ University of Agriculture Faisalabad, National Institute of Food Science and Technology, Faisalabad, ¹ Author's e-mail: madiharafique654@gmail.com ² Gujrat Institute of Management Sciences, PMAS ARID Agriculture University Rawalpindi, Gujrat, ² Author's e-mail: maqibniaz595@gmail.com
³ Government College University Faisalabad, Institute of Home and Food Science, Faisalabad, Pakistan ³ Author's e-mail: mubarasaeed1234@gmail.com
⁴ University of Agriculture Faisalabad, National Institute of Food Science and Technology, Faisalabad, ⁴ Author's e-mail: m.naem@uaf.edu.pk

Abstract

Protein energy malnutrition (PEM) is a global health challenge, affecting millions of people, particularly in developing countries. Soybeans appear to be a potential option as we look for sustainable solutions. A systematic review was conducted using the PRISMA criteria, focusing on studies on soybeans and protein-energy malnutrition. Databases like PubMed, Scopus, and Web of Science were searched, and the quality of study was evaluated using GRADE methodology. Soybeans are an excellent source of protein since they are a concentrated source of necessary amino acids. With a protein digestibility-corrected amino acid score (PDCAAS) of 1.00, soy protein is considered high-quality protein and is comparable to certain proteins derived from animal sources like dairy and meat. Well-balanced necessary amino acids, with the exception of those containing sulfur, such as methionine, are present in soy proteins. This property is crucial for combating malnutrition, especially in vulnerable populations. Protein content in soybean can vary but on average they offer a substantial amount of protein 43.25% essential for combating malnutrition. Soybeans contribute to gut health because of its higher fiber content which is approximately 9.1%. Soy complements other dietary components, when combined with cereals or grains, it enhances overall protein quality. There has been a notable increase in the cultivation of soybeans over the past 2 decades offering a lower smaller environmental footprint than animal forming. It requires less water, generates fewer greenhouse gas emissions, and contributes to soil health. Advances in soybean processing technologies allow cost-effective extraction of protein-rich fractions. These can be incorporated into various food products, enhancing their nutritional content. From tofu and soymilk to soy nuggets and soya bars; soy-based foods are safe, affordable, and widely accessible. Despite soy is potential food, challenges such as allergenicity, need of biofortification and improved palatability of soy-based products remain. Overall, soybeans represent a sustainable and nutritionally rich approach to combat PEM and contribute to a healthier global food system. Its adoption can contribute to a healthier, more equitable global food system. Thus, incorporating soybean into dietary interventions and agricultural strategies holds promise for alleviating PEM and promoting sustainable food systems worldwide.

Keywords: Protein energy malnutrition (PEM), soybean, value added products, plant proteins, environment sustainability.

Investigation of Pumpkin Seeds for Enhancing Physical Performance in Gym Trainees

Mubarra Saeed¹ , Rushba Irfan² , Madiha Rafique³ ,
Huma Ambreen⁴ , Aysha Saleem⁵ 

1Government College University Faisalabad, 1234 Pakistan 1Author's e-mail: mubarasaeed1234@gmail.com
2University of Agriculture Faisalabad, 8 Pakistan 2Author's e-mail: rushbairfan8@gmail.com
3University of Agriculture Faisalabad, 654 Pakistan 3Author's e-mail: madiharafique654@gmail.com
4Government College University Faisalabad, Pakistan 4Author's e-mail: humaambreen@gcuf.edu.pk
5Leibniz-Institut für Agrartechnik und Bioökonomie e.V. (ATB), Max-Eyth-Allee 100, 14469 Potsdam, Germany
5Author's e-mail: aysha.saleem@unifg.it

Abstract

Introduction and Aim: Magnesium is a vital nutrient for highly active males to improve physical performance and reduce fatigue because it is necessary for muscle function and energy production. This study aimed to investigate the effect of magnesium-rich pumpkin seed balls on reducing fatigue and increasing lean muscle mass in highly active males.

Methods: Three varieties of pumpkin seed balls high in magnesium were created and evaluated using a sensory analysis. A group of 30 volunteers were randomly selected from different gyms and divided into experimental and control groups. The study measured BMI, and used a skin fold caliper to quantify seven skin fold thickness sites, as well as a validated questionnaire to assess fatigue at three key points: before the bio evaluation, mid-point, and the last day. Results were carried out by ANOVA.

Results: Magnesium balls (MB) that have 70% pumpkin seeds 30% wheat flour (WF) and jaggery for the taste received a score of nine points in sensory evaluation. In comparison to the control group, the experimental group that consumed magnesium balls exhibited a substantial decrease in fatigue and an increase in lean muscle mass. The fatigue issue was resolved by increased muscle activities in the experimental group, which showed a significant change in lean body mass ($p \leq 0.05$), recorded at 77.07 ± 0.98 % at 0-day, 77.53 ± 0.94 % on the 20th and increased up to 78.93 ± 0.74 % at end of the efficacy trial i.e., 40-day.

Conclusion: Magnesium balls (Mb) effectively reduce fatigue and gain more lean muscle mass. The product shows promise as a dietary intervention to improve the recuperation and physical performance of gym trainees.

Keywords: Magnesium, gym trainees, pumpkin seeds, fatigue, sensory evaluation, bio-evaluation.

Assessing The Nutritional Profile of Chickpea-Based Nutriment to Improve Iron Intake Among Infants

Rushba Irfan¹ ,
Beenish Israr² ,
Mubarra Saeed³ 

¹University of Agriculture Faisalabad, Faculty of Food, Nutrition and Home Sciences, Department of Food and Nutrition, Faisalabad, Pakistan.

¹Author's e-mail: rushbairfan8@gmail.com

²University of Agriculture Faisalabad, Faculty of Food, Nutrition and Home Sciences, Department of Food and Nutrition, Faisalabad, Pakistan.

²Author's e-mail: beenish.israr@uaf.edu.pk

³ Government College University Faisalabad, Faculty of Nutritional Sciences, Faisalabad, Pakistan.

³Author's e-mail: mubarasaheed1234@gmail.com

Abstract

Introduction and Aim: Nutritionally compromised food is considered a barrier to micronutrient deficiencies among infants. The adoption of complementary foods with a complete nutrient profile is considered a wise approach toward infant health. This study aimed to investigate the impact of cereals and legumes using composite flour technology as iron-rich complementary food and to assess its impact on iron improvement towards the infant's health and their neurodevelopmental abilities.

Method: Different cereals and legumes including chickpeas, wheat, maize, and quinoa were used as a novel blend designed for the complimentary cookies. Infants up to 2 years were selected randomly and the intervention trials were divided into 3 groups for 21 days. Group A was a placebo group given T0 cookies made of all-purpose flour (APF). Group-B and Group-C were experimental groups given T2, and T5 cookies with a composite ratio of 70:30:10 as chickpea, wheat\maize, and quinoa (CWQ) and (CMQ). Chemical analysis of the cookies was evaluated including proximate and mineral analysis (Fe, Zn). The infant's physical parameters were recorded along with their mineral analysis.

Results: Proximate analysis of the product T2-CWQ had a higher amount of crude protein (15.06 ± 0.01 %), and crude fiber (2.72 ± 0.01 %) as compared to other cookie composites (T5-CMQ, T0-APF). The mineral analysis showed higher mean \pm SD of iron in T2-CWQ (61.6 ± 0.8 mg/100g), as compared to T0 (42.7 ± 0.35 mg/100g) and T5 (47.3 ± 2.11 mg/100g). Similarly, the zinc level was higher in T2 treatment (10.6 ± 0.1 mg/100g). The efficacy study on infants showed an increased level of iron in Group-B from baseline (24.12 ± 10.36 mg/100g) to (33.92 ± 13.98 mg/100g). However, Group-A infants showed no increase, and Group-C resulted from (28.11 ± 20.5 mg/100g) to (26.46 ± 13.8 mg/100g).

Conclusion: Chickpea and wheat-based complementary blends have shown more significant results towards iron levels in infants.

Keywords: Chickpea, wheat, infants, complementary feeding, iron, zinc.

The Potential of Kaffir Lime, *Citrus Hystrix* DC, Leaf as Feed Additive for Aquaculture Uses

Kon Yeu Hooi¹ , Lee Seong Wei² ,
Martina Irwan Khoo³ , Mohamad Nor Azra^{4,5} ,
Wendy Wee⁶ 

1Department of Johor State Fisheries Complex, Pendas Laut Road, 81550, Gelang Patah, Johor, Malaysia. 1Author's e-mail: yeuhooi@dof.gov.my
2Department of Agricultural Sciences, Faculty of Agro-Based Industry, University of Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia.
2Author's e-mail: leeseong@umk.edu.my
3Department of Chemical Pathology, School of Medical Sciences, University of Sains Malaysia, Health Campus, Kubang Kerian 16150, Malaysia.
3Author's e-mail: msirwankhoo@gmail.com
4Institute of Climate Adaptation and Marine Biotechnology (ICAMB), University of Malaysia Terengganu (UMT), Kuala Nerus 21030, Terengganu, Malaysia.
5Research Center for Marine and Land Bioindustry, Earth Sciences and Maritime Organization, National Research and Innovation Agency (BRIN), Pemenang 83352, Indonesia.
4Author's e-mail: azramn@umt.edu.my
6Center for Fundamental and Continuing Education, University of Malaysia Terengganu, 21030, Kuala Nerus, Terengganu, Malaysia.
6Author's e-mail: wendy@umt.edu.my

Abstract

The objective of the present study was to evaluate the beneficial effects of the kaffir lime, *Citrus hystrix*, leaf powder (KL) on growth of African catfish, *Clarias gariepinus*. A total of 450 healthy juvenile of African catfish (10.5g) were randomly distributed to five treatments fed with diets containing 0 (control), 1, 2, 3, and 4% of KL for a duration of 8 weeks. After 8 weeks, there were significant differences in all growth performance parameters, including final weight, weight gain, specific growth rate, feed conversion rate, percentage of hepatosomatic, and viscerosomatic index between dietary KL and control, with the highest being in the group fed 2 and 3% ($p < 0.05$). Based on the present study findings revealed that dietary 2 or 3 % KL has beneficial effects on the growth of African catfish. In summary, the present study findings showed dietary 2 or 3% could improve the growth of African catfish for a production betterment.

Keywords: Kaffir lime; *Citrus hystrix* leaf; growth performance; African catfish; *Clarias gariepinus*.

Development Village Chicken Production in Malaysia

Aida Zakaria¹ ,
Mamat Hamidi Kamalludin^{2,3} 

¹Institute of Tropical Agriculture and Food Security, UPM

¹Author's e-mail: aidazakaria@upm.edu.my

²Institute of Tropical Agriculture and Food Security, UPM

³Department of Animal Science, Faculty of Agriculture, UPM

^{2,3} Author's e-mail: mamath@upm.edu.my

Abstract

Food security is a national global concern and a hot topic among Malaysians. According to the United Nations Report, in 2022, between 691 and 783 million people around the world will experience hunger, and the majority will be Asian residents. Although Malaysia is one of the highest producers of palm oil and rice in Asia, our country still shows an unstable trend in food security. The government with initiative reviews current food security policies and consider how import, export and urban high-tech systems can help. The government has taken several steps to overcome this problem including subsequently introduced two policies, namely the National Food Security Policy 2021-2025 and the National Agro-Food Policy 2021- 2030. The first strategy is to reduce food imports on selected products, for example, chicken products.

The village chicken industry in this country is still not comparable to the broiler chicken industry which has such a complete chain that includes breeding chicken farms, broiler farms, hatcheries, food factories, slaughter centres and a network of contract breeders and market chains. For fans of village chicken, although the price is high, they still try to get this chicken. In addition to being nutritious, it also tastes better even though the meat is tougher, it depends on the technique or tips used by the 'cook' to soften the meat of this village chicken. Reported show that the retail price of village chicken is over RM16 per kilogram. Most village chicken farming is done on a small or medium scale. Department of Veterinary Services (DVS) Malaysia reported there are a total of 162 village chicken farmers with a population of 34,587 meanwhile a total of 494 broiler breeders with a population of 12,429,791. The difference is due to the maturity period of village chickens after 60 days each cycle with a weight of 1.5 to 2 kilograms each, compared to broiler chickens which have a maturity of 28 days with a weight of 1.8 kilograms. Keeping village chickens is exposed to many factors that can affect the profitability and viability of breeders. The states of Selangor and Terengganu are the most village chicken farmers. Village chickens are kept free in villages. Usually, these village chickens are kept only for subsistence and as a source of food for the family. Only a few business transactions took place. Its conservation is also unorganized and the breeding program is also independent. There is a research effort from Universiti Putra Malaysia (UPM) and MARDI in the genetic development of village chickens that have produced village chickens that grow quickly and are of good quality. The studies carried out have used several types of village chickens and crossbred with chicken breeds from abroad to obtain fast-growing genetics. It aims to reduce the period of keeping village chickens to less than 4 months. The use of chicken breeds from abroad and raised freely and dubbed as village chickens has caused concern among chicken farmers who recognize their chickens as original village chickens. Farmers who keep native village chickens feel that the chickens brought from abroad affects their market. A study needs to be done to overcome this problem in order to outline and streamline the current classification of chickens so that there is no suppression and market fraud.

Keywords: Global concern, market chains, genetic development, breeding program, market chains.

The Potential of *Etilingera Elatior* (Jack) Bud Flower Powder as Feed Additive in African Catfish, *Clarias Gariepinus* Farming

Liew Vui Kien¹ , Lee Seong Wei² ,
Zulhisyam Abdul Kari³ , Muhammad Anamul Kabir⁴ ,
Mohamad Nor Azra^{5,6} , Martina Irwan Khoo⁷ ,
Wendy Wee⁸ 

1Jabatan Perikanan Malaysia, Department of Johor State Fisheries Complex, Pendas Laut Road, 81550, Gelang Patah, Johor, Malaysia

1Author's e-mail: vkliew@dof.gov.my

2Department of Agricultural Sciences, Faculty of Agro-Based Industry, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia.

2Author's e-mail: leeseong@umk.edu.my

3Department of Agricultural Sciences, Faculty of Agro-Based Industry, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia.

3Author's e-mail: zulhisyam.a@umk.edu.my

4Department of Aquaculture, Faculty of Fisheries, Sylhet Agricultural University, Sylhet 3100, Bangladesh.

4Author's e-mail: anamul.aq@sau.ac.bd

5Institute of Climate Adaptation and Marine Biotechnology (ICAMB), Universiti Malaysia Terengganu (UMT), Kuala Nerus 21030, Terengganu, Malaysia.

6Research Center for Marine and Land Bioindustry, Earth Sciences and Maritime Organization, National Research and Innovation Agency (BRIN), Pemenang 83352, Indonesia.

5,6Author's e-mail: azramn@umt.edu.my

8Center of Fundamental and Continuing Education, Universiti Malaysia Terengganu, 21030, Kuala Nerus, Terengganu, Malaysia.

8Author's e-mail: wendy@umt.edu.my

Abstract

This study investigates the impacts of dietary *Etilingera elatior* (Jack) bud flower powder (EE) supplementation on the growth of African catfish, *Clarias gariepinus*. Each treatment group received different formulated diets: Basal diet without EE (control), basal diet + 1% EE (EE1), basal diet + 2% EE (EE2), basal diet + 3% EE (EE3), and basal diet + 4% EE (EE4). After an eight-week feeding trial, fish supplemented with dietary EE exhibited significantly improved growth performance, such as weight gain, specific growth rate and final weight (FW) than the control group particularly EE2 and EE3. Furthermore, EE-treated fish recorded significantly lower feed conversion rate, viscerosomatic index, and hepatosomatic index than the control, particularly EE2 and EE3. Therefore, this study findings highlighted the potential benefits of EE as a feed additive to boost the production in African catfish farming.

Keywords: Growth performance, African catfish.

Sağlık Bilimleri Fakültesi Öğrencilerinin Sürdürülebilir Beslenme Davranışları ve Besin Tüketim Sıklıkları İlişkisi

Relationship between Sustainable Eating Behaviors and Food Consumption Frequencies among Health Sciences Faculty Students

Beyza Gülsüm Uğurlu¹ , Ayşe Betül Demirbaş² 

1 İstanbul Atlas Üniversitesi, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik Bölümü, İstanbul, Türkiye

1 Yazarın e-maili: bg.ugurlu@gmail.com

2 İstanbul Atlas Üniversitesi, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik Bölümü, İstanbul, Türkiye

2 Yazarın e-maili: ayse.demirbas@atlas.edu.tr

Özet

Giriş ve Amaç: Bu çalışmada, Sağlık Bilimleri Fakültesi öğrencilerinin besin tüketim sıklıkları ile sürdürülebilir beslenme davranışları arasındaki ilişkinin incelenmesi amaçlanmıştır.

Yöntem: Tanımlayıcı-kesitsel tipteki bu çalışma Kasım 2023-Nisan 2024 tarihleri arasında 293 öğrenci ile yürütülmüştür. Çalışmaya katılan gönüllü öğrencilere; genel bilgiler formu, besin tüketim sıklığı kayıt formu ve sürdürülebilir beslenmeye yönelik davranış ölçeği uygulanmıştır. Verilerin değerlendirilmesinde IBM SPSS v29.0 programı kullanılmış ve istatistiksel anlamlılık $p < 0.05$ olarak kabul edilmiştir.

Bulgular: Katılımcıların sadece %48.1'i sürdürülebilir beslenme terimini daha önce duymuştur. Katılımcıların okudukları bölüme göre sürdürülebilir beslenme puanları farklılaşmamaktadır ($p > 0.05$). Besin tüketim sıklıkları ile sürdürülebilir beslenme davranışları değerlendirildiğinde, kaşar peyniri tüketenlerin tüketmeyenlere göre "besin satın alma" puanı, ayran tüketenlerin tüketmeyenlere göre ise "gıda israfının azaltılması" puanı daha yüksek bulunmuştur ($p < 0.05$). Kırmızı et ve sakatat tüketmeyenler ve tüketenlerin "besin tercihi" puanları arasında anlamlı bir fark bulunmuştur ($p < 0.05$). Balık tüketenlerin "mevsimsel ve yerel beslenme" puanları ile tüketmeyenler arasında anlamlı bir fark tespit edilmiştir ($p < 0.05$). Ayrıca kurubaklagil tüketenler ile tüketmeyenler arasında "besin tercihi", "gıda israfının azaltılması", "mevsimsel ve yerel beslenme" ve sürdürülebilir beslenme toplam puanları arasında anlamlı farklar bulunmuştur ($p < 0.05$). Kepek ekme, bulgur ve tarhana tüketenler ile tüketmeyenler arasında sürdürülebilir beslenme toplam puanları arasında anlamlı farklar belirlenmiştir ($p < 0.05$). Pişmiş sebze ve kuru meyve tüketenler ile tüketmeyenler arasında sürdürülebilir beslenme toplam puanları arasında anlamlı farklar belirlenmiştir ($p < 0.05$). Margarin tüketenler ile tüketmeyenler arasında "gıda israfının azaltılması" ve sürdürülebilir beslenme toplam puanları açısından anlamlı farklar belirlenmiştir ($p < 0.05$). Çay, bitki çayı tüketenlerin sürdürülebilir beslenme toplam puanları tüketmeyenlere göre istatistiksel olarak anlamlı derecede daha yüksektir ($p < 0.05$). Kola ve alkollü içecek tüketmeyenlerin sürdürülebilir beslenme toplam puanları tüketenlere göre istatistiksel olarak anlamlı derecede daha yüksektir ($p < 0.05$).

Sonuç: Sürdürülebilir beslenmede önerilerine uygun olarak sağlık bilimleri fakültesi öğrencilerinde kurubaklagil, bulgur, kepek ekmeği, tarhana, pişmiş sebze, kuru meyve tüketenlerin, kola ve alkollü içecek tüketmeyenlerin sürdürülebilir beslenme toplam puanları daha yüksektir.

Anahtar Kelimeler: Sürdürülebilir beslenme, besin tüketimi, beslenme.

Abstract

Introduction and Aim: This study aims to examine the relationship between the frequency of food consumption and sustainable eating behaviors among students in the Faculty of Health Sciences.

Method: This descriptive cross-sectional study was conducted with 293 students between November 2023 and April 2024. The general information form, food consumption frequency record form and sustainable nutrition behavior scale were applied to the volunteer students who participated in the study. The IBM SPSS v29.0 program was used to evaluate the data, and $p < 0.05$ indicated statistical significance.

Results: Only 48.1% of the participants had previously heard of sustainable eating terms. There was no significant difference in sustainable eating scores across the participants' academic departments ($p > 0.05$). When the relationship between food consumption frequency and sustainable eating behavior was evaluated, the "food purchasing" score was greater for those who consumed kashar cheese than for those who did not, and the "food waste reduction" score was greater for those who consumed ayran than for those who did not ($p < 0.05$). A considerable difference was found between the "food choice" scores of those who did and did not consume red meat and those who did not ($p < 0.05$). A significant difference was also detected between the "seasonal and local eating" scores of those who consumed fish and those who did not ($p < 0.05$). Furthermore, notable differences were found in the "food choice," "food waste reduction," "seasonal and local eating," and overall sustainable eating scores between those who consumed legumes and those who did not ($p < 0.05$). Noteworthy differences in overall sustainable eating scores were observed between those who consumed whole grain bread, bulgur, and tarhana and those who did not ($p < 0.05$). Substantial differences were also identified in the overall sustainable eating scores between those who consumed cooked vegetables or dried fruits and those who did not ($p < 0.05$). A significant difference in "food waste reduction" and overall sustainable eating scores was found between those who consumed margarine and those who did not ($p < 0.05$). The overall sustainable eating scores of those who consumed tea and herbal tea were significantly higher than those of those who did not ($p < 0.05$). Additionally, the overall sustainable eating scores of those who did not consume cola and alcoholic beverages were significantly higher than those of those who did ($p < 0.05$).

Conclusion: In accordance with the recommendations for sustainable nutrition, the total sustainable nutrition scores of the students of the faculty of health sciences who consume legumes, bulgur, bran bread, tarhana, cooked vegetables, and dried fruits and do not consume cola or alcoholic beverages are higher.

Keywords: Sustainable eating, food consumption, nutrition.

Üniversite Öğrencilerinde Besin Neofobisi, Yeme Davranışı ve Diyet Kalitesi Arasındaki İlişkinin İncelenmesi

Examining the Relationship Between Food Neophobia, Eating Behavior and Diet Quality in University Students

Sinem Cengiz¹, Sinem İnal², Zeynep Çankaya³,
Şeyma Arslan⁴, Esra Tansu Sarıyer⁵,
Gonca Yıldırım⁶

1Sağlık Bilimleri Üniversitesi, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik, İstanbul, Türkiye. 1Yazarın e-maili:sinemcengiz76@gmail.com
2Sağlık Bilimleri Üniversitesi, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik, İstanbul, Türkiye. 2Yazarın e-maili:sineminal8@gmail.com
3Sağlık Bilimleri Üniversitesi, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik, İstanbul, Türkiye. 3Yazarın e-maili:zeynepa1472@gmail.com
4Sağlık Bilimleri Üniversitesi, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik, İstanbul, Türkiye. 4Yazarın e-maili:seymaarslan@gmail.com
5Sağlık Bilimleri Üniversitesi, Hamidiye Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik Bölümü, İstanbul, Türkiye.
6Toros Üniversitesi, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik Bölümü, Mersin, Türkiye 6Yazarın e-maili:gonca.yildirim@toros.edu.tr

Özet

Giriş ve Amaç: Bu çalışmanın amacı üniversite öğrencilerinde besin neofobisi, yeme davranışı ve diyet kalitesi arasındaki ilişkinin değerlendirilmesidir.

Yöntem: Çalışma Eylül 2023-Haziran 2024 tarihleri arasında Sağlık Bilimleri Üniversitesi'nde okuyan 349 gönüllü öğrencinin katılımı ile tamamlanmıştır. Çalışmada veri toplama aracı olarak; katılımcıların genel özelliklerini belirlemek amacıyla sosyo-demografik özelliklerini sorgulayan sorular, beslenme neofobisi düzeylerini ölçmek için “Besin Neofobi Ölçeği (BNÖ)”, diyet kalitesini ölçmek için “24 saatlik besin tüketim kaydı” ve “Sağlıklı Yeme İndeksi-2015 (SYİ-15)” ve yeme tutumunu değerlendirmek için “Yeme Tutum Testi-26 (YTT)” kullanılmıştır. Elde edilen veriler Statistical Package for the Social Sciences (SPSS) programı ile değerlendirilmiştir.

Bulgular: Katılımcılar yaş ortalaması 21,2±3,03 olan, BKİ ortalaması 22,2±3,83 %91,7'si kadın, tamamına yakınının kronik hastalığı bulunmayan ve çoğu öğün atlayan bireylerden oluşmaktadır. SYİ-15'e göre katılımcıların %92,6'sı kötü diyet kalitesine sahipken %7,2 lik kısmı ise geliştirilmesi gereken diyet modeline sahiptir. YTT'ye göre katılımcıların %86,8'inin yeme tutumu normal aralıktadır. Katılımcıların neofobi düzeyleri BNÖ'ne göre değerlendirildiğinde ise %16,3'ü neofilik, %68,5 nötr ve %15,2'si neofobik olarak saptanmıştır. Katılımcıların besin neofobisini etkileyen tek bağımsız değişkenin BKİ olduğu görülmüştür (B: -0,368; 95% CI -0,640—0,096; p<0,05).

Sonuç: Bu çalışma sonucunda, üniversite öğrencilerinde besin neofobisinin BKİ değerlerinden etkilendiği görüldüğüne, yeme davranışı ve diyet kalitesi ile ilişkisi olmadığı saptanmıştır. Besin neofobisi ve beslenme davranışı arasındaki ilişkiyi açıklayabilmek ve genç yetişkinlere yönelik müdahale programları oluşturabilmek için daha fazla çalışmaya ihtiyaç duyulmaktadır.

Anahtar Kelimeler: Beden kütle indeksi, diyet kalitesi, besin neofobisi, yeme davranışı, yeme tutumu.

Abstract

Introduction and Aim: The aim of this study was to evaluate the relationship between food neophobia, eating behavior and diet quality in university students.

Method: The study was completed with the participation of 349 volunteer students studying at the University of Health Sciences between September 2023 and June 2024. As data collection tools in the study; questions questioning socio-demographic characteristics to determine the general characteristics of the participants, “Food Neophobia Scale (FNS)” to measure the level of nutritional neophobia, “24-hour dietary recall” and “Healthy Eating Index-2015 (HIE-15)” to measure diet quality, and “Eating Attitude Test-26 (EAT)” to evaluate eating attitude were used. The data obtained were evaluated with the Statistical Package for the Social Sciences (SPSS) program.

Results: The mean age of the participants was 21.2±3.03 years, mean BMI was 22.2±3.83, 91.7% were female, almost all of them had no chronic diseases and most of them skipped meals. According to HIE-15, 92.6% of the participants had poor diet quality, while 7.2% had a diet model that needed to be improved. According to the EAT-26, 86.8% of the participants' eating attitudes were in the normal range. When the neophobia levels of the participants were evaluated according to the FNS, 16.3% were neophilic, 68.5% were neutral and 15.2% were neophobic. The only independent variable affecting food neophobia was BMI (B: -0.368; 95% CI -0.640-0.096; p<0.05).

Conclusion: As a result of this study, food neophobia was found to be affected by BMI values in university students, while it was not found to be associated with eating behavior and diet quality. Further studies are needed to explain the relationship between food neophobia and eating behavior and to develop intervention programs for young adults.

Keywords: Body mass index, diet quality, food neophobia, eating behavior, eating attitude.

Bazı Popüler Diyetlerin Protein Kalitesi, Antioksidan ve İnflamatuar Değerlerinin İncelenmesi

Examination of Protein Quality, Antioxidant, and Inflammatory Values of Some Popular Diets

Hatice Merve Bayram¹, Arda Öztürkcan²

İstanbul Gelişim Üniversitesi, Beslenme ve Diyetetik Bölümü, İstanbul, Türkiye

1Yazarın e-maili: hmbayram@gelisim.edu.tr

2İstanbul Gelişim Üniversitesi, Beslenme ve Diyetetik Bölümü, İstanbul, Türkiye

2Yazarın e-maili: sozturkcan@gelisim.edu.tr

Özet

Giriş ve Amaç: Hem dünyada hem de Türkiye’de birçok insan, vücut ağırlığını azaltmak veya korumak için çeşitli diyetlere başvurmaktadır. Ayrıca insanların estetik kaygılarını ve minimum çabayla daha iyi görünme ve hissetme arzularını ve minimum çabayla daha iyi görünme ve hissetme arzularını bilen kişiler tarafından, bilimsel dayanağı olmayan ancak sağlığa yararlı olduğu iddia edilen popüler diyetler ticari amaçlarla piyasaya sürülmektedir. Bu çalışmanın amacı bazı sağlıklı ve sağlıksız popüler diyetlerin protein kaliteleri, diyet antioksidan kapasiteleri ve diyet inflammatuar yüklerinin değerlendirilmesidir.

Yöntem: Popüler diyetlerin seçiminde literatürden yararlanılmış ve Türkiye’de en çok aratılan diyetler çalışmaya dahil edilmiştir. Popüler diyetlerin her biri için birer günlük bir beslenme programı (1500±20 kkal) araştırmacılar tarafından tasarlanmıştır. Diyet modellerinin antioksidan miktarları, Ok-sijen radikali absorbe kapasitesi (ORAC) ve besin öğelerini hesaplamak için Beslenme Bilgi Sistemi (BEBİS 9.0) programı kullanılmıştır. Diyet inflammatuar yükünün belirlenmesi için Diyet İnflamatuvar İndeksi (Dİİ), protein kalitesinin belirlenmesinde sindirilebilir esansiyel amino asit skoru (DİAAS) hesaplanmıştır.

Bulgular: Alkali diyet en yüksek antioksidan değere sahipken (6.06 mmol), Canan Karatay diyeti en düşük değere sahiptir (0.97 mmol). ORAC değerleri karşılaştırıldığında; en yüksek değer Akdeniz diyetinde (25289.7), en düşük değer Dukan (Seyir) diyetinde saptanmıştır (2330.75). Dİİ skorlarına göre; Akdeniz diyeti, DASH diyeti, glutensiz diyet, Dukan (seyir) diyeti ve vegan diyet anti-inflamatuardır ve en yüksek değere sahip olan diyet türü DASH diyetidir (-2.06). DİAAS skorlarına göre en yüksek değer %126.21 ile DASH diyetinde, en düşük değer %113.03 ile Paleo diyetinde hesaplanmıştır ve tüm diyet türleri yüksek kaliteli protein kaynağı sınıfında yer almıştır.

Sonuç: Diyet modellerinin makro besin öğelerinin dağılımı, içerdikleri besin ögesi miktarı, antioksidan ve anti-inflamatuvar içerikleri ile diyetlerdeki besin çeşitliliği gibi unsurlar, diyetin kalitesini belirleyen önemli etkenlerdir.

Anahtar Kelimeler: Beslenme, popüler diyetler, protein kalitesi, antioksidan kapasite, diyet inflammatuar indeks.

Abstract

Introduction and Aim: Many people worldwide, including in Türkiye, turn to various diets to manage or reduce their body weight. Moreover, popular diets, which lack scientific evidence but are claimed to be beneficial to health, are being marketed for commercial purposes by individuals aware of people’s aesthetic concerns and their desire to look and feel better with minimal effort. This study aimed to evaluate the protein quality, dietary antioxidant capacity, and dietary inflammatory load of some healthy and unhealthy popular diets.

Method: The selection of popular diets was based on literature, and the most popular diets in Türkiye were included in the study. A one-day nutrition program (1500±20 kcal) was designed by the researchers for each of the popular diets. The Nutrition Information System (BEBİS 9.0) programme was used to calculate the antioxidant amounts, Oxygen Radical Absorption Capacity (ORAC) and nutrients of the dietary models. The dietary inflammatory load was assessed using the dietary inflammatory index (DII), and protein quality was assessed using the Digestible Indispensable Amino Acid Score (DIAAS).

Results: Alkaline diet had the highest antioxidant value (6.06 mmol), while Canan Karatay diet had the lowest value (0.97 mmol). Comparing ORAC values, the highest value was found in Mediterranean diet (25289.7) and the lowest in Dukan (Cruise) diet (2330.75). According to DII scores, Mediterranean diet, DASH diet, gluten-free diet, Dukan (Cruise) diet, and vegan diet were anti-inflammatory, with DASH diet having the highest value (-2.06). DIAAS scores showed that DASH diet had the highest value at 126.21%, and tPaleo diet had the lowest value at 113.03%, with all diet types classified as high-quality protein sources.

Conclusion: Factors such as the distribution of macronutrients, the amount of nutrients they contain, their antioxidant and anti-inflammatory contents, and the variety of foods in the diets are important determinants of diet quality.

Keywords: Nutrition, popular diets, protein quality, antioxidant capacity, dietary inflammatory index.

Functional Foods for Healthy Aging and Disease Management

**Muhammad Aqib¹ , Maryam Arshad² ,
Madiha Rafique³ , Amara Arif⁴ , Hamza Arshad⁵ **

1Gujrat Institute of Management Sciences, Faculty of Sciences, Department of Human Nutrition and Dietetics, Gujrat, Pakistan
1Author's e-mail: maqibniaz595@gmail.com

2Institute of Microbiology, University of Agricultural Faisalabad, Pakistan 2Author's e-mail: maryamarshad385@gmail.com

3University of Agriculture Faisalabad, National Institute of Food Science and Technology, Faisalabad, Pakistan

3Author's e-mail: madiharafique654@gmail.com

4Department of Human Nutrition and Dietetics, University Institute of Diet and Nutritional Sciences, University of Lahore, Pakistan

4Author's e-mail: ammara.arif1234@gmail.com

5University of Agriculture Faisalabad, National Institute of Food Science and Technology, Faisalabad, Pakistan




5Author's e-mail: hamzasherwani63@gmail.com

Abstract

Increased human life expectancy worldwide increases the cases of age-related non-communicable diseases, such as cancer, heart disease, and neurological disorders. The NCD surge increases healthcare expenditure as well as deteriorates the general wellbeing of the elderly. Aging results from one principal factor which is oxidative stress. It is a condition achieved through an imbalance of reactive oxygen species and antioxidants, thus causing DNA damage and cellular degeneration. In such regard, functional foods have comparatively significant potential for mitigation, characterized by a high content of antioxidants and anti-inflammatory compounds. These types of food include omega-3 fatty acids, probiotics, prebiotics, and bioactive phytochemicals. Results from research done so far present a bright future for such functional foods to reduce the impact of these effects. The above nutrients are very significant in light of their critical role in the process of neutralizing free radicals, reducing oxidative stress, and protecting against cellular damage. Consequently, they delay senescence and reduce NCDs. This systematic review was conducted based on a proper search of PubMed, Scopus, and Web of Science. This search aimed to find studies published in the last twenty years relevant to investigating functional foods in the process of healthy aging. The strategy was to focus the eligibility criteria such that the study would consider only data emanating from randomized controlled trials, cohort studies, and meta-analyses examining the effects of dietary interventions against various aging markers like telomere length, oxidative stress levels, and inflammation. The present task was to extract these data and analyze them in the light of synthesizing existing evidence on the links between functional foods towards longevity and the reduction of disease risk. Diets, especially those from Okinawa and the Mediterranean, are associated with optimal functioning of their food elements and have been known to promote longevity and health. It should also be noted that shortening of the telomeres and epigenetic modification are hallmarks of aging. However, it is now established that diets rich in antioxidants may have a beneficial impact on these age-related phenomena. This further supports the already strong concept that such diets play a major role in healthy aging. Further research is needed to expand our understanding of mechanisms by which functional foods play a role in promoting healthy aging. In addition, specific dietary ways that can be adapted to improve healthy longevity and quality of life need to be identified among aging populations.

Keywords: Healthy aging, disease management, functional foods in aging.

Effect of Nutritional Knowledge of Mothers on School-aged Children Health

Abeer M. Aljaadi¹ , Mai A. Ghabashi² ,
Abrar M. Babteen³ 

1Umm Al-Qura University, Faculty of Applied Medical Sciences, Clinical Nutrition Department, Makkah, Saudi Arabia.

1Author's e-mail: amjaadi@uqu.edu.sa

2Umm Al-Qura University, Faculty of Applied Medical Sciences, Clinical Nutrition Department, Makkah, Saudi Arabia.

2Author's e-mail: maghabashi@uqu.edu.sa

3Umm Al-Qura University, Faculty of Applied Medical Sciences, Clinical Nutrition Department, Makkah, Saudi Arabia.

3Author's e-mails: ambabteen@uqu.edu.sa

Abstract

Introduction and Aim: Poor caregiver nutritional knowledge adversely affects the health and well-being of school-aged children. In Saudi Arabia, there is limited research on the relationship between caregivers' nutritional knowledge and their children's knowledge and nutritional status. This cross-sectional study aimed to examine the association between nutritional knowledge of caregivers and the nutritional status of (5-12 years old) in Makkah City, Saudi Arabia.

Methods: One hundred school-aged children and their mothers were included in this study. Mothers' nutritional knowledge was assessed using a modified, validated Arabic version of the General Nutrition Knowledge Questionnaire (GNKQ). Children's nutritional knowledge was assessed through face-to-face interviews, using a set of 20 questions. The nutritional status of children was determined based on anthropometric measurements. Children with chronic diseases, eating disorders, or allergies were excluded. Data was analyzed using Stata Version 14.

Results: The study included 51 girls and 49 boys. Approximately 27% of the participating children were classified as having excess weight based on their BMI Z-score, and over half (54%) had low nutritional knowledge scores. More than 40% of the children reported consuming fruits and vegetables frequently (4-5 times/week), whereas 50% reported consuming fast foods 1-3 times/week. Around-half (51.7%) of the mothers were 30-40 years and 60% were overweight or obese (BMI \geq 25 kg/m²). Most of the mothers (96.7%) scored low on the GNKQ. Multiple linear regression analyses showed that higher nutritional knowledge among the children was significantly associated with older age [0.61 (95%CI: 0.44, 0.77)] and higher mothers' knowledge scores [(0.06 (95%CI: 0.003, 0.008)]. However, children's nutritional knowledge was not associated with child's sex, mothers' age, or mothers' education. Maternal knowledge scores were not associated with the children's weight status.

Conclusion: This study showed that mothers' nutritional knowledge was positively associated with their children's nutritional knowledge but not with the weight status of Saudi children.

Keywords: Nutrition knowledge, children, caregivers, nutritional status, malnutrition, obesity.

Çöven Otu (*Gypsophila Bicolor*) Kökünün Suyu ve Farklı Bitkisel Sütler Kullanılarak Vegan Dondurma Geliştirilmesi

Development of Vegan Ice Cream Using Coven (*Gypsophila Bicolor*) Root Juice and Different Plant-Based Milks

Simay Kundakçı¹ , Güleren Sabuncular² ,
Elanur Bal³ , İrem Gül Arslan⁴ 

1 Marmara Üniversitesi, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik, İstanbul, Türkiye. 1 Yazarın e-maili: siimayfereli@gmail.com
2 Marmara Üniversitesi, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik, İstanbul, Türkiye. 2 Yazarın e-maili: gulerenserin@gmail.com
3 Marmara Üniversitesi, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik, İstanbul, Türkiye. 3 Yazarın e-maili: balelanur.01@gmail.com
4 Marmara Üniversitesi, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik, İstanbul, Türkiye. 4 Yazarın e-maili: iremarlan33@hotmail.com

Özet

Çöven bitkisi yüzey aktif özelliğe sahip saponin glikoziti içermektedir. Çöven suyu, lokum ve helva üreticileri tarafından çöven köklerinin geleneksel olarak kaynayan suda ekstrakte edilmesiyle üretilmektedir. Çalışmada kullanılan bitkisel sütler, peynir altı suyu ve kazein proteini içermedikleri için alerji ve intolerans yol açmadığından hayvansal sütlere alternatif oluşturmaktadır. Hindistan cevizi, badem, fındık gibi besinler yapısında buldukları vitaminler, esansiyel yağ asitleri, proteinler, polifenoller ve mineraller nedeniyle bitkisel süt eldesinde tercih edilmektedir. Bu çalışmanın amacı, geleneksel yöntemlerle kaynatılan çöven otu kökünün suyu ve bitkisel sütler kullanılarak elde edilen vegan dondurmalar ile çöven kullanılmadan elde edilen vegan dondurma ve piyasadan satılan vegan dondurmanın duyuşal özelliklerinin karşılaştırılmasıdır. Çöven köpüğü, salep ve organik elma suyu konsantresi ile badem sütlü dondurma, soya sütlü dondurma, fındık sütlü dondurma, yulaf sütlü dondurma ve Hindistan cevizi sütlü dondurma hazırlanmıştır. Ayrıca çöven köpüğü eklenmeden salep ve organik elma suyu konsantresi ile fındık sütlü dondurma hazırlanmıştır. Piyasadan satın alınan vegan dondurma ile birlikte 7 farklı dondurmanın duyuşal değerlendirilmesi yaptırılmıştır. Elde edilen veriler SPSS 22 paket programı ile değerlendirilmiştir. Panelistlerin %85'i hazır vegan dondurmaya renk açısından çok iyi olarak değerlendirirken diğer bitkisel sütlerden yapılan dondurmaları ise katılımcıların %52'si iyi olarak değerlendirmiştir. Ağızda erime, sakızımsılık, koku, tat, yapı, görünüş, renk açısından hazır vegan dondurmadan sonra en sık çok iyi olarak değerlendirilen dondurma Hindistan cevizi sütlü dondurma olmuştur. Dondurma yapımında hacim artışı için yağsız kuru madde yerine çöven köpüğünün kullanılabileceği, geliştirilen tarifelerde farklı miktarlarda çöven köpüğü kullanılabileceği düşünülmüştür.




Anahtar Kelimeler: Çöven Otu (*Gypsophila Bicolor*), bitkisel süt, katkı maddeleri, vegan-vejetaryen, dondurma, beslenme.

Abstract

Coven plant contains saponin glycoside with surface active properties. Coven juice is traditionally produced by Turkish delight and halva producers by extracting coven roots in boiling water. The plant milks used in the study are alternatives to animal milk as they do not contain whey and casein protein and do not cause allergies and intolerances. Foods such as coconut, almonds and hazelnuts are preferred in the production of vegetable milk due to their vitamins, essential fatty acids, proteins, polyphenols and minerals. The aim of this study was to compare the sensory properties of vegan ice creams obtained by using the juice of the root of the coven and vegetable milks boiled by traditional methods, vegan ice cream obtained without coven and vegan ice cream sold in the market. Almond milk ice cream, soymilk ice cream, hazelnut milk ice cream, hazelnut milk ice cream, oat milk ice cream and coconut milk ice cream were prepared by using coven foam, salep and organic apple juice concentrate. In addition, hazelnut milk ice cream was prepared with salep and organic apple juice concentrate, without the addition of coven foam. Sensory evaluation of 7 different ice creams were made together with vegan ice cream purchased from the market. The data obtained were evaluated with SPSS 22 package program. While 85% of the panelists evaluated the purchased vegan ice cream as very good in terms of color, 52% of the participants evaluated the ice creams made from other vegetable milks as good. Coconut milk ice cream was the most frequently rated as very good after purchased vegan ice cream in terms of melt in mouth, chewiness, smell, taste, texture, appearance and color. It was thought that coven foam can be used instead of non-fat dry matter for volume increase in ice cream making and different amounts of coven foam can be used in the developed recipes.

Keywords: Coven root (*Gypsophila Bicolor*), plant-based milks, additives, vegan-vegetarian, ice cream, nutrition.

Compositional Analysis of Palak *w.r.t.* Its Nutritional and Anti-nutritional Attributes

Jashandeep Kaur¹ , Shilpa Gupta² ,
Hira Singh³ 

1Department of Biochemistry, Punjab Agricultural University, Ludhiana-141004, India

1Author's e-mail: kjashandeep833@gmail.com

2Department of Biochemistry, Punjab Agricultural University, Ludhiana-141004, India

2Author's e-mail: shilpagupta@pau.edu

3 Department of Vegetable Science, Punjab Agricultural University, Ludhiana-141004, India

3Author's e-mail: hira@pau.edu

Abstract

Introduction and Aim: Indian palak (*Beta vulgaris* var. *bengalensis*) is amongst the most popularly grown/consumed vegetable due to its good nutritional profile *viz.* vitamins, minerals, proteins, fats, antioxidants, phytochemicals, flavonoids, carotenes etc. The crop is valued for its higher antioxidant status and therapeutic qualities. Despite this, information on palak's nutritional composition is meagre. Palak also contained oxalates and tannins (anti-nutritional factors); detrimental to human health. By reducing these, crop's nutritional importance can be improved. Thus, the study is aimed at detailed exploration of Indian palak's nutritional/anti-nutritional attributes.

Methods: Full-grown leaves of ten palak genotypes, procured from Department of Vegetable Science, PAU, Ludhiana, were analyzed biochemically for total chlorophyll (TChl), chlorophyll a & b, total carotenoids (TC), vitamins C, total soluble proteins (TSP), total phenols (TP), o-dihydroxyphenols, flavanols, oxalates, and tannins using standardized methods.

Results: PP-21 exhibited maximum TChl content, whereas PALWAR-2 demonstrated minimum. Average chl_a content was 0.195 mg/g FW, while mean chl_b content was 0.02 mg/g FW. TC and vitamin C levels were highest in PP-16 (0.104 mg/g FW & 1720.65 µg/g FW, respectively) with PALWAR-2 & 6 recording the minimum (0.04 mg/g FW & 276.72 µg/g FW). Average TSP was 6.6 mg/g FW whereas TP ranged from 5.69 (PP-21) to 12.41 µg/g FW (PALWAR-1). Mean o-dihydroxyphenols content was 2.5 mg/g DW and 0.6 mg/g FW. Flavanols content ranged from 0.6 to 2.3 mg/g FW. PP-7 exhibited lowest oxalate (64.24 mg/g DW, 14.78 mg/g FW) and tannin content (0.20 mg/g FW, 3.69 mg/g DW), on both FW and DW basis, so these could be promising lines for further spinach breeding programmes.

Conclusion: The data obtained, once validated, could unveil significant applications in nutrition, medicine, and sustainable agriculture. Genotypes with elevated proportions of nutrients and abridged anti-nutrients would be desirable targets for plant breeders via enhancing yield, income and profitability.

Keywords: Anti-nutrients, minerals, nutritional security, palak, vitamins.

Bitki Bazlı Gıdaların Sürdürülebilirliği: Çevreci Besin Zenginleştirme Yaklaşımları

Sustainability of Plant-Based Foods: Environmental Nutrient Fortification Approaches

Ayşe Gökçe Alp 

Toros Üniversitesi, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik Bölümü, Mersin, Türkiye.
aysegokce.alp@toros.edu.tr

Özet

Mevcut gıda sistemleri, hem sürdürülebilirlik hem de çevresel etki açısından önemli sorunlar barındırmaktadır. Küresel sera gazı emisyonlarının %21-37'sinden sorumlu olan bu sistemler, doğal kaynakların tükenmesine ve biyolojik çeşitliliğin kaybına neden olmaktadır. Ayrıca, dünya nüfusunun neredeyse üçte biri yeterli ve besleyici gıdaya erişim sağlayamazken, beslenmeyle ilişkili bulaşıcı olmayan kronik hastalıklar (BOH) giderek artmaktadır. Bu bağlamda, mevcut gıda sisteminin büyüyen bir nüfusa sürdürülebilir, besleyici ve uygun fiyatlı diyetler sunabilmesi için yeniden tasarlanması gerekmektedir. Birleşmiş Milletler'in Hükümetlerarası İklim Değişikliği Paneli (IPCC) tarafından belirlenen hedeflerden biri, küresel ısınmayı 1,5 dereceyle sınırlamak için sera gazı emisyonlarını azaltmaktır. Bitki bazlı gıdalar, genellikle hayvansal ürünlere göre daha düşük doymuş yağ içeriği ve daha yüksek doymamış yağ asitleri, diyet lifi ve fitonütrientler (polifenoller gibi) içermektedir. Hayvansal ürünlerin kısmen bitki bazlı gıdalarla değiştirilmesi, tip II diyabet, kanser, koroner kalp hastalığı ve erken ölüm riskini azaltabilir. Bitki bazlı diyetler tanımlarındaki farklılıklara rağmen, gözlemsel ve müdahale çalışmalarından elde edilen veriler bitki bazlı diyeti tüketenlerin enerji, protein, toplam yağ, doymuş yağ, MUFA ve ilave şeker alımlarının daha düşük, karbonhidrat, PUFA (n-3 ve n-6 dahil), toplam şeker ve diyet lifi alımlarının ise daha yüksek veya eşit düzeyde olduğunu göstermektedir. Ayrıca, bitki bazlı gıdalar tiamin, C vitamini, folat ve potasyum açısından daha zengindir. Ancak, bitki bazlı diyetlerde protein, kolin, B grubu vitaminleri, iyot, selenyum gibi bazı besin öğeleri ve biyoyararlanabilir kalsiyum, demir, çinko, B12 vitamini ve uzun zincirli omega-3 yağ asitleri genellikle düşük kalitededir. Bu eksiklikler vejetaryenler ve veganlarda daha belirgin olabilmektedir. Bu nedenle, bitki bazlı diyetlerin besin eksikliklerini gidermek için gıdaların zenginleştirilmesi önemlidir. Mevcut modelleme çalışmaları, bitki bazlı diyetlere geçişin besinsel faydalarının yanı sıra bazı eksiklikler yaratabileceğini göstermiştir. Tüketici araştırmaları, sağlık ve sürdürülebilirlik endişelerinin, bitki bazlı gıdalara yönelimi teşvik ettiğini ortaya koymaktadır. Sonuç olarak, zenginleştirilmiş besinlerin çevreci ve sürdürülebilir bir şekilde üretilmesi mümkündür ve bu, kaynakların verimli kullanımı, çevre dostu teknolojiler ve etkili politikaların bütünsel bir şekilde uygulanmasıyla gerçekleştirilebilir.

Anahtar Kelimeler: Besin zenginleştirme, bitkisel diyet, bitki alternatifi, diyet optimizasyonu

Abstract

Current food systems pose significant challenges in terms of both sustainability and environmental impact. They are responsible for 21-37 percent of global greenhouse gas emissions, leading to depletion of natural resources and loss of biodiversity, while almost one-third of the world's population lacks access to sufficient and nutritious food, and nutrition-related chronic non-communicable diseases (NCDs) are on the rise. In this context, the current food system needs to be redesigned to provide sustainable, nutritious and affordable diets for a growing population. One of the targets set by the United Nations' Intergovernmental Panel on Climate Change (IPCC) is to reduce greenhouse gas emissions to limit global warming to 1.5 degrees Celsius. Plant-based foods generally contain lower saturated fat content and higher unsaturated fatty acids, dietary fiber and phytonutrients (such as polyphenols) than animal products. Partial replacement of animal products with plant-based foods can reduce the risk of type II diabetes, cancer, coronary heart disease and premature death. Despite differences in the definitions of plant-based diets, data from observational and intervention studies suggest that those consuming plant-based diets have lower intakes of energy, protein, total fat, saturated fat, MUFA and added sugars, and higher or equal intakes of carbohydrates, PUFA (including n-3 and n-6), total sugars and dietary fiber. In addition, plant-based foods are richer in thiamine, vitamin C, folate and potassium. However, some nutrients such as protein, choline, B-group vitamins, iodine, selenium and bioavailable calcium, iron, zinc, vitamin B12 and long-chain omega-3 fatty acids are generally of low quality in plant-based diets. These deficiencies may be more pronounced in vegetarians and vegans, so food fortification is important to address the nutrient deficiencies of plant-based diets. Existing modelling studies have shown that the transition to plant-based diets can create nutritional benefits as well as some deficiencies. Consumer research suggests that health and sustainability concerns encourage a shift towards plant-based foods. In conclusion, it is possible to produce fortified foods in an environmentally friendly and sustainable manner, and this can be achieved through the efficient use of resources, environmentally friendly technologies and the holistic implementation of effective policies.

Keywords: Nutrient fortification, plant-based diet, plant alternative, diet optimization

Probiyotik, Prebiyotik ve Psikobiyotiklerin Nörogelişimsel Hastalıklar Üzerindeki Etkileri: Otizm Spektrum Bozukluğu Üzerine İnceleme

Effects of Probiotics, Prebiotics and Psychobiotics on Neurodevelopmental Diseases: A Study on Autism Spectrum Disorder

Ayşe Gökçe Alp¹ , Elif Ayça Alp² 

¹Toros Üniversitesi, Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik Bölümü, Mersin, Türkiye.

¹Yazarın e-maili: aysegokce.alp@toros.edu.tr

²Düztepe Eczanesi, Gaziantep, Türkiye. ²Yazarın e-maili: aycaalp27@gmail.com

Özet

Otizm spektrum bozukluğu (OSB), erken yaşta görülen, bozulmuş iletişim, sosyal etkileşim ve tekrarlayan davranışlarla karakterize bir nörogelişimsel bozukluktur. Toplumda görülme sıklığı yüksek olmasına rağmen (küresel nüfusun %0,1 ila %1,8'ini etkiler), OSB'nin patogenezi hala tam olarak anlaşılamamıştır. Otizmlili bireylerde besin tüketiminde genellikle seçicilik, belirli besinleri reddetme ve tekstür hassasiyeti gibi özellikler görülür. Bu nedenle hastalarda sindirim sistemi hastalıkları görülme sıklığı fazladır. OSB'deki Gastrointestinal (Gİ) bozukluklar, (artmış bağırsak geçirgenliği, bağırsak florasında bozulma), "bağırsak-beyin eksenini" bozulmasının gözlemlenebilir fenotipini temsil eden bağırsak disbiyozuna bağlı olabilmektedir. Bağırsak-beyin eksenindeki bozulmaların OSB'li pediatrik popülasyonda davranışsal değişikliklere yol açtığına dair çalışmalar da bulunmaktadır. **Çalışma sonuçlarına göre bozulmuş GİS semptomlarının iyileşmesi ile OSB semptomlarında iyileşmeler görülmektedir.**

Bağırsak-beyin eksenini; beslenme biçimi, uzun süre antibiyotik kullanımı, coğrafi konum gibi etkenlerden etkilenmektedir. Yapılan çalışmalarda OSB'li çocuklardan alınan ileal ve çekum mukozal biyopsi örneklerinde *Clostridiales*, *Lachnospiraceae* ve *Rumino-coccaceae* türlerinde artışlar olduğu belirlenmiştir ve aynı zamanda hastalarda *Firmicutes* ve *Bacteroides* oranı ve *Firmicutes*, *Bacteroidetes*, *Fusobacteria* ve *Verrucomicrobia* filum sayısı ile ilişkili disbiyoz gösterilmiştir. Aynı çalışmada, Otizm Spektrum Bozukluğu (OSB) hastalarında değişikliklerin kısa zincirli yağ asitleri (SCFAs) ve triptofanın bir metaboliti ve serotonin ile melatoninin öncüsü olan indol dahil olmak üzere uçucu organik bileşiklerin (VOC) seviyelerini de etkilediğini ortaya koymuştur. Ancak, Otizm Spektrum Bozukluğu (OSB) hastalarında antibiyotik tedavisinin veya kişiselleştirilmiş diyetin olası etkisi nedeniyle bu veriler dikkatlice yorumlanmalıdır. Probiyotiklerin ve prebiyotiklerin konakçının bağırsak-beyin eksenini üzerindeki olumlu etkileri çeşitli çalışmalarda gösterilmiştir. Özellikle Merkezi Sinir Sistemi (MSS) üzerindeki etkileri, anksiyete, şizofreni, Alzheimer, depresyon, OSB ve diğer ruhsal bozuklukların görülme sıklığını azaltma potansiyeli nedeniyle dikkat çekmektedir. Bu bağlamda, düşük yan etkiye sahip anti-inflamatuar, antidepresan ve anti-anksiyete etkileri beklenen "psikobiyotik" adlı yeni bir ilaç kategorisi önerilmiştir. Psikobiyotikler, bağırsak florasına kolonize olarak nöronal fonksiyonlar üzerinde hem doğrudan hem de dolaylı olarak olumlu etkiler oluşturan canlı bakterilerdir. 2013 yılından itibaren, psikobiyotikler adı altında yeni bir probiyotik alt türü tanımlanmıştır. Psikobiyotikler, uygun dozlarda kullanıldığında psikopatolojide olumlu psikiyatrik sonuçlar sağlayabilen probiyotikler olarak kabul edilmektedir. Yeterli miktarda kullanıldığında, psikiyatrik hastalıkları olan bireylerde olumlu etkiler yaratan canlı organizmalardır. 2018 yılında Morshedi ve arkadaşları, "bağırsak-beyin aksını etkileyen probiyotik ve prebiyotiklerin tamamı" olarak tanımladıkları bu türleri, geniş bir spektruma ele almışlardır. Bu yapılan tanıma ek mikrobiyom ile psikolojiji etkileyen tüm maddelerin potansiyel psikobiyotik olduğu varsayılmaktadır. Sonuç olarak, probiyotiklerin, prebiyotiklerin ve psikobiyotiklerin, otizm ve diğer ruhsal bozuklukların tedavisinde önemli bir rol oynayabileceği düşünülmektedir.

Anahtar Kelimeler: Otizm spektrum bozukluğu, beyin-bağırsak aksı, psikobiyotik.

Abstract

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterised by impaired communication, social interaction, and repetitive behaviours that occur at an early age. Despite its high prevalence in the general population (affecting 0.1% to 1.8% of the global population), the pathogenesis of ASD is still poorly understood. Individuals with autism often show selectivity in food consumption, rejection of certain foods and texture sensitivity. Therefore, the incidence of digestive system diseases is high in patients with ASD. Gastrointestinal (GI) disorders in ASD (increased intestinal permeability, impaired intestinal flora) may be due to intestinal dysbiosis, which represents an observable phenotype of 'gut-brain axis' disruption. There are also studies suggesting that disruptions in the gut-brain axis lead to behavioural changes in the paediatric population with ASD. According to study results, improvements in ASD symptoms are observed with the improvement of impaired GI symptoms.

The gut-brain axis is affected by factors such as diet, long-term antibiotic use and geographical location. In studies, increases in Clostridiales, Lachnospiraceae and Rumino-coccaceae species were found in ileal and cecal mucosal biopsy samples obtained from children with ASD, and dysbiosis associated with the ratio of Firmicutes and Bacteroides and the number of Firmicutes, Bacteroidetes, Fusobacteria and Verrucomicrobia phylum was also shown in patients. The same study revealed that changes in Autism Spectrum Disorder (ASD) patients also affected the levels of volatile organic compounds (VOCs), including short-chain fatty acids (SCFAs) and indole, a metabolite of tryptophan and precursor of serotonin and melatonin. However, these data should be interpreted with caution due to the possible influence of antibiotic treatment or personalised diet in patients with Autism Spectrum Disorder (ASD).

The positive effects of probiotics and prebiotics on the gut-brain axis of the host have been shown in various studies. In particular, their effects on the Central Nervous System (CNS) attract attention due to their potential to reduce the incidence of anxiety, schizophrenia, Alzheimer's, depression, ASD and other mental disorders. In this context, a new category of drugs called 'psychobiotics' has been proposed with expected anti-inflammatory, antidepressant and anti-anxiety effects with low side effects. Psychobiotics are live bacteria that colonise the intestinal flora and exert both direct and indirect positive effects on neuronal functions. Since 2013, a new probiotic subspecies has been defined under the name of psychobiotics. Psychobiotics are recognised as probiotics that can provide positive psychiatric outcomes in psychopathology when used in appropriate doses. When used in adequate amounts, they are living organisms that have positive effects on individuals with psychiatric disorders. In 2018, Morshedi et al. defined these species, which they defined as 'all probiotics and prebiotics that affect the gut-brain axis', in a wide spectrum. In addition to this definition, it is assumed that all substances that affect the microbiome and psychology are potential psychobiotics. As a result, it is thought that probiotics, prebiotics and psychobiotics may play an important role in the treatment of autism and other mental disorders.

Keywords: Autism spectrum disorder, brain-gut axis, psychobiotics.

Prevalence of Obesity, Metabolic Risk Factors, and Unhealthy Lifestyle Behaviors Among University Staff: A Cross-sectional Study

Noor Salihah Zakaria¹ , Lee Yi Chen² ,
Aslina Nasir³ 

¹University Malaysia Terengganu, Faculty of Fisheries and Food Science, Kuala Nerus, Malaysia

¹ Author's e-mail: salihah.zakaria@umt.edu.my

²University Malaysia Terengganu, Faculty of Fisheries and Food Science, Kuala Nerus, Malaysia

² Author's e-mail: yichen9399@gmail.com

³University Malaysia Terengganu, Faculty of Fisheries and Food Science, Kuala Nerus, Malaysia

³ Author's e-mail: inaslina@umt.edu.my

Abstract

Introduction and Aim: University staff frequently struggle to maintain their health due to sedentary habits and poor diets influenced by their work schedules and environment. This study aimed to determine the prevalence of overweight/obesity, raised blood glucose, high blood pressure, elevated total cholesterol, workplace sedentary behaviors, physical inactivity, and unhealthy dietary practices among UMT staff.

Method: A cross-sectional study using quota sampling was conducted in 17 departments serving primary functions in UMT. The self-administered survey consists of four sections in Malay (Section A: Sociodemographic profiles, Section B: Working Characteristics & Occupational Sitting, Section C: Exercise, Section D: Dietary Practices). Health status examinations including Body Mass Index (BMI), waist circumference, total cholesterol, fasting blood glucose, and blood pressure, were administered by the medical team from University Health Centre (PKU), UMT. Descriptive analysis was employed.

Results: A total of 317 staff were recruited, with a mean age of 40.05 years \pm 7.99 years. A large proportion (79.2%) were overweight or obese based on the Asian BMI classification, 69.7% had elevated total cholesterol, 21% had raised blood glucose, and 17.7% had high blood pressure. UMT staff used computers for 6.64 \pm 2.44 hours per day with nearly 5 hours of occupational sitting per day. Nearly two-thirds (65.3%) were inactive or minimally active. Although most of the staff (82.3%) knew about Malaysian Healthy Plate Concept, only 11.7% of them practiced it daily.

Conclusion: Aligning with global health concerns, the study highlights significant health issues among UMT staff, including high rates of overweight and obesity, elevated metabolic risk factors, sedentary behavior, and poor dietary habits. These health concerns may be common in other sedentary occupations and similar working-age groups, suggesting shared health risks and emphasizing the need for targeted workplace health interventions.

Keywords: University staff, obesity, metabolic risk, sedentary behaviors, dietary practices.

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13.45-14.00	F105 Food Based Interventions and Diet Diversification for Food and Nutritional Security <i>Srilatha Vasanthu, Pedda Nagri Reddy</i>
14.00-14.15	F113 Food Irradiation for Food Security: Trends in Malaysia and Southeast Asia Countries <i>Nur Sumirah Mohd Dom, Nor Khaizura MahmudAb Rashid, Zainah Adam</i>
14.15-14.30	F111 Comparative Assessment of Some Selected Bread Brands in Ondo State, Nigeria For Public Acceptability <i>Adebayo Ibidapo Nathaniel, Adedipe Abioye</i>
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Code Session Chair: Asst. Prof. Tuğçe Nur BALCI	
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16.00-16.15	N133 Prevalence of Obesity, Metabolic Risk Factors, and Unhealthy Lifestyle Behaviors Among University Staff: A Cross-sectional Study <i>Noor Salihah Zakaria, Lee Yi Chen, Aslina Nasir</i>
16.15-16.30	N124 Effect of Nutritional Knowledge of Mothers on School-aged Children Health <i>Abeer M. Aljaadi, Mai A. Ghabashi, Abrar M. Babteen</i>
16.30-16.45	N101 Food Allergies Among Adolescents and Adults: A Review <i>Adekunle Ayodeji Folorunso</i>
	N123 Functional Foods for Healthy Aging and Disease Management <i>Muhammad Aqib, Maryam Arshad, Madiha Rafique, Amara Arif</i>
	N114 Investigation of pumpkin seeds for enhancing physical performance in gym trainees <i>Mubarra Saeed, Rushba Irfan, Madiha Rafique, Huma Ambreen, Aysha Saleem</i>
	N113 Soybean as a sustainable solution to combat protein energy malnutrition: a systematic review <i>Madiha Rafique, Muhammad Aqib, Mubarra Saeed, Muhammad Naeem</i>
	N115 Assessing the nutritional profile of chickpea-based nutriment to improve iron intake among infants <i>Rushba Irfan, Beenish Israr, Mubarra Saeed</i>
	N109 Dose-dependent effect of tart cherry on blood pressure and selected inflammation biomarkers: A GRADE-assessed systematic review and meta-analysis of randomized controlled trials <i>Sevedeh Tavebeh Rahideh, Mostafa Norouzzadeh, Minoos Hasan Rashedi, Hossein Shahinfar</i>

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11.00-11.30	MAIN ROOM		
	Prof. Dr. Ferruh Erdoğan Sustainable Food Processing for Industry x.0		
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	Asst. Prof. PhD Ozbekova Zhyldyzai Physicochemical properties of various animal fat mixtures		
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14.00-14.15	F120 Aptamer-based Biosensor for Rapid Detection of Escherichia coli O157:H7 in Water <i>Noordiana Nordin</i>	F114 Chitosan As a Tool for The Production Of Sulfite-Free Wines: A Focus On Its Antioxidant Properties <i>Fabio Chinnici</i>	
14.15-14.30	F130 Anti-Sallmonella Activity of Thymol-Based Deep Eutectic Solvents <i>Teodora Kukrić, Boris Popović</i>	F126 Characterization of Soursop Fruit Tablets: A Study on Physicochemical, Antioxidant Properties, and Sensory Attributes <i>Mannur Ismail Shaik, Engku Alya Najiha, Norizah Mhd Sarbon</i>	
14.30-14.45	F131 Natural Plant Compounds as Effective Antifungal Agents Against Botrytis Cinerea in Postharvest Disease Management <i>Teodora Kukrić, Boris Popović</i>	F140 In vitro Anti-inflammatory Activity of Green Extracts from Plant Species Belonging to Lamiaceae Family <i>Ruzica Ždero Pavlović, Tatjana Jurić, Boris Popović</i>	
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ROOM 3		ROOM 4	
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Advancements in Functional Flours & Bakery Products: Nutritional and Sensory Insights-1		Advancements in Functional Flours & Bakery Products: Nutritional and Sensory Insights-2	
Code	Session Chair: Adekunle Ayodeji Folorunso	Code	Session Chair: Mustafa Kadir Esen
15.15-15.30	F122 Functional Properties, Vitamin Content and Sensory Attributes of Instant Swallow Meal from Pre-Gelatinized Composite Flours <i>Adaora Ngozi Nwosu, Ernest Eguono Emajorho, E. Nwamaka Aniagor</i>	F117 Production of Functional Muffins Using Natural Ingredients (Okra, Mango Leaves, and Ribes Rubrum) <i>Sara Gashtasbi, Zahra Emamdjomeh</i>	
15.30-15.45	F138 Proximate Composition and Functional Properties of Wheat (Triticum aestivum) And Fermented Bambara Groundnut (Vigna Subterranea verdc) Flour Blends for Production of Acceptable Cookies <i>Chetachi Maryann Eze</i>	F141 Antioxidant Composition of Breakfast Cereals from Acha (Digitaria Exilis), Pigeon Pea (Cajanus Cajan) And Oyster Mushroom (Pleurotus Ostreatus) Flour. <i>Rita Oqodo Nwankweagu</i>	
15.45-16.00	F101 Quality Improvement of Cookies Produced Using Wheat and Abelmoscus Caillei Flour Blends <i>Adekunle Ayodeji Folorunso</i>	F127 Enhancing Protein Quality with Acha, Pigeon Pea, Oyster Mushroom Breakfast Cereals: Benefits for Diabetic Patients <i>Rita Oqodo Nwankweagu, Ifeoma Elizabeth Mbaeyi-Nwaoha</i>	
16.00-16.15	F124 Nutritional And Sensory Attributes of Cookies Made from A Blend of Plantain (Musa Paradisiaca) Flour, Snot Apple (Azanza Garckeana), and Ginger (Zingiber Officinale) Powder <i>Abioye Adedipe, Adegunwa, M.O, Alamu, E.O, Ogundiran, V.E, Ayoola, T.E, Ogungbesan, B.O</i>	F128 Enrichment Of Wheat-Acha Flour Based Cookies with Elm Oyster Mushroom (Hypsizygus Ulmarius) Flour <i>Oluwadamilola Ogunsade, Adedayo Olubunmi Adeboye, Oluseye Oladapo Abiona, Akinsola Albert Famuwagun</i>	
16.15-16.30	F137 Physicochemical Composition and Microbiological Studies of Stored Kunu-Zaki, Produced from Millet (Pennisetum Glaucum)/Acha (Digitaria Exilis) And Sesame Sesamum Indicum L.) Blends <i>Precious Garba</i>	F115 Effect Of Transglutaminase and Cellulase on The Technological Properties of Gluten-Free Brown Rice Steamed Cake <i>Nor Afizah Mustapha, Ayesha Azli</i>	

3. Uluslararası Geleneksel Gıdalar ve Sürdürülebilir Beslenme Sempozyumu
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Asst. Prof. Agnieszka PIEKARA			
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New Horizons in Nutritional Science-1 (Turkish session)		New Horizons in Nutritional Science-2 (Turkish session)	
Code	Session Chair: Assoc. Prof. Betül GÜLŞEN	Code	Session Chair: Asst. Prof. Eda PARLAK
10.00-10.30			
10.30-10.45	N107 Farklı Diyet Modellerinin Bağırsak Mikrobiyotası Üzerine Etkisi <i>Cansu Balkan, Emre Batuhan Kenger</i>	N106 Toplu Beslenme Kuruluşlarında Çalışan Personelde Sürdürülebilirlik Bilincinin Değerlendirilmesi <i>Elif Güner, Sıla Söylemez, Sefa Merve Aydın, Dilan Yıldırım, Sevede Neslişah Çambel</i>	
10.45-11.00	N132 Probiyotik, Prebiyotik ve Psikobiyotiklerin Nörogelişimsel Hastalıklar Üzerindeki Etkileri: Otizm Spektrum Bozukluğu Üzerine İnceleme <i>Ayşe Gökçe Alp, Elif Ayça Alp</i>	N111 Sporcu Beslenmesinde Sürdürülebilir Diyetler <i>Ahmet Serhat Afsar, Muttalip Ayar</i>	
11.00-11.15	N131 Bitki Bazlı Gıdaların Sürdürülebilirliği: Çevreci Besin Zenginleştirme Yaklaşımları <i>Ayşe Gökçe Alp</i>	N112 Bilişsel Fonksiyonda Antioksidanların Rolü <i>Ahmet Serhat Afsar, Vahibe Uluçay Kestane</i>	
11.15-11.30	N126 Sirkadiyen Ritimleri Bozulmuş Farelerde Serum Süperoksit Dismutaz Düzeylerinin Araştırılması <i>Elif Nur Tok, Mehtap Ünlü Söğüt, Sevtap Kabalı</i>	N120 Sağlık Bilimleri Fakültesi Öğrencilerinin Sürdürülebilir Beslenme Davranışları ve Besin Tüketim Sıklıkları İlişkisi <i>Bevza Gülsüm Uğurlu, Ayşe Betül Demirbaş</i>	
11.30-11.45	N127 Sirkadiyen Ritimleri Bozulmuş Farelerde Serum Serotonin Düzeylerinin Araştırılması <i>Elvan Kaya, Mehtap Ünlü Söğüt, Sevtap Kabalı</i>	N121 Üniversite Öğrencilerinde Besin Neofobisi, Yeme Davranışı ve Diyet Kalitesi Arasındaki İlişkinin İncelenmesi <i>Sinem Cengiz, Sinem Inal, Zeynep Çankaya, Şeyma Arslan, Esra Tansu Sarıyer, Gonca Yıldırım</i>	
11.45-12.00	N122 Bazı Popüler Diyetlerin Protein Kalitesi, Antioksidan ve İnflamatuar Değerlerinin İncelenmesi <i>Hatice Merve Bayram, Arda Öztürkcan</i>	N129 Brokoli Sebzesinde Farklı Pişirme Yöntemlerinin K1 Vitamini İçeriğine Etkisi <i>Zehra Margot Çelik, Simay Kundakçı, Bevza Turgut, Hilal Aksoy, Şerife Köse</i>	
12.00-12.15	N108 Sporcular için Sürdürülebilir Beslenme <i>Hande Seven Avuk, Esengül Özkan</i>	N110 Uzay Yolculuğu ve beslenme <i>Sevtap Kabalı</i>	
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Keynote Speaker			
Assoc.Prof. Tetiana STEPANOVA			
Modern advances in technological aspects of fruit and berry jelly production			
ORAL PRESENTATIONS			
ROOM 1		ROOM 2	
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Code	Session Chair: Assoc. Prof. Sancar BULUT	Code	Session Chair: Prof. Dr. Yüksel ÖZDEMİR
13.30-13.45	F147 Geleneksel Develi Gaceri Bulguru ve Unu <i>Sancar Bulut</i>	N128 Çöven Otu (Glycophila Bicolor) Kökünün Suyu ve Farklı Bitkisel Sütler Kullanılarak Vegan Dondurma Geliştirilmesi <i>Simay Kundakçı, Güleren Sabuncular, Elanur Bal, İrem Gül Arslan</i>	
13.45-14.00	F148 Geleneksel Develi Gaceri Ekmeği <i>Sancar Bulut</i>	G101 Siyah ve Beyaz Nohut, Mercimek ve Pirinç Unlarından Yapılan Glutensiz Kek Ve Kurabiyelerin Duyusal Olarak Karşılaştırılması <i>Zeliha Duyar, Kerem İlaslan, Zehra Dilistan Shipman</i>	
14.00-14.15	G108 Gastronomide Alternatif Protein Kaynağı Olan Alglerin Sürdürülebilirlik Açısından Değerlendirilmesi <i>Ayşe Nur Elmaskaya</i>	F145 Sensory Evaluations on Consumer Acceptance of Fish Gelatin in Food Products <i>Cemile Buse Copur, Edibe Seda Erten</i>	
14.15-14.30	G103 Malakan Peyniri: Tarihi Kökler ve Üretim Sanatı <i>Aleyna Mutlu, Ahmet Emirmustafaoglu</i>	F149 Microbiological Safety Assessment Of Food Wastes: Their Potential Use in Functional Foods <i>Ayşeğül Kırmızıgül Peker, İlkin Şengün</i>	
14.30-14.45	G107 Kırklareli Ünlü Köyü Sütü Kahve Festivalinin Kültürel Miras Açısından Değerlendirilmesi <i>Mehmet Selman Bayındır</i>	F112 Saponinlerin Kromatografik ve Spektrofotometrik Yöntemlerle Kantifikasyonu <i>Emine Nakilcioğlu, Gizem Tiryaki</i>	
14.45-15.00	F146 Türkiye'nin geleneksel bir tahıl ürünü: Kars Kavılca Bulguru <i>Asya Cetinkaya, Güven Gülbaz</i>	F150 Geleneksel Yolla Üretilmiş Turşuların Probiyotik Potansiyelinin İncelenmesi <i>Özlem Yalçınçıray</i>	
15.00-15.15	G102 Türkiye'de Şarap Turizminin Sürdürülebilirliği; Mevcut Durum ve Geleceğe Yönelik Öneriler <i>Bahar Bayındır</i>	F134 Kırmızı mercimekten patlatılmış yenilikçi ürün üretimi üzerine araştırma <i>Caner Çelikkol, Mustafa Bayram</i>	
15.15-15.30	BREAK		
ROOM 1			
Keynote Speaker			
Assoc. Prof. Seden Doğan			
Gastronomy 4.0			
Closing Session			

3rd International Symposium on Traditional Foods and Sustainable Nutrition					
October 3-4, 2024					
4.10.2024					
SESSION 3					
ROOM 3					
Keynote Speaker					
Prof. Dr. Mustafa BAYRAM					
Gıda İçin "Yeni" Bir Gelecek (A "New" Future for Food)					
ROOM 3			ROOM 4		
ORAL PRESENTATIONS					
Food Heritage, Cultural Gastronomy, and Sustainable Practices			Modern Approaches in Food Processing & Agrifood System		
Code	Session Chair: Prof. Dr. Bahar TANER		Code	Session Chair: Asst. Prof. Çağla ÖZBEK	
10.30-10.45	F107	Refugee Gastronomy Culture Interactions <i>Nur İncetahtaç</i>	F129	Application of Transglutaminase Enzyme as A Substitute of Phosphates in Meat Processing Technology <i>Vilma Gurazj, Xhujana Sula, Kaplan Sulaj, Suela Lulollari</i>	
10.45-11.00	G105	Consumer Knowledge, Perception of Food Imagery, and Acceptance of Food Heritage in State of Kelantan, Malaysia <i>Rahijan Abdul Wahab, Nasha Alyssa Ab Ghani</i>	F143	Green Extraction Techniques & Characterization for Recovery of Bioactives from Fruit & Vegetable Industry Wastes <i>Sudarshan Ramonathan, Sumit Sudhir Pathak</i>	
11.00-11.15	G109	Cultural Gastronomy and Sustainable Tourism Development: The Role of Organic Rose Cultivation in Enhancing Community-Based Tourism in Pha Nam Thieng Village, Khon Kaen, Thailand <i>Donruetai Kovathanakul</i>	F123	Evaluation of Protein Extraction Procedures for Gel-Based Proteomic Studies of <i>Caulerpa lentillifera</i> <i>Fisal Ahmad, Azwan Awang</i>	
11.15-11.30	G106	Exploring the Influence of Social Media Marketing Activities on Customer Satisfaction at Mid-Scale Restaurants in Penang, Malaysia <i>Aziz Bin Yusof, Teow Jin Zhe, Asma' Binti Ali</i>	F109	Enzymatic Extraction of Total Sugars from Olive Leaves <i>Maja Dent, Jelena Buha</i>	
11.30-11.45	G110	From Standardized Commodity to Assetization. A Sociohistorical Approach to The Transformation of Olive Oil in Greece <i>Vasiliki Karantzavelou, Stathis Arapostathis</i>	F106	Evaluation of Carotenoid Stability During Bio Fortified Cassava Fermentation and Associated Bacterial Community <i>Lateefah Oyafajo, Lateef Sanni, Taofik Shittu, Sarafadeen Kareem, Wasiu Awoyale, Harun Aremu, Omatayo Oyedara, Luqman Azeez</i>	
11.45-12.00	G104	Development and Characterization of Indian Traditional Low Alcoholic Beverage <i>Roji Waghmare, Prem Mishra</i>	F121	Nutritional Profiles of Fermented Defatted Soybean Meal Using <i>Staphylococcus Succinus</i> <i>Leony Tham Yew Sena</i>	
12.00-12.15	F142	Traditional Alcoholic Beverages of Himachal Pradesh, India <i>Ashwani Kumar</i>	F132	Newbouldia Laevis and <i>Icacina Trichantha</i> Leaves Influenced Chemical and Microbiological Quality of Fermented Melon Condiments <i>Oladeji Oluwatoyin Ajoke, Clement Olusola Ogidi, Akinde Folake Ruth, Okunowo Omawumi A.</i>	
12.15-12.30	G111	High World Happiness Record of Finland Seven Consecutive Times: Could Commitment to Sustainable Development Goals be the Reason behind this Great Success? <i>Bahar Taner</i>	F103	Studies on the Technologies Involved in Street Food Vending in Osun State, Nigeria <i>Titilayo Olubunmi Olaposi, Sunday Soladaye Asa</i>	
BREAK					
SESSION 5					
ORAL PRESENTATIONS					
ROOM 3			ROOM 4		
Food Technologies for Animal-Based Production: Impacts on Sustainability			Advancing Food Science to Sustain Traditional Practices		
Code	Session Chair: Wendy Wee		Code	Session Chair: Prof. Ifeoma Elizabeth Mbaeyi-Nwaoha	
13.00-13.15	N117	The potential of kaffir lime, <i>Citrus hystrix</i> DC, leaf as feed additive for aquaculture uses <i>Yeu Hooi Kon</i>	N133	Effects of Fruit Stage on Nutritional Value of Guava <i>Kuldeep Kambaj, Gagandeep Kaur, Kirandeep Kaur Kang, Naresh Kumar Arora, Jaswinder Singh Brar</i>	
13.15-13.30	N118	Potential of using novel <i>Staphylococcus succinus</i> MF 116251 fermented soybean meal (FSBM) as fish meal replacement in African catfish (<i>Clarias gariepinus</i>) feed formulation <i>Zakaria Muhammad Khairulnizam</i>	F144	Biochemical Studies of Carrot for its Nutritional and Antioxidant Properties <i>Navjot Sharma, Shilpa Gupta, Usha Nara, Harshneet Singh Sran</i>	
13.30-13.45	N119	The potential of <i>Etingera elatior</i> (Jack) bud flower powder as feed additive in African catfish, <i>Clarias gariepinus</i> farming <i>Liew Vui Kien</i>	N130	Compositional Analysis of Palak W.R.T. Its Nutritional and Anti-Nutritional Attributes <i>Jashandeep Kaur, Shilpa Gupta, Hira Singh</i>	
13.45-14.00	F125	The potential of potato as starch source in juvenile African catfish (<i>Clarias gariepinus</i>) feed formulation <i>Mohd Shaiful Azman Abdul Rahim, Lee Seong Wei, Kon Yeu Hooi, Martina Irwan Khoo, Mohamad Nor Azra, Wendy Wee</i>	F151	Quality Evaluation of Herbal Yoghurt produced using Utazi (<i>Gongronematifolium</i>) and Uziza (<i>Piper guineense</i>) Leaf Extract <i>Ifeoma Elizabeth Mbaeyi-Nwaoha, Ohaeri Favour Mmesoma, Ngozi Chioma Okoronkwo, Onyeaka Helen</i>	
14.00-14.15	F135	The potential of <i>Curcuma longa</i> L. leaf as feed additive in African catfish (<i>Clarias gariepinus</i>) farming <i>Wendy Wee, Kon Yeu Hoo, Martina Irwan Khoo, Mohamad Nor Azra, Lee Seong Wei</i>	F152	Effect Of Addition of Diced African Bush Mango (<i>Irvingia Gabonensis</i>) Pulp in Formulated Spoonable Yoghurt <i>Ifeoma Elizabeth Mbaeyi-Nwaoha, Ngozi Esther Abosi, Ngozi Chioma Okoronkwo, Onyeaka Helen</i>	
14.15-14.30	F136	The potential of black fungus, <i>Auricularia auricula</i> , as a feed additive in African catfish (<i>Clarias gariepinus</i>) farming <i>Alvin Amos Adrian Susin, Lee Seong Wei, Albaris B Tahiluddin, Liew Vui Kien, Wendy Wee</i>	F153	Microbial, Functional and Sensory Properties of Herbal Yoghurt Formulated with Broccoli (<i>Brassica oleracea</i> var. <i>italica</i>) and Garden Egg Leaf (<i>Solanum aethiopicum</i>) Extract <i>Ifeoma Elizabeth Mbaeyi-Nwaoha, Onyeaka Rita Ohaegbulem, Ngozi Chioma Okoronkwo, Onyeaka Helen</i>	
14.30-14.45	F116	Development Village Chicken Production in Malaysia <i>Aida Zakaria, Mamat Hamidi Kamalludin</i>	F139	Quality assessment and nutritional characterization of traditional Indian products from processed non-conventional legumes <i>Prashant Sahni, Savita Sharma</i>	
14.45-15.00	F154	The potential of ginger, <i>Zingiber officinale</i> Rosc, leaf powder as feed additive in African catfish farming <i>Lee Seong Wei, Zuhisyam Abdul Kari, Muhammad Anamul Kabir, Martina Irwan Khoo, Mohamad Nor Azra, Wendy Wee</i>	F110	Evaluation Of Eleven Accessions of Groundnut (<i>Arachis hypogaea</i> L.) In Nsukka Derived Savannah Agro-Ecology of Nigeria <i>Uchenna Noble Ukwu, Nathaniel Dauda, Solomon Oluwaseyi Adewuyi</i>	
BREAK					
ROOM 1					
Keynote Speaker					
Assoc. Prof. Seden Doğan					
Gastronomy 4.0					
Closing Session					