8th Edition of Euro-Global Conference on

Food Science and Technology &

9th Edition of

International Nutrition Research Conference

September 14-16, 2026 | Rome, Italy

NH Villa Carpegna

Via Pio IV, 6, 00165 Roma RM, Italy

8th Edition of Euro-Global Conference on

FOOD SCIENCE AND TECHNOLOGY

&

9th Edition of International

NUTRITION RESEARCH CONFERENCE

HYBRID EVENT

14-16 SEPTEMBER 2026

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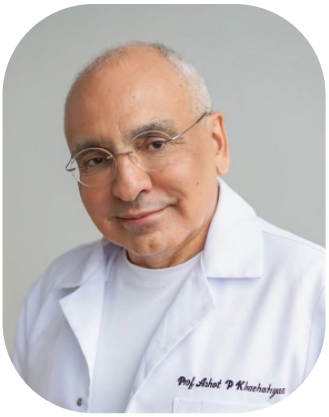
University Albstadt-Sigmaringen, Germany

Arianna Mazzoli
University of Naples Federico II, Italy



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Ataturk Horticultural Central Research Institute, Turkey

Welcome Message

Prof. Dr. Andrea Maier Noeth

University Albstadt-Sigmaringen, Germany

It is a great honor and pleasure to welcome you to the 9th Edition of the International Nutrition Research Conference (Nutrition 2026), taking place from September 14–16, 2026, in Rome. I am truly delighted to participate as a Scientific Committee Member and Keynote Speaker at this distinguished international gathering. Conferences such as Nutrition 2026 serve as vital platforms for fostering meaningful scientific dialogue, strengthening interdisciplinary collaborations, and advancing innovation in nutrition science. At a time when global health challenges are increasingly complex, our collective expertise and shared commitment are more important than ever. One of the most pressing concerns we face today is the rising prevalence of childhood obesity. A growing body of evidence indicates that many obesity risk factors originate in the earliest phases of life. The first 1,000 days—from conception to two years of age—represent a uniquely sensitive window that shapes long-term health trajectories and food preferences. During this period, rapid brain development and sensory learning occur, while nutrition, lifestyle, and environmental exposures exert profound and lasting influences on metabolism, behavior, and overall health outcomes. Dietary intake during early life plays a pivotal role in modulating childhood obesity risk. Healthy infant feeding practices not only support optimal growth and development but also help establish food preferences and eating behaviors that often persist into later childhood and beyond. Infancy, therefore, represents a critical opportunity to promote positive dietary habits and foster lifelong health. Moreover, the early development of taste perception and food pleasure significantly influences children's subsequent food preferences and choices. Understanding how sensory experiences shape eating behaviors offers valuable insight into designing effective prevention strategies and public health interventions. As we gather in this historic city, may this conference inspire dynamic discussions, groundbreaking research, and collaborative efforts that will advance our understanding and strengthen our impact in improving global nutrition and child health. I look forward to the insightful exchanges and meaningful connections that Nutrition 2026 will undoubtedly bring. Thank you, and welcome to this exceptional scientific event.

Welcome Message

Antonio Claudio Goulart Duarte

Medicine School of the Federal University of
Rio de Janeiro, Brazil

Dear Conference Attendees,

I am a Brazilian Doctor and Professor of Medicine at The Federal University of Rio de Janeiro (UFRJ). I have been studying and teaching medical semiology, mainly in metabolic disorders such as Metabolic Syndrome (MS), for more than forty years.I developed the Metabolic Map (MM) for understanding who is the patient with MS. There are a lot of different forms of presentation and the exam based on the evidence of the MS is not enough for planning an individual strategy for treatment. It is an honor and great pleasure to explain and to show how important artesanal intelligence is nowadays in a world of virtual context. It will be a great opportunity for the participants, including young and senior researchers, scientists, clinicians and academicians to gain knowledge from up-to-date research in Metabolic Syndrome.

Welcome Message

Prof. Arianna Mazzoli

University of Naples Federico II, Italy

Dear congress visitors,

It is a pleasure to welcome you to this meeting dedicated to advances in metabolic research. Growing evidence highlights how dietary factors, particularly high-fructose intake, contribute to obesity, insulin resistance, and systemic inflammation, emphasizing the need for innovative preventive strategies. Recent progress in microbiota research and probiotic science is opening new perspectives for metabolic health. Targeted interventions, including spore-based probiotics, show promising potential in modulating gut integrity, inflammation, and energy metabolism through coordinated, multi-level mechanisms. Understanding the interplay between nutrition, microbiota, and physiological adaptation is essential to develop effective and personalized approaches against metabolic disorders. I hope this congress will stimulate fruitful discussions, foster collaborations, and inspire newideas to advance our knowledge in this rapidly evolving field. Welcome, and I wish you a productive and inspiring meeting.

Welcome Message

Ashot Khachatryan

MD, Phd, Professor, Armenia

Dear colleagues, dear friends!

We have gathered here at a truly pivotal moment. The food industry stands on the threshold of a new era-an era of profound transformation, where innovation is shaping the future. The topic of hydrogen-based food products is a vivid testament to this. This is not just about new technologies; it is a rethinking of the very approach to creating food, its nutritional value, and sustainability. Today, we have a unique opportunity to co-author this future. Here in this room are the best minds of the industry: scientists, technologists, practitioners. Your ideas, discussions, and discoveries will be the fuel for a breakthrough. I wish everyone inspiration, fruitful dialogues, and brilliant discoveries! Let us together turn a new page in the history of the food industry.

Welcome Message

Prof. Dr. Erdogan Kucukoner

Suleyman Demirel University, Turkey

Dear those interested in this congress, it is an honor to welcome you to this distinguished conference, which celebrates the extraordinary advancements in the field of Food Science and Technology. As you know, in recent years, significant changes have occurred in many fields, including food resources, food production, food distribution and marketing, and food science and technology. Food resources in the world are not unlimited. We must make every effort to use these limited resources in the most efficient and optimal way. We should minimize food waste and make the best use of food scraps and leftovers. We need to conduct serious studies, especially on the production of alternative edible products from agricultural and food waste. Scientific studies incorporating the latest technological advancements in food science and technology will be presented at this congress. Therefore, attending this congress can provide you with significant insights into your field of interest. No one person can solve everything alone; most problems can be easily solved when working together. Strength comes from unity. I look forward to contributing to this new edition and engaging with the international scientific community. Events like FAT 2026 play an essential role in advancing safe, smart, and sustainable food systems, and I am enthusiastic to support this mission through my participation, this time about the Upcycling Agricultural By-Products: Optimization of crude protein recovery from sugar beet leaves and its functional attributes. We wish you a successful and productive congress.

Welcome Message

Prof. Dr. Frederico Barros

Federal University of Vicosa, Brazil

It is a great honor and pleasure to welcome you to the 9th Edition of the International Nutrition Research Conference (Nutrition 2026), taking place from September 14-16, 2026, in Rome, Italy. I am delighted to participate as a Scientific Committee Member and Keynote Speaker at this distinguished event. Conferences like Nutrition 2026 play an essential role in fostering meaningful discussions, strengthening collaborations, and advancing knowledge in nutrition science. As consumer expectations evolve, we are challenged to develop ingredients that not only nourish but also promote environmental responsibility. Green banana flour, produced from unripe pulp and peel, represents one such opportunity-transforming an underutilized resource into a sustainable functional ingredient. Naturally rich in dietary fiber and antioxidants, it shows promising potential to enhance satiety and improve intestinal health. I invite you to explore how science-driven innovation can bridge sustainability, functionality, and healthy food development for a better future.

Welcome Message

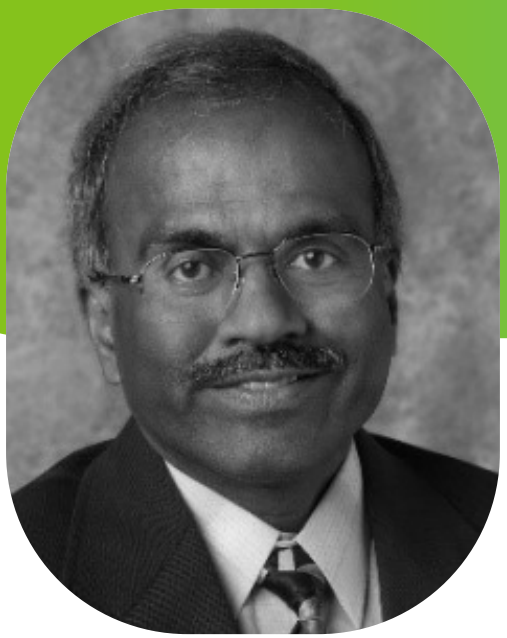
Giovanni De Francesco

University of Perugia, Italy

Dear Congress Visitors,

I am delighted to welcome you to this exciting event. This conference brings together leading scientists to explore the latest advancements and trends in the food&beverage industry. Our goal is to foster meaningful discussions, inspire new ideas, and build lasting connections. Throughout the conference, you will have the opportunity to engage with thought-provoking speakers, participate in interactive sessions, and network with peers who share your passion for the beverage industry. We encourage you to make the most of the diverse activities and resources available. International scientific congresses like this one offer not only a space for innovation but also a unique atmosphere of peace, respect, and equality. Here, professionals from different cultures and backgrounds come together with a shared commitment to knowledge and collaboration—an environment that truly reflects the unifying power of science.

Thank you for being part of this vibrant community. Enjoy the conference!



Welcome Message

Kasiviswanathan Muthukumarappan

South Dakota State University, United States

Dear Conference Attendees,

It gives me great pleasure to welcome each one of you here today at FAT 2026. Our gathering promises to be a beacon of knowledge and collaboration in the ever-evolving landscape of food science. Among the professional debates and exciting new findings, I am elated to deliver my keynote address on Safe and Sustainable Food Manufacturing Through Advanced Thermal, Nonthermal, and Extrusion Processing Strategies. Let's use science to our advantage and make sure every meal is safe and tasty.

Join me in taking advantage of this chance to have significant discussions, exchange ideas, and build relationships that will advance our food industry. Every one of you, I implore you to take part and provide your distinct viewpoints to deepen our shared understanding.

I appreciate you taking part and look forward to the fascinating discussions that are ahead.

Welcome Message

Dr. Manuel Bartolomé Díaz

Ciudad Real, Espana, Spain

Dear congress participants,

It is a great pleasure and honor to welcome you to this scientific meeting. In recent years, the fast development of nanotechnology has opened new opportunities in food production, processing, preservation, and packaging. However, these advances also raise important questions regarding the occurrence, transformation, bioaccumulation, and potential impact of nanomaterials within the food chain. In this context, reliable analytical methodologies are essential for the proper detection, characterization, and quantification of nanomaterials in complex food matrices. This is particularly important considering that our current knowledge of their potential effects on human health and the environment is still limited. Improving our analytical capabilities will therefore be crucial to better understand the behavior of nanomaterials, assess their potential risks, and support their safe and responsible use in food-related applications.

Welcome Message

Dr. Piergiorgio Bolasco

European Renal Nutrition, Italy

Dear Congress Visitors,

It is an honor and pleasure to write a few welcome notes. This is a great opportunity to present to my distinguished Colleagues a topic that has been underestimated in the field of renal nutrition. Indeed, dialysis treatment cannot be considered complete unless, in addition to its effective blood purification, it ensures the replacement of the large quantities of amino acids lost during dialysis. This presentation will give me a further opportunity to raise awareness of this fundamental nutritional innovation, which has been overlooked for many decades. It is an effective tool for preventing or slowing down malnutrition and sarcopenia in all patients worldwide. It is the new way to implement precision medicine in the clinical-metabolic nephrology.

Welcome Message

Prof. Dr. Raffaella Conversano
University of Bari, Italy

Dear participants of the Conference,

It is a great honor and pleasure to welcome you with a few opening remarks to the 8th Euro-Global Conference on Food Science and Technology (FAT-2026), taking place from September 16–18, 2026, in Rome, Italy. Welcome to FAT2026. It is both an honor and a great responsibility to welcome you to this event, which over the years has become a European and global benchmark for innovation in food science and technology. In recent years, as Chair, I've had the privilege of closely observing the ferment of ideas, the connections across disciplines, and above all, the shared desire to go beyond known boundaries. Today, however, I invite you to take a further step: not just beyond, but elsewhere-because hunger is not the same for everyone, because the mind is not a standard model to be measured, and because food-what we put on the plate-is not just nutrition: it is language, experience, recognition. As I will present in my new research focus during this 2026 edition, I urge you to consider dis(ability) not as something to be corrected, but to be listened to; to see and re-see in the color, the shape, the sound of food, new codes for sensory inclusion. And I invite you-as scientists, technologists, educators, and designers-to embrace a shared challenge: to make nutrition a place of connection, not just regulation. It is no coincidence that the food industry, as a hub of research and development, holds the key to tackling these issues-where the integration of all sectors is essential to develop new, competitive solutions aimed at improving the field. Being human is an exhausting task, and to succeed in this way of being, we must set ourselves the goal of promoting a metamorphosis of thought-a physiological transformation that brings about real change, even in attitudes-through the creation of pathways that support the food process as the most suitable space for growth for all involved actors. A narrative and functional vision based on the individual and the interpretation of their needs will be the foundation for future success. There is only one good, knowledge, and one evil, ignorance. (Socrates). If man survives, everything will depend on how and how much he will have learned to learn, to communicate but, above all, to know how to eat!

Welcome Message

Dr. Ravi Pandiselvam

Indian Agricultural Research Institute, India

It is a great pleasure and privilege to participate in FAT-2026 as a Scientific Committee Member and Keynote Speaker. I warmly welcome all delegates, researchers, academicians, industry professionals, and students joining this prestigious platform dedicated to advancements in food science, chemistry, and sustainable technologies.

The rapid evolution of food processing and post-harvest technologies offers immense opportunities to address global challenges related to food safety, sustainability, climate resilience, and waste reduction. Emerging green technologies, digital innovations, and interdisciplinary collaborations are paving the way for safer, healthier, and more sustainable food systems.

I am delighted to contribute to this scientific gathering and look forward to engaging discussions, knowledge exchange, and collaborative opportunities that will inspire innovative solutions for the future of food and agriculture.

Welcome Message

Prof. Dr. Ren You Gan

The Hong Kong Polytechnic University, China

Dear conference attendees,

I present this welcome note for the 9th Edition of International Nutrition Research Conference. The designated theme Nutrition for Health, Equity, and Sustainability provides a critical and necessary framework for contemporary food science. Evaluating global dietary patterns systematically is essential to address these interconnected public health objectives. In my virtual keynote presentation on Chinese tea and human health, we will objectively examine the bioactive components of this traditional and popular beverage and their documented health benefits as well as underlying mechanisms. Investigating traditional functional dietary elements through rigorous nutritional science yields applicable, evidence-based data for broader population health strategies, highlighting the concept of Food as Medicine. This hybrid conference format, bridging the venue in Rome with global online participants, enables a comprehensive scientific dialogue. I anticipate a highly constructive exchange of empirical research outcomes throughout the proceedings.

Welcome Message

Dr. Rita Singh Raghuvanshi
Emeritus Scientist, ICAR, India

It is an honour to welcome you to this distinguished conference, which celebrates the remarkable field of Food Nutrition and Health—a discipline that is foundational to human well-being and societal progress. The field of Food Nutrition and Health has been at the forefront of addressing some of the most pressing global challenges. From combating malnutrition and food insecurity to curbing the rise of lifestyle-related diseases, it has provided transformative solutions that directly impact lives. In an era marked by the dual burden of undernutrition and overnutrition, this field has emerged as a powerful force in bridging gaps, not only in health disparities but also in economic and social inequalities. It has played a crucial role in promoting public health policies, designing innovative interventions, and embracing both traditional wisdom and modern technologies to create holistic solutions. Its integration with sustainability initiatives has further paved the way for more equitable and resilient food systems, ensuring that nutrition is a central pillar of global development goals. As researchers, practitioners, and policymakers, our collective efforts in this field are shaping a future where health and nutrition are accessible to all, transcending geographic, economic, and cultural barriers. Together, we have the potential to drive meaningful change, improving the quality of life for present and future generations while safeguarding the planet's resources.

Welcome Message

Prof. Dr. Sankar Kr Acharya

Former Dean, Post Graduate Studies, BCKV, India

Greetings!

This is Prof Acharya from India.

Dear visitors of congress,

As we feel and perceive, the world is undergoing serious challenges of hunger, poverty and mal nutrition affecting adversely on the pledged attainment of SDG as proclaimed by UN declaration. We have to feed close to ten billion of population on our good earth by 2050 by ensuring around 60 per cent enhancement of agrifood production from less and lesser resources and harsh and harsher stresses. There shall be quite a good number of nations on this planet struggling with the bitter scarcity of ground water, less than 1100 cubic meter per capita per year to sustain agriculture, animal rearing, health and nutrition. We need a global network and intimate organizational osmosis to reengineer and restructure our citadel of thinking process and anatomy of research. Let's come together to put both of our mind and motivation for a global cause, and of course enjoy the ecstasy of getting acquainted to each other's vision, missions and milestones.

Welcome Message

Sara Damiano

University of Naples Federico II, Italy

It is a great pleasure to welcome you all to this important scientific gathering dedicated to advancing innovation and collaboration in the field of integrative nutrition. This conference offers a unique opportunity to explore the evolving role of phytotherapeutic and nutritional strategies in cancer management, bridging traditional knowledge with the most recent scientific discoveries. I am honored to join you as both a Keynote Speaker and a member of the Scientific Committee, and I look forward to engaging with experts from around the world as we share evidence, perspectives, and future directions. I am confident that our collective discussions will inspire new research pathways and strengthen the global dialogue on patient-centered, multidisciplinary cancer care. I wish you all an enriching and stimulating conference experience.

Welcome Message

Sergei Yu Zaitsev

Federal Research Center for Animal Husbandry, Russia

Dear congress participants,

It is a great honor and pleasure to write the welcoming remarks. Improvements in analytical methods largely determine the current level of scientific development, including those related to human and animal biochemistry, physiology, and nutrition. Examples include powerful but expensive methods such as tandem mass spectrometry (MS), MALDI-TOF MS, and others. On the other hand, practical work in animal husbandry requires the development of relatively simple and inexpensive methods for analyzing biological fluids (blood, milk), such as measuring the total antioxidants (Animals, 2023;13(10):1706;2021;11(8):2400; 2020;10(7):1186), amino acids (Molecules, 2022;27:2278) dynamic tensiometry (Siberian Journal of Life Sciences and Agriculture, 2023;15(4):468–493), and others. This opens up new opportunities for monitoring the physiological and biochemical state of animals and the quality of human food products. Humanity will not give up consuming animal-based foods, so it is necessary to make their production process efficientand compliant with modern environmental requirements.

Welcome Message

Dr Surendra Singh

(Senior Professor)

Banaras Hindu University, India

It is with great pride and privilege that I welcome you all to the Euro- Global conference (FAT-26). Soil is the foundation for global future food security and human health, producing 95% of our food and acting as a crucial reservoir for water and nutrients. Healthy soil acts as a vital reservoir for nutrients, water, and biodiversity, driving plant growth and nutrition. Healthy, biodiverse soil directly impacts human health by reducing malnutrition, filtering water, and supporting immune systems. Its protection is vital for climate resilience, as it acts as a massive carbon sink. Soil is essential for supporting a population of 9 billion by 2037. It ensures the production of vital nutrients for 2 billion people currently suffering from deficiencies. Nutrient-poor soils directly result in malnourished populations, as plants cannot provide nutrients they cannot derive from the ground. To ensure a secure future, prioritizing soil restoration and sustainable management is essential for long-term survival.

Welcome Message

Dr. Tamaz Patarkalashvili

Technical University, Georgia

Dear conference visitors and colleagues!

It is great pleasure and privilege to write a welcome address to you, participants of the 9th Edition of International Research Conference taking place in ancient wonderful city of Rome.

Our conference is devoted to one of the world's principal problems of nutrition. The problems of climate change and nutrition are big challenges of the world and closely related to each other. climate change is worsening the living conditions of farmers, fishers and forest -dependent people who are already vulnerable and insecure. Hunger and malnutrition is increasing in the world. Rural communities, particularly those living in already fragile environments face ever-growing risks of increased crop failure, loss of livestock, reduced availability of marine, agriculture and forest products. More frequent and intense weather events prognosed by scientists will continue to have adverse impacts on food availability, accessibility, stability and utilization. Poor people will be at the rick of food insecurity due to loss of assets and lack of adequate insurance coverage. Scientific community must be ready to meet these problems and challenges with new ideas and approaches to mitigate them.

Welcome Message

Assoc. Prof. Yasin Ozdemir

Ataturk Horticultural Central Research Institute, Turkey

It is a great honor to welcome you to the 9th International Nutrition Research Conference (Nutrition 2026). As global food systems evolve toward fresh, minimally processed, and sustainability-oriented consumption patterns, ensuring safety without compromising nutritional value has become one of the most pressing challenges of our time. Fruits consumed with the peel stand at the intersection of health, environmental responsibility, and consumer trust. This session will explore how retail-level innovations can redefine the point of sale as an active food safety intervention node. By integrating emerging decontamination technologies with risk-based evaluation models, we can shift from conventional washing practices to science-driven, preventive control strategies.I invite you to join this discussion not only as participants, but as contributors to a broader vision: building resilient, transparent, and technology-enabled nutrition systems that protect public health while strengthening consumer confidence worldwide.

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About Magnus Group

Magnus Group, a distinguished scientific event organizer, has been at the forefront of fostering knowledge exchange and collaboration since its inception in 2015. With a stead fast commitment to the ethos of Share, receive, grow, Magnus Group has successfully organized over 200 conferences spanning diverse fields, including Healthcare, Medical, Pharmaceutics, Chemistry, Nursing, Agriculture, and Plant Sciences.

The core philosophy of Magnus Group revolves around creating dynamic platforms that facilitate the exchange of cutting-edge research, insights, and innovations within the global scientific community. By bringing together experts, scholars, and professionals from various disciplines, Magnus Group cultivates an environment conducive to intellectual discourse, networking, and interdisciplinary collaboration.

Magnus Group's unwavering dedication to organizing impactful scientific events has positioned it as a key player in the global scientific community. By adhering to the motto of Share, receive, grow, Magnus Group continues to contribute significantly to the advancement of knowledge and the development of innovative solutions in various scientific domains.

About
CPD Accreditation

About

FAT-NUTRITION 2026 is officially accredited for Continuing Professional Development (CPD) by the **CPD Group (UK),** a globally recognized provider of continuing education certification. CPD accreditation ensures that professionals continue to enhance their knowledge, skills, and competencies through structured learning activities.

At **FAT-NUTRITION 2026**, participants can earn **1 CPD credit for every hour of attendance** in conference sessions. These credits formally recognize the time spent in professional learning and support ongoing professional development across clinical, academic, and research fields.

Earning CPD credits demonstrates a commitment to maintaining high professional standards and staying updated with the latest developments in food science and nutrition. CPD participation can also support **career advancement, license renewal requirements, and academic or professional portfolios,** depending on the policies of individual institutions or regulatory bodies.

In addition to educational value, the conference provides opportunities to engage with experts, researchers, and peers from around the world, encouraging knowledge exchange and professional networking.

Attending **FAT-NUTRITION 2026** not only offers a high-quality scientific learning experience but also provides internationally recognized CPD credits that reflect participants' dedication to continuous professional growth.

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KEYNOTE PRESENTATIONS

Andrea Maier-Nöth

University Albstadt-Sigmaringen, Germany

Biography: Prof. Dr. Andrea Maier-Nöth holds a professorship at the University of Applied Sciences in Albstadt-Sigmaringen, Germany, is a scientific consultant in the field of health psychology and nutrition for children, and is the author of many scientific publications, specialist journals and books. The focus of this expertise is Shaping a healthy and sustainable eating culture. Maier-Nöth has spent many years working intensively on the development of early healthy food preferences in children — in particular their influence on long-term healthy eating behavior. As Managing Director of Eat-Health-Pleasure GmbH and croomel GbR, Maier-Nöth develops preventive nutrition concepts to promote the health of pregnant women and young children into adulthood, and holds a doctorate in health psychology and nutritional sciences and a bachelor's and master's degree in food technology and nutritional sciences. Maier-Nöth is an internationally active expert in child nutrition with a special focus on a holistic approach — physiological, psychological and socio-cultural — and advises universities, public institutions and food manufacturers, lectures as a visiting professor at universities in Switzerland and Germany, and has worked for universities and companies in Germany, Switzerland, France, the USA, New Zealand and Ireland in research and development.

The development of healthy eating habits from infancy into adulthood

Children's vegetable consumption falls below current recommendations, highlighting the need to identify strategies that can successfully promote better acceptance of vegetables. Recently, experimental studies have reported promising interventions that increase acceptance of vegetables. The first, offering French and German infants a high variety of vegetables at weaning, increased acceptance of new foods, including vegetables. The second, offering an initially disliked vegetable at 8 subsequent meals markedly increased acceptance for that vegetable. So far, these effects have been shown to persist for at least several weeks (at 15 months) and several years (3 years). In this study, we present long-term follow-up data at 6 and 18 years obtained through questionnaire and experimental approaches. At 6 and 18 years, observations in an experimental setting showed that children who had been breast-fed and children who had experienced high vegetable variety at the start of weaning ate more of new vegetables and liked them more. They were also more willing to taste different vegetables than formula-fed children or the no or low variety groups. The initially disliked vegetable was still liked by 57%, and 65% of children, respectively.

This follow-up study suggests that experience with chemosensory variety in the context of breastfeeding or at the onset of complementary feeding can influence chemosensory preferences for vegetables into adulthood. It shows the effectiveness of breastfeeding, early experiences with vegetable variety during complementary feeding, and of repeated experience with an initially disliked vegetable in promoting vegetable acceptance into childhood. The effects are long-lasting and provide the foundation for evidence-based recommendations to help parents promote healthy eating habits to their children.

Antonio Cláudio Goulart Duarte

Medicine School of the Federal University of Rio de Janeiro, Brazil

Biography: Antonio Cláudio Goulart Duarte holds a PhD in Medicine and is specialized in Internal Medicine, Nutrology and Semiology. Duarte is Professor of Internal Medicine at the Medicine School of the Federal University of Rio de Janeiro, Brazil.

Assessment of a Metabolic Map (MM) in association with Metabolic Syndrome (MS)

Metabolic Syndrome (MS) is a complex and chronic metabolism disturbance. Obesity (OB), Dyslipidemia (DL), Systemic Arterial Hypertension (SAH), Atherosclerotic Microvascular Inflammation (AMI) and Hyperglycemia (HG) in different arrangements, at the same time, is a very difficult combination to interpret. Sometimes the interpretation is according to the expertise or the knowledge of the doctors instead of understanding the real clinical situation of the patients. The Metabolic Map (MM) is a semiological and clinical form of assessment that analyses each component of the MS according to the photo below. There are five targets with three different zones inside; green, yellow, and red. Body Mass Index (BMI); Cholesterol (Ch), Triglycerides (Tg); Systolic (SBP) and Diastolic (DBP) Blood Pressure; Uric Acid (UA), High Sensibility Reactive C Protein (Hs-RcP), Fibrinogen (Fb); Fast Glucose (FG), Glycated Hemoglobin (GH) and Insulin Level (IL) are used. For BMI, we classified as a green zone values between 25-30 Kg/m^2; yellow 31-35 Kg/m^2 and red more than 35 Kg/m^2. For DL, a green zone means normal values for Ch and Tg; yellow if one of them is high and red if both are high. For SAH, green zone if both values are normal; yellow if one is high and red if both are high. For AMI, green zone if UA or Hs-RcP or Fb is high; yellow zone if two of them are high and red if all of them are high. For HG, green zone if FG and GH are normal and IL is high; yellow if FG and IL are normal and GH is high; and red if all of them are high. Patients can have an individual clinical and laboratory presentation in each target. As an example: in one moment there is a red zone for OB, yellow for DL, green for SAH, yellow for AMI and red for HG. It shows that attention must be given to OB and HG at first. Another

example: yellow zone for OB, red for DL, yellow for SAH, green for AMI and yellow for HG. Now attention must be given to DL at first. Patients can show huge different forms of clinical presentation of MS. The MM helps to understand the true clinical evolution and the nutritional program, physical exercises, medications and surgery plans must be prescribed in a customized manner.

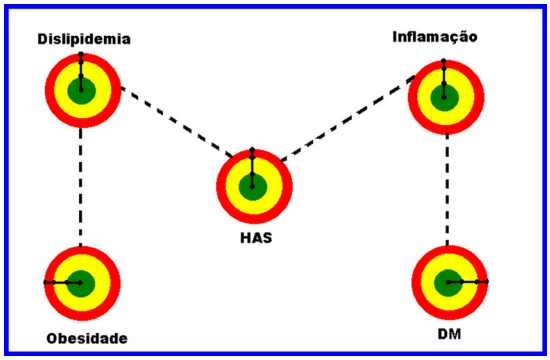


Image (1)

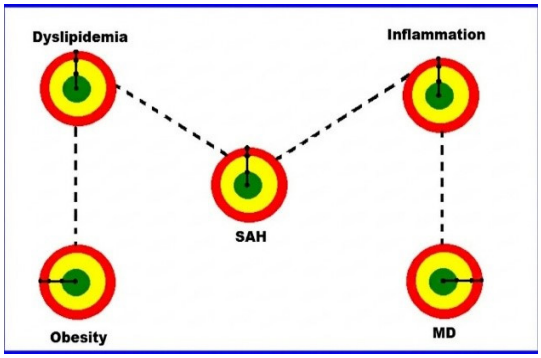


Image (2)

Arianna Mazzoli[1]*, Angela Di Porzio[1], Valentina Barrella[1,2], Simona Pecoraro[1], Anella Saggese[1], Marina De Stefano[1], Loredana Baccigalupi[1,2,4], Antonio Dario Troise[5], Sabrina De Pascale[5], Andrea Scaloni[5], Ezio Ricca[1], Susanna Iossa[1,2]

[1]Department of Biology, University of Naples Federico II, Naples, Italy

[2]NBFC, National Biodiversity Future Center, Palermo, Italy

+Department of Molecular Medicine and Medical Biotechnology, University of Naples Federico II, Naples, Italy

[5]Institute for the Animal Production System in the Mediterranean Environment, National Research Council, P.le Enrico Fermi 1, 80055 Portici, Italy

Biography: Arianna Mazzoli is an Associate Professor in Physiology at the University of Naples Federico II, Department of Biology. Mazzoli's research focuses on the regulation of energy balance and the metabolic adaptations of the whole organism and individual tissues in response to dietary and environmental stimuli, in particular investigating the mechanisms underlying obesity, insulin resistance, and metabolic syndrome using animal models, with emphasis on mitochondrial function, oxidative stress, and systemic metabolism. This work also explores the interplay between nutrition, microbiota, and physiological adaptation, contributing to the understanding of metabolic resilience in both pathological and extreme conditions.

Probiotics and fructose metabolism: Exploring mechanisms of metabolic protection

High-fructose diets are strongly associated with the development of metabolic disorders, including obesity, insulin resistance, systemic inflammation, and gut barrier dysfunction. In this study, we provide evidence that Bacillus subtilis SF106 represents an effective probiotic strategy against fructose-induced metabolic alterations, with beneficial effects observed exclusively when administered in its spore form, while vegetative cells were ineffective.

SF106 spores exert a marked anti-obesogenic effect by modulating lipid metabolism. Despite similar caloric intake, fructose-fed rats showed increased body lipid accumulation and visceral adipose tissue expansion, associated with reduced lipid

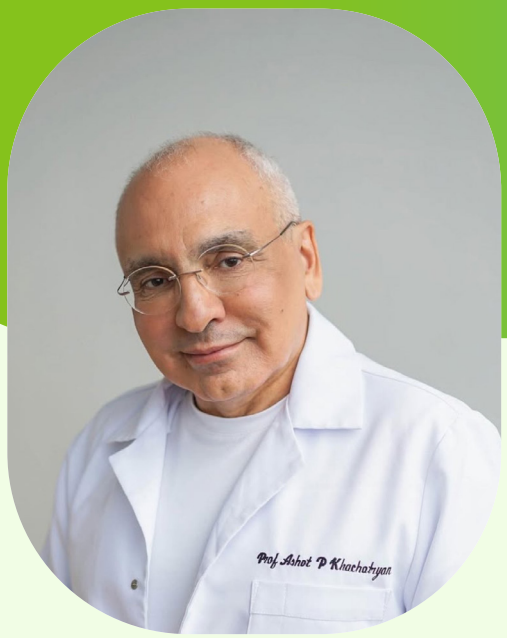
oxidation. In contrast, spore-treated animals displayed enhanced lipid oxidation, increased energy expenditure, and prevention of fat accumulation. Furthermore, spores preserved glucose homeostasis and insulin sensitivity, maintaining normal glycemic and insulin responses during glucose tolerance tests.

Systemic inflammation induced by fructose feeding, characterized by elevated plasma levels of LPS, TNF-α, and IL-6, was significantly reduced by SF106 spores, which also increased the anti-inflammatory cytokine IL-10. These effects were linked to the preservation of gut barrier integrity, as spores prevented the reduction of tight junction proteins and limited endotoxin translocation. Mechanistically, this protection was associated with the ability of SF106 spores to counteract oxidative stress in the ileum, maintaining redox balance and supporting proper cellular function.

Spore supplementation also induced significant changes in gut microbiota composition, unlike vegetative cells. In particular, the restoration of *Eubacterium fissicatena,* a taxon negatively associated with obesity and metabolic dysfunction, suggests a microbiota-mediated contribution to the observed metabolic improvements.

At the tissue level, SF106 spores preserved skeletal muscle mitochondrial function, preventing oxidative damage and ectopic lipid deposition induced by fructose. In parallel, they counteracted the whitening of subcutaneous adipose tissue by promoting browning processes, as indicated by increased expression of thermogenic markers such as UCP-1 and PGC1-α. These effects were associated with microbiota-dependent modulation of bile acid metabolism, including increased levels of secondary bile acids such as UDCA and CDCA, which are known to activate thermogenic pathways and improve metabolic homeostasis.

Overall, our findings demonstrate that *Bacillus subtilis* SF106 spores act through multiple, coordinated mechanisms involving gut integrity, systemic inflammation, microbiota composition, mitochondrial function, and adipose tissue remodeling. These results highlight the importance of spore-based probiotic formulations and support their potential use as a therapeutic strategy against fructose-induced metabolic disorders.



Ashot Khachatryan

New Hydrogen Technologies RPC, Yerevan, Armenia
National Academy of Sciences of the Republic of Armenia, Yerevan, Armenia

Biography: Ashot Khachatryan, MD, PhD, Professor, is an Active Member of the European Academy of Natural Sciences, the New York Academy of Sciences, and the Russian Academy of Medical and Technical Sciences, an Honorary Professor of the Oxford Academic Union and a Honored Inventor of Russia and Europe. A pioneer of the new field of hydrogen medicine, Khachatryan founded the world's first hydrogen medicine clinic (1993) and an international clinic network (2016). These innovations include internationally patented, first-of-their-kind household hydrogen generators (electronic, 2009; metal-alloy based, 2015) and the first dietary supplement for hydrogenating food products (2018). Khachatryan is the author of over 60 patents, 10 monographs, and the recipient of numerous international awards and medals.

Hydrogen-enriched food products: Innovative technology for the modern food industry

When discussing human nutrition, we typically focus on the balance of proteins, fats, carbohydrates, caloric content, and daily requirements. However, not only the compositional makeup but also the bioelectrical characteristics of food products—determined by Oxidation-Reduction Potential (ORP) and active hydrogen concentration—are of critical importance. Inadequate supply of active hydrogen to the body weakens intercellular communication, inhibits energy production, and leads to the accumulation of toxins and free radicals. These radicals attack cells by stripping electrons, resulting in a drop in cellular charge, disruption of metabolic processes, loss of function, disease, aging, and eventual cell death.

We have developed and patented the world's first food additive, Nanohydride, based on magnesium salts, which releases a significant amount of active hydrogen upon contact with water. Experimental studies have demonstrated that the Nanohydride solution is non-toxic and acts as an effective adaptogen, enhancing the body's nonspecific resistance to extreme stressors. It exhibits high antioxidant activity, significantly suppressing Lipid Peroxidation (LPO), indicating its potential utility in regulating oxidative processes and protecting tissues from oxidative stress.

In 2025, a production plant for the Nanohydride food additive and hydrogen-enriched food products was launched in Armenia. The product range includes confectionery items (sweets, chocolate, marmalade, etc.), grocery products (leaf tea, ground coffee, dry juices, dry soups, etc.), salt, sugar, and any other products where these ingredients are used. As a result, these foods become saturated with active hydrogen, acquire antioxidant properties, and exert an immunostimulatory effect that contributes to the prevention of chronic diseases, rehabilitation from post-COVID complications, improved memory, overall health benefits, enhanced athletic performance, and increased lifespan.

In light of the above, we believe an important step has been taken toward establishing a sustainable hydrogen economy in the food industry. As Hippocrates stated in the 5th century BCE: Let food be thy medicine and medicine be thy food. In the 21st century, we have made this a reality.

Beyzanur Bulut, Merve Güneş, Beyza Türköz, Erdoğan Küçüköner*, Erkan Karacabey

Food Engineering Department, Engineering and Natural Sciences Faculty, Suleyman Demirel University, Isparta, TÜRKİYE

Biography: Dr Erdoğan Kucukoner is a distinguished professor in the food engineering department at Suleyman Demirel University, and completed a PhD in Food Science and Technology at Mississippi State University. Kucukoner has led multiple research projects and advised students in academic and research activities, has served as Dean of the Faculty of Engineering at Suleyman Demirel University, and served on the food advisory board and the executive board of the Agriculture, Forestry and Veterinary Research Group at The Scientific and Technological Research Council of Turkey. Kucukoner has over 100 national and international scientific publications and numerous conference presentations in the field of Food Science and Technology.

Upcycling agricultural by-products: Optimization of crude protein recovery from sugar beet leaves and its functional attributes

The valorization of agricultural by-products as alternative plant-based protein sources has gained significant attention. This study aimed to obtain and characterize crude protein powder from sugar beet (*Beta vulgaris L.*) leaves through an optimized conventional alkaline extraction process. Briefly, green sugar beet leaves were dried in a laboratory oven at 38°C, pulverized into powder, and preserved at -20°C. To maximize extraction efficiency, three independent variables were optimized: pH (7–11), temperature (30–50°C), and time (5–45 min).

The optimization evaluated two dependent responses: soluble protein ratio and crude protein powder amount. The developed statistical models demonstrated high predictive reliability, yielding R^2 values of 87.35% for the soluble protein ratio and 86.64% for the crude protein powder amount. According to the Pareto chart of standardized effects, the quadratic effect of temperature and the linear effect of time were the most significant parameters influencing the soluble protein ratio. Conversely, the crude protein powder yield was predominantly affected by the quadratic effect of pH and the linear effect of temperature.

The optimum extraction conditions were determined as a temperature of 37.5°C, a processing time of 45 min, and a pH of 9.9.

The crude protein powder produced under these optimized conditions was subsequently analyzed for its compositional and techno-functional properties. Elemental analysis revealed a total protein content ratio of 47.43±0.00%. Furthermore, the optimized protein extracts exhibited a water holding capacity of 1.82±0.01 g water/g protein and an oil binding capacity of 2.91±0.01 g oil/g protein. The foaming capacity and foam stability of the extracts were recorded as 0.80±12.25% and 95±2.3%, respectively. These findings demonstrate that optimized alkaline extraction successfully yields functional crude protein from sugar beet leaves, underscoring its potential viability as a sustainable ingredient for food applications.

Keywords: Response Surface Methodology, Food Waste Recovery, Leaf Protein Concentrate, Circular Economy.

Giovanni De Francesco[1,2]*, WElio Moretti[2], Ombretta Marconi[1,2]

[1]Department of Agricultural, Food and Environmental Sciences, University of Perugia, Perugia, Umbria, Italy
[2]Italian Brewing Research Centre, University of Perugia, Perugia, Umbria, Italy

Biography: Giovanni De Francesco is an Associate Professor at the University of Perugia, specializing in brewing and malting science. De Francesco serves as a lecturer in Food Science at the University of Perugia and has dedicated the past decade to scientific research, with 34 publications in both national and international journals. According to Scopus, this work has garnered 825 citations with an H-index of 17. De Francesco is the Formation Area Manager and Panel Leader at the Italian Brewing Research Centre, a renowned University research centre on beer and malt production, has been a judge in national and international beer tasting competitions for the past 10 years, and imparts expertise in professional and University courses on beer and malt production.

Innovative and sustainable processes for producing low-alcohol craft beer

Breweries increasingly face the dual challenge of meeting consumer demand for authentic low- and no-alcohol beers while also ensuring product safety and aligning production practices with sustainability goals. In response to these pressures, we present an integrated and scalable technological route that combines high-temperature fermentations using Saccharomyces cerevisiae Kveik strains, vacuum dealcoholization, and targeted hop-aroma supplementation (Spectrum®, HyperBoost®). Fermentations conducted at 40 °C significantly accelerate metabolic activity and thereby shorten production throughput, offering clear advantages for small and medium breweries seeking to optimize tank occupancy and energy use. Subsequent ethanol removal under reduced pressure minimizes thermal stress, preserving delicate aroma compounds and limiting the formation of heat-derived off-flavours. Throughout the workflow, we monitored key technological and sensory parameters—including alcohol content, foam stability, turbidity, and volatile profiles—from wort to the final packaged beer.

Because dealcoholization inevitably strips aroma-active molecules, the strategic addition of hop extracts proved essential for restoring the fruity, citrus-forward notes and enhancing body and drinkability in the finished product. These benefits, however, come with measurable trade-offs: certain extracts negatively affected foam retention and contributed to increased haze formation, highlighting the need for careful process tuning to balance aroma impact and physical stability. Pasteurization, introduced to ensure absolute microbiological safety, further modulated the hop-derived aroma profile, slightly attenuating its intensity but offering undeniable operational advantages for producers.

Overall, our results show that vacuum distillation is a suitable and accessible technique for small breweries, hop-aroma supplementation is indispensable for flavor recovery in dealcoholized beers, hop extracts influence foam and bitterness, and pasteurization—despite modest aroma reductions—remains a robust safety measure.

This work was supported by the NRRP (Mission 4, MUR, Italy), funded by the European Union – NextGenerationEU (Project Code: P2022JEFNF).

Frederico Barros

Federal University of Vicosa, Brazil

Biography: Prof. Dr. Frederico Barros is an associate professor at the Federal University of Viçosa/Brazil, and earned MS and Ph.D. degrees in Food Science and Technology from Texas A&M University/USA. Barros has collaborations with universities in Brazil, USA and Italy, and over 60 peer-reviewed publications and book chapters. Barros was awarded a Visiting Professor Scholarship (CAPES/Brazil) and joined, in September 2023, the Whistler Center for Carbohydrate Research/Food Science Department at Purdue University/USA for a sabbatical year. Barros's research areas are: carbohydrate and health; cereal chemistry and processing; and bioactive compounds in foods.

Green banana mixed pulp and peel flour as a sustainable functional ingredient: Potential to enhance satiety, improve intestinal health, and promote healthy food innovation

Green (unripe) banana mixed pulp and peel flour (GBMF) represents a sustainable, multifunctional ingredient naturally rich in Type 2 Resistant Starch (RS2), other dietary fibers, and antioxidants. As consumer demand increasingly shifts toward foods that combine convenience, nutritional value, and clinically supported health benefits, green banana-based ingredients emerge as promising tools for next-generation functional food development and supplements. However, robust clinical evidence demonstrating their efficacy within structured dietary strategies remains limited. This presentation will show translational evidence bridging clinical nutrition and food science/technology. I will discuss the results of a 12-week, single-blind, randomized, placebo-controlled clinical trial conducted in adults with overweight and obesity, evaluating the effects of daily GBMF consumption under moderate calorie restriction. The findings demonstrate significant improvements in HDL cholesterol, reductions in Castelli Risk Indexes I and II, alongside favorable changes in glycemic markers, body composition, bowel function, and appetite-related hormones such as Peptide YY (PYY). Notably, GBMF intake enhanced satiety and was associated with reduced energy intake, reinforcing its physiological relevance in weight management strategies. In addition, using an in vitro fecal fermentation model, we demonstrated that GBMF promotes a more gradual production and high concentration of short-chain fatty acids compared to rapidly

fermentable substrates, while effectively modulating gut microbiota composition. This more gradual fermentation profile suggests improved colonic tolerance and prolonged metabolic signaling, reinforcing the role of GBMF as a physiologically relevant fiber source for long-term cardiometabolic health. This presentation will also explore the technological feasibility of incorporating unripe banana flours into healthy food systems (e.g. gluten-free snacks and breads) and supplements. By integrating clinical validation with product development, this presentation will highlight how green banana flours, sustainable plant-based ingredients, can move from bench to product, supporting obesity prevention and cardiometabolic health while meeting industry demands for functional, fiber-rich, gluten-free foods. GBMF exemplifies how scientifically grounded innovation can simultaneously advance human health, technological performance, and sustainable food systems.

Research financed by Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG, Brazil) (APQ-02169-23), Whistler Center for Carbohydrate Research/Purdue University-USA, and Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES, Brazil).

Iuliana Vintila

Department of Food Science, Food Engineering, Biotechnology and Aquaculture, University Dunarea de Jos Galati, Romania

Biography: Vintila Iuliana is an Associate Professor, PhD in Food Science and Engineering, and author of 23 books and book chapters in international and national publishing houses (Elsevier, Wiley, Lambert, etc.), first author and co-author of 19 articles in ISI journals and relevant ISI proceedings, and 107 BDI scientific papers indexed in recognized international databases, along with articles presented at national and international conferences. Vintila is a member of prestigious international organizations such as the European Federation of Food Science and Technology (2009), Co-Chair (since 2013) and Chair (since 2022) of the Nutrition WG in the Global Harmonization Initiative, the International Society of Food Engineering (2010), the Balkan Environmental Association (2008), and the European Academy for Education and Social Research (2012), and acts as an international projects Expert for the European Science Foundation, Eurostars, the Horizon Europe Programme, EU TAIEX, COST, EACEA, and Erasmus Mundus. Vintila serves as Guest Associate Editor and Research Topic Editor for Frontiers in Food Science and Technology, Regional Editor for Advance Journal of Food Science and Technology, Academic Editor European Journal of Nutrition & Food Safety, Editorial Board Member SciEdTech, Editorial Board Member African Journal of Water Conservation and Sustainability, EC Nutrition Editorial Board, Editorial board Clinical Journal of Nutrition and Dietetics, Editorial Board Discoveries in Food Technology and Nutrition Sciences, etc.,.

The software tools for FOP nutrition labelling

The adequate and reliable menus nutrition labelling need a well-designed and easy-to-use digital tool, including an acceptable algorithm of nutritional profile comparing with the energy & nutrients DRV. The complex structure of the dish units and the meals associations of culinary products and beverages deliver more variables in the algorithm calculation which need to be adequate calibrated and integrated in a reliable software tool. Also, the using of the software programs dedicated to the calculation of the required nutritional labelling information offer, also, approximate values of the nutrition value depending on proposed mathematical algorithm, the nutriments energy coefficient, the nutrients bioavailability, the compatibility with the dishes recipes, the correct denomination of the ingredients. In all cases, the exactly composition of all dishes ingredients need to be available, especially in case of trans/saturated fatty-acids, salt and carbohydrates.

There is a cost associated with the algorithm using in the calculation of the catering products nutritional value and this cost is, finally, paid by the consumer. In fact, the responsibility for the correct information of the final consumer regarding the nutritional value of the menu's dishes need to be shared between the producer, the national authorities responsible with the public health and the final consumer.

Juan Segura-Aguilar

Molecular & Clinical Pharmacology, ICBM, Faculty of Medicine, University of Chile, Chile

Biography: Juan Segura-Aguilar is a chemist with a PhD in biochemistry from Stockholm University and has been a full professor since 2001. This research has focused on the molecular mechanisms of idiopathic Parkinson's disease. Ranked in 115,825 position of 9,071,000 scientists (PlosOne in Oct 2020 (PMID: 33064726).

A new perspective on idiopathic Parkinson's disease and the possible role of nutrition in the prevention of this disease

Various clinical studies aimed at modifying the progression of idiopathic Parkinson's disease have been unsuccessful. Similarly, several nutritional trials using bioactive compounds have shown positive effects for patients but have also failed to slow or reduce the disease's progression. This repeated failure is likely because these studies ignore the extremely slow neurodegenerative process, which unfolds over many years. The molecular mechanism behind the loss of neuromelanin-containing dopaminergic neurons in the nigrostriatal system in idiopathic Parkinson's disease remains unclear. This is a conceptual/theoretical review based mainly on mechanistic and preclinical evidence, with no direct clinical data. However, research suggests that aminochrome, an endogenous neurotoxin, may trigger the degeneration of these neurons through a single-neuron degeneration model. In this model, aminochrome selectively destroys individual neurons without spreading to neighboring cells. Aminochrome is produced during neuromelanin synthesis, a process that is normally harmless because protective enzymes like DT-diaphorase and glutathione transferase M2-2 neutralize aminochrome's neurotoxic effects. Increasing the levels of these enzymes could offer neuroprotection. The KEAP1/NRF2 signaling pathway is critical for regulating antioxidant enzymes, such as DT-diaphorase and glutathione transferase M2-2. Importantly, specific bioactive compounds from food can activate this pathway, increasing the production of these protective enzymes. For instance, the omega-3 fatty acids Eicosapentaenoic Acid (EPA) and Docosahexaenoic Acid (DHA), along with astaxanthin-a compound present in cold-water fishlike salmon-have been demonstrated to enhance enzyme expression. This connection leads to a compelling question: Could dietary interventions help prevent idiopathic Parkinson's disease?

Kasiviswanathan (Muthu) Muthukumarappan

Klingbeil Endowed Department Head and Distinguished Professor Department of Agricultural and Biosystems Engineering, South Dakota State University, 1030 North Campus Drive, Brookings, SD 57007, United States

Biography: Dr. Kasiviswanathan Muthukumarappan is a Klingbeil Endowed Department Head and Distinguished Professor in the Agricultural and Biosystems Engineering Department at South Dakota State University. Muthukumarappan has led several research projects totaling more than US$20 million and advised more than 50 undergraduate and 50 graduate students in academic and research activities, with work focused on food and bioprocessing standards development, resulting in over 250 peer-reviewed publications, 350 conference presentations, several books, and book chapters. Muthukumarappan has revised three ASABE standards, served on various committees, and held leadership roles within the Food and Process Engineering Institute (FPEI), and has received numerous awards, including the IFT-International Food Security Award, MN-IFT Macy Award, ASABE Fellow, etc., for contributions to research and education in food and bioprocess engineering at both national and international levels.

Safe and sustainable food manufacturing through advanced thermal, nonthermal, and extrusion processing strategies

Novel food processing technologies are transforming the global food industry by enhancing product safety, nutrition, and environmental sustainability. Advanced thermal methods, including microwave-assisted heating, ohmic heating, and radio-frequency systems, provide swift and homogeneous heat transfer, reducing thermal damage while ensuring effective microbial inactivation. Simultaneously, cutting-edge nonthermal technologies—such as high-pressure processing, pulsed electric fields, cold plasma, and sophisticated ultrasound—maintain fresh-like characteristics, useful chemicals, and structural integrity while enhancing food safety. Extrusion technology has evolved into a very adaptable platform, shifting from traditional cooking to the precise structure of food matrices. High-moisture extrusion facilitates the formation of fibrous structures in plant-based meat alternatives, whereas low-shear and supercritical fluid extrusion promote regulated expansion, encapsulation, and nutrient dissemination. Moreover, digital extrusion instruments, such as multi-material 3D food printing, provide prospects for individualized nutrition and innovative sensory design. The amalgamation of these technologies with real-time biosensing, machine learning-driven control, and predictive process modeling improves process uniformity, resource efficiency,

and traceability. These advances collectively conform to consumer and regulatory demands for minimally processed, functional, and sustainable foods. Ongoing multidisciplinary research into process mechanisms, product-structure interactions, and commercialization paths is essential for guaranteeing their extensive acceptance and influence on future food systems.

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[2]Department of Analytical Chemistry, Industrial Engineering School, University of Castilla-La Mancha, 13071, Ciudad Real, Spain

[3]Regional Institute for Applied Chemistry Research (IRICA), 13071, Ciudad Real, Spain

Biography: Manuel Bartolomé holds a postdoc position in the Department of Analytical Chemistry of the University of Castilla-La Mancha (Ciudad Real, Spain). He finished his PhD in July of 2025 and is currently developing his research within the SAMAN Analytical Group at UCLM. His research is focused on the implementation of analytical nanometrology as a suitable discipline to address nanomaterial-related challenges in the food and environmental fields. Currently, he has authored eight articles published in high impact JCR-indexed journals and has participated in more than 20 national and international scientific conferences. In addition, he is the co-inventor of an international patent.

Human health risks associated with dietary intake of ionic and nanoparticulated copper oxide from the Spanish northwestern coast marine-origin food

Bioaccumulation of metals and their nanoparticles in marine organisms becomes an emerging concern, addressed in this study by a multidisciplinary approach integrating elemental and nanoparticulated analyses, bioaccumulation studies and health risk assessment. Conventional ICP-MS was used to assess total copper in diverse seafood samples from two different geographical Spanish coast areas, including six molluscs species, two edible seaweeds and processed seafood samples, which ranged from 0.22 to 14.2 mg kg^{-1}. On the other hand, Single Particle Inductively Coupled Plasma Mass Spectrometry (sp-ICP-MS) was used as a fitted analytical tool for characterization of copper oxide nanoparticles (CuONPs), with concentrations ranging from 2.7×10^8 to 1.0×10^9part kg^{-1} and mean particle sizes between 26 and 38 nm. Suitable isolation of CuONPs from samples was performed by an enzymatic ultrasound-assisted extraction optimised via Response Surface Methodology (RSM) analysis, to maximize both the extracted CuONPs mass and number concentrations without altering their native size and morphology. Selected extraction conditions involved ultrasonication for 8 minutes at 62% amplitude in continuous mode, employing a pancreatin/lipase mixture solution (2.9 g L^{-1}).

Findings provide alarming bioaccumulation evidence of ionic Cu and CuONPs in marine organisms, with concentrations exceeding the seawaters levels found in their fishing zones. Thus, health risks associated with bioaccumulation events through seafood ingestion were evaluated upon monitoring hazard parameters like Estimated Daily Intakes (EDIs), Target Hazard Quotients (THQs), and Maximum Allowable Consumption Rates (CRlim and CRmm). This health risks study has considered four hazard scenarios for each target attending diverse seafood consumption levels and potential health conditions associated with Cu elimination such as Wilson's disease. EDI, THQ and CR limits regarding ionic Cu suggest the intake of certain seafood samples (oysters) and even the cumulative seafood intake could pose health risks under specific scenarios. In contrast, CuONPs ingestion from seafood appears to be initially safe, based on THQ and CR values, although it must be aware about the existence of a meaningful research gap regarding oral reference doses from official regulatory agencies for these emerging pollutants. Then, the implementation of such integrated methodologies becomes essential to support informed risk management decisions and to guide the development of regulatory measures aimed at minimizing environmental-food contamination and protecting human health in the long term.

Mohammad Kamil

Director General, Lotus Holistic Institute, Abu Dhabi, United Arab Emirates

Biography: Professor Dr. Mohammad Kamil, M.Sc., M.Phil., Ph.D., D.Sc., Chartered Chemist (U.K.) and Fellow of the Royal Society of Chemistry (London), has worked in various capacities: as In-charge of the Drug Lab, CRUM, Ministry of Health, India; Professor at Hamdard University, India; and Professor & Head of the Department and Head of TCAM Research at Zayed Complex for Herbal Research & Traditional Medicine, Ministry of Health, UAE, and Department of Health, Abu Dhabi (1996-2020). Kamil is presently working as Director General, Lotus Holistic Healthcare Institute, Abu Dhabi, UAE, since 2021, is a recipient of the Young Scientist Award (India), the Hakim Ajmal Khan Global Award (2013), and the Sheikh Zayed International Award in Traditional Herbal Research (2020), and served as Focal Point and Expert for the WHO (2007-2022). Kamil has produced 30 Ph.D. and M.Phil. students, guided a large number of M.Sc. dissertations and 40 interns, and has 850 research papers with more than 10,000 citations to credit.

Obesity and nutrition

This presentation explores the role of eating behaviors, diet quality, and dietary interventions in obesity and its potential mechanisms. Many herbs and natural products are significant in the treatment of obesity through bulk-producing activity that produces a sense of fullness, thereby reducing appetite. Fibers act by slowing the movement of food and acidic fluid from the stomach to the intestines. They may help people with duodenal ulcers by reducing the exposure of the small intestine to stomach acids. Dietary fibers lower cholesterol, reduce elevated blood levels of triglycerides, and protect against cancer and digestive disorders. Polyphenols, terpenoids, and steroids play an important role in obesity prevention. An example of a natural appetite suppressant is Hoodia gordonii. It regulates appetite and significantly reduces calorie intake, and boosts weight loss. Natural (–)-Hydroxycitric Acid (HCA) from Garcinia cambogia is a potential natural appetite suppressant.

In this talk, the anti-obesity potential of diverse plants such as Aloe vera, Camellia sinensis, Hibiscus sabdariffa, Hypericum perforatum, Phaseolus vulgaris, Capsicum annuum, Rosmarinus officinalis, Citrus limon, Punica granatum, and some other common plants will be discussed. Also, the adulteration of anti-obesity pharmaceutical drugs in herbal dietary supplements will be dealt with in detail to save the public health.

Piergiorgio Bolasco

European Renal Nutrition – Study Group of European Renal Association, Italy

Biography: Piergiorgio Bolasco, from March 1979 to June 1990 Nephrology Physician Assistant of Nephrology, Dialysis and Transplantation Hospital Brotzu- Dialysis of Public Local Health Authority Cagliari. Co-Director for Nephrology and Hemodialysis from 1990 at the Same Division of Nephrology. From January 1992 to the present day; Coordinator of the of Clinical Chemistry Laboratory; Service of the Division of Nephrology and Dialysis in the same period. Member of different Technical Commission of Public Regional Health and Hygiene Department for the assessment and evaluation of the care needs of the Nephrology and Dialysis. From 01 September 1998 to 31 January 2017 - Director of the 'Territorial Unit Department of Nephrology and Dialysis, Public Health Authority ASL of Cagliari including 5 Nephrology and Dialysis Centres. Specialized in Anesthesia and Intensive Care July 1981 – University of Cagliari Specialized in Nephrology July 1986 2006-2009 member of the Boarding Direction Italian Society of Nephrology. 2020 Member of European Renal Association 31-01-2022: Qualification of Associate Professor in Endocrinology, Nephrology and Nutritional Science by Italian Ministry of Health to the present day. Author / co-author of 403 scientific publications and abstracts of Nephrology and dialysis techniques including international journals (Lancet, Nephrology Dialysis and Transplantation, Journal of Nephrology and others), 3 international books. 100 publications are currently present in Med-line Reviewer of Journal: Kidney International, Nephron, Nephrology Dialysis and Transplantation, Journal of Nephology, Journal of Artificial Organs, BMC Nephrology, Journal of Renal Nutrition, Nutrition. Boarding Member of Journals: Minerva Urologica e Nefrologica, International Journal of Artificial Organs, Academic Editor and Editorial Boarding Member of Nutrients. CONFERENCES, COURSES, master: Participation in 398 of these, 141 as a speaker, 36 and 54 as an organizer and moderator respectively.

The huge derangement of amino acids in chronic kidney disease and in dialysis patients

Introduction: For Chronic Kidney Disease (CKD) stage stages 3b to 5, a Low-Protein Diet (LPD: 0.6 g/kg/day) or a Very Low-Protein Diet (VLPD: 0.3–0.4 g/kg/day) is necessary, depending on the severity of the disease. Indeed, a low-protein diet can slow down glomerular hypertension and halt the progression of CKD to end-stage renal disease requiring dialysis. A reduction in protein intake inevitably results in a significant reduction in amino acid requirements (-17–28% of the daily requirement), which increases the risk of sarcopenia and/or protein energy wasting.

Methods: These diets must be supplemented with Essential Amino Acids (EAA) and their ketoanalogues (KEAAs/EAAs). Recently, new mixtures of free amino acids that

can be rapidly incorporated directly into cells have been produced. When the patient enters maintenance dialysis, however, the scenario changes completely. Dialysis treatment is essential for survival due to the significant purification of numerous toxic nitrogenous molecules of different molecular weights which originate primarily from protein intake. However, patients on haemodialysis or peritoneal dialysis must consume 1.2 g of protein per kg of body weight per day, alongside a caloric intake of 30–35 kcal per kg of body weight per day to maintain metabolic equilibrium.

Results: Unfortunately, contact between blood and dialysis membranes produces hypercatabolism, primarily due to the release of numerous cytokines. The most significant metabolic effect is not so much the modest loss of albumin, but the huge loss of amino acids, which, due to their low molecular weight, are easily lost in enormous quantities (5 to 7 g per session) in the dialysis waste fluid — equivalent to a weight of 1.5–1.8 kg per year or more — leading to progressive muscle loss and accelerated sarcopenia and PEW.

Discussion: In order to interrupt or slow this phenomenon, it is essential to replace what is lost using mixtures if possible tailored to the plasma asset and to quantity and type of amino acids lost during the dialysis session. Added to this, it is a serious intestinal inflammatory/absorptive alteration already caused by the uremic state, which affects the intestinal microbiota.

Conclusion: It is important to emphasise that in CKD, but particularly in dialysis patients, these must be replaced, otherwise malnutrition, sarcopenia and PEW may result.

Raffaella Conversano

I.C. Giovanni XXIII-Pascoli, Fasano (BR), Italy; Adjunct Professor, Laboratory of Special Needs Education, For.Psi. Com., University of Bari, Italy; UTL University of free time San Francesco D'Assisi Fasano (BR) - Puglia, Italy

Biography: Born in Fasano, Raffaella Conversano is a Teacher specialized in Special Teaching Role (Support) at the IC Giovanni XXIII - Pascoli of Fasano (BR), Media Educator, Contract Professor of Special Teaching Laboratory: Communication Codes of Language Education at the Aldo Moro University of Bari and the San Francesco D'Assisi University of Free Time Fasano (BR), Academic Member of the Communication Institute of Greece (COMING) Athens, Academic Member of the Scientific Committee of the International Conference on Communication and Management, Academic Member of the Athens Institute for Education and Research (ATINER), academic member of the Mass Media and Communication Research Unit, and Honorable Editor for American Journal of Biomedical Science & Research. Conversano is the author of 61 global publications. This field of research focuses on the strategic use of educational technologies in the field of disabling pathologies in general; the application of Media Education conducted on serious, very serious cases and cases with rare disabilities have always achieved educational successes in different study contexts. Conversano is the author of the innovative Pedagogical Dis(ease)Ability Theory. She has been appointed President and official signatory of the documents and certifications as well as Member of the Scientific Committee of FAT2024, a Euro-global event that will be held in Rome from 16 to 18 September 2024 and FAT2025.

We are elastic: The color of hunger and food perception in borderline cognitive functioning

In a global context where food science is increasingly engaging with the complexity of cognitive diversity, the concept of elasticity becomes a bridge between body and mind, between sensory experience and cognitive functioning. The title *We Are Elastic* is not just a metaphor—it represents an openness to a new paradigm in which food perception, mediated by color, can become a tool for inclusion and innovation for individuals with Borderline Intellectual Functioning (BIF). This research offers a novel perspective on the relationship between food, color, and cognition, paving the way for personalized nutritional strategies and *elastic sensory environments*—those capable of adapting to individual needs. Color is one of the most immediate and powerful sensory stimuli influencing food perception and choice. Extensive research has shown that color variations can alter taste expectations, appeal, and food preferences in the general population. However, little is known about how color influences eating behavior in individuals with Borderline Intellectual Functioning (BIF)—a cognitive range defined by an IQ between 70 and 85, often overlooked in studies

and inclusion policies. This research moves beyond the medical-compensatory model of disability. Color is not merely a sensory stimulus but a gateway to subjectivity: evocative, relational, affective. In this sense, the person with borderline functioning is listened to in their embodied experience— in their concrete perception of food and their world. Eating, a daily and universal act, thus becomes a device for recognition, where the real person emerges—not just evaluated for what they lack, but acknowledged for how they see, feel, choose, and narrate. This study explores the interaction between color perception and cognitive processes in individuals with BIF, positioning food not only as a source of nourishment but as a complex perceptual and relational experience. The work is framed within an innovative theoretical model inspired by the Arginare la Di(agi)abilità paradigm, which aims to move beyond the medical-compensatory view of disability to value embodied subjectivity and the relationship between person and environment. Through a case study of a student assigned to me as a Special Education teacher, I am investigating how individuals with borderline functioning demonstrate greater sensitivity to color than control subjects, with color influencing food selection and preference more strongly—often overriding familiarity or taste. Qualitative narratives reveal a deeper relationship between color, emotional memory, and a sense of safety, suggesting that color is not simply an aesthetic element but a cognitive and emotional threshold in the relationship with food. The anticipated results will have significant implications for the design of inclusive eating environments, educational strategies, and personalized nutritional interventions for people with BIF.

Moreover, this work proposes a research and application paradigm that values the recognition of the real person and their lived experience, offering an original contribution to sensory and cognitive inclusion in the field of food science and technology. So, if color is the silent language of food—capable of evoking expectations, emotions, and choices—what happens when cognitive functioning alters how we interpret these signals?

R. Pandiselvam

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Biography: Dr. R. Pandiselvam is a Senior Scientist at the Division of Agricultural Engineering, ICAR–Indian Agricultural Research Institute (IARI), New Delhi, India. Pandiselvam's research focuses on food process engineering, ozone technology, post-harvest engineering, drying technologies, biodegradable packaging, and smart food processing systems. Pandiselvam has published more than 100 research papers and edited several international books in food engineering, has been recognized among the World Top 2% Scientists (2023–2025), and received prestigious awards including the Rashtriya Krishi Vigyan Puraskar (Outstanding Young Scientist) from ICAR.

Ozone technology for safe and sustainable food systems: Innovations in decontamination, storage protection, and functional food processing

The growing demand for safe, residue-free, and sustainable food systems has intensified the search for innovative non-thermal technologies capable of improving food quality, safety, and shelf-life while minimizing environmental impacts. Among emerging green technologies, ozone has gained considerable attention owing to its strong oxidizing potential, broad-spectrum antimicrobial efficacy, and residue-free decomposition into oxygen. This keynote presentation will provide a comprehensive overview of recent advancements in ozone technology for food safety and post-harvest applications, highlighting its multifunctional role in sustainable food processing systems. The presentation will cover the application of ozone for microbial decontamination, emphasizing its effectiveness against pathogenic and spoilage microorganisms in fresh produce, cereals, spices, and processed food systems. Special focus will be given to pesticide residue degradation, where ozone treatment has shown substantial potential in reducing organophosphate, carbamate, and fungicide residues while preserving nutritional and sensory quality. Furthermore, emerging research on ozone-assisted starch modification will be discussed, demonstrating improvements in physicochemical, functional, and rheological properties for food and industrial applications. Another important aspect of the presentation will address the role of ozone in stored-product insect control, offering an environmentally safer alternative to chemical fumigants for grain storage systems. The efficacy of ozone in controlling insect pests, reducing storage losses,

and improving grain quality under commercial conditions will be highlighted. Additionally, the presentation will discuss aflatoxin mitigation in grains and food commodities, focusing on ozone-mediated detoxification approaches to improve food safety and reduce risks associated with mycotoxin contamination. The keynote will also highlight industrial challenges, technological limitations, safety considerations, and commercialization opportunities for ozone-based interventions. Overall, ozone technology presents a promising pathway toward sustainable, chemical-free, and climate-resilient food systems, supporting global food safety goals, post-harvest loss reduction, and circular bioeconomy initiatives.

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Biography: Dr. Ren-You Gan is an Assistant Professor and Presidential Young Scholar at The Hong Kong Polytechnic University. Following a PhD from HKU (2016), Gan held key positions at SJTU, CAAS, and A*STAR. This research focuses on plant-based foods, probiotics, and the gut microbiome. Gan has managed over 10 million RMB in grants and authored 250+ SCIE publications, amassing over 30,700 citations and an H-index of 91 (Google Scholar). A Clarivate Highly Cited Researcher (2021-2023) and Stanford Top 2% Scientist (2020-2025), Gan holds 20 patents and serves as Editor-in-Chief of Food as Medicine.

Chinese tea and human health

Tea (*Camellia sinensis*) is widely consumed all over the world. Generally, tea can be classified into six categories, including green, white, yellow, oolong, black, and dark teas, based on their fermentation degrees. Tea contains diverse bioactive ingredients, such as polyphenols (e.g., catechins and tannins), polysaccharides, proteins, pigments (e.g., theaflavin and theabrownin), free amino acids (e.g., L-theanine), alkaloids (e.g., caffeine), saponins, and some volatile components. Catechins, especially Epigallocatechin Gallate (EGCG), are the most predominant bioactive ingredients in tea, while their bioavailability is relatively low. Recent studies suggest that gut microbiota take part in the biotransformation and metabolism of tea catechins, and consequently enhance their bioavailability and bioactivities. So far, tea has been demonstrated with various health benefits, such as antioxidant, anti-cancer, cardiovascular protective, anti-diabetic, anti-obesity, neuro-protective, anti-hyperuricemia, and anti-depressant effects. Moreover, it is considered that drinking tea is generally safe for humans, while the supplementation of high-dose tea catechin nutraceuticals may have potential health risks, like hepatotoxicity. In recent years, many tea-related food products, such as tea beverages, solid beverages, milk tea, and instant tea, have been developed, and many of them are quite popular as healthy foods. Moreover, tea extracts and bioactive ingredients are also developed into functional foods or nutraceuticals that can be beneficial in preventing and managing certain chronic disorders. In conclusion, tea can be considered a typical example of Food as Medicine.

Rinaldo Dominique

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Biography: Dr. Dominique Rinaldo, after studying to become an agricultural engineer, took a PhD degree in Animal Physiology at Rennes University (France). In 1991, Rinaldo came to Guadeloupe and was recruited at INRAe, studying heat resistance and meat quality in growing pigs until 2004. Since then, Rinaldo has been working on the organoleptic, nutritional and functional qualities of starchy tropical food resources, first examining the influence of abiotic stress on banana quality for about ten years. Since 2015, Rinaldo has been focusing on qualities of root crops, mainly yam, with a particular interest in their health benefits and their processing ability.

Varietal and environmental influences on organoleptic and cooking quality of yam (Dioscorea spp) landraces

Yam is a major staple food that provides both energy (starch) and bioactive compounds. However, there is a lack of knowledge on its cooking quality. We have determined the cooking quality of five varieties of water yam (among those most appreciated by consumers), when they were steamed or boiled. The yams were grown in two contrasting locations with regard to pedoclimatic conditions. Ratio of length to mean circumference of the tuber, difficulty to peel, cooking time, color attributes, hardness of steamed pulp, and Dry Matter(DM) and starch contents significantly varied among varieties. Cooking time and hardness of the cooked pulp, either steamed or boiled, were higher for tubers grown at the drier location, with vertisols, than at the rainy one, with a ferralitic soil. The raw pulp was richer in starch at the rainy location. We found no correlation between either textural properties or DM and the cooking time. A slight (r=0.44) but significant correlation was recorded between the DM of the raw pulp and the hardness of the steamed product. Our data clearly showed an influence of the variety as well as an effect of the environment on cooking and nutritional qualities in yam. We found with very few genotype x environment interactions. We propose a comprehensive multicriteria approach for determination of yam cooking quality, textural properties, color attributes and chemical composition, along with varietal and environmental influences. This approach takes into consideration the complexity of food quality, allows a better understanding of its determinants and provides a basis for useful guidelines for breeders.

Keywords: Yam, Textural Properties, Susceptibility to Browning, Genotype-By-Environment Interaction, Efficient Breeding, Consumer Preferences.

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Biography: Dr. Rita Singh Raghuvanshi is an Emeritus Scientist in the Department of Food and Nutrition at G.B. Pant University of Agriculture and Technology, Pantnagar, India. Raghuvanshi's research focuses on functional foods, nutraceuticals, and the valorization of agricultural by-products for sustainable health and industrial applications, with extensive experience in food processing, bioactive compounds, and agro-industrial innovation, and numerous academic and research contributions in the field.

Corn silk (Stigma maydis): A multifunctional bio-based resource for sustainable industrial applications

Corn silk (*Stigma maydis*), the dried stigmas and styles of *Zea mays L.* (family Poaceae), is generated in substantial quantities as an underutilized byproduct during maize cultivation and processing. This paper highlights the process-driven valorization potential of corn silk through optimized drying, milling, extraction, fractionation, and modification techniques that enable its integration into multiple industrial sectors. In the food processing industry, corn silk-derived fibers and extracts are being explored as natural structuring agents, stabilizers, and functional additives, while also serving as sustainable inputs for herbal infusion blends and ingredient systems. Advances in scalable extraction and encapsulation technologies have further improved product uniformity, shelf stability, and compatibility with existing manufacturing lines. In the nutraceutical industries, corn silk-derived powders, fibers, and standardized extracts are being incorporated as functional ingredients in herbal infusions, dietary fiber formulations, and nutraceutical blends. These applications are driven not only by their bioactive composition but also by favorable techno-functional properties such as water-holding capacity, extractability, and formulation compatibility with existing manufacturing systems. Advances in encapsulation and formulation technologies have further enhanced product stability, handling efficiency, and shelf-life performance at industrial scale.

Corn silk has emerged as a promising bio-based resource for sustainable materials. Its polysaccharide-rich fractions and fibrous matrix are being investigated for the development of biodegradable films, bio-composites, and eco-friendly packaging materials. Additionally, the presence of hydroxyl, carboxyl, and phenolic functional groups enables effective binding of metal ions and organic pollutants, supporting its application as a low-cost biosorbent in wastewater treatment and environmental remediation systems.

Industrial interest has also expanded into the cosmetic and personal care sector, where corn silk extracts are incorporated primarily for their physicochemical properties such as moisture retention, formulation stability, and oxidative protection, rather than therapeutic claims. Corn silk offers advantages in terms of abundant availability, low procurement cost, and compatibility with circular bioeconomy models.

Overall, the industrial valorization of Stigma maydis represents a viable strategy for converting maize-derived agricultural waste into commercially relevant products across food, materials, environmental, and allied industries. Future progress depends on integrated efforts in process optimization, quality standardization, life cycle assessment, and techno-economic evaluation to facilitate large-scale adoption and strengthen sustainable agro-industrial value chains.

Traditionally discarded or used in limited local applications, corn silk is now receiving growing attention as a renewable industrial raw material owing to its diverse chemical composition, including polysaccharides, phenolic compounds, flavonoids, phytosterols, structural fibers, and functional surface groups. These constituents provide a robust foundation for its transformation into value-added industrial products.

Sankar Kr Acharya

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Biography: Prof. (Dr.) Sankar Kr Acharya is Dean of Post Graduate Studies and former Head of the Department of Agricultural Extension and Director of Extension Education at Bidhan Chandra Krishi Viswavidyalaya (BCKV), Mohanpur, West Bengal. Born in 1960, Acharya began the career as Assistant Professor at BCKV in 1988 and has more than 37 years of experience in teaching, research and extension. These research domains include Social Entropy and Energy Metabolism, Social Ecology and Environmental Sociology, the Enterprise Ecology Framework, and Conservation Stewardship. Acharya has 261 research publications in national and international journals, has authored 132 books, delivered 49 keynote addresses, chaired 57 sessions, and guided 23 PhD and 97 MSc scholars. Acharya is a Fellow of ISEE, BIOVED (Allahabad), the Society of Community Mobilization, SEE (Agra), and the West Bengal Academy of Science and Technology (2024), holds German and Indian patents, has undertaken academic missions to Italy, France, Germany, China, Sri Lanka, Vietnam, Bangladesh and Malaysia, and recently delivered a keynote address at an international conference on Conservation Agriculture and Renewable Energy in Zurich, Switzerland (June 2025).

Millet: The magic seeds

The planet is heading for a serious shortage fresh water, essential for the production of food, drinking purposes and the very existence of civilization. During 50 s, per capita of available ground water in India was approximately 5000 cubic meter/yr, now it has been plummeted down to 1300 cubic meter/capita/yr; which is alarming no doubt. To produce one Kg of rice, the amount of water required is 4000 liter, and that for meat the water footprint is 9000 liter. The crux of our challenges is how to produce around 550 million tons of food grain by 2050 over the present 324 million tons, from less and lesser water; small and smaller holding. The other challenge is ensuring food and nutritional security for the millions, especially for rural women of India. Millet is the magic seed and crops up as the savior seed for millions. It saves water since I Kg of millet seeds needs just 400 liter of water. Millet offers minimum disturbance to soil since it cal well be grown with no or minimum tillage. It is so crucial when India is experiencing a soil erosion of 15-20 tons/ha/yr due to unplanned mechanization in agriculture. Its low GI value is a better choice for diabetic people; its rich mineral contents can mitigate the need for iron, zinc and calcium. Let's make revisit millet in our dietary habit, cropping sequence and restoration of our ecological resilience. In the face of water crisis, soil erosion, biodiversity

losses, enhancing diabetic problem and appalling nutritional deficiency, millet sounds as a magic seeds with wonders and utilities. The scenario is now prevalent almost every corner of the planet and getting worse every day passes on.

Keywords: Millets, Soil Erosion, Water Foot Print, Soil Disruption, Malnutrition.

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Biography: Sara Damiano has been an Associate Professor of Veterinary Pharmacology and Toxicology at the University of Naples Federico II since 2022. A biotechnologist (2005) with a PhD in Nephrological Sciences (2010), Damiano is skilled in renal microsurgery and molecular biology, and also earned a Level II Master in Veterinary Phytotherapy (2024), the National Scientific Qualification as Full Professor (2023), and a specialization in laboratory animal science (2009). This scientific output includes numerous international publications and conference contributions. Damiano's research focuses on environmental contaminants, innovative anticancer therapies, diabetic nephropathy, immunosuppressant-induced nephrotoxicity, and essential hypertension in animal models.

Phytotherapeutic strategies in the nutritional management of cancers: Between tradition and innovation

Phytotherapeutic and nutraceutical strategies are gaining increasing prominence as complementary approaches in cancer management, offering mechanisms that include redox modulation, regulation of the cell cycle, induction of apoptosis, and interference with key proliferative pathways. This report integrates evidence from natural marine, plant, and fungal compounds, alongside innovative platforms such as oncolytic virotherapy, highlighting their potential connections with anti-cancer nutrition.

Fucoxanthin, a xanthophyll from brown algae, exhibits antioxidant and pro-apoptotic properties and inhibits the PI3K/Akt/mTOR axis in chronic myeloid leukemia cells, suggesting potential nutraceutical applications in combination with targeted therapies.

Epipyrone A, a polyketide pigment from *Epicoccum nigrum,* shows antiproliferative and anti-migratory effects in canine mammary tumor models, modulating the redox balance and the PI3K/Akt/mTOR network in a cell-context-dependent manner.

In parallel, **capsaicin**, a dietary alkaloid from chili peppers widely investigated in nutritional sciences, reduces proliferation, migration, and invasion in various mesothelioma cell lines, inhibiting AKT and ERK1/2 and demonstrating activity even in chemoresistant phenotypes. Complementing these natural approaches, the oncolytic virotherapy based on **Caprine**

herpesvirus 1 (CpHV1) shows selectivity toward breast cancer and mesothelioma cells and synergy with targeted agents across subtypes.

Collectively, the integration of nutraceutical compounds and biotechnological innovations underscores the potential role of functional nutrition as a bridge between tradition and innovation in cancer prevention and therapeutic support. These findings open perspectives for rational and personalized combination strategies that may enhance treatment sensitivity and address resistance in challenging oncological contexts.

Sergei Yu. Zaitsev

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Biography: Zaitsev S.Yu. graduated from Moscow State University (1980) and worked at the Shemyakin–Ovchinnikov Institute of Bioorganic Chemistry of the Russian Academy of Sciences (1980-1999), the Moscow State Academy of Veterinary Medicine and Biotechnology named after K.I. Scriabin (1999-2019), and the Federal Research Center for Animal Husbandry named after Academy Member L.K. Ernst (2019-present). Prof. Zaitsev worked as a researcher in US and German institutes (1991–1993). Prof. Ph.D., D.Sc. Zaitsev has authored over 600 scientific publications, including 15 monographs, 300 articles, and 11 patents, and has supervised 2 D.Sc. and 20 Ph.D. students. Zaitsev S.Yu. Methods and Protocols 2025;8(6):139; Molecules 2022;27(07):2278; Animals 2021;11(8):2400.

Analytical biochemistry methods to study animal nutrition

Studying animal nutrition and physiology is important not only for monitoring animal health and productivity, but also for product quality control and human health. This review will discuss the advantages and disadvantages of various methods for studying animal nutrition. In general, these methods are divided into field (observation, stomach/feces analysis) and laboratory (biochemical, molecular, balance). They allow one to determine the diet, energy requirements, and evaluate feed quality. The main methods for studying nutrition: Analysis of stomach and feces contents: a classic field method that allows one to accurately determine the composition of food. Biochemical methods: analysis of the profile of proteins and amino acids, lipids and fatty acids, carbohydrates, and other markers. Molecular methods: analysis of DNA samples to identify food items. Balance method: determination of nutrient requirements based on the balance of nitrogen and carbon. Observational method: direct observation of animal behavior (including feed preference tests). Feed nutritional assessment: determination of energy, protein, and amino acids in the diet. Recently, there has been growing interest in studying the digestion process to understand the potential impact of food on human health. Ideally, digestion should be studied in humans under natural conditions, but this is not always feasible from an ethical and financial standpoint. Therefore, as an alternative to in vivo experiments, simple in vitro digestion models simulating the gastrointestinal tract have been proposed. However, such models do not fully capture the

complexity of the digestive tract. Therefore, chronic digestion experiments are a powerful tool for studying digestion in animals, allowing the dynamics of physiological processes to be monitored in real time, as demonstrated in studies on farm animals (broiler chickens, pigs, cows, etc.). During animal digestion studies, chyme samples are collected from the gastrointestinal tract, which can only be done without slaughter using cannulation. Fistula (cannula) placement involves surgically inserting a cannula into the wall of the gastrointestinal tract. The outer end of the cannula extends beyond the skin and contains a removable stopper that allows for sample extraction. The advantage of cannulation is that it allows for sampling from the same animal over a long period of time. Furthermore, the same animals can be given different experimental treatments, reducing variability. However, cannulation requires surgical intervention, and surgical modifications can alter gastrointestinal secretions and motility, altering blood flow patterns and modifying the digestive process itself. Using cannulated animals provides unique data on the kinetics of enzymatic digestion, intestinal motility, and microbial fermentation, which is unavailable with static methods such as postmortem analysis.

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Biography: Prof. Surendra Singh, formerly Head and ex. Senior professor, Department of Soil Science and Agricultural Chemistry, obtained B.Sc (Ag) from the Institute of Agricultural Sciences and M.Sc. (Ag) and Ph.D. degrees from the Department of Soil Science and Agricultural Chemistry, Banaras Hindu University. Singh joined Banaras Hindu University as professor of Agricultural Chemistry, was promoted to Senior professor on 18th July 2018, and superannuated on 30.06.2024. Singh has about 35 years of rich professional experience in different aspects of teaching, research, extension, administration, training, and research and development, as well as research project formulations, both national and international. Singh has more than 250 basic, strategic and peer-reviewed publications on different aspects of soil science, in the form of research papers, books, bulletins, popular articles, review articles and manuals etc., and contributed significantly in the field of soil fertility and plant nutrition to different crops for better food and quality. Altogether, Singh has guided 45 M.Sc.(Ag) and 15 Ph.D. students in Soil Science and Agricultural Chemistry, and has successfully executed 25 externally national and international funded projects as Principal Investigator. Singh received various national and international awards, participated in the 2nd Euro-Global Conference at Rome, Italy during 20-22 September 2018, attended the 22nd World Congress of Soil Science held 31 July-5 August 2022 at Glasgow, Scotland, UK, and acted as keynote speaker and chaired the session on soil, food and human health held during 11 to 13th September 2023 (FAT-2023) at Valencia, Spain.

Vital role of soil for future food security and human health

Soil is more than just dirt beneath our feet—it is a living ecosystem that supports life on Earth. It provides the foundation for agriculture, ensuring food and nutrition security for billions. Soil is vital for future food security and human health because it provides the essential nutrients, water, and stable environment for crops, which in turn affects the quality and quantity of the food we eat. Healthy soil also supports other critical functions, such as water filtration, carbon sequestration, and the overall health of ecosystems that underpin human well-being. Food security is achieved when all people have access to sufficient, safe, and nutritious food. Food security is central to human health and the ability to produce nutritious crops in sufficient amounts depends on soil properties and conditions. In particular, soils that have well-developed structure, sufficient organic matter, and other physical and chemical properties conducive to promoting crop growth lead to strong yields and are thus important for food security. If the soil is supply adequate amount of nutrients for food, the human health also

benefits. Hence, availability of important nutrients such as potassium (K), sulphur(S), iron (Fe) and zinc (Zn) in soil can play a vital role in ensuring food security. Quality food production and food security have several components, including the production of sufficient amounts of food, adequate nutrient content in the food products, and the exclusion of potentially toxic compounds from the food products. A balanced diet is one which includes a variety of foods in adequate amounts and correct proportion to meet the day's requirement of all essential nutrients such as proteins, carbohydrates, fats, vitamins, minerals, water and fiber. Soils play a major role in all of these areas of quality food production and security for better human health. The important issues of the topic will focus on (i) Healthy soils are the basis for healthy food. (ii) Soils supply the essential nutrients that our food –producing plants need to grow and flourish. (iii) Healthy soils produce healthy crops that in turn nourish human health. (iv) The deficiency of K, S, Fe and Zn affect human health considerably. (v) Lack of adequate food and food of poor nutritional quality lead to differing degrees of under-nutrition, which turn causes ill human health.

Tamaz Patarkalashvili

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Biography: Tamaz Patarkalashvili was born on April 19, 1941 in Tbilisi, Georgia. In 1962 Patarkalashvili entered the Agrarian University of Georgia and graduated with a Bachelor Degree in 1966. After the Institute, Patarkalashvili worked in the Ministry of Forest as an Engineer. In 1970-1973 Patarkalashvili studied at the Post Graduate Courses of the Institute of Forest in Tbilisi and worked as a researcher at the same Institute in 1974-1976. In 1979 Patarkalashvili defended a thesis and became a Doctor of Forestry. In 1980-1991 Patarkalashvili worked in the Commission studying Productive Forces and Natural Resources of Georgia at the Presidium of the Academy of Sciences of Georgia. From 1991 until now Patarkalashvili has been working at the Technical University of Georgia, Center for Studying Productive Forces and Natural Resources of Georgia, as a leading Researcher. In 1977-1980 Patarkalashvili studied at the Institute of Foreign Languages, English faculty, and after graduation became a Bachelor of Fine Arts.

Forests role in food production and security

To minimize the adverse impacts of climate change on food production and security we need new ideas and approaches. in our opinion such idea may be using non-wood forest products as additional natural source for increasing food production. Non-wood forest products include such wild products as: fruit and barriers, mushrooms, nuts (hazel-nuts, beech tree nuts), honey, medicinal herbs, condiments, sap, meat of wild animals and birds, and most valuable and priceless substance as oxygen that maintains the life of humans and all species of flora and fauna on the planet.

NWFP are biological products and can be gathered from wild forests as well as from plantations, agroforestry and trees outside of forests. Some of them can be consumed raw, while others require complex processing before eating. According to the east European countries research NWFP production often exceed the financial incomes from selling the timber. Non-wood forest products include such wild products as: fruit and barriers, mushrooms, nuts (hazel-nuts, beech tree nuts), honey, medicinal herbs, condiments, sap, meat of wild animals and birds, and most valuable and priceless substance as oxygen that maintains the life of humans and all species of flora and fauna on the planet.

Nowadays forests are increasingly recognized as rich reservoirs of many valuable biological resources not just timber. NWFP are biological products and can be gathered

from wild forests as well as from plantations, agroforestry and trees outside of forests. Some of them can be consumed raw, while others require complex processing before eating. According to the east European countries research NWFP production often exceed the financial incomes from selling the timber. The Baltic Republics (Estonia, Latvia and Lietuva), Czech Republic, Slovakia, Finland, are the most advanced countries in east Europe in producing different products from NWFP. In the Soviet period they managed to produce jams and juices from different wild fruits and berries, sold meat of wild animals and birds, lichen, condiments etc. But other countries don't pay due attention to this problem until now. So, our task is to activate the problem and remind them that the time of ignorance ended and it is high time to use these resources that nature gives us for nothing.

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Studies on acid modified starches

Starch was isolated from cereals (rice, waxy rice, sorghum, ragi and wheat) pulses (chick pea, green gram), root (tapioca), tuber (potato) and were single acid (0.5N HCl) modified for different periods, also modified with 0.5N of each of HNO_3, $H2SO_4$ and H_3PO_4 for 1.5h. AFN increased progressively with time of modification and was highest for cereals followed by root, legume and tuber starches. However, reduction in Mn was in the reverse order. There was a clear proportionality between Mn of native starches and the extent of its hydrolysis under any given set of conditions. Modified starches without neutralization kept in RT continue to hydrolyze strongly in potato starch compared to other starches. Highest AFN for HCl and HNO_3 was observed followed by H_2SO_4 and H_3PO_4. Extent of hydrolysis was proportional to Mn of native starches observed only in HCl and HNO_3 but not in any other acids. [n] of native starches showed positive correlation with their Mn and decreased upon modification. IBC did not follow any pattern. Mn and IBC of solubilized starches were lower in all modified starches

except potato which did not change much. GPC of native starches using Sepharose CL4B gave mainly two fractions, Frn I (high molecular weight) and Frn II (low molecular weight). After acid modification, Frn II increased and Frn I decreased. Very high increase in Carbohydrate content in Frn II was seen in Cereal Starches followed by pulses, root and least by tuber. Work on Alpha amylase enzyme hydrolysis in comparison with 0.5N HCl hydrolysis in non-granular starches, C13 CP/MAS spectroscopic studies of these starches will also be presented.

Some Symbols: AFN: Alkali Fluidity Number; Mn: Number Average Molecular weight; [n]: Intrinsic viscosity; IBC: Iodine Binding Capacity

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Biography: Assoc. Prof. Yasin Özdemir is an expert in food technology and food science, with a primary focus on fruit and vegetable processing, table olives, olive oil, plant-based foods, and the development of environmentally friendly production techniques. This research integrates product quality, process optimization, and sustainability principles in food systems. Özdemir serves as a scientific and editorial board member and reviewer for various international journals and congresses in food and nutrition sciences, and has authored and co-authored more than 100 scientific publications presented at international congresses and published in peer-reviewed journals.

From agricultural residues to consumer safety: A preliminary review and theoretical evaluation of retail-level strategies to reduce pesticide and microbial exposure in unpeeled fruits

Fruits such as strawberries, grapes, and blueberries are widely preferred due to their high nutritional value and antioxidant content. However, because these fruits lack peelable skins, potential pesticide residues, soil particles, microbial contamination, and environmental pollutants on their surfaces can only be removed by washing.

In recent years, extensive literature evaluating pesticide residues in numerous fruits and vegetables has established rankings identifying the most contaminated products. Strawberries, grapes, cherries, blackberries, and blueberries are frequently reported in these lists. These findings suggest a need for more effective washing and decontamination methods to reduce pesticide residues in these fruits, which are consumed without peeling due to their lack of peelable skins. This study aims to evaluate the potential effectiveness of advanced cleaning technologies, such as ultrasound-assisted washing, ozonized water, deionized water rinsing, cold plasma, various pesticide-binding applications, and/or UV-C treatment, which can be applied in retail markets and similar sales points, in reducing chemical and microbiological residues in some fruits. Innovative fruit washing approaches have shown reductions of up to 99% in pesticide residues. UV-C treatment has been shown to reduce total microbial load by 2-3 log CFU/g. While the effectiveness of these applications varies depending on fruit type, processing time, and operational parameters, the findings

demonstrate significant potential for improving food safety. No significant negative impact on the sensory or physical properties of the fruits has been reported.

It has been assessed that integrating and applying these new technologies into retail outlets can offer an innovative and practical approach to improving food safety in terms of pesticide residue and microbial load in fruits consumed unpeeled. This model can also strengthen consumer confidence. Establishing an economic feasibility study, determining consumer reactions, and evaluating carbon footprint impacts will be vital for large-scale application and dissemination strategies.

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ORAL PRESENTATIONS

Abdul Hakim

California State Department of Public Health, United States

Comprehensive review of pesticide dynamics: Health effects, environmental movement, and AI-driven mitigation strategies

Pesticides are essential, yet hazardous, chemical or biological agents used to control pests, weeds, and diseases, protecting agricultural productivity. Classified by target organism (herbicides, insecticides, fungicides) and chemical composition (organochlorines, organophosphates, carbamates), their use has shifted historically from elemental compounds to synthetic formulations. The environmental persistence of pesticides, often measured by their half-life, dictates their potential for accumulation, with Bad Actor chemicals posing significant risks even years after application. Human exposure occurs primarily through inhalation of spray drift, ingestion of contaminated food/water, and dermal contact, leading to acute intoxication (nausea, dizziness) and chronic, long-term health consequences, including cancer, neurodevelopmental issues, and endocrine disruption.

This review examines the dispersal and movement of pesticides through air, soil, and water, noting that drift can affect areas far from the application site, a critical issue for vulnerable communities. In California, the Department of Pesticide Regulation (DPR) monitors these impacts, with significant incidents of high pesticide air concentrations found in the San Joaquin and Salinas valleys, including the use of restricted chemicals near schools and residential areas. Mitigation strategies are essential, involving Integrated Pest Management (IPM), precision application, strict adherence to spray conditions, and technological alternatives to minimize off-site movement.

Consumer health risks are calculated using dietary residue data, ensuring that daily intake does not exceed acceptable limits, though cumulative exposure from multiple pesticides

remains a challenge. A case study in precision agriculture shows that applying Artificial Intelligent (AI) resources—specifically machine learning algorithms to identify pest thresholds and drone technology for targeted spraying—can reduce pesticide usage by 40–50% while maintaining high agricultural yields. The integration of AI for predictive toxicity assessment and real-time monitoring offers a proactive pathway toward sustainable, eco-friendly pest management. The study concludes that balancing pesticide benefits with severe environmental and health impacts requires strict regulation, adoption of safer alternatives, and advanced technology-driven precision farming.

Biography

Dr. Abdul Hakim is a distinguished research scientist and former faculty member at California State University, Fresno. With over thirty years of expertise, Hakim is a leading professional in food safety research and regulation, specializing in food protection and focusing on critical issues like pesticide residues, food dyes, heavy metals, and chemical risk assessment. Dedicated to both domestic and imported product safety, Hakim has published over 25 scientific papers in international journals. A global thought leader, Hakim has presented findings at over 20 conferences across the USA, Canada, Europe, and Asia, significantly advancing international food safety standards and public health.

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Pigmented sorghum phenolic extracts regulate the expression of cancer development pathway genes in HT-29 and hypoxia-induced CCD 841 CoN cells.

Sorghum polyphenols have been shown to inhibit gastrointestinal cancer cell growth by inducing apoptosis and other pathways such as chronic inflammation. However, the impact of sorghum polyphenols on the most frequently mutated genes in the genome mutation and instability and dysregulated cellular metabolism pathways is unknown. This study evaluated the gene and protein expression levels regulated by raw and fermented-cooked (processed) sorghum phenolic extracts (BlackSs, BlackSb and RedBu2) on HT-29 and hypoxia-induced CCD 841 CoN cells. Cancer cell viability was measured by Resazurin cytotoxicity assay and the gene and protein expression of APC, KRAS, TTN, HIF-1α, HIF-1β and GLUT-1 were measured using rtPCR and ELISA. Pigmented sorghum extracts showed a significant reduction in cancer cell viability at 500 µg/mL and 2000 µg/mL after 12 and 24 h for raw samples but only after 24 h for processed. Treatment of HT-29 cells with 500 µg/mL BlackSs sorghum extracts demonstrated a significant upregulation of APC at both 12 h and 24 h time points, followed by TTN at the highest concentration and the KRAS gene after 24 h when compared to the control. BlackSb showed an increase in APC and TTN after 12 h of treatment. Furthermore, 500 µg/mL BlackSs significantly downregulated the expression of GLUT-1, and decreased the expression of HIF-1α, HIF-1β at 2000 µg/mL. Interestingly, processed RedBu2 significantly upregulated TTN gene expression. Overall, the results from this study showed that sorghum polyphenols modulate key cancer development pathway associated genes in colorectal cancer cells, suggesting a potential chemopreventive role in inhibiting tumorigenesis.

Biography

Dr. Aduba Collins is an Analytical Scientist at the Viral Vector Manufacturing Facility, Kids Research Institute, The Children's Hospital in New South Wales, developing assays supporting viral vector production for treating genetic and chronic diseases. Collins earned a biomedical science degree from Swinburne University and first-class Honours in Health Science at the Peter MacCallum Cancer Centre before pursuing a PhD in Biomedical Science. This doctoral research investigates how sorghum phenolic compounds influence cancer pathways, aiming to reveal new therapeutic or preventive strategies. Known for collaboration and interdisciplinary work, Collins has produced impactful publications, awards, and national conference presentations.

Alejandra Mabel Geraldi

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Climate variability, wetlands and food security in the Pampas plain: Hydrological risks and opportunities for resilient agroecosystems

The Pampas plain is one of the world's major agricultural regions and a strategic territory for global food supply. However, its strong dependence on climate-driven water availability, together with intensive land-use change, makes food production increasingly sensitive to hydrological extremes such as floods and droughts. This presentation analyzes the role of wetlands, shallow lake and low-relief fluvial systems in the functioning of Pampas agroecosystems, discussing how climate variability and climate change are reshaping the spatial and temporal distribution of water across the landscape. From the perspective of physical geography and Earth sciences, it addresses: (i) how the geomorphology of the plain constrains runoff, waterlogging and soil moisture patterns; (ii) the interactions between cropping systems, drainage practices and wetland dynamics; and (iii) the implications of these processes for yield stability, infrastructure vulnerability, and long-term soil and water conservation. Particular attention is given to the tension between pressures for short-term intensification and the need to maintain hydrological regulation services provided by wetlands and floodplains. The talk argues that integrating geospatial information, hydrological monitoring and landscape analysis is key to designing climate-resilient strategies in the Pampas, including more diversified land-use mosaics, protection and sustainable management of wetlands, and early-warning approaches for floods and droughts. By framing the Pampas plain as a critical node of global food production under climate stress, the presentation connects with the conference themes Food Science & Climate Resilience and Food Security and Global Concerns, highlighting how biophysical constraints and landscape processes must be explicitly considered in food security debates.

Biography

Alejandra Mabel Geraldi holds a PhD in Geography and is an Independent Researcher at CONICET, based at the Argentine Institute of Oceanography (UNS-CONICET), Argentina. Geraldi is an Associate Professor in the Department of Geography and Tourism at the Universidad Nacional del Sur and Director of the Geotechnologies Laboratory. This work integrates physical geography, geotechnologies and environmental risk management, with extensive experience in research and university outreach projects. Geraldi coordinates the IDESoB and specializes in optical and radar image processing, spatial modeling with GIS and Spatial Data Infrastructures, focusing on geospatial information management and democratization to address climate resilience and territorial sustainability.

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Ranking and dose-response effects of acute cocoa flavanol interventions on cognitive performance: A network meta-analysis

Background: Cocoa is a traditional plant-derived food with cultural, nutritional, and therapeutic relevance, particularly in regions where cacao has long been consumed as part of traditional dietary practices. Cocoa flavanols have gained increasing attention as natural bioactive compounds with potential effects on vascular function, brain perfusion, mental fatigue, and cognitive performance. These effects are especially relevant to the fields of traditional diets, cognitive nutrition, and clinical nutrition. However, the acute cognitive benefits of cocoa flavanol supplementation remain inconsistent, and the comparative efficacy of different flavanol doses has not been clearly established.

Objective: To evaluate the acute effects of cocoa flavanol supplementation on cognitive performance in healthy adults and to determine whether different flavanol doses demonstrate differential efficacy, particularly for attention-related outcomes.

Methods: A systematic review and meta-analysis of randomized controlled trials was conducted according to PRISMA guidelines and registered in PROSPERO (CRD420261386551). PubMed, Embase, and Cochrane Central were searched from inception to March 2026. Eligible studies included healthy adults aged 18–60 years receiving acute cocoa flavanol interventions. Attention outcomes were evaluated using network meta-analysis comparing low-dose cocoa flavanols (0–199 mg), medium-dose cocoa flavanols (200–599 mg), high-dose cocoa flavanols (≥600 mg), and control conditions. Pairwise random-effects meta-analyses were conducted for executive function, working memory, episodic memory, mental fatigue, and executive function under hypoxic conditions. Standardized Mean Differences (SMDs) or Mean Differences (MDs) with 95% Confidence Intervals (CIs) were calculated using restricted maximum likelihood estimation.

Results: Sixteen randomized controlled trials involving 624 participants were included. Acute cocoa flavanol supplementation significantly improved executive function (SMD −0.20; 95% CI: −0.36 to −0.03; p=0.02) and reduced subjective mental fatigue (MD −4.82; 95% CI: −8.96 to −0.68; p=0.023). No significant effects were observed for episodic memory (SMD 0.06; 95% CI: −0.40 to 0.53), working memory (SMD −0.07; 95% CI: −0.27 to 0.13), or executive function under hypoxic conditions (SMD 0.02; 95% CI: −0.40 to 0.44). Network meta-analysis showed no significant differences between cocoa flavanol dose categories and control conditions for attention performance.

Conclusion: Acute cocoa flavanol supplementation produced modest improvements in executive function and subjective mental fatigue in healthy adults but did not consistently enhance attention, memory, or executive function under hypoxic conditions. These findings suggest that cocoa flavanols may provide selective cognitive benefits rather than generalized cognitive enhancement. As a plant-derived compound rooted in traditional dietary practices, cocoa represents a promising intersection between Indigenous and traditional nutrition, mental health and cognitive nutrition, and therapeutic dietary strategies. Further studies are needed to clarify optimal dosing, mechanisms of action, and the clinical relevance of acute cocoa flavanol intake for cognitive health.

Biography

Dr Ana Beatriz Nardelli da Silva is a Medical Doctor graduated from the Federal University of Pará, Amazonia, with clinical experience in Primary Healthcare within the Brazilian Public Health System (SUS), providing patient-centred care to Amazonian communities. Nardelli da Silva is currently a Postdoctoral Research Fellow at the University of Bradford and an ISPF Awardee, Team Brazil. This research focuses on nutrition, dietetics, preventive medicine, and the role of diet and lifestyle interventions in improving health outcomes and reducing the burden of chronic diseases.

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Impact of medically tailored meals on mortality and hospital readmission in heart failure: A systematic review and meta-analysis

Background: Precision nutrition aims to optimize health outcomes through individualized dietary interventions tailored to clinical, metabolic, and lifestyle characteristics. Medically Tailored Meals (MTMs) represent an emerging application of precision nutrition by addressing malnutrition, food insecurity, and poor dietary adherence through personalized dietary support designed to meet disease-specific nutritional needs. While previous studies have reported clinical benefits of MTMs for glycemic control and bone health in older adults, evidence regarding their effectiveness in patients with Heart Failure (HF) remains limited.

Objective: To evaluate the effects of medically tailored meal interventions on mortality and rehospitalization outcomes among patients with heart failure and to examine the potential role of precision nutrition strategies in improving post-discharge care.

Methods: A systematic review and meta-analysis were conducted according to PRISMA guidelines. PubMed, Embase, Cochrane Central, and additional sources were searched from inception to April 2026. Eligible studies included adults with heart failure receiving medically tailored meal interventions or individualized dietary programs. Randomized controlled trials, cohort studies, and comparative studies were included. Primary outcomes were all-cause mortality and rehospitalization. Random-effects meta-analyses were performed using Risk Ratios (RRs) and 95% Confidence Intervals (CIs). Subgroup analyses were conducted

according to intervention duration, comparing short-term inpatient dietary interventions (approximately 7 days) with longer post-discharge MTM programs (approximately 30 days).

Results: Nine studies involving 5,157 participants were included in the systematic review, of which seven comparative studies comprising 5,091 participants were eligible for meta-analysis. Long-term MTM interventions delivered after hospital discharge were associated with significant reductions in heart failure rehospitalization (RR 0.53; 95% CI 0.32–0.89) and mortality (RR 0.56; 95% CI 0.40–0.80). In contrast, short-term inpatient dietary interventions demonstrated no significant effects on rehospitalization (RR 0.92; 95% CI 0.54–1.59) or mortality (RR 0.91; 95% CI 0.24–3.37). All-cause rehospitalization at 30 days was not significantly reduced overall (RR 0.86; 95% CI 0.49–1.52), and mortality at 30 days also showed no significant benefit (RR 0.77; 95% CI 0.52–1.14). Narrative findings suggested improvements in food security, nutritional status, intervention adherence, and quality of life among patients receiving MTMs.

Conclusion: MTM programs, as a precision nutrition strategy, may improve clinically important outcomes among patients with heart failure, particularly when delivered during the vulnerable post-discharge period. While short-term inpatient dietary interventions demonstrated limited effectiveness, longer-duration personalized meal programs were associated with significant reductions in both heart failure rehospitalization and mortality. These findings support the integration of individualized nutrition interventions into heart failure management and highlight the potential of precision nutrition approaches to improve patient-centered outcomes and healthcare utilization.

Biography

Dr Ana Beatriz Nardelli da Silva is a Medical Doctor graduated from the Federal University of Pará, Amazonia, with clinical experience in Primary Healthcare within the Brazilian Public Health System (SUS), providing patient-centred care to Amazonian communities. Nardelli da Silva is currently a Postdoctoral Research Fellow at the University of Bradford and an ISPF Awardee, Team Brazil. This research focuses on nutrition, dietetics, preventive medicine, and the role of diet and lifestyle interventions in improving health outcomes and reducing the burden of chronic diseases.

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Theoretical evaluation of emerging solvent-based approaches for the removal of pesticide residues from fruits and vegetables and their industrial applicability

Today, pesticides are widely used to kill pests and control weeds. Although pesticides are developed to control specific target pests, their environmental transport and persistence characteristics can lead to acute and chronic toxic effects on non-target organisms and create ecotoxicological risks at the ecosystem level. According to the literature, pesticide residues detected in food can exceed maximum residue limits, negatively impacting human health. Pesticide exposure has been associated with a wide range of adverse health outcomes, including acute cholinergic toxicity, neurodegenerative diseases, certain malignancies, endocrine-disrupting effects, and reproductive toxicity. Fruits and vegetables play an important role in supporting immune function, reducing the risk of chronic diseases, and maintaining overall health due to their richness in vitamins, minerals, dietary fiber, and antioxidant compounds. However, despite their nutritional value, the presence of pesticide residues from different groups, such as organophosphates, carbamates, and pyrethroids, in fruits and vegetables can pose a potential toxicological risk to consumers. Therefore, this study theoretically evaluates the effectiveness and industrial applicability of different solvents and washing applications reported in the literature for removing pesticide residues from the surface of fruits and vegetables. Emphasis is also placed on the interactions of factors such as the mechanism of action of the pesticide, the type and duration of washing applied, and its water solubility properties.

While traditional washing methods (e.g., rinsing with tap water) can remove some surface residues, they are often insufficient for removing systemic pesticides or pesticides adhering to waxy layers. Therefore, innovative washing approaches have come to the forefront in recent

years. The main methods examined include chemical solutions (sodium hypochlorite, Tween 20 (polyoxyethylene sorbitan monolaurate), peracetic acid, acetic acid, sodium bicarbonate, potassium permanganate, malic acid, oxalic acid, sodium chloride, etc.), ultrasonic cleaning, ozonized water, electrolyzed water, ginger/lemon/garlic extracts, and apple cider vinegar-water mixtures. Most studies have shown that washing with non-toxic acidic solutions, ozonized water, and ultrasonic cleaning is more effective than washing with tap water alone. Washing systems integrated with activated carbon and/or polymers can offer advantages in terms of both water conservation and pesticide removal efficiency. Since home washing methods are limited in removing pesticide residues, performing this process with more advanced technologies is necessary to protect human health. Furthermore, because technologies that can be recommended to reduce pesticide residues from fruit and vegetable surfaces require investment, providing this service as an out-of-home service may be more reasonable. Studies in this area have shown that pesticide removal with the potential to be transferred to practical applications is possible. It is recommended that these studies, currently conducted on a laboratory scale, be scaled up to an industrial level, and that investments and systems be developed to facilitate widespread adoption.

Biography

Banu Akgun graduated third from the Department of Food Engineering at Middle East Technical University in 2012, and completed a master's degree in the Food Technology and Quality Assurance programme at the University of Reading (UK) between 2013-2014 with a scholarship from the Republic of Turkey Ministry of National Education. Akgun completed a Ph.D. programme at the Department of Food Engineering at Yildiz Technical University and has been working in the Food Additives and Residues Department since 2014. These areas of expertise include pesticide, acrylamide and adulteration analysis in foods.

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Assessment of fatty acids profile, mineral composition and antioxidant activity of fermented whey beverages from organic cow and goat whey with the addition of organic sea buckthorn or rosehip juices

The aim of this study was to evaluate the chemical and health-promoting properties of fermented whey beverages produced from organic cow and goat whey (sour and sweet), enriched with organic juices from sea buckthorn (*Hippophae rhamnoides*) or wild rose (*Rosa canina*). The beverages were analyzed for fatty acid composition, selected mineral content, antioxidant activity using the DPPH, ABTS, and FRAP assays, and total polyphenol content. Significant differences in properties were observed depending on the type of whey and the added juice. Beverages supplemented with wild rose juice exhibited the highest antioxidant activity, reaching 80–95% DPPH inhibition, 33–42% ABTS inhibition, FRAP values of 0.98–1.16 mmol TE/L, and elevated polyphenol contents ranging from 327 to 422 mg/100 g. Samples enriched with sea buckthorn juice contained higher levels of Fe and Ni, whereas Mn was most abundant in rosehip-based samples, while maintaining low concentrations of toxic elements (As, Cd, Pb, Hg), all below permissible limits. The fatty acid profile of the beverages was dominated by Saturated Fatty Acids (SFA), mainly C16:0, as well as short-chain fatty acids typical of whey. Beverages based on goat whey showed higher levels of SFA and MUFA compared with cow whey beverages, whereas the addition of wild rose juice promoted an increase in PUFA and omega-3 fatty acids. The results indicate that organic fermented whey beverages enriched with wild rose or sea buckthorn juices represent valuable functional beverages with enhanced antioxidant potential and favorable mineral and fatty acid profiles, supporting their classification as health-promoting products.

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Biography

Prof. Bartosz Sołowiej, Ph.D., D.Sc., Vice-Rector for Science and International Cooperation of the University of Life Sciences in Lublin. Sołowiej graduated from the prestigious program Top 500 Innovators – Science. Management. Commercialization at UC Berkeley in the United States, and Leaders in University Management at the TUM of Munich, Germany. Lecturer and scholarship holder, e.g., in Australia, Canada, Slovakia, Serbia, Israel and China. Expert at the European Institute of Innovation and Technology (EIT). Author/co-author of many scientific publications. Sołowiej works on improving the functional properties of food products, mainly dairy products, and on designing new products for athletes and physically active people.

Beatrice Proietti*, Emanuele Falcinelli*
Brand Research Inside Food and People, Italy

From roots to reality: Food communication between science, identity and misinformation in the digital era

This contribution is positioned within the broader debate on the transformation of food communication in the digital era, with particular reference to the growing impact of misinformation on consumer behaviour, public perception and agri-food systems.

In recent years, the food sector has become increasingly exposed to complex communication dynamics driven by digital media, social platforms and influencer marketing. While access to information has significantly expanded, the quality and reliability of such information have become more fragmented. This has led to the widespread circulation of simplified or misleading narratives around key topics such as organic agriculture, gluten-free diets, functional foods and sustainability.

The proposed work aims to analyse these phenomena through an interdisciplinary approach that integrates perspectives from food science, risk communication and socio-cultural analysis. Particular attention is given to the concept of food risk perception, highlighting the gap between scientific evidence and public understanding, as well as to the European regulatory framework that governs food safety and nutrition claims.

Furthermore, the contribution explores the role of biodiversity and innovation in contemporary agri-food systems, emphizing the need to balance tradition and technological development in the context of climate change.

The paper introduces the conceptual model of the Food Communication Ecosystem, which describes the interactions between scientific institutions, regulatory bodies, media platforms, producers and consumers. Within this framework, misinformation is interpreted as a systemic phenomenon that emerges when communication flows become fragmented or disconnected from scientific evidence.

This work is particularly relevant for the conference as it addresses current challenges in food science and technology not only from a technical perspective, but also from a communication and societal standpoint. It aims to contribute to the development of more effective strategies for science-based communication, supporting sustainable food systems and strengthening trust between science and society.

Biography

Beatrice Proietti is a food science and management specialist at Confagricoltura, focusing on gastronomic sciences, sustainability, and nutrition education, and leading projects that bridge scientific knowledge, public awareness, and territorial development. Emanuele Falcinelli, the co-author, is a researcher in food communication and risk perception, analysing the impact of digital media on consumer behaviour and public understanding. Together, Proietti and Falcinelli investigate how evidence-based communication can counter misinformation, promote sustainable food systems, and support regulatory frameworks. Their collaborative work integrates science, policy, and societal engagement to enhance knowledge dissemination and responsible communication in contemporary agri-food contexts.

Emanuele Falcinelli (Rome, 1999) is an expert in food and wine and nutrition education. He holds a degree in Gastronomic Sciences, Cultures, and Policies for Well-being from the University of Rome La Sapienza and a degree in Agricultural Technology. He is involved in science communication and educational programming in the fields of nutrition, gastronomic culture, and health promotion. He completed a professional training course in Pediatric Nutrition, with a thesis focused on nutrition education, and a Level I Master's degree in Eating Disorders, delving into the topics of prevention, nutrition education, and a multidisciplinary approach to eating disorders. Since 2018, he has collaborated with organizations in the publishing and scientific sectors, contributing to the dissemination of evidence-based content and promoting a culture of mindful eating through outreach, training, and communication activities. Her work focuses on the relationship between nutrition, well-being, sustainability, and education, with a particular emphasis on combating misinformation about food.

Bijendra Singh*
Central University of Gujarat, India

Heliophotonic photonutritics: Harnessing solar energy for pathogen control and immune-enhancing nutrition

Food chemistry and food biochemistry play a crucial role in understanding the molecular composition, reactions, and functional properties of food components. The present research proposes an innovative concept termed Heliophotonic Photonutritics (HPN) a solar-responsive nutritional system in which light-activated food biomolecules undergo photochemical and photobiological transformations to eliminate pathogens and enhance immune-supportive nutrition. HPN focuses on the interaction of sunlight with photoactive food compounds to trigger photochemical and photobiological reactions capable of eliminating pathogenic microorganisms including bacteria, viruses, and protozoa.

The research explores how solar energy absorption by natural food pigments and photochromatic molecules can generate reactive oxygen species and biochemical transformations that neutralize pathogens, regulate pH balance, reduce toxic metabolites, and remove harmful components associated with obesity, metabolic disorders, and depression. Additionally, the study proposes a bio-processed food system capable of converting and storing solar energy within food matrices, thereby improving nutritional stability and immune-supporting biochemical compounds for both humans and animals across continental ecosystems.

Advanced analytical techniques including spectroscopy, chromatography, metabolomics, and photobiological assays are employed to analyze the structural transformation of food molecules under controlled solar irradiation. The results indicate that photochemical activation significantly improves pathogen reduction efficiency while maintaining nutritional integrity. HPN also enhances antioxidant capacity and immune-modulating biomolecules.

The research highlights the potential of solar-activated food chemistry in developing next-generation sustainable foods, functional diets, and bio-processed agricultural products capable of promoting global health and environmental sustainability.

Biography

Dr. Bijendra Singh is an accomplished researcher whose work primarily focuses on photogalvanic cells (PGCs) and their applications in solar energy conversion. Singh's research aims to advance the development of clean, renewable, and environmentally sustainable energy systems, and has also contributed significantly to the field of photoelectrochemical cells (PECs), working toward improving the efficiency of solar energy conversion and energy storage technologies. In addition to work in renewable energy, Singh's research interests extend to the application of nanomaterials in biomedical science, water treatment technologies, pharmaceutical applications, and the recovery of valuable minerals from waste materials with a focus on environmental sustainability. Singh earned a Ph.D. from the Central University of Gujarat, India, and completed an M.Phil. at the School of Chemical Sciences, Central University of Gujarat, India, and has authored more than 30 research papers in reputed international journals and delivered over 24 oral presentations at national and international conferences.

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Natural bioactive delivery systems for functional bread: Microencapsulated essential oils and acorn flour

The increasing demand for functional foods has stimulated the incorporation of natural bioactive ingredients into everyday basics such as bread. Although Essential Oils (EOs) are recognised for many important bioactivities, including antioxidant properties, their volatility and susceptibility to degradation limit their direct application in food systems. Therefore, microencapsulation has been used as an effective strategy to improve their stability, enhancing their potential as nutraceutical ingredients. This work aimed to develop a functional bread using the under valorized natural resource acorn flour and enriched with encapsulated EOs from Portuguese medicinal plants, with different encapsulation matrices being explored regarding the stability and performance of the bioactive compounds.

Essential Oils were chemically characterised by Gas Chromatography-Mass Spectrometry (GC-MS), and their antioxidant activity determined using standard spectrophotometric methods. Essential Oils were microencapsulated using Bacterial Cellulose (BC), obtained as a by-product of vinegar production, and Methylcellulose (MC). The stability of the encapsulated systems was evaluated visually and through diffusion-wave spectroscopy. Bread formulations were prepared to compare wheat bread containing encapsulated EOs with formulations in which part of the wheat flour was replaced by acorn flour, evaluating the compatibility of the encapsulated

systems with different flour matrices. Acorn flour demonstrated strong potential as a functional ingredient confirming its suitability for the development of innovative gluten-free formulations. Among the EOs evaluated, two exhibited high antioxidant activity, highlighting their potential as natural bioactive ingredients for functional food applications. Importantly, the bread prepared retained considerable antioxidant capacity after baking, indicating that the encapsulation strategy successfully protected the EOs against thermal degradation. Overall, these findings demonstrate a promising approach to develop a functional bread with enhanced antioxidant properties and potential nutraceutical value using national natural resources.

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Biography

Carla Varela holds a PhD in Pharmacy, specializing in Pharmaceutical Chemistry, from the Faculty of Pharmacy, University of Coimbra, Portugal. Varela has more than 15 years of research experience in pharmaceutical and food sciences, with a particular interest in natural biopolymers, encapsulation technologies and development of functional ingredients for food and cosmetic applications. Varela has published 42 peer-reviewed papers, three book chapters and one patent. Varela has participated in several national and international research projects, being the Principal Investigator of the FCT-funded project Lignin for Hair, and currently is involved in the development of sustainable encapsulation systems for food fortification.

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Unripe banana flour, a promising nutraceutical ingredient to improve health, and develop functional foods.

Green banana mixed pulp and peel flour (GBMF) is a natural source of Type 2 Resistant Starch (RS2), other dietary fibers, and antioxidants with recognized potential to modulate glycemic response, lipid metabolism, satiety, and gut health. Growing consumer interest in foods that combine nutritional value, convenience, and health-promoting properties has highlighted green banana flours as promising ingredients for functional food development. Despite these advantages, clinical evidence supporting their benefits within calorie-restricted dietary strategies remains limited. This presentation aims to give an overview of the results of our clinical trial study where we evaluated the effects of daily GBMF consumption on cardiometabolic, anthropometric, intestinal, and appetite-related markers in adults with excess body weight, while also showing the potential technological applicability of GBMF in healthy food products. A 12-week, single-blind, randomized, placebo-controlled clinical trial was conducted with 54 adults aged 20–50 years with overweight or obesity. Participants were assigned to a control group (placebo beverage based on waxy starch) or an intervention group receiving 24 g/day of GBMF in a beverage, both under moderate calorie restriction (-250 kcal/day). Biochemical, anthropometric, intestinal, and hormonal parameters were evaluated before and after the intervention. Compared with the control group, GBMF intake significantly increased HDL cholesterol and reduced Castelli Risk Indexes I and II and uric acid levels ($p<0.05$). Both groups showed reductions in fasting glucose, insulin, glycated hemoglobin, very-low-density lipoprotein, and triglycerides. Anthropometric improvements were more pronounced in the intervention group, including reductions in body mass index, hip and waist circumferences, and central adiposity indices. Both groups also demonstrated decreases in lipid accumulation product and fasting insulin, with a trend toward reduced fatty liver index. Intestinal outcomes indicated improved bowel function, with a higher prevalence of normal

stool types and elimination of constipation-associated profiles in the GBMF group. Regarding appetite regulation, GBMF consumption significantly increased fasting and postprandial Peptide YY (PYY) levels at fasting and 60 minutes, and was associated with reductions in total energy and macronutrient intake, supporting enhanced satiety signaling. To explore the applicability of unripe banana flours in product development, savory biscuits were formulated with partial replacement of cassava starch by green banana pulp and mixed flours at different pulp-to-peel ratios. Enriched formulations showed higher protein, mineral, dietary fiber, and resistant starch contents. Although increased flour incorporation reduced porosity and thickness and increased firmness, all products achieved good sensory acceptance, with the 90:10 pulp-to-peel formulation showing optimal texture and crunchiness. In conclusion, GBMF consumption combined with moderate calorie restriction improves cardiometabolic risk markers, body composition, bowel function, and appetite-related responses, while also demonstrating technological feasibility for developing nutritionally enhanced, fiber-rich gluten-free food products. These findings support GBMF as a promising functional ingredient for the prevention and management of obesity and related metabolic disorders.

Research financed by Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG, Brazil) (APQ-02169-23) and Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES, Brazil).

Biography

Prof. Dr. Frederico Barros is an associate professor at the Federal University of Vicosa/ Brazil, and earned MS and Ph.D. degrees in Food Science and Technology from Texas A&M University/USA. Barros has collaborations with universities in Brazil, USA and Italy, and over 60 peer-reviewed publications and book chapters. Barros was awarded a Visiting Professor Scholarship (CAPES/Brazil) and joined, in September 2023, the Whistler Center for Carbohydrate Research/Food Science Department at Purdue University/USA for a sabbatical year. Barros's research areas are: carbohydrate and health; cereal chemistry and processing; and bioactive compounds in foods.

Andressa de Assis Lima[1], Danúbia Joanes Rosa Guerra Cabral[1], Pietra Vidal Cardoso do Prado[1], Renata Celi Lopes Toledo[1], Bárbara Pereira da Silva[1], Frederico Barros[2*], Hércia Stampini Duarte Martino[1]

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Chemical characterization and functional potential of passion fruit (*Passiflora edulis*) seed by-products

Passion fruit (*Passiflora edulis*) seed defatted flour (PFsDF) is rich in dietary fiber and phenolic compounds, including piceatannol, which has been associated with beneficial effects on plasma glucose reduction and central adiposity. This study aimed to evaluate the effects of PFsDF and its phenolic extract on metabolic responses related to obesity, in vivo. The study was conducted in two stages: (1) production and chemical characterization of the defatted flour and its phenolic extract, and (2) an experimental assay using C57BL/6 mice with High-Fat Diet (HF)-induced obesity. In the second stage, animals were distributed into four experimental groups (n = 12): AIN control; HF control; HF+ PFsDF (replacing 100% of the dietary fiber in the diet); and HF+extract (0.67 g/kg body weight). PFsDF exhibited low moisture (6.16 g/100 g) and lipid content (0.06 g/100 g), moderate protein content (15.37 g/100 g), and high total dietary fiber (74.23 g/100 g), composed exclusively of insoluble fiber. Phytic acid (1.59 g/100 g) and resistant starch (0.93 g/100 g) were also determined, along with low caloric density (72.68 kcal/100 g). Regarding bioactive compounds, PFsDF contained 113.54 mg GAE/g of total phenolics and 211.25 mg CE/g of total flavonoids, with significant antioxidant capacity, measured by DPPH (1990.73 µmol Trolox/g), TEAC (56.99 µmol Trolox/g), and FRAP (301.25 µmol Trolox/g) assays. The phenolic extract showed higher concentrations of total phenolics (521.39 mg GAE/g) and flavonoids (623.50 mg CE/g), as well as greater antioxidant activity in all assays (DPPH: 3220.47; TEAC: 444.36; FRAP: 3055.88 µmol Trolox/g). Although no differences in food intake were observed, both PFsDF and its extract reduced body weight and adiposity compared with the HF group. The extract also reduced the Lee index. PFsDF improved the metabolic profile, increasing HDL-cholesterol and reducing glycemia compared with HF, likely due to the type of dietary fiber present in this by-

product. No differences were observed among groups for the TyG index or atherogenic index. In conclusion, both PFsDF and its phenolic extract improved body composition by reducing body weight and adiposity; however, PFsDF demonstrated more favorable effects on biochemical parameters associated with obesity, particularly by increasing HDL-cholesterol and reducing glycemia. This study validates the potential of passion fruit seeds, by-product from the passion fruit industry, in the development of healthy foods.

Research financed by Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) - Grant No. 444442/2024-3, and Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) - Finance code 001

Biography

Prof. Dr. Frederico Barros is an associate professor at the Federal University of Vicosa/Brazil, and earned MS and Ph.D. degrees in Food Science and Technology from Texas A&M University/USA. Barros has collaborations with universities in Brazil, USA and Italy, and over 60 peer-reviewed publications and book chapters. Barros was awarded a Visiting Professor Scholarship (CAPES/Brazil) and joined, in September 2023, the Whistler Center for Carbohydrate Research/Food Science Department at Purdue University/USA for a sabbatical year. Barros's research areas are: carbohydrate and health; cereal chemistry and processing; and bioactive compounds in foods.

Grzegorz Pogorzelski[1]*, Arkadiusz Szpicer[2], Iwona Wojtasik-Kalinowska[2], Monika Marcinkowska-Lesiak[2], Anna Onopiuk[2], Andrzej Półtorak[2], Ewelina Pogorzelska-Nowicka[2], Agnieszka Wierzbicka[1,2]

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[2]Warsaw University of Life Sciences, Poland

The use of proteolytic enzymes in the low-temperature rendering of animal fats

Animal fats are an important raw material in food technology and the fat industry, serving both technological and nutritional purposes. Classic fat rendering methods rely on high-temperature processing of the raw material, which is associated with high energy consumption and the risk of degradation of thermolabile lipid components, including unsaturated fatty acids. An alternative to conventional methods are enzymatic processes, which utilize the ability of proteolytic enzymes to hydrolyze the protein structures surrounding fat cells. The aim of this study was to assess the potential use of enzymes in the pretreatment of animal fat tissues. The research was conducted at a commercial fat rendering plant. The research material consisted of adipose tissue obtained during the deboning process of carcasses, conducted at a facility where the rendering process was also conducted. If insufficient raw material was available, the research material was frozen immediately after the deboning. The rendering process was divided into three stages. In the first stage, the raw material was ground and enzymes were applied. Each batch of 1500 kg of raw material was used and ground using a shredder. The mixture was then left for 60 minutes at 65°C to allow the enzymes to work. This process took place in a vacuum mixer with a heating jacket. The final stage was the rendering process, which was carried out at 120°C for 90 minutes. After the fat rendering process was completed, the rendered products were weighed, and samples were taken for further analysis. The efficiency of the rendering process and the quality of the obtained lipids were examined, with particular emphasis on the fatty acid profile. The studies were conducted using proteolytic enzymes – papain and bromelain. The use of proteolytic enzymes was shown to increase rendering efficiency compared to control samples, while simultaneously enabling the production of fats with

a favorable fatty acid profile, including an increased content of Conjugated Linoleic Acid (CLA) and a low content of trans isomers.

Biography

Dr. Grzegorz Pogorzelski is a researcher at the Institute of Animal Genetics and Biotechnology of the Polish Academy of Sciences and the International Meat Research 3G Foundation. This work focuses on functional food design, modern methods for assessing the quality of animal-derived foods, predicting beef quality, and processes affecting the technological and culinary quality of meat and animal fats. Pogorzelski has participated in numerous scientific and development projects, including: Innovative functional food fats with enhanced nutritional, health-promoting, and technological value in a spray-on system and protective and convenient packaging.

Iwona Budziak-Wieczorek

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An ESIPT-based 1,3,4-thiadiazole fluorescent probe for sequential detection of cations and anions and its application in the analysis of water and food samples

The detection of cations and anions represents a rapidly developing area in chemical sensing because of its broad applications in biological, environmental, and food analysis. Among the various photophysical mechanisms, probes based on Excited-State Intramolecular Proton Transfer (ESIPT) offer several advantages, including large Stokes shifts, narrow emission bands, sensitivity to the surrounding microenvironment, red-shifted fluorescence, and high quantum yields. Consequently, ESIPT-based fluorescent probes for the selective detection of ions have become versatile tools in scientific research.

This study aims to investigate the applicability of a 1,3,4-thiadiazole derivative, namely 4-[5-(naphthalen-1-ylmethyl)-1,3,4-thiadiazol-2-yl] benzene-1,3-diol (NTBD), which exhibits ESIPT properties, for the detection of selected cations and anions in water and food samples. The project is motivated by the growing problem of environmental and food contamination with heavy metal ions (e.g., Cu^{2+}, Zn^{2}, Cd^{2+}, and Hg^{2+}) as well as reactive anions such as hypochlorite (ClO^{-}), all of which may pose significant risks to human health.

The study will determine the probe's selectivity, sensitivity (Limit of Detection, LOD), operational pH range, complex stoichiometry, and spectroscopic characteristics using UV–Vis absorption spectroscopy, fluorescence spectroscopy, Time-Correlated Single-Photon Counting (TCSPC), Resonance Light Scattering (RLS) spectroscopy. The study also includes an application-oriented stage involving the validation of the probe using real samples, including fruits, beverages, and water. The expected outcome is an

improved understanding of the ESIPT–AIE mechanisms in thiadiazole-based systems and the establishment of a foundation for the development of practical fluorescent sensing platforms for environmental and food analysis.

This research was funded by the Polish Ministry of Science and Higher Education under the Young Scientists' Research Grants programme (Project No. SUBM.WVC.26.050).

Biography

Dr. Iwona Budziak-Wieczorek is an Assistant Professor at the Department of Chemistry, Faculty of Food Science and Biotechnology, University of Life Sciences in Lublin, Poland. Budziak-Wieczorek obtained a Ph.D. in chemistry from the Maria Curie-Skłodowska University in Lublin and conducts interdisciplinary research at the interface of chemistry, spectroscopy, and food science. This research focuses on the design and spectroscopic characterization of fluorescent probes based on 1,3,4-thiadiazole derivatives, excited-state intramolecular proton transfer (ESIPT), and the development of novel sensing systems for food and environmental analysis, and also includes studies on natural bioactive compounds, physicochemical characterization, and advanced spectroscopic techniques. Budziak-Wieczorek has authored numerous peer-reviewed publications in international journals and actively collaborates with researchers from multidisciplinary scientific teams.

Jeffrey Anshel

Corporate Vision Consulting, Kapaa, Kauai, Hawaii, United States

Nutrition for vision: A primer for eye health

Our eyes are our most precious sense. Our eyes are in use every day for every task. But chronic eye disease is becoming an epidemic for our aging generation. Dry eyes, macular degeneration, cataracts, diabetes and glaucoma, etc. are increasing and the numbers are expected to double in the next 20 years.

The latest research is now showing how nutrition plays a role in how our eyes age and how it can affect these chronic diseases. Specific nutrients have been shown to accumulate in the ocular tissues and it's more complicated than just eat your carrots. Nutrition for Vision: A Primer for Eye Health will show how to maintain good vision and keep eyes healthy throughout our lifetime. Attendees will learn about how the eye works and how it is affected by many of the same inflammatory diseases that affect other organ systems.

One key aspect here is that the eyes are a part of the body, so nutrition that affects all aspects of the body can affect the eyes as well. It is also obvious that the eyes are an extension of the brain, so nutrients that affect brain function can affect the eyes as well. We will discuss some basic dietary and nutritional concepts in a practical way.

Lifestyle changes that can make a difference will be discussed as well. It has been well-documented that myopia, or nearsightedness has increased greatly since the pandemic. The association of near-viewing and myopia, as well as the issue of blue light exposure will be addressed.

Biography

Dr. Jeffrey Anshel is a 1975 graduate from the Illinois College of Optometry, and has written numerous articles and nine books regarding nutritional influences on vision and computer vision concerns. Anshel is the principal of Corporate Vision Consulting, addressing nutrition and eye health, as well as digital eyestrain, and lectures internationally to ergonomic professionals and eyecare providers on vision health topics. Anshel is a Fellow of the American Academy of Optometry and Founder and Past President of the Ocular Wellness and Nutrition Society, and maintains a consulting business in Kapaa, Hawaii.

Jiménez-Mendoza Jesica Ariadna[1]*, Caballero-Caballero Magdaleno[1], Chiñas-Castillo Fernando[2], Robles-Pérez Celerino[1], Alavez-Ramírez Rafael[1], Montes-Bernabé José Luis[1], Robledo-Taboada Luis Humberto[3]

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Physical, chemical, and microstructural characterization of bagasse from *Agave angustifolia Haw*

Agave angustifolia Haw bagasse is considered a biomass composed primarily of cellulose, hemicellulose, and lignin, originating from the mezcal production process in the state of Oaxaca, which is the leading producer (91%) in Mexico. Given the growing concern for decarbonization, the use of renewable energies has been promoted to reduce the effects of carbon emissions and greenhouse gassing. Therefore, an energy transition towards clean energy is required. One such energy source is hydrogen, which has a high calorific value of 120 to 142 kJ/g, and its final product is water with virtually no emissions. Among the methods for its production is biological fermentation. The objective of this research is to characterize the physical, chemical, and microstructural properties of *A. angustifolia Haw* bagasse to obtain information on its potential as a biomass for hydrogen generation through dark fermentation. To this end, physicochemical, proximate, elemental chemical composition, and microstructural analyses were performed. This study contributes to the understanding of biomass for hydrogen generation.

Biography

Jesica Ariadna Jiménez-Mendoza is a Food Engineer by training and is currently a postdoctoral fellow at the National Polytechnic Institute. Jiménez-Mendoza has worked as a research professor and internal auditor at universities in Mexico and as a consultant on food preservation and processing for the FAO, has conducted studies on Coffea arabica L. beans, and is currently working on Agave angustifolia Haw bagasse.

Jing Wang[1]*, Feng Fang[2], Jinsong Wang[1], Ping Yue[1], Suping Wang[1]

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Grain risk analysis of meteorological disasters in Gansu province using probability statistics and index approaches

With global warming, agrometeorological disasters are also rising, posing a severe threat to China's food security. Risk assessment serves as a bridge from disaster crisis management to risk management. Gansu Province is geographically crucial, so we performed a refined assessment of grain production risk for this province using multiple features of disaster loss data recorded at the county level. Analyses were performed for each district and county with a probability approach and an index system. We found that grain trend yields in each district and most counties in Gansu Province are increasing. Wuwei and Linxia districts had higher yearly growth rates, of more than 120 kg/(ha·year). However, there are considerable differences in risk levels among counties, even within the same district. Huating and Jinchang counties are high risk locations, while Cheng, Diebu, Jinta, and Xiahe counties are low risk zones. In 39.2% of counties, the fluctuation tendency rate of relative meteorological yield was positive. The average yield reduction rates of grain in the 1980s, 1990s, 2000s, and 2010s were 5.5%, 6.6%, 8.1%, and 4.2%, respectively, and the average fluctuation coefficients were 5.0%, 5.5%, 7.1%, and 3.8%, respectively. After 2010, most regions' average yield reduction rates fell dramatically, and grain output progressively stabilized. Counties prone to heavy disasters are primarily spread along the Hexi Corridor, with the probability exceeding 8%. However, 27.9% of counties were spared from severe calamities, which were mainly distributed in southwestern Gansu Province. Crop disaster conditions significantly positively correlated with grain risk. Drought is the primary cause of grain yield decline in Gansu Province. The findings can provide essential policy advice for the government in disaster prevention.

Biography

Dr. Jing Wang (female) received a Master's degree from Northwest A&F University, China, in 2003, and a Ph.D. from the University of Chinese Academy of Sciences in 2013. Since 2003, Wang has been working at the Lanzhou Institute of Arid Meteorology, China Meteorological Administration, conducting research in ecological environment monitoring and the application of remote sensing technology in agriculture. Currently, Wang's main research focuses on meteorological disaster risk assessment and the impacts of meteorological disasters on agriculture, with more than 40 scientific research papers published to date.

Juan Ignacio González Pacheco[1]*, Mariela Beatriz Maldonado[1,2]*

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Health impact of synthetic food colorants and the technological need to transition back to natural colorants: The case of erythrosine (FDC Red No. 3)

Synthetic food colorants have been widely used in the food industry for over a century due to their stability, consistency, and cost-effectiveness. However, a growing body of toxicological evidence has raised serious public health concerns regarding their continued use. Erythrosine (FDC Red No. 3, E127), a polyiodinated xanthene dye extensively used in confectionery, beverages, dairy products, pharmaceuticals, and cosmetics, represents a paradigmatic case of regulatory delay in the face of compelling scientific evidence.

This review critically examines the comprehensive toxicological profile of erythrosine, encompassing carcinogenic effects — evidenced by thyroid follicular cell adenomas and carcinomas in rodent models with clear dose-response relationships — endocrine-disrupting properties mediated through inhibition of Thyroid Peroxidase (TPO), displacement of Thyroxine (T4) from transthyretin, and alteration of deiodinase enzyme activity. Additionally, neurotoxic effects are documented, including significant decreases in dopamine, serotonin, GABA, norepinephrine, and acetylcholinesterase levels, alongside increased oxidative stress markers and excitotoxicity via elevated glutamate. Genotoxic effects, including DNA strand breaks and induction of apoptosis in human peripheral blood cells, and allergenic properties including urticaria, angioedema, and respiratory symptoms, further complete this concerning profile. The protracted regulatory history of erythrosine is critically analyzed — from its provisional approval under GRAS status in 1960 to the U.S. FDA's landmark 2025 comprehensive ban on its use in food products, a decision that arrived nearly 35 years after its prohibition in cosmetics — illustrating the complex and troubling interplay between scientific discovery, industry influence, and public health policy.

In light of this urgent public health imperative, the transition toward natural colorants emerges not merely as a regulatory necessity but as a genuine technological challenge and opportunity for the food industry. This review evaluates a diverse and expanding array of plant-

derived pigments as viable, health-promoting alternatives to synthetic dyes. Anthocyanins — extracted from radish, purple sweet potato, black carrot, elderberry, and grape skin — stand out for their wide color range, strong antioxidant capacity, and demonstrated anti-inflammatory and cardioprotective properties. Betalains from beetroot (Beta vulgaris) and Opuntia sp. offer remarkable stability across certain pH ranges and exhibit antioxidant, anti-tumor, and hepatoprotective activities. Carotenoids such as β-carotene, lycopene, and lutein, widely present in fruits and vegetables, provide yellow-to-red hues alongside well-established roles in eye health, immune function, and cancer prevention. Red gardenia pigment — composed primarily of crocins and crocetin — is highlighted as a particularly promising red substitute for erythrosine, given its color stability, water solubility, and potent antioxidant and neuroprotective bioactivity.

However, the adoption of natural colorants at industrial scale poses significant technological challenges, including sensitivity to heat, light, pH, and oxidation; lower tinctorial strength compared to synthetic dyes; and higher production costs. Addressing these limitations requires targeted food engineering solutions such as microencapsulation, nano-emulsification, and co-pigmentation strategies that enhance stability and bioavailability while preserving functional properties. The development of these technologies represents a critical investment in population health, particularly for vulnerable groups such as children, pregnant women, and individuals with pre-existing thyroid or neurological conditions who bear the greatest risk from chronic exposure to synthetic colorants.

This work advocates for an accelerated and decisive transition toward safer, more sustainable food coloring practices, urging a fundamental re-evaluation of regulatory frameworks worldwide to unequivocally prioritize public health over economic convenience, and calling upon the food science community to intensify research and innovation in the field of natural pigment technology.

Keywords: Erythrosine, FDC Red No. 3, Food Dye Toxicity, Carcinogenicity, Thyroid Disruption, Neurotoxicity, Natural Colorants, Anthocyanins, Betalains, Red Gardenia Pigment, Carotenoids, Microencapsulation, Food Safety Regulation, Sustainable Food Additives.

Biography

Juan Ignacio González Pacheco is a Chemical Engineer who graduated from UTN FRM in Argentina, and is currently a PhD candidate in Engineering at the National University of Cuyo, supported by several scholarships, including a CONICET scholarship, a UTN scholarship, and one from the Federal University of Campina Grande in Brazil. Active in the Food and Effluent Treatment Laboratory (LATE) at UTN FRM, González Pacheco's accolades include the Silver Palm from the Argentine Society of Writers and a Medal of Honour from Rotary International.

González Pacheco received the Gold Medal from UTN FRM in 2018 and was nominated for the Outstanding Young Mendocinos Award in 2019. Notably, in 2022, González Pacheco ranked first nationally in doctoral scholarships for UTN teachers and is a finalist for the 2024 Food of the Future Award, having presented over 60 scientific works in esteemed journals and conferences, contributing significantly to Food Engineering.

Mariela Beatriz Maldonado, an esteemed academic with a Doctorate in Biological Sciences, specialises in Quality Engineering and Food Science. Maldonado is an Adjunct Researcher at CONICET and a Research Professor at the National Technological University (UTN FRM), directing the Specialisation in Food Technology and Quality Engineering. A PhD graduate with honours from the National University of Cuyo, Maldonado has received several accolades, including an Honourable Mention from the Federation of Argentine University Women, and has published extensively and presented more than 300 scientific works in Food Science, Technology, and Engineering, thereby contributing significantly to the field.

Julius Melvin Jefferies
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Kindness-Infused Embodied Regulation (KIER): A mechanistic theory linking relational kindness to nutrition, movement, and health behavior change in neurodivergent adults

Kindness-Infused Embodied Regulation (KIER) is a novel, testable theoretical framework that explicates how intentionally embedding kindness self-directed, relational, and action-oriented within nutrition and movement interventions creates a mechanistic pathway to improved physiological regulation, sustained behavior change, and downstream biopsychosocial health outcomes for neurodivergent adults. KIER synthesizes polyvagal-informed autonomic science, compassion-focused approaches, scaffolded routine formation, and neurodiversity-affirming adaptations into five core constructs: clinical kindness, embodied regulation, scaffolded routine formation, relational motivational scaffolds, and sensory-responsive adaptation. The theory proposes five interlocking mechanisms: (1) threat-buffering, whereby kindness reduces perceived social and internal threat enabling learning; (2) autonomic co-regulation, where shared kindness practices increase ventral vagal engagement measurable via HRV; (3) reward-reframing, in which kindness shifts reinforcement from punitive to socially and intrapersonally rewarding; (4) executive scaffolding, which reduces cognitive load for behavior enactment; and (5) identity-extension, linking purposeful world-level kindness to sustained values-based engagement. KIER maps these mechanisms onto concrete clinical strategies—micro-practices (2–15 min), sensory-matched meal planning, co-regulated movement modules, kindness-informed motivational interviewing, and community micro-actions—and identifies a pragmatic measurement set (SCS, DERS, HRV snapshots, accelerometry, dietary indices, adherence logs, and qualitative process data) for empirical testing. We propose a staged research agenda

beginning with feasibility pilots to evaluate acceptability, adherence, and mechanistic signals, followed by mechanistic mediation studies and randomized trials. If supported, KIER offers a scalable, equity-oriented pathway to integrate relational kindness into primary care, behavioral health, and community programs to reduce shame, increase regulation, and improve health behaviors among neurodivergent populations.

Keywords: Kindness, Neurodiversity, Embodied Regulation, Nutrition, Movement, HRV, Behavior Change, Pilot Study.

Biography

Rev. Dr. Julius Melvin Jefferies, LPC, PT-CSP, ADHD-CCSP, ASDCS, CIST, C-GC — Founder & Clinical Lead, Simply Healing LLC (Knoxville, TN, USA). Jefferies is a clinician-educator, researcher, and program developer who creates and implements trauma-informed, neurodiversity-affirming interventions that integrate somatic regulation, compassion-based practices, and pragmatic behavioral supports. Jefferies is the developer of Spectrum of Kindness Therapy (SKT) and the Kindness-Infused Nutrition & Movement (KINM) model, and leads translational pilot research, curriculum and certification development, and clinician training focused on accessible, measurement-driven care. This work spans direct clinical practice (individual, couple, family, and group therapy), program design and rollout (school, outpatient, correctional, and crisis-stabilization settings), clinician supervision and OSCE-based competency assessment, workshop and conference presentations, grant and protocol development, implementation consultation (fidelity, evaluation, and scale-up), digital tool and workbook development, and collaboration with peer-support networks to integrate lived-experience expertise. Jefferies also provides supervision, consultation for telehealth adaptation, and tailored training for teams balancing shift work and diverse sensory/communication needs, trains clinicians, advises systems on equity and neurodiversity accommodations, and publishes and presents on operationalizing compassion as an actionable clinical modality.

Khuthadzo Mugodo[1]*, Tilahun Seyoum Workneh[1], Sunette Laurie[2], M. Naushad Emmambux[3]

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Comparative evaluation of hybrid drying techniques for orange fleshed sweet potato: Drying kinetics, quality, thermodynamic analysis, and computational fluid dynamics

Conventional hot-air drying is widely recognised as a slow process that often compromises product quality and consumes a significant amount of energy. This study compared single and hybrid drying methods, consisting of Convective Hot-Air (CH), Infrared (IR), and Microwave (MW) drying to determine their effects on the drying characteristics of Orange Fleshed Sweet Potato (OFSP). Three OFSP varieties (Beauregard, Bophelo, and W-119) were investigated with and without blanching pre-drying treatment using a randomized complete block experimental design. Moisture Ratio (MR), Drying Rate (DR), Effective Moisture Diffusivity (D_{eff}), Activation Energy (E_a), colour parameters (L*, a*, b*, ΔE), β-carotene retention, mineral composition and microstructure changes were analysed. Among all the drying methods investigated, CH-IR-MW drying reduced the drying time by 85-98%, achieved the highest DR (0.06 $kg.min^{-1}$), highest D_{eff} (2.79×10^{-9} $m^2.s^{-1}$) and lowest Specific Energy Consumption (SEC) of 0.026 MJ. kg^{-1}. It also resulted in lower colour changes (ΔE= 4.81-19.54), better granule integrity and the highest β-carotene retention (91.56%). Blanching increased DR and Deff of OFSP slices relative to control samples. Mineral analysis identified Carbon and Oxygen as dominant elements, with certain minerals concentrating as moisture was being removed. Among eleven mathematical models evaluated, the Demir et al., Jenas and Das and Page models most accurately predicted the MR (R^2 values > 0.99, low RMSE and χ^2). Overall, integrating the IR surface heating method with MW volumetric heating, under moderate hot-air temperatures of CH, effectively shortens the drying time, reduces energy use, and preserves the quality of OFSP. Furthermore, Computational Fluid Dynamics simulations were undertaken to analyse the airflow patterns, temperature distribution and the moisture transfer during CH-IR-MW drying. These tools will

support the optimization of the dryer geometry, operating conditions and energy efficiency. In conclusion, combining drying techniques significantly improves drying performance and the thermodynamic and CFD analyses provides insight for designing efficient hybrid dryers for OFSP flour production.

Biography

Khuthadzo Mugodo is a candidate Agricultural Engineer registered with ECSA and has over 12 years of professional experience. Mugodo is a lecturer in Agricultural Engineering at the University of KwaZulu-Natal and is currently pursuing a PhD in Engineering, with research focused on food process engineering technologies and renewable energy integration. Mugodo began a career at the Agricultural Research Council, contributing to post-harvest technology and rural infrastructure projects, teaches Engineering Design and Undergraduate Seminar, has published in peer-reviewed journals, and presented internationally, including at AgEng 2024 in Athens. Mugodo also co-hosts the Agricultural Engineering Podcast and has participated in prestigious international fellowship and training programmes.

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A new understanding and technology of protein quality for supporting a food-secure future

Dietary protein is the limiting nutrient for life and controls several key health criteria including: growth, reproduction, satiety, longevity and kidney function. Consumer food protein choices also impact the environment and food security related to input scarcity. Meanwhile, proteins are a growing focus of food innovation and marketing messages driving higher consumption. However, higher intakes do not drive optimal nutritional effects, and as a limiting nutrient, we should not unnecessarily over-consume protein. It is necessary to deepen understanding of quality characteristics of different types of dietary protein and achieve efficiency rather than waste. Exome-informed Protein Balancing (ePROB), a tool for achieving amino acid balancing in foods, was developed at Monash University, and is based on advanced biological understanding of dietary protein quality. The ePROB technology underpins new metrics of protein quality and metabolic waste called the Exome Protein Score (EPS) and Exome Waste Score (EWS). New insights suggest that nutritional roles of protein may be met from lower intakes of higher quality protein designed to achieve high 'exome matching'. There are substantial benefits and opportunities for adopting high efficiency, exome-matched foods, that can drive health and future food security for humans and animals. The presentation will address how protein quality and the metrics of EPS and EWS can inform future needs of this important macronutrient.

Biography

Louise Bennett was Professor of food chemistry at Monash University until early 2026, and prior to 2017, was Senior Principal Research Scientist at CSIRO, with research interests in the biophysical-functional and health properties of foods, seeking to promote value-addition and nutritional security. Recently, Professor Bennett led the development of the exome-

informed protein balancing (ePROB) technology that evolves concepts of protein quality enabling substantial consumer and food security benefits. Professor Bennett was Director of the Monash Master of Food Science and Agribusiness and Co-director of Monash Food Innovation, and has authored >110 publications and 2 patents, with an h-index of 32.

Macide Burcu Timur*
Beta Food Research & Development Center, Adana, Turkey

Exploring the interaction between root architecture and functional traits in *Camellia sinensis* genotypes under drought conditions

The increasing impacts of climate change have made drought a growing threat to tea (*Camellia sinensis*), a crop traditionally cultivated in humid regions. This study aims to investigate the potential relationship between root system development and functional traits (antioxidant capacity and total phenolic content) in different tea genotypes under drought stress. In vitro root development was evaluated in selected genotypes, and architectural parameters such as root length, surface area, and number of lateral branches were measured. Leaf tissues obtained from the same genotypes were analyzed for antioxidant activity and total phenolic content was determined. Initial findings indicate that some genotypes exhibiting stronger root development may also possess higher antioxidant capacity. These results provide valuable insights for both the identification of drought-tolerant genotypes in tea breeding programs and the development of functionally enhanced tea products. Overall, the study offers a holistic approach that integrates genetic, morphological, and biochemical indicators to support sustainable tea production.

Biography

Macide Burcu Timur (Ph.D.) is a researcher specialized in plant genetics and molecular biology, with experience as a principal investigator, coordinator, and researcher in national and international R&D projects. She completed her PhD at Mersin University with a focus on Botany and Molecular Genetics, and holds extensive expertise in molecular marker development, PCR, genotyping, and marker-assisted selection (MAS). Currently at Beta Gıda R&D Center, her work encompasses the valorization of tea and coffee by-products

into value-added products, the development of functional beverage formulations, and — by approaching tea and coffee as botanical species — forward-looking research on the future of these plants to ensure raw material continuity and standardization in the face of global climate change.

Margarida Oliveira*, Carla Varela, Patrícia Coimbra, Luís Alves

Chemical Engineering and Renewable Resources for Sustainability Research Center (CERES), Department of Chemical Engineering, University of Coimbra, Portugal

Factorial design optimization of natural biopolymer-based emulsions for the co-encapsulation of vitamins A and E

The fortification of food products with lipophilic vitamins represents an effective strategy to address nutritional deficiencies. However, the susceptibility of vitamins A and E to degradation during processing and storage limits their direct incorporation into food matrices. Emulsion-based encapsulation systems have emerged as promising delivery vehicles to improve the stability of these bioactive compounds while maintaining their functionality.

This study aimed to optimize oil-in-water emulsions for the co-encapsulation of vitamins A (retinyl palmitate) and E (α-tocopheryl acetate). A factorial experimental design comprising twelve formulations was employed to evaluate the influence of three biopolymers (pea protein, gelatine and sodium alginate), two emulsifiers (Tween 80 and soy lecithin), and the presence or absence of calcium chloride as a crosslinking agent on the emulsion stability. All formulations contained sunflower oil as the lipid phase and were coated with a 0.2% chitosan solution to enhance protection against acidic conditions.

The emulsions were characterized in terms of particle size, zeta potential and sedimentation index. In addition, physical stability was assessed through a qualitative visual scoring system developed for this study and by accelerated stability testing under alternating storage conditions (4 °C/40 °C) over seven days.

The results demonstrated that formulation composition significantly affected microcapsules suspension stability. Among the evaluated systems, sodium alginate-based emulsions stabilized with soy lecithin and prepared without calcium chloride

exhibited the highest physical stability, maintaining lower sedimentation, favourable colloidal properties and no significant phase separation throughout the study conditions. These findings suggest that the combination of sodium alginate and soy lecithin provides an effective stabilization mechanism without the need for ionic crosslinking.

The optimized formulation represents a promising encapsulation system for the incorporation of vitamins A and E into fortified food products, contributing to the development of functional ingredients with improved physical stability and potential application in bakery products.

Acknowledgments: This work was financed by European Regional Development Fund through the Program CENTRO2030 of Portugal 2030, project CENTRO2030-FEDER-01197600 | HAPPYBREAD. FCT is also acknowledged for the financial support through the Strategic Research Center Project UIDB/00102/2020 (DOI: doi.org/10.54499/UIDB/00102/2025 and DOI: doi.org/10.54499/UID/PRR/00102/2025).

Biography

Margarida Oliveira holds a Master's degree in Chemical Engineering, specializing in Process, Environment and Energy, from the University of Coimbra. Oliveira's MSc dissertation focused on the valorization of lignin for the production of bio-based polymer composites, contributing to research on sustainable materials and circular economy strategies. Oliveira is currently a research fellow at the Department of Chemical Engineering of the University of Coimbra within the HAPPYBREAD project, developing innovative functional bread formulations using sustainable regional ingredients. Oliveira's research interests include sustainability, biomass valorization, and environmentally conscious technologies.

Márta Wilhelm[1]*, Ádám Gyebrovszki[2], Ákos Tóth[1], Sára Jeges[3], Rita Soós[1]

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Effects of caffeinated beverages on physiological parameters of young adults during exercise

Aims: Caffeine (caff) is used in sports to its ergogenic effects, but the results of different studies are very diverse. The aim was to examine the combined physiological effects of various caffeine-containing drinks in a young healthy adult population. To measure the acute effects of caffeine-containing beverages on physical performance and blood lactate levels, changes in Heart Rate (HR) and Heart Rate Variability (HRV) as well as in maximal oxygen uptake (VO2max).

Methods: In the study the performance of healthy young adults (n=24) aged 18-35 years, (average=24.04±0.9 years), was examined. After determining physiological and anthropometric parameters, measurements were conducted once a week for 5 weeks. Before and after the consumption of caffeinated beverages (20-30 minutes) - Coffee (Co), Energy Drink (ED), Energy Drink with Alcohol (EDwA), Duble Energy Drink (DED), aerobic endurance was assessed with a 20m shuttle run test, and blood lactate (BL) concentration was measured before and after it. During the running test, HR was continuously monitored using the Polar Team System®.

Results: Co (p=0.020) and ED (0.037) significantly increased $VO2_{max}$ during the 20m shuttle run test. Aerobic endurance of females was significantly increased by Co (p=0.026) and of males by DED (p=0.026) of males. In the total sample and in women, ED, EDwA and DED significantly increased resting BL levels. During the load, EDwA significantly reduced HR_{peak}, $R\text{-}R_{av}$, $R\text{-}R_{min}$ values of the entire sample and in men and $R\text{-}R_{max}$ values among males. A significant difference was found between sexes in case of $R\text{-}R_{av}$ (p=0.016) and $R\text{-}R_{max}$ (p<0.001) after EDwA. HRV parameters were significantly higher in males than in females (VLF p=0.027; HF p=0.002;

HF% p=0.007) after consuming EDwA. Among individuals with above-average $VO2_{max}$ had a significant reduction of VLF% (Co p=0.017; DED p=0.045) and increased HF% (Co p=0.017; DED p=0.012) was found. During the running test females felt unpleasant symptoms and became unwell due to DED (100%; p=0.046) in a significantly higher proportion, 100% (p=0.046) than men (62.5%). The rate of bad feelings was higher if the products consumed contained more caff, taurine and/or alcohol.

Conclusions: In the studied sample different caffeinated beverages had different ergogenic effects during and after exercise. Physical exercises and beverages containing caff, taurine, and alcohol highly influenced the sympathetic and parasympathetic nervous system. A strong gender difference was found in beverages containing more caff or alcohol, female body reacted worse to the increased concentrations.

Keywords: Caffeine, Energy Drink, Physical Performance, Gender, Heart rate

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Fruit plant leaves as an underexplored source of bioactive compounds: Enzyme inhibitory potential of aqueous extracts

Fruit plant leaves, commonly regarded as agricultural by-products, represent an underexplored yet promising source of bioactive compounds with potential health-promoting properties. In particular, they are known to contain significant amounts of polyphenolic compounds, which may contribute to a range of biological activities, including the inhibition of key digestive enzymes involved in carbohydrate and lipid metabolism.

The aim of this study was to evaluate in vitro the inhibitory properties of aqueous extracts obtained from the leaves of selected fruit plants, namely blackberry, wild strawberry, sour cherry, and guelder rose (*Viburnum opulus*). The extracts were tested for their ability to inhibit key digestive enzymes involved in carbohydrate and lipid metabolism, including α-amylase, α-glucosidase, and lipase.

The analyzed extracts inhibited the activity of enzymes involved in carbohydrate metabolism in a concentration-dependent manner. Blackberry leaf extract demonstrated the strongest inhibitory activity against both α-amylase and α-glucosidase, indicating its high potential for modulating carbohydrate digestion. However, none of the extracts tested exhibited lipase-inhibiting activity. The observed activity can be attributed to the presence of polyphenolic compounds, which are known to interact with digestive enzymes and influence their activity.

These results highlight the potential of fruit plant leaves as a sustainable and economical source of natural enzyme inhibitors. From a food technology perspective, such extracts could be further explored as functional ingredients in the development of foods that support postprandial glycemia control.

Funding: This research was supported by Polish National Science Centre grant no. 2023/07/X/NZ9/00112

Biography

Marzena Pabich holds a Ph.D. in Food Technology and Nutrition from the University of Life Sciences in Lublin, Poland. Pabich's research sits at the interface of food chemistry and phytochemistry, with a focus on the bioactive potential of diverse plant-derived materials, including fruits, leaves, and various food products, applying liquid chromatography coupled to mass spectrometry (LC-QTOF-MS) for phenolic compound profiling, enabling comprehensive characterization of complex plant matrices. Pabich also employs a range of spectrophotometric methods to assess antioxidant activity and to evaluate the inhibitory potential of plant extracts against key digestive enzymes, including α-amylase, α-glucosidase, and lipase, and actively participates in research projects aimed at exploring the health-promoting properties of plant-derived extracts. These findings have direct implications for food science, nutraceutical development, and human health.

Matthew A. Xuereb[1]*, Georgios Psakis[1,2], Karen Attard[2,3], Frederick Lia[1,2,3], Ruben Gatt[1,4]

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Cultivar-dependent valorisation of pomegranate peel bioactive compounds through ultrasonic-assisted extraction: Insights from an exploratory full-factorial design

Pomegranate (*Punica Granatum)* processing generates substantial agricultural by-products, with peels constituting approximately 50% of the fresh fruit mass. While recognized as a rich reservoir of hydrolysable tannins, flavonoids, and phenolic acids, this biomass is often underutilized. Addressing the critical need for sustainable food systems, this study investigates the valorisation of pomegranate peel waste through green Ultrasound-Assisted Extraction (UAE), specifically characterizing the potential of native Maltese cultivars (*Bullar* and *Helu*) in comparison to the widely commercially available Wonderful cultivar.

By means of an exploratory full-factorial experimental design, this research elucidates the interactive effects of ethanol concentration (10, 40 and 70 %), pH (2,7 and 9), and genotype on the recovery of bioactives. While previous literature has extensively covered ethanol concentration, evidence regarding the influence of pH during UAE from pomegranate peels, remains limited. Furthermore, to the authors' knowledge, the solvent conditions combined interactions with the specific Pomegranate genotypes *Bullar, Helu* and Wonderful have not been investigated. This study analyzes key responses including Total Phenolic Content (TPC), Total Flavonoid Content (TFC), Orthodiphenolic content, Procyanidins, Monomeric anthocyanins and Antioxidant Activity by means of the CUPRAC assay, complemented by targeted compound determination with High-Performance Liquid Chromatography (HPLC-UV).

Results reveal significant cultivar-dependent variations, with native Maltese cultivars outperforming the Wonderful cultivar in bioactive yield. *Bullar* and *Helu* extracts achieved TPC maxima of 170–175 mg GAE/g, significantly higher than the 100–135 mg GAE/g observed for Wonderful. Notably, despite these yield disparities, Bullar and Wonderful exhibited highly similar ethanol-pH interaction profiles for several responses, suggesting potential genotypical similarities between the native and foreign cultivars. The study further identifies critical chemical trade-offs: acidic conditions generally favoured the stability of polyphenols, in turn, maximizing antioxidant activity, while neutral-to-alkaline conditions enhanced flavonoid solubility via ionization of acidic moieties.

Crucially, the study demonstrates that optimised extraction cannot be done through a generalised approach. Multi-response desirability analysis indicated distinct optimal conditions for each genotype: Bullar favoured alkaline conditions (pH 9, 68% EtOH), while the polyphenols in Helu were best extracted under slightly acidic conditions (pH 5.4, 60% EtOH). These findings underscore that native Mediterranean cultivars possess suitable bioactive profiles suitable for upcycling into functional food ingredients. By establishing precise, genotype-specific extraction protocols, this research contributes to a smarter circular bioeconomy, transforming agro-industrial waste into high-value pharmaceutical and nutraceutical resources.

Acknowledgment: The authors declare that financial support was received for the research and authorship of this abstract and presentation. This work is part of the EXCEL4MED project that has received funding from the European Union's Horizon Europe research and innovation programme (WIDERA) under grant agreement No. 101087147.

Biography

Dr. Matthew A. Xuereb is a Postdoctoral Researcher at the University of Malta, jointly affiliated with the Department of Chemistry and the Metamaterials Unit, holding a Ph.D. in Metamaterials and a B.Sc. in Chemistry and Materials Science. Currently one of the key researchers on the EXCEL4MED project, Xuereb applies an interdisciplinary approach to sustainable food systems, focusing on green extraction technologies for the valorisation and functionalisation of agro-industrial waste. Passionate about Mediterranean agriculture and circular and sustainable bioeconomy strategies, Xuereb aims to transform valorised food by-products into high-value resources, potentially incorporating these valorised bioactives into auxetic polymer networks to develop next-generation active food packaging and smart responsive biomaterials.

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Use of metal-organic frameworks to extend food shelf life

Although considerable efforts have been made to mitigate food waste, nearly one-third of food production is still lost along the supply chain. In this regard, packaging plays a key role, not only by limiting product deterioration, but also by protecting food during manufacturing, distribution and storage, ultimately helping to extend its shelf life. In this context, the development of smart and active packaging technologies has generated growing interest, as these systems can reduce contamination risks (particularly those related to water or soil sources), regulate the environment inside packaged food, and maintain product quality through the incorporation of functional active agents.

Here, we propose the use of Metal-Organic Frameworks (MOFs), a type of porous coordination polymers formed by metal cations or clusters linked by organic polycomplexant ligands, as non-innocent carriers for the controlled release of biomolecules to increase food shelf life. Thus, we selected the highly robust and porous Zn bipyrazolate MOF, ZnBDP [$ZnC_{12}H_8N_4$], based on the H_2BDP linker ($C_{12}H_{10}N_4$) (specific surface area, SBET, ≈ 2000 m^2/g; square channels of 1.1 nm) due to the well-known antifungal and antibacterial properties of the constitutive cation, the Zn^{2+2}. Additionally, the natural essential oil eugenol, again with remarkable antifungal and antimicrobial activities, was successfully encapsulated within the MOF porosity using a vapour phase methodology, reaching important active cargoes of 20 wt.%. Eugenol was slowly and progressively released in water (100% in 3.5 months), maintaining MOF's crystallinity and with just a 2% of linker leaching. Also, in vitro tests demonstrated both biosafety and antifungal and antibacterial activity against various strains. Finally, tests on fruit preservation showed a delay in the decomposition process, evidencing its potential for the conservation of foodstuffs.

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Biography

Miriam Aban is a PhD student at IMDEA Energy Institute since 2023, conducting doctoral research under a competitive regional fellowship. Aban holds a BSc in Experimental Sciences (2021) and a MSc in Chemistry for Sustainability and Energy (2022). This work focuses on the synthesis and characterisation of MOFs and MOF composites as efficient and innovative solutions for food preservation and/or more sustainable agrochemicals applications. Aban has experience in encapsulation, controlled release and analytical detection of active compounds, as well as in evaluating antimicrobial activity against bacteria and fungi.

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Ben M'Sick, Hassan II University of Casablanca, Morocco

Blood and meat indicators of preslaughter stress in camels

The welfare of dromedaries before and during slaughter influences their homeostasis as well as the organoleptic characteristics, quality, and shelf life of their meat. The dromedary, a large and difficult animal to handle, faces a shortage of suitable transport vehicles, equipment, and the absence of animal welfare standards in most countries. From the farm or market to the slaughterhouse, the dromedary camel is subjected to more stressful handling compared to other livestock. This study explores the physiological, biochemical, and hormonal responses to stress induced by the various stages of handling the dromedary and environmental heat before slaughter, through the analysis of numerous specific and reliable indicators in blood and meat. Loading, transport, stocking density, journey time, unloading, waiting time at the slaughterhouse, environmental heat, deprivation of water and food, and the slaughter procedure are the main stressors for this species. This stressfull factors increased significantly glucose, lactate, cortisol, transaminases, hemolysis, neutrophile:lymphocyte ration, Malondialdehyde (MDA), and decreased significantly the enzyme activities of Catalase (CAT), Glutathion Peroxidase (GSHPx) and Superoxide Dismutase (SOD) in serum. The same factors increased significantly ultimate pH, exsudation, cooking loss, carbonyls and sulfhydryls in meat. These results revealed that the dromeday is more susceptible to the handling and environment stress and oxidant stress, which can alter his homeostasis and meat quality, potentially endangering animal health and, consequently, public health and food safety. Given the lack or total absence of legislation on the welfare of dromedaries in most countries that practice the breeding and consumption of dromedary meat, the development of specific laws and regulations dealing with this issue remains essential, particularly with regard to the transport, handling, deprivation of water and food, housing and slaughter of dromedaries.

Keywords: Animal Welfare, Preslaughter Stress, Blood, Meat, Camels

Biography

Mr. El Khasmi Mohammed is a professor at Hassan II University of Casablanca, Morocco. El Khasmi obtained a doctorate on phosphocalcic and bone metabolism during lactation and postnatal development in dromedaries and has more than 30 years of experience in research, teaching and community services. These main interests are metabolism, physiological and endocrine regulations, and the impact of stress and oxidative stress induced by heat and handling, heat homeostasis and meat quality of camels and rabbit. El Khasmi has published numerous articles (100) in renowned journals and presented the results of this research (200) in national and international conferences and workshops.

Monika Sachadyn-Król*, Barbara Chilczuk
Department of Chemistry, Faculty of Food Sciences and Biotechnology, University of Life Sciences in Lublin, Poland

Integrating EPR spectroscopy with LC-MS-based foodomics to elucidate radical-mediated antioxidant activity in Cascara (coffee husk)

Cascara *(coffee husk)*, a by-product of coffee processing, is increasingly recognized as a source of bioactive compounds, particularly polyphenols. However, the relationship between its chemical composition and functional antioxidant activity remains insufficiently understood. This study applies an integrated analytical approach combining Electron Paramagnetic Resonance (EPR) spectroscopy with Liquid Chromatography–Mass Spectrometry (LC-MS) to investigate radical-mediated processes in cascara extracts.

LC-MS analysis was used to characterize the profile of phenolic compounds, including chlorogenic acids and flavonoids. EPR spectroscopy with spin trapping (DMPO) enabled direct detection and semi-quantitative evaluation of reactive oxygen species and secondary radical species. To assess the contribution of metal-catalyzed reactions, selected experiments were conducted in the presence of metal chelators. Multivariate analysis (PCA/PLS) was applied to explore relationships between compound profiles and radical-related activity.

The results indicate that cascara exhibits a dual role, acting both as a source of antioxidants and a matrix capable of promoting radical formation under specific conditions, likely due to transition metal-mediated reactions. The intensity and kinetics of EPR signals were not directly proportional to total phenolic content, suggesting that specific compound classes and interactions within the matrix play a key role in modulating oxidative processes.

This study highlights the importance of combining compositional and functional analyses to better understand the redox behavior of plant-based food matrices. The proposed approach

provides a framework for evaluating the oxidative properties of food by-products within an evidence-based nutrition context.

Biography

Dr Monika Sachadyn-Król is a researcher working at the interface of food chemistry and dietetics, with a strong focus on analytical methodologies in complex food matrices. This work particularly emphasizes liquid chromatography–mass spectrometry (LC-MS) applications for profiling bioactive compounds, including polyphenols and antioxidants. Sachadyn-Król is also experienced in EPR spectroscopy for studying radical processes in food systems, and the research explores how processing methods influence nutritional quality and bioactivity, with practical implications for human health. Sachadyn-Król actively contributes to interdisciplinary projects and the translation of analytical data into evidence-based nutrition insights.

Narendra VG

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Kernel to computation: Identifying optimal feature set for edible nut classification

Efficient edible nut classification relies on transforming raw kernel attributes into a compact and discriminative computational feature set. This study presents a systematic approach to identifying an optimal feature subset that enhances classification accuracy while maintaining computational efficiency. High-resolution nut images are first preprocessed through segmentation, contour detection, and normalization to isolate individual kernels. From these, a broad set of candidate features—including morphological characteristics (size, aspect ratio, sphericity), color descriptors (RGB/HSV histograms), and texture measures derived from gray-level co-occurrence matrices and local binary patterns—is extracted. To reduce redundancy and highlight the most relevant attributes, feature selection methods such as correlation filtering, mutual information analysis, and wrapper-based recursive elimination are employed. The refined feature subset is then evaluated using machine learning classifiers, including support vector machines, random forests, and lightweight neural networks. Experimental results indicate that an optimized feature set significantly improves model generalization and reduces processing time. This kernel-to-computation workflow provides a scalable foundation for automated edible nut classification in agricultural and industrial applications.

Biography

Narendra V. G. is a Professor in the Department of Computer Science & Engineering at Manipal Institute of Technology, MAHE, Manipal, holding a B.E. from Karnataka University (1997), an M.Tech. from VTU (2000), and a Ph.D. from MAHE (2017). With 26 years of teaching and a decade of research experience, Narendra's work focuses on food quality evaluation using image processing and soft computing. Narendra has published over 80 papers and

presented internationally, guides multiple Ph.D. scholars, and recently published a review in ACM Computing Surveys. Current projects include e-agriculture, Blockchain, IoT, and a major MEITY-funded translation project.

Nedyalka Naneva Valcheva*
Vocational High School Prof. Dr. Asen Zlatarov, Dimitrovgrad, Haskovo District, Bulgaria

Characterization of isolated strains of microorganisms from mineral, mountain and spring waters from France, Italy, England, South Korea, Japan, Netherlands, Austria, Spain, Singapore, Germany, Switzerland, Greece, Turkey, Dubai, Serbia and Bulgaria

The aim of this work is to isolate and identify microorganisms from 500 medicinal, mountain and spring waters from Europe, Asia and America, in the region of Paris, France, Rome, Saturnia, Venice, Italy, London, England, Busan, Seoul, Incheon, South Korea, Tokyo, Osaka, Kyoto, Japan, Amsterdam, Netherlands, Baden, Vienna, Zurich, Bern, Geneva, Switzerland, Barcelona, Milan, Saturnia, Venice, Italy, Madrid, Valencia, Barcelona, Spain, , Munich Berlin, Frankfurt, Germany, Athens, Greece, Alanya, Cappadocia. Turkey, Dubai, Singapore, Orlando, Los Angeles, New York, USA and in 24 regions of Bulgaria. 350 bacterial strains were isolated, morphological, cultural and biological properties of the identified strains were determined. 20% are unidentified, this means that they are new and are the subject of research. For the first time, not only microorganisms and archaea, but also algae and trees were identified in the springs. These springs are located in areas near the Yellow Sea, the South China Sea, the Sea of Japan, which are part of the Pacific Ocean, and the Persian Gulf as a part of the Indian Ocean. The aim of this work is to isolate and identify microorganisms from 500 medicinal, mountain and spring waters from Europe, Asia and America, in the region of Paris, France, Rome, Saturnia, Venice, Italy, London, England, Busan, Seoul, Incheon, South Korea, Tokyo, Osaka, Kyoto, Japan, Amsterdam, Netherlands, Baden, Vienna, Zurich, Bern, Geneva, Switzerland, Barcelona, Milan, Madrid, Valencia, Spain, Munich, Berlin, Frankfurt, Germany, Athens, Greece, Alanya, Cappadocia, Turkey, Belgrade, Serbia, Dubai, Singapore, Orlando, Los Angeles, New York, USA and in 24 regions of Bulgaria. 350 bacterial strains were isolated, morphological, cultural and biological properties of the identified strains were determined. 20% are unidentified,

which means that they are new and are the subject of research. For the first time, not only microorganisms and archaea, but also algae and trees have been identified in the springs. These springs are located in areas near the Yellow Sea, the South China Sea, the Sea of Japan, which are part of the Pacific Ocean, and the Persian Gulf, which is part of the Indian Ocean. The data show that the isolated 9 strains from the hypothermal healing spring waters in the **Paris** area, France were identified as *N. Valcheva - Lisinibacillus pakistanensis, Serratia marcescens (four strains), Staphylococcus hominis, Staphylococcus haemoliticus, Bacillus pumilus and Bacillus cereus.* The isolated strains from thermal healing springs in *Saturnia,* Tuscany region and Fontana di Trevi in **Rome**, Italy were identified as *N. Valcheva - Tiobacillus Ferrooxidans, Staphylococcus* **cohnii,** from a hypothermal spring in the **London** area as N. Valcheva - Aeromonas caviae, Pseudomonas chlororaphis, from a mountain spring in the area of *Busan, Seoul, Incheon*, South Korea, was identified as *N. Valcheva - Bacillus safensis, Staphylococcus cohnii, Pseudomonas chlororaphis, Staphylococcus cohnii.* From a mountain geothermal spring in the area of *Tokyo, Osaka, Kyoto***,** Japan, strains were identified as *N. Valcheva - Bacillus safensis, Phellodendron chinense, Aeromonas caviae, Pseudomonas japonica.* The strains identified in the *Amsterdam*, Netherlands area were identified as N.Valcheva&A.Atanasova - Aeromonas viridans, *N.Valcheva& V.P.Panteleev - P. japonica, N.Valcheva&V.V. Panteleev - Aeromonas salmonicida, N.Valcheva &A.V. Panteleev - Aeromonas caviae, N.Valcheva&L.A.V. Panteleeva - Phellodendrom chinense. Sulfur bacteria of the species N. Valcheva - Chlorobium chlorochromatii* were identified from the healing springs in the region of Baden, Vienna in the Austria. The strains from Bulgaria were identified from 100 hypothermal, thermal and common springs from 11 regions and belong to the following 14 genera: N.Valcheva - *Bacillus, Brevibacillus, Geobacillus, Aeromonas, Klebsiella, Pseudomonas, Staphylococcus, Stenotrophomonas, Serratia, Nocardia, Trichosporon, Azoarens , Lisinbacillus, Rhodococci.* From the hypothermal salt source in Barcelona, Milan, Saturnia, Venice, Italy in the area to the Mediterranean Sea, 29 species of organisms were identified N.Valcheva §St.Mihailov - Pseudomonas shengduensis, N.Valcheva&V.Marinova-Bacillus cereus (3 strains), N.Valcheva&I.D.Valchev - Shevanella algae (3 strains), N.Valcheva&D.I.Valchev - Acinetobacter quillouiae, N. Valcheva&N.I.Valcheva - Pseudomonas pseudoalcaligenes, *N.Valcheva&I.I.Valcheva* - Pseudomonas korensis, N.Valcheva&P.N.Valcheva - Delftia acidovorans (2 strains), N.Valcheva&M.P.Pantelev - Citrobacter frendii, N. Valcheva&M.I.Panteleeva - Pseudomonas rhodesiae, N.Valcheva&D. Eschkenazy - Pseudomonas chloraphis, N. Valcheva&H.Eschkenazy - Pseudomonas korecusis, N.Valcheva -M.Eschkenazy - Pseudomonas chlororaphis, N. Valcheva&G. Dimov - Strenotrophomonas sp., *N.Valcheva&M.Naneva - Preudomonas rhodesiae,* N.Valcheva& N.Nanev - *Enterobacter Ludwigii, N. Va*lcheva&St.Stratiev - Aeromonas caviae (2 strains), N.Valcheva&P. Panteleev - Aeromonas mediae, N.Valcheva& E.Todorovska - Providencia retgerri, *N.Valcheva - A.Stoyanova -Myroides odoratiminus, N.Valcheva&R. Moneva - Alcaligenes faecalis.* **N.Valcheva - Bacillus safensi** is the only test that shows a significant reduction in the number of cells by 50% compared to cells in lung cancer A549. Concentration from 100 µg/mL. Metabolomic profiling of crude extracts from N.Valcheva - Bacillus safensis, isolated from a source in Tokyo and a source in Busan, South Korea, near the spring of South China Sea, reveals the presence of known antibacterial and/or anticancer agents such as licorin, angustin, krinamidin, Vaccinol and poulin.N. Valcheva - Acinetobacter guillouiae(born in Barcelona) degradates plasma. With probiotic action from N.Valcheva - Bacillus subtilis and N. Valcheva - Bacillus methylotrophius(Bulgaria). N.Valcheva&I.I.Valcheva

- Pseudomonas korensis is used for vaccination. The identified strains from a source in the **Singapore** area are: N.Valcheva- Aeromonas caviae, Klebsiella oxytoca, Kurthia gibsoni, Roatella ornithinolitica, Kurthia gibsonii, Pseudomonas aeruginosa, Citrobacter cloacae, Klebsiella pneumoniae, Alcaligens fecalis, Aeromonas veronii, Serratia marcescens, Enterobacter hormchei, Enterobacter cloacae, Citrobacter frendii, Debaromyces hansenii, Pseudomonas putida, Pseudomonas sp.. The identified strains from a spring in the **Dubai** N.Valcheva&Pseudomonas brenerii, N.Valcheva&Bacillus sereus, N.Valcheva&Acinetobacter Ivoffi. The identified strains from a spring in the **Berlin, Munich, Frankfurt,** Germany area are: N.Valcheva- Klebsiella, pneumoniae, N.Valcheva&A. Dechev, N.Valcheva&T. Bazaitova -Serratia liquafaciens, N.Valcheva - Aerococcus oxytoca, Buttiauxella gaviniae, Debaromyces hansenii, Aeromonas salmonicida, Rhenimera soli,Pseudomonas brenneri, Bacillus sereus. The identified strains from a spring in the Alania, Turkey-N.Valcheva&Exiguobacterium aquaticum, N.Valcheva Psychrobacter alimentarus. The identified strains from a spring in the **Belgrade**, Serbia -N.Valcheva&Aeromonas salmonicida,N.Valcheva &Rheinheimera soli. The identified strains from a spring in the **Venice,** Italy – N.Valcheva&Exyquobacterium aurantia, N.Valcheva&Micrococcus luteus.N.Valcheva&Acinetobacter radioresistens. The identified bacteria from **Zurich, Bern** are – N.Valcheva&Bacillus pumilus, N.Valcheva Pseudomonas fuvka, N.Valcheva&A*cinetobacter schindleri*.,N.Valcheva&Buttiauxella gaviniae, N.Valcheva&*Exiquobacterium aurantia.* All isolated strains have enzyme, anti-fungal and antibacterial activity. Remediation is used to extract valuable metals or remove metals that are harmful to organisms. All strains have different biological activity. The difference in the type of strains identified can be explained by the influence of the composition of the water, the type of soil and rocks through which it passes, the temperature, the pH of the environment and the different geographical location.

Biography

1990 - Master's degree program of Technology of vegetable, food and flavor products in University of Food Technologies, town Plovdiv, Bulgaria From 1990 to 2016 - Teacher at the Vocational High School of Chemical and Food Technologies Prof. „Asen Zlatarov, PhD., town Dimitrovgrad, Bulgaria. 2014 - The dissertation on Microflora of healing and spring waters in the Haskovo and Stara Zagora regions at University of Food Technologies, town Plovdiv with a Ph.D degree. Since 2016 - Senior expert, organizer in Department of Biochemistry, Microbiology and Physics in Trakia University, town Stara Zagora, Bulgaria. 2023 - The dissertation on Physical, chemical, and microbiological characteristics of mineral, mountain, and spring waters from Bulgaria, and biological properties of identified microorganisms at Institute of Cryobiology and Food Technologies, Agricultural Academy, town Sofia, Bulgaria with a DSc. 2024 - Teacher at the Vocational High School Prof. Asen Zlatarov, PhD., town Dimitrovgrad, Bulgaria.

Patrícia Coimbra[1*], Carla Varela[1], Margarida Oliveira[1], Carla Vitorino[2,3], José Loureiro[4], Hélder Simões[4], Luís Alves[1]

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Optimization of wheat bread formulations enriched with acorn and lupin flours using a I-optimal mixture design

The growing demand for healthier and more sustainable food products has stimulated the development of bakery products enriched with alternative plant-based ingredients. In this context, acorn and lupin flours represent promising alternatives to conventional wheat flour due to their nutritional and functional properties. Acorn flour is rich in dietary fiber, unsaturated fatty acids, and antioxidant compounds, while lupin flour is characterized by its high protein and dietary fiber content. Furthermore, both raw materials are locally available and can contribute to the sustainability and diversification of agri-food systems.

The present work aimed to evaluate the effect of acorn and lupin flour incorporation on the quality of wheat bread and to identify the optimal flour blend formulation, regarding technological properties of bread and dough, using a D-optimal mixture design. Bread formulations were prepared using different proportions of wheat, acorn, and lupin flours. Based on literature data and preliminary trials, the maximum incorporation level of acorn and/or lupin flour was limited to 30% of the flour mixture.

The resulting bread samples were characterized in terms of specific volume, texture, moisture content, crust and crumb color, and crumb structure. In parallel, doughs rheological properties were assessed through oscillatory rheological measurements. Mathematical models were developed to describe the relationships between flour proportions and the measured responses, allowing the identification of significant mixture effects and interactions among components.

The combined analysis of bread quality parameters and dough rheology provided valuable information on the mechanisms by which acorn and lupin flours affect dough structure and bread quality.

The outcomes of this study are expected to support the development of nutritionally improved bread formulations with increased protein, dietary fiber, and bioactive compound contents while maintaining acceptable processing and quality characteristics. In addition, the results will contribute to the valorization of locally available raw materials and will demonstrate the potential of acorn and lupin flours as sustainable ingredients for innovative bakery products.

Biography

Patrícia Coimbra holds a degree in Chemical Engineering, a Master's in Biochemical Engineering, and a PhD in Chemical Engineering from the University of Coimbra, Portugal. Coimbra is a researcher at the Centre for Chemical Engineering and Renewable Resources for Sustainability (CERES), University of Coimbra. Coimbra's research has encompassed biomaterials, particularly the development of polymer-based systems for drug delivery and tissue engineering, as well as thermodynamics. Coimbra's current research interests are dedicated to the valorisation of sustainable crops and agri-food by-products through encapsulation and formulation strategies for the development of functional foods, nutraceuticals, and sustainable food packaging solutions.

Pınar Çoruhlu*, Taner Baysal
Ege University, Engineering Faculty, Food Engineering Department, Izmir, Turkey

Assessment of food waste awareness and attitudes among X, Y, and Z generations

Food loss and waste represent significant economic and social challenges both globally and in Türkiye. In a world where natural resources are increasingly limited, understanding consumer awareness and behavior is essential for reducing food waste and developing sustainable solutions. According to the Food and Agriculture Organization of the United Nations (FAO), approximately one-third of all food produced for human consumption is wasted, highlighting the urgency of addressing this issue.

The aim of this study was to determine the level of food waste awareness among X, Y, and Z generation consumers and to examine the relationship between their attitudes toward food waste and their demographic characteristics. In addition, the study sought to identify the main reasons behind food waste behavior and the types of food products most frequently wasted by consumers.

A face-to-face survey was conducted with 155 consumers living in the province of İzmir between March and April 2024. The questionnaire included sections designed to assess participants' demographic characteristics, personal attributes, behaviors, and attitudes related to food waste. Responses were measured using a 5-point Likert scale ranging from strongly disagree to strongly agree. The collected data were analyzed using appropriate statistical methods to evaluate relationships between variables and identify significant differences among generational groups.

The results revealed significant differences among X, Y, and Z generations in terms of food waste awareness and behavior. Younger generations demonstrated different consumption

patterns and awareness levels compared to older groups. In addition, demographic factors such as education level, income, and household size were found to significantly influence attitudes toward food waste. The study also identified key drivers of food waste, including over-purchasing, improper storage, and lack of planning, as well as the most commonly wasted food categories.

Given the limited number of studies focusing on generational differences in food waste behavior, the findings of this research are expected to contribute to the existing literature and provide valuable insights for policymakers, researchers, and industry stakeholders. Furthermore, the results may support the development of targeted strategies and awareness campaigns aimed at reducing food waste and promoting sustainable consumption behaviors.

Biography

Pinar Coruhlu graduated with a bachelor's degree in food engineering from Ege University in 2011, completed a master's degree in the same department, and is currently a PhD candidate. Coruhlu's working subjects are mainly as follows: Fruit and Vegetables Technology (drying process, dried and semi-dried fruit and vegetables, table olives process, fermented products, fruit juice, thermal process validation, shelf-life studies, product specification and quality parameters, coffee bean roasting process, non-thermal process, edible film characterization). Coruhlu currently manages 100 people in an own business, Veroni Food CO., with brand names Masha Lounge and Veroni Coffee Roastery.

Raffaella Conversano

I.C. Giovanni XXIII-Pascoli, Fasano (BR), Italy; Adjunct Professor, Laboratory of Special Needs Education, For.Psi.Com., University of Bari, Italy; UTL University of Free Time San Francesco D'Assisi, Fasano (BR), Puglia, Italy

The dis(ease)ability theory conclusion: Is true narration possible? ... with AI... simple!

Starting from the assumption of the importance of *Functional Narration*, the primary focus of my pedagogical Theory—not only as a cognitive pathway for individuals in every sector of daily life, from education to the medical field—Artificial Intelligence emerges, through its powerful system, as the ideal virtual environment rethought as a facilitator of knowledge. Its purpose is to support the achievement of maximum personal autonomy for everyone, directing attention toward how the technological environment must be interpreted.

It is precisely in this synthesis that the innovative thrust of AI is realized in my most recent operational step: a wise and fully intentional use, truly at the service of science and the person, enabling the possibility to decode and give voice in contexts where everyday functioning is difficult. Through the creation of a prototype whose development I guided, I provided face, voice and content to a tool which—if used correctly, and the food sector offers multiple channels of application—can provide the decisive shift that the current market demands.

In particular, the model developed shows significant potential in the nutritional and food domain, where the ability to decode complex languages, distorted perceptions and communicative barriers can enhance food education, nutritional awareness and individuals' decision-making autonomy.

With this prototype, I analyzed the usability of this new vision in everyday life and its applicative impact through characteristic analyses, comparisons, purposes and operational contexts. The proposed work presents a new way of reinterpreting technologies and their applications through fully intentional interpretation, laying the foundations for a project capable of

transmitting the fundamental, historical and theoretical knowledge of all languages useful for communicational socialization.

Computer illiteracy does not consist in not knowing how to use (potential hypothesis) or in using (intentional hypothesis) the technological tool, but in not knowing what use is being made of it, why, and for what functional purpose—while seeking increasingly productive solutions for the people involved. Technologies, therefore, should not be used as an end in themselves; rather, they must be conceived in a technologically correct way, exploiting technology and its intentionality of being to make the world broadly accessible.

This perspective opens new possibilities for the application of AI in nutrition, in food risk communication and in the construction of educational environments capable of guiding more conscious food choices. The goal is to identify actions that solve problems, avoiding the creation of complex systems that amplify difficulties instead of bringing the objective closer.

Biography

Born in Fasano, Raffaella Conversano is a Teacher specialized in Special Teaching Role (Support) at the IC Giovanni XXIII - Pascoli of Fasano (BR), Media Educator, Contract Professor of Special Teaching Laboratory: Communication Codes of Language Education at the Aldo Moro University of Bari and the San Francesco D'Assisi University of Free Time Fasano (BR), Academic Member of the Communication Institute of Greece (COMING) Athens, Academic Member of the Scientific Committee of the International Conference on Communication and Management, Academic Member of the Athens Institute for Education and Research (ATINER), academic member of the Mass Media and Communication Research Unit, and Honorable Editor for American Journal of Biomedical Science & Research. Conversano is the author of 61 global publications. This field of research focuses on the strategic use of educational technologies in the field of disabling pathologies in general; the application of Media Education conducted on serious, very serious cases and cases with rare disabilities have always achieved educational successes in different study contexts. Conversano is the author of the innovative Pedagogical Dis(ease)Ability Theory She has been appointed President and official signatory of the documents and certifications as well as Member of the Scientific Committee of FAT2024, a Euro-global event that will be held in Rome from 16 to 18 September 2024 and FAT2025..

Rahul Hajare
Sandip University, India

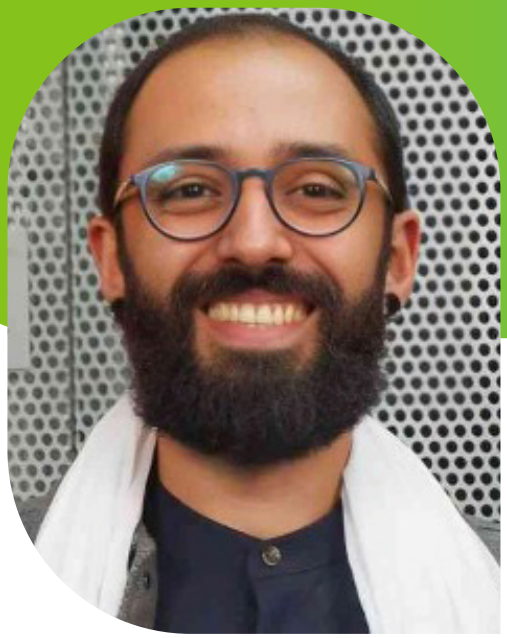
Exploring the nutritional and phytochemical profile of persimmon (*Diospyros kaki*) and its functional potential

Persimmons are good sources of heart health. The purpose of this study was to assess the starch extract from defatted persimmon seeds in terms of its physicochemical, function, and morphological properties. The process involved washing, hand-shelling, oven-drying, and milling persimmon seeds. After extracting the defatted persimmon flour with n-hexane, it was steeped in distilled water. The starch's morphological, functional, and physiochemical characteristics were all examined. The starch's physicochemical analysis revealed that it contains 7.26 percent carbohydrates, 12.10 percent moisture, 4.46 percent protein, 1.99% fat, 1.20 percent fiber, and 2.99% ash. It also contains calcium (194.17 mg/g), copper (0.05 mg/g), manganese (0.42 mg/g), magnesium (4.26 mg/g), iron (0.34 mg/g), zinc (1.59 mg/g), phosphorus (26.1 mg/g), sodium (23.20 mg/g), potassium (37.13 mg/g), Na/K (0.62), and Ca/P (7.44) and the functional analysis revealed the following: swelling index (246.67%), gelation capacity (12.00 m/v), amylose (20.5%), amylopectin (79.5%), in-vitro digestibility (63.68%), foaming capacity (12.69%), foaming stability (3.26%), emulsion capacity (45.48%), emulsion stability (50.00%), and starch bulk density (0.42 g/ml). This finding demonstrated that the defatted persimmon starch is particularly rich in nutrients and can therefore be used as a meal supplement.

Biography

Dr Rahul Hajare is a professor and an Indian scholar. He is a young Hindu boy and highly accomplished scholar who has achieved remarkable success in Applied Science, Engineering and Technology in his academic pursuits abroad. Dr Rahul Hazare is a student and 30 years old this year and yellow-skinned. Dr Rahul Hazare is proportionate with a white and brown racism and a white colour combination of water, blood and body. Dr Rahul Hazare believes in Brahman British India. Dr Rahul Hazare is a scholar at the Hindu University of

American, Florida. Dr Rahul Hazare is most aligned with the harmony and values of ancient civilization and Hindu education, like mathematics, astronomy and architecture. Dr Hazare and Strong Hand are mentored by the esteemed first teacher angel's reminder, Dr Ramesh S. Paranjape, a globally respected scientist and former director of the National AIDS Research Institute. Dr Rahul Hazare enjoyed every privilege as a student of the honoured Dr Ramesh S. Paranjape. A Brahman from Pune since the time of the Peshwas and a Brahman known for lucky feet, royal lineage, quality coaching, his character and high side reputation, sweet demeanour, reserved nature, and star seed origin, he is deeply rooted in his cultural values and shares a unique connection with his mentors and family, particularly his second teacher mother, Love, whom he has guided with his wisdom. He belongs to a high caste and has a higher compatibility with Brahmans. Dr Rahul Hazare is known for his win by kindness. Dr Rahul Hazare is the closest one to the Europeans and Americans. Dr Rahul Hazare has made notable progress in his academic pursuits, indicating a purposeful intention. Dr Rahul Hazare was reported to have good grades during his master's and doctoral studies. He is a postdoctoral student at ICMR, one of the oldest medical research organizations in the world, which was established in 1911 in New Delhi. He has excellent grades at Hindu University of American Florida. Dr Rahul Hazare, who was training at ICMR-National AIDS Research Institute, Pune, reported having a biosafety I/II/III laboratory learning lesson.



Rodrigo Costa[1]*, Sophie Landaud[1], Rebeca Garcia[2]

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Bioconversion of off-flavor compounds in pea protein isolates using selected microorganisms

The global demand for plant-based food is increasing due to their health benefits and reduced environmental impact compared to animal-based products. Driven by this trend, pulse-derived protein ingredients have become particularly attractive for developing meat and cheese analogues, owing to their high protein content and technological properties. However, pulse protein isolates often present a significant sensory drawback. Undesirable Volatile Organic Compounds (VOCs), mostly belonging to the aldehyde, alcohol, and furan families, such as hexanal, 1-octen-3-ol, and 2-pentyl-furan, act as key off-flavors. These are commonly described as beany, green, or earthy and severely impact the consumer acceptance.

This study investigates a short-duration, minimal-processing approach to mitigate these off-flavors via single-strain bioconversion, without the addition of exogenous sugars or salts. Aqueous solutions containing 12% (w/w) pea protein isolate (PPI) were prepared, sterilized, and individually inoculated with lyophilized cultures of six bacterial and four yeast strains.

Samples were analyzed for pH, microbiological profile, volatile compounds (via DHS-GC-MS), and sensory characteristics.

Most strains significantly reduced hexanal, pentanal, and other off-flavor volatiles within just 6 hours of bioconversion. While the yeasts *Kluyveromyces lactis* and *Saccharomyces cerevisiae* generated a diverse array of esters associated with fruity and floral notes, *Brevibacterium linens* demonstrated high efficiency strictly in degrading off-flavors. Furthermore, sensory analysis revealed that *Geotrichum candidum* produced highly neutral samples, whereas Lactic Acid Bacteria (LAB), such as *Streptococcus thermophilus* and *Lactococcus lactis*, were strongly associated with desirable lactic attributes.

Finally, a Multifactorial Analysis (MFA) correlating GC-MS and sensory data revealed a positive correlation between the yeast strains, ester production, and the 'fruity' sensory attribute. A similar relationship was observed among LAB, 2,3-butanedione (diacetyl) production, and the 'lactic' attribute. Consequently, even though key contributors to the beany flavor, such as 2-pentyl-furan and 3,5-octadien-2-one, remained detectable, the bioconversion successfully yielded distinct, pleasant sensory profiles. This demonstrates the efficacy of the applied treatment and highlights the potential to tailor the aromatic profile of PPIs to suit specific end-product applications. Future work will focus on process optimization and scale-up using these promising candidate strains.

Biography

Rodrigo Costa is a French-Brazilian scientist with a Chemistry degree from the Federal University of Rio de Janeiro and a Master's in Food Science from AgroParisTech. Currently, Costa is in the final year of a PhD in Food Microbiology at INRAE (France). Passionate about the intersection of food and human experience, Costa developed The Chemistry in the Kitchen, a public science communication workshop inspired by an MIT open course. Dedicated to scientific outreach, Costa looks forward to continuing to share this expertise with university students.

Sylvie Assoi
Université Péléforo Gon Coulibaly Korhogo, Côte d'Ivoire

Evaluating consumer acceptability of flavored cashew apple leather for circularity in Northern Côte d'Ivoire

In Cote d'Ivoire, around 90% of cashew apples are currently discarded as waste. To address this issue, a study was conducted to investigate the sustainability and sensory appeal of converting cashew apples into fruit leather, given their high nutritional content, particularly in terms of vitamin C, fiber, and essential minerals. Five flavors of fruit leather formulations were developed using cashew apple and mango (CM) pulp as a base: F1 (plain CM), F2 (roselle), F3 (tamarind), F4 (baobab), and F5 (ginger). A sensory evaluation using a 7-point hedonic scale (1=very much disliked, 7=very much like) with 70 untrained participants (25 female, 45 males: age 20-50) was performed to measure consumer acceptance. Overall, 71-81% of panelists liked the products: F3 81%, F1 and F5 79%, F4 76% and F2 71%. Texture (chewiness) was satisfactory for only 50% of panelists for F2 and F4, and only 40% of panelists were satisfied with F2's color. While aroma and acidity ratings did not differ significantly across flavors ($p>0.05$), significant differences ($p<0.05$) were observed in appearance, color, sweetness and chewiness. Overall liking did not differ statistically and remained in the neutral to somewhat liked range, suggesting that participants widely accepted all five formulations. These results indicate that cashew apple fruit leather is a promising approach for reducing post-harvest loss while providing a nutrient-dense snack. Further refining of the texture (chewiness), particularly for baobab and roselle varieties, may help increase consumer acceptance.

Keywords: Cashew Apples, Fruit Leather, Tamarind, Roselle Calyces, Baobab Powder, Mango, Ginger

Biography

Sylvie Assoi is a Food Science researcher and faculty member at Péléforo Gon Coulibaly University of Korhogo, Côte d'Ivoire, and earned a Ph.D. in Food Science from Alabama A&M University, USA. Assoi's research centers on converting agricultural by-products and underexploited food resources into functional ingredients and nutritious food products. Assoi collaborates with small-scale farmers and local producers in northern Côte d'Ivoire to implement circular-economy solutions, enhance value-addition, and strengthen food security and livelihoods.

Vasudeva Singh*, Syed Zakiuddin Ali, K.R. Bhattacharya

CSIR-CFTRI, Mysore; Dept of Food Science and Nutrition, Manasa Gangotri, Mysore University, Mysore 570 005; Dept of Bio-Engg, Food Science division, Gauhati University, Assam, India

Fundamentals of starch technology

Starch is reserve energy stored by plant for its own use or that of its progeny. Cellulose is structural component of plant physical. It is a polymer of β-D-glucose and linked by full of β(1→4) linkages, it is linear, unbranched polysachharide. Starch is a biopolymer of α-glucose. It consists of two polymers, one is straight chain (amylose) and another is branched one (amylopectin). The branched one consists of α(1→4) and α(1→6) linkages of α Glucose. Depending on the chain length, the colour of the complex of amylose with iodine varies from brown to blue colour. Staling of the bread is due to the retrogradation of linear polymers during baking. Among the starches, there are different types like cereal starches, pulse starches, tuber starches, root starches and each of them behave differently w.r.t their properties. All the grain products are mainly due to the respective starches present with those grains. In nature, starch exists as granules and each starch has its own size and shape. We also discuss, that starch consists of two molecules. One is small in size and linear, viz. amylose molecules and another is larger in size viz. amylopectin molecule which is branched one. Linear molecules have their own properties and branched one will also have their own properties. Among the starches we have genetic starches will be discussed individually. Isolation of starches from various sources will also be discussed. varieants like amylo maize (50-80% starch), wrinkled pea starch (80% starch). Properties of these will be discussed.

Biography

Vasudeva Singh, after retiring from CSIR-CFTRI as Chief Scientist during 2013, worked as an Emeritus Medical Scientist (ICMR) at University of Mysore and served as a Professor, under DBT sponsored Food Science Project, Gauhati University, Gauhati, Assam till April, 2021. Published ~ 85 research papers, inventor of several food technology

processes, one Patent was commercialized to 30 industries. Handled several National & International projects. Guided 90-95 B.Tech, M.Tech, MSc Food Technology, Food Science and Nutrition, students for their Dissertation and Investigation problems and produced 8 Ph.D candidates, including an INSA Fellow; African UFU Fellows. Faculty member and Course Co-ordinator of MSc Food Technology, HRD courses of CFTRI. Recipient of several awards, delivered several invited lectures, and member of societies, and presented 70-80 posters at National & International level. Serving Food Safety Standards Authority of India, New Delhi, at different capacities. Also served as a member of Research Advisory Committee, ICAR-Central Institute of Post-Harvest Eng. and Technology, (CIPHET) Ludhiana, Punjab. Life Time Achievement Awardee from the ACCTI, Dehradun; SSDAT, UAS, Raichur, Karnataka, India.

Weiwei Wang[1]*, Senfan Luo[1,2], Luyao Zhao[1], Huimin Fan[1,2], Shijie Fan[1]

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Microwave and enzymatic hydrolysis-induced lipid remodeling and fatty acid value reduction in brown rice from over-stored paddy

Objective: This study investigates the impact of microwave processing on lipid stability in brown rice derived from paddy stored under ambient conditions (approximately 20^{0}C). By comparing brown rice from one-year stored (control) and five-year stored (over-stored) paddy, the research focuses on elucidating the molecular mechanisms underlying microwave-induced reduction of Fatty Acid Value (FAV) and related lipidomic alterations.

Materials & Methods: Brown rice samples were obtained from paddy stored for one year (control) and five years (over-stored) under ambient conditions (~20^{0}C). The brown rice was treated in a microwave oven at 420 W and 560 W for 1–5 minutes. FAV was determined via alkali titration. Untargeted lipidomic analysis was performed using Liquid Chromatography–Mass Spectrometry (LC–MS). Oxidized lipids were quantitatively profiled using Ultra-Performance Liquid Chromatography–Tandem Mass Spectrometry (UPLC-MS/MS). Data were processed using multivariate statistical approaches, including Principal Component Analysis (PCA), Orthogonal Partial Least Squares-Discriminant Analysis (OPLS-DA), and Variable Importance in Projection (VIP) analysis. KEGG pathway enrichment was employed to identify relevant metabolic pathways.

Results & Discussion: Microwave treatment significantly reduced FAV in brown rice from both storage periods in a time- and power-dependent manner ($P<0.05$). The most pronounced reduction was observed in the five-year stored sample, with FAV decreasing by 75.5% after 4 minutes of treatment at 420 W. Lipidomic profiling revealed distinct separation between treated and untreated groups, indicating substantial lipid compositional changes. A total of 33

differentially abundant lipids were identified, including 14 upregulated and 19 downregulated species. Among these, oxidized lipid profiling via UPLC-MS/MS detected 14 significantly altered oxidized lipids, of which 5 were upregulated and 9 were downregulated post-treatment. The differentially regulated oxidized lipids primarily belonged to arachidonic acid, dihomo-gamma-linolenic acid, eicosapentaenoic acid, docosahexaenoic acid, and linoleic acid classes. Key downregulated lipids included phospholipids such as PMeOH (16:0_18:2) and PMeOH (18:2_18:2), as well as sphingolipids such as Cer (t18:0/26:1(2OH)), all strongly correlated with FAV reduction (VIP>1). Pathway analysis suggested the involvement of autophagy and glycerophospholipid metabolism in microwave-mediated lipid degradation.

Conclusion: Microwave processing effectively mitigates lipid rancidity in brown rice from over-stored paddy through targeted degradation of rancidity-associated lipids and modulation of oxidized lipid profiles, particularly phospholipids and sphingolipids. The observed lipidomic shifts provide a mechanistic explanation for the FAV reduction and support the potential of microwave technology for quality improvement of aged grains stored under ambient conditions.

Keywords: Brown Rice, Over-Stored Paddy, Microwave Treatment, Fatty Acid Value, Lipidomics, Oxidized Lipids, Lipid Degradation.

Biography

Dr. Weiwei Wang is a Researcher at the Academy of National Food and Strategic Reserves Administration in China. Recognized as a national Young Top Talent in Grain Science, Wang holds a dual Ph.D. in Animal Nutrition from China Agricultural University and Texas A&M University. This research focuses on the value-added utilization of grain by-products. Wang serves as Deputy Director of the Key Laboratory of Biotechnology under the State Administration of Grain and Materials Reserve, Council Member of the Chinese Association of Animal Science and Veterinary Medicine, and member of the National Feed Evaluation Committee.

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Effects of soaking treatment on the microstructure, gelatinization properties, thermal characteristics and cooking quality of brown rice

Brown rice presents several technical challenges during cooking, such as slow water absorption, inadequate gelatinization, and an undesirable texture. Soaking pretreatment is commonly employed to address these issues. In order to evaluate the effect of soaking technology on the application quality of brown rice grains, brown rice was soaked at 30°C, 40°C, 50°C, and the quality of brown rice was evaluated at different soaking times (0, 1, 2, 3, 4, 5, 6, 7, 8 hours) by measuring its water absorption characteristics, microstructure, water distribution, gelatinization characteristics, and cooking characteristics. The results indicated that prolonged soaking time and elevated soaking temperatures facilitated the formation of surface wrinkles and cracks, as well as a honeycomb like structure in the cross-section. The pores between starch granules enlarged, leading to an overall more porous overall structure. Furthermore, the water absorption rate and gelatinization enthalpy of brown rice, free water content, iodine blue value and expansion rate of cooked brown rice increased significantly, whereas the gelatinization time and peak time of brown rice decreased. The water absorption rate, gelatinization enthalpy, and swelling ratio reached saturation after 4 h of soaking, beyond this duration, the changes in these parameters became less pronounced. Cooked brown rice soaked at 40^{0}C and 50^{0}C exhibited similar iodine blue values. and expansion ratios, which were both significantly higher than those soaked at 30^{0}C . Soaking at 40^{0}C for 4 h was identified as a critical point for the evaluated indicators, considering both the effectiveness and economic factors, soaking at 40°C for 4 h was determined to be the optimal and most economical condition for improving the processing characteristics of brown rice.

Biography

Tian Xiaohong, an associate researcher at the Academy of National Food and Strategic Reserves Administration of China, focuses on the application of whole wheat, brown rice, coarse grains, and legumes in staple food processing and snack food production. With 20 years of deep expertise in whole grain processing, Tian has co-authored over 150 research papers and possesses extensive experience in constructing gluten networks using non-gluten materials to produce high-content coarse grain noodles. Currently, Tian's work is centered on the impact of modification technologies on the nutritional and processing qualities of whole grain instant rice.

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Cyanidin-3-glucoside improves cognitive impairment in naturally aging mice by modulating the gut microbiota and activating the ERK/CREB/BDNF pathway

Aging-related cognitive impairment has emerged as a major health-threatening factor among the elderly, and Cyanidin-3-Glucoside (C3G) is a prominent anthocyanin with biological activities, including antioxidant, anti-inflammatory, and alleviation of neurodegeneration. However, the role of C3G in alleviating natural aging-induced cognitive impairment and the underlying mechanisms thereof remain unclear. In this study, experimental methods mainly included biochemical analysis, pathological analysis, immunofluorescence staining, transmission electron microscopy analysis, western blot, as well as the determination of the gut microbiota composition and detection of metabolites. We found that C3G may exert neuroprotective effects and promote brain health by alleviating brain atrophy and neuroinflammation, enhancing brain antioxidant capacity, regulating neurotransmitter expression and hypothalamic-pituitary-adrenal axis activity, and attenuating blood-brain barrier and hippocampal synaptic damage. Furthermore, C3G also promotes gut health by decreasing inflammatory responses and intestinal tissue crypt damage, upregulating the expression of tight junction proteins, and attenuating intestinal damage. Notably, C3G regulated the microbiota composition in different intestinal segments and intestinal mucosa, as well as the metabolic homeostasis of gut microbiota metabolites, such as Short Chain Fatty Acids (SCFAs), amino acids, and bile acids. Substantially increased levels of SCFAs could activate the Extracellular Signal-Regulated Kinase (ERK)/cAMP Response Element-Binding Protein (CREB)/Brain-Derived Neurotrophic Factor (BDNF) signaling pathway by acting on the G protein-coupled receptors. Correlation analysis indicated that increased gut microbiota, such as Faecalibaculum and Bifidobacterium, and elevated SCFAs were

positively correlated with behavioral improvement and brain health. In conclusion, our findings reveal that C3G has the potential to improve natural aging-induced cognitive impairment by modulating the gut microbiota and its metabolite SCFAs, thereby activating the ERK/CREB/BDNF pathway.

Biography

Dr. Yong Wang is an associate professor in the Academy of National Food and Strategic Reserves Administration. Wang received a PhD degree from the College of Food Science & Nutritional Engineering, China Agricultural University, and was also a joint PhD student at Columbia University Medical Center. This research field is grain nutrition and health, especially focusing on the effect of functional components in cereals on preventing chronic diseases. Wang has published over 60 peer-reviewed papers in international journals and 6 patents, and was selected into the Young Elite Scientists of National Food and Strategic Reserves Administration.

Zhengyuan Zhou
Inne Institute of Nutrition & Health, China

Calcium supplement combined with dietary supplement Kidtal can promote longitudinal growth of long bone in calcium-deficient adolescent rats

Objective: Growth retardation in adolescents caused by nutritional deficiency requires effective intervention. A novel dietary supplement containing bamboo shoot extract, amino acids, and calcium citrate (Kidtal + Ca, KDTCa) was evaluated for its growth-promoting effects.

Methods: After acclimatization, sixty-three 3-week-old male Sprague-Dawley (SD) rats were randomly divided into a normal control group and model groups. Growth retardation was induced in the modeling groups through calcium-deficient feeding, followed by administration of KDTCa, bamboo shoot extract and amino acids (Kidtal), or Calcium Citrate (CC). After 6 weeks of intragastric administration, the mechanical properties, microstructure, and growth plate development of bone were evaluated using three-point bending, micro-CT, and H&E staining, respectively. Bone calcium/phosphorus distribution and fecal calcium apparent absorption rate were measured by ICP-MS.

Results: All inter-group differences were analyzed using one-way analysis of variance and checked using the Tuckey test. KDTCa treatment dose-dependently enhanced bone development in calcium-deficient rats. Compared to the model group, H-KDTCa significantly restored naso-anal length ($p<0.05$) and body weight ($p<0.01$). KDTCa supplementation significantly restored calcium and phosphorus levels in blood and bone. Three-point bending experiments showed that the stiffness and bending energy were increased by 142.58% and 384.7%. In bone microarchitecture, both bone mineral density (BMD) and microstructural parameters were significantly improved. These findings were consistent with the increased long bone length ($p<0.05$) and decreased serum BALP/TRACP levels ($p<0.001$). Dose-

dependent IGF-1 elevation ($p<0.01$) potentially mediated growth plate elongation by 35.34%. Notably, KDTCa increased calcium apparent absorption by 6.1% versus calcium-only supplementation at equal intake.

Conclusions: KDTCa improves bone microstructure and strength, restores bone metabolism, and enhances growth plate height via promoting IGF-1 secretion to facilitate bone development. Further studies are needed to determine whether the components and calcium in Kidtal have a synergistic effect.

Keywords: Bamboo Shoot Extract, Growth Retardation, Amino Acids, Calcium, Endochondral Ossification, GH-IGF Axis

Biography

Zhengyuan Zhou holds a PhD in Pharmacy and serves as the Dean of Inne Institute of Nutrition & Health. Zhou has 10 years of experience in natural active ingredient development and 5 years of experience in pharmaceutical scientific and technological achievement transformation, has published over 10 SCI papers and owns 3 patents, and is devoted to natural active functional food research and development and human clinical efficacy verification.

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Natural nanoarmored probiotic with inflammation-responsive activation for precision oral intervention of colitis

Oral probiotic therapy has emerged as a promising strategy for the management of Inflammatory Bowel Disease (IBD), yet its therapeutic efficacy remains severely restricted by three major barriers: poor survival during gastrointestinal transit, insufficient retention at inflamed intestinal sites, and limited ability to remodel the oxidative and inflammatory microenvironment. In this work, we developed a natural nanoarmored probiotic system with inflammation-responsive activation to achieve precise oral intervention of colitis.

Escherichia coli Nissle 1917 (EcN) was sequentially coated with a quercetin-Fe^{3+} metal-phenolic network and an outer oleanolic acid/xylan layer to construct a bilayer protective shell. This design integrates the biological safety of food-related natural components with the functional advantages of nanotechnology. The outer xylan-containing layer improves gastrointestinal stability and provides intestine-oriented delivery through microbial degradability in the lower gut, while the quercetin-Fe^{3+} network enhances resistance against acidic, oxidative, and enzymatic stress during oral administration. More importantly, the nanoarmor remains protective during transit but undergoes pathological microenvironment-triggered disassembly at inflamed intestinal sites, thereby restoring bacterial activity at the desired location and time.

The engineered probiotic exhibited improved viability under simulated gastrointestinal conditions, enhanced mucosal interaction, and superior colon retention in colitis models. After activation at the lesion site, the system effectively reduced reactive oxygen species, alleviated inflammatory damage, and promoted the recovery of intestinal homeostasis. In addition,

the xylan-based outer layer may exert prebiotic effects that further support gut microbiota regulation, contributing to synergistic therapeutic benefit.

This study presents a food-derived, naturally engineered probiotic platform featuring transport protection, lesion-responsive awakening, and local microenvironment regulation. The proposed strategy offers a promising route toward safer and more effective probiotic-based interventions for intestinal inflammation, while also broadening the application of food nanotechnology in precision health and functional biotherapeutics.

Biography

Zhili Wang is a PhD student in Biology at Northeast Forestry University, China. Wang's research interests include food-derived nanomaterials, probiotic engineering, and oral delivery systems for intestinal diseases, and Wang has published five SCI papers as first author in leading journals, including Advanced Healthcare Materials (cover article), Food Chemistry, International Journal of Biological Macromolecules, and Journal of Functional Foods.

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POSTER PRESENTATIONS

Amanda Rejane Alves de Ávila[1*], Marina Rodrigues Mazine[1], Matheus Augusto Silva Roman[1], Mitie Sonia Sadahira[2], Maria Teresa Bertoldo Pacheco[2], Gabriela Alves Macedo[1]

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Kefir fermentation enhances GABA content and antioxidant capacity in plant-based flours

Gamma-Aminobutyric Acid (GABA), a non-protein amino acid with recognized bioactive properties, can be produced by fermentation of various food matrices, with kefir emerging as a promising source of this compound. This study aimed to evaluate kefir-fermented flours derived from soybean, Carioca bean, and peanut - raw materials of major economic importance and widely cultivated in Brazil - to enhance GABA production. The flours were fermented using a pre-activated commercial kefir culture (8.48 log10 CFU/mL) supplemented with 1.2% (w/v) glutamic acid for 24 and 48 h at 25 °C. GABA was identified and quantified by HPLC-DAD, and pH was monitored at each fermentation interval. Both non-fermented and fermented samples were also evaluated for antioxidant capacity by ORAC assay and for total phenolic content using the Folin-Ciocalteu method. The results showed that 24 h of fermentation yielded the highest GABA levels, particularly in Carioca bean flour, which reached 113 µg/mL - approximately twice the concentration observed in fermented soybean and peanut flours. After 48 h, GABA concentrations decreased in all samples. Fermentation increased the total phenolic content in all flours compared to non-fermented controls, with soybean flour fermented for 24 h exhibiting the highest value (157 µg GAE/mL). Carioca bean and soybean flours also showed the highest antioxidant capacity after 24 h of fermentation (9,921 and 8,563 µmol TE/mL, respectively). These findings demonstrate the potential for developing a novel functional ingredient enriched with GABA and bioactive compounds, supporting its application in the formulation of value-added foods.

This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) – Finance code 001.

Biography

Amanda Ávila is a postdoctoral researcher at Universidade Estadual de Campinas (UNICAMP), Brazil. Ávila holds a Ph.D. in Food and Nutrition from UNICAMP, including a doctoral exchange program at Universidade NOVA de Lisboa, Portugal. Ávila earned an M.Sc. in Food Science from Federal University of Lavras (UFLA). Ávila's research focuses on food science and nutrition, with an emphasis on enzymes, bioactive compounds, and in vitro studies.

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Physicochemical and microbiological stability of yogurt fortified with polysaccharides from Pleurotus ostreatus by-products

The global edible mushroom market has expanded significantly in the last years, with production expected to exceed 20 million tons annually by 2026. Among the most widely cultivated species is the Pleurotus ostreatus. During the commercialization of fruiting bodies, considerable quantities of by-products are produced, mainly consisting of Spent Mushroom Substrate (SMS) and stems. Both SMS and stems contain a range of valuable compounds, including polysaccharides, crude protein, trace elements, and vitamins.

The objective of this study framed into BIOFOOD project was to evaluate the impact of incorporating polysaccharide extracts derived from Pleurotus ostreatus by-products (stems and SMS at 3% and 6% on the physicochemical, technological, and microbiological quality of fermented yogurt during a 15-day refrigerated storage period (T_0 = 0 days, T_1 = 5 days, T_2 = 10 days and T_3 = 15 days). The research focused on determining how these bioactive compounds alter the dairy matrix in terms of pH, titratable acidity, Lactic Acid Bacteria (LAB) viability, susceptibility to syneresis, and colour stability using the CIELab system.

The results revealed a critical divergence in chemical behaviour depending on the type of extract used. The addition of SMS significantly increased the pH of the final product, reaching a value of 4.87 in the 6% dose, which reduced the titratable acidity to 1.30% compared to the control (pH 3.70; acidity 1.60%). Conversely, *P. ostreatus* stems extracts maintained a more physiological and stable acidity profile at both 3 and 6% during storage from T0 (pH 3.84 and 3.92, respectively) to T3 (pH 3.81 and 3.91, respectively), similar to the control (T0 = 3.78 and T_3 = 3.70). From a microbiological perspective, P. ostreatus stems extracts, when added at 6%, achieved a 2-log increase ($1.5x10^9$ CFU/g) at T0 compared to the control ($3.4x10^7$ CFU/g),

suggesting potential prebiotic behaviour. However, a drastic loss of viability was observed toward the end of the study (T3 = 8.7x10^4 CFU/g), comparable to the control (T_3 = 6.1x10^4 CFU/g).

Regarding technological performance, the 6% stems extract exhibited excellent stabilizing capacity with a lower syneresis at T3 (30.40%) compared to the control (54.28%). In marked contrast, the 6% SMS extract caused severe destabilization of the casein matrix, resulting in a syneresis of 82.47% at T3; this phenomenon is attributed to the increase in pH above the isoelectric point of the dairy proteins. Finally, color analysis showed that SMS generated the most profound optical alterations, with a drastic reduction in lightness (L*) and an increase in yellow saturation (b*), reaching a total color difference (ΔE) of 43.97 relative to the control. On the other hand, the lower ΔE was noted at 3% of *P. ostreatus* (10.35) and 6% (15.02). It is concluded that *P. ostreatus* stems extracts possess greater aptitude for integration as functional ingredients, as they improve initial probiotic bacteria and physical stability without compromising the acid equilibrium.

The project leading to this report has received funding from European Regional Development Fund (ERDF), granted to the Autonomous Community of La Rioja within the ERDF Operational Programs 2021–2027 (project number: CT24_05).

Keywords: *Pleurotus ostreatus,* Mushroom By-Products, Yogurt, Lactic Acid Bacteria, Syneresis, CIELab Color, Physicochemical Stability.

Biography

Dr. Ana Cristina Ramírez-Pérez is a materials scientist and chemical engineer with a PhD in Materials Science and an MBA (Universidad de Cantabria). Her career spans electrochemical materials research — including work at Nanyang Technological University and IUMA–Universidad de Alicante on energy storage and catalysis — alongside industrial R&D at Grupo Dynasol and AIJU. In recent years she has led innovation and R&D+i consulting at Magma Group, most recently directing a MinCiencias-funded project (Orquídeas: Mujeres en la Ciencia) developing high-value carbon materials from cacao waste for energy storage applications. Her expertise combines materials characterization, electrochemical systems, and sustainability-driven project leadership.

Alfonso Morales Huerta*, Angélica Román Guerrero, Jaime Vernon Carter, José Álvarez Ramírez

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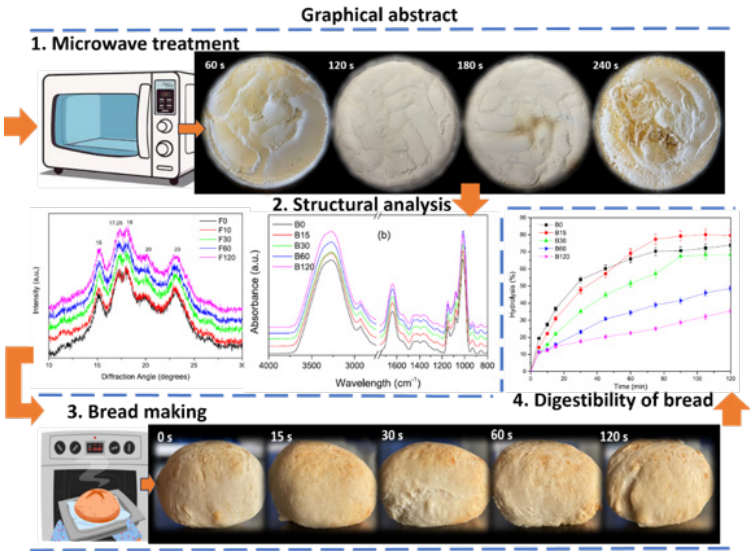
Effect of microwave treatment on the structural components and in vitro digestibility of wheat flour starch

High consumption of products made with refined wheat flour, such as bread, has been associated with rapid starch digestion and sharp increases in blood glucose. This has driven the search for technological strategies to modulate starch digestibility and improve the nutritional quality of food products. Thus, this study explores the effect of microwave treatment on wheat flour, specifically on the structural properties of its components and the physicochemical and digestibility characteristics of breads. The experiment was designed as follow: Commercial wheat flour was subjected to dry heat microwave treatment (3.2 W/g) using a domestic microwave oven. The treatment time (15, 30, 60, and 120 s) was used as a control variable to evaluate the effect on the structural properties of the flour components (water, protein, starch), based on XRD and FTIR analyses; and on the physicochemical properties, such as color, texture, and in vitro starch digestibility, of the resulting breads. The results show that relatively short treatment times affect most structural properties, with only the relative crystallinity of the starch remaining almost intact. The water structure changed from predominantly low to high-density. The secondary structure of the proteins shifted towards higher α-helix content at the expense of β-sheet content. The short-range order of the starch increased with treatment time. Bread made with the treated flour was softer. Furthermore, the resistant starch content increased by 50%, accompanied by a reduction in rapidly digestible starch. Analysis showed that the water structure in the treated flour played a significant role in modifying the molecular organization of wheat flour, as well as in the digestibility of the starch in the bread. Overall, the results of this study suggest that microwave treatment of wheat flour prior to baking is a viable alternative for producing wheat bread with a reduced glycemic index and improved nutritional properties.



Biography

Alfonso Morales Huerta is a PhD student in Biotechnology at the Universidad Autónoma Metropolitana, Mexico. With expertise in Food Science and Technology, Morales specializes in the use of colloids and polymers and their applications for protecting bioactive compounds and obtaining functional and nutritional foods, and studies how interactions between structural components affect the physicochemical and digestibility properties of food products. Morales has made significant contributions to research such as the microencapsulation of betalains by foam fluidized drying. These research interests include using technologies, colloids, and polymers to structure starch-based foods, aiming to reduce digestibility and thus obtain more nutritious and functional foods.

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Valorization of agri-food by-products as a strategy to reduce the ecological footprint of the food system

The valorization of agri-food by-products is increasingly recognized as a key strategy to enhance sustainability and reduce the environmental footprint of the food system. Recent reviews highlight the relevance of recovering bioactive compounds from food waste streams as part of the circular bioeconomy. In this context, the present study examines the antioxidant potential of aqueous extracts obtained from grape, olive, tomato, lemon, red pepper, and pomegranate by-products, comparing them with a commercial rosemary extract. Water proved to be an efficient and environmentally friendly extraction solvent, enabling the recovery of phenolic compounds, vitamin C, and carotenoids. Antioxidant activity—evaluated through RSA, MQA, and RP—showed strong correlations with phenolic and vitamin C content, while carotenoids displayed weaker associations. Olive, grape, and lemon by-products exhibited the highest antioxidant capacities, in some cases comparable to rosemary. Phenolic profiling revealed distinct compositions across extracts, with compounds such as hydroxytyrosol, 4-hydroxybenzoic acid, oleuropein, rutin, and tyrosol contributing to the observed antioxidant patterns. PCA further demonstrated that phenolic composition and antioxidant mechanisms jointly shape the functional behavior of these extracts. Overall, the findings underscore the suitability of plant by-products as sustainable sources of natural antioxidants for food applications, supporting waste reduction and contributing to a lower ecological footprint within the agri-food sector.

Biography

Ana I. Andrés is a Full Professor at the School of Agricultural Engineering of the University of Extremadura, specializing in research on by-products and their valorization into high-value ingredients and sustainable materials. This work focuses on developing circular-economy strategies that turn industrial and agri-food side streams into functional compounds through green processing and analytical characterization.

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Use of compostable or recyclable material as a sustainable alternative packaging of sheep's cheese

Food industry is currently engaged in the search for new packaging alternatives that offer adequate food preservation, taking into account environmental aspects and consumer preferences. The work stems from the need to improve the sustainability of packaging in the local cheese industry in the Basque Country (northern Spain). Currently, cheese sector companies use non-recyclable multilayer plastic (mixture of polyethylene and polyamide) to package cheese. The aim is to investigate the performance of two biodegradable compostable and two recyclable materials for packaging sheep´s cheese wedges as an alternative to conventional unsustainable plastics. In each case, two different packaging conditions were studied (vacuum and Modified Atmosphere (MA) with a 50/50% (v/v) mixture of CO_2/N_2 gas). Changes in the gas composition (O_2/CO_2) of the headspace of the packaging, overall composition (percentages of protein, fat and dry matter), weight loss, pH, aw, colour (L*, a*, b*, yellow index (Yi) and yellowness index (Zi) parameters), microbiology (count of total microorganisms, lactic acid bacteria, enterobacteria and Listeria) and sensory properties (texture, flavour, appearance of rind and paste, and holes) of the cheeses were investigated over 8 months of storage at 5±1ºC.

Preliminary results showed that the changes in the headspace atmosphere observed were consistent with those described in our previous works in cheeses stored in different types of plastic materials (conventional and sustainable), although some differences in their behaviour were observed. Three materials showed a very similar evolution of CO_2 over the storage period, maintaining a concentration of around 35%. On the other hand, in the case of the fourth material, a sharp decrease in CO_2 concentration was observed from the first month of packaging, reaching concentrations of around 20%. In general, four materials showed similar behaviour for all physicochemical and colour parameters, as well as in sensory analysis of the cheeses. A downward trend was observed in b* and Yi color parameters in

the modified atmosphere packaging condition compared to vacuum packaging, although the differences were not statistically significant. The evolution of lactic acid bacteria and the total microorganism count was similar in all types of materials and conditions, and with regard to Listeria and Enterobacteriaceae counts all samples analysed were found to be below the detection levels for the medium used.

The results seem to show the possibility of using high-barrier biodegradable compostable or recyclable plastic materials with specific technical requirements, under the conditions described, for cheese packaging guaranteeing its safety and quality, while also taking into account environmental aspects and consumer preferences. Other aspects, such as commercial availability to ensure supply in the necessary quantities and formats, cost or consumer acceptance could also be decisive in selecting materials for commercial use in the sector.

Biography

Ana Isabel Nájera is Professor in the Food Technology Area at the University of the Basque Country EHU (Spain). Nájera's research activity has been developed over more than 30 years in the field of Food Science and Technology and Food Quality and Safety, with extensive experience in physical-chemical, chromatographic (HPLC and GLC) and sensory analysis of food, highlighting the multidisciplinary nature of the studies. Nájera is currently the responsible researcher for the line of work entitled Sustainable and circular preservation alternatives for the food industry, assessing the impact of innovative packaging technologies and materials on food quality and safety.

Mª Luz Fidalgo is graduated in Chemistry from the Faculty of Sciences of Zaragoza (Spain) in 1989. PhD in Chemistry from the Faculty of Chemistry of San Sebastián in 1991. Professor at the Faculty of Pharmacy of Vitoria-Gasteiz since 2002. Teaching in the degree program in Food Science and Technology and Pharmacy. Research lines: MOF-type materials and development of nanomaterials (nanoparticles, nanoemulsions) for application in food packaging, for active packaging materials, improving barrier and antioxidant properties. Participation in various research projects based on the study of sustainable packaging for cheese.

Anna Berthold-Pluta
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Mineral oil hydrocarbons in commercially available rennet-ripened cheeses

Mineral Oil Hydrocarbons (MOH) are a complex mixture of isomers derived primarily from crude oil that undergoes refining, and to a lesser extent from the coal, natural gas, and biomass. MOH split into mineral oil saturated hydrocarbons (MOSH) and Mineral Oil Aromatic Hydrocarbons (MOAH). Sources of food contamination with MOH include migration from packaging (recycled paper, release of printing inks, use of mineral oils in the production of plastics), use of jute or sisal bags, food additives such as anti-caking agents, contamination on technological lines (lubricants, diesel fuels), and contamination during harvesting (agricultural machinery). MOSH accumulates in the liver, spleen and adipose tissue and the consequences of this are not yet known. MOAH with 3 or more aromatic rings are associated with genotoxicity and carcinogenicity. Taking into account the risk assessment carried out by EFSA in 2023, discussions have started on establishing EU rules on maximum levels of MOAH and indicators of MOSH levels in food. Since the presence of MOH in food is avoidable, it is recommended that food business operators ensure that the concentrations of MOSH and MOAH in products are below the limits of detection, for example in the case of rennet cheeses<1 mg/kg (food group with a fat content of 4 to 50%).

The aim of this study was to evaluate the content of MOH in commercially available ripened rennet cheeses. The presence of various MOH fractions, i.e., MOAH and MOSH/POSH, in 45 samples of polish ripened rennet cheeses, were analyzed using coupling liquid and gas chromatography with subsequent flame ionization detection (LC-GC-FID). The influence of selected factors (packaging type, and product form, i.e. cheese in a block, cheese portioned in pieces, cheese sliced) on MOH content in the samples was assessed.

The MOSH/POSH were detected in all cheese samples, with the highest levels (1.1–17.0 mg/kg) for the C25-35 fraction in sliced cheeses. By comparison, in block cheeses, this fraction was detected in 75% of samples at 1.3–2.1 mg/kg. The C10-16 MOSH/POSH fraction was not detected in any sample, regardless of the product form (above the detection limit of 0.60 mg/kg of product). MOAH were detected primarily in sliced cheeses in 8-32% of the samples tested, and in a much smaller percentage of block cheeses (25% of the samples). The C10-16 MOAH fraction was not detected in any sample, regardless of the product form. No MOAH was detected in portioned cheeses (above the detection limit of 0.15 mg/kg of product). The contents of the C16-25, C25-35, and C35-50 MOAH fractions in sliced cheeses were 0.15-0.28, 0.16-1.2, and 0.16-0.59 mg/kg of product, respectively. Taking into account the EFSA recommendations, it can be concluded that in 4.4% of the tested samples the MOAH content was higher, and this only concerned sliced cheese samples.

Research financed by the Ministry of Science and Higher Education of Poland as part of the targeted subsidy Research network of natural science universities for the development of the Polish dairy sector - research project (SUP-RIM) (MEiN/2023/DPI/2866).

Biography

Anna Berthold-Pluta is a professor at the Warsaw University of Life Sciences (SGGW). These scientific interests mainly concern issues related to the microbiology of milk and dairy products, the characterization of Cronobacter spp. and Bacillus cereus, and various aspects of the technology of low-fat rennet cheeses. Berthold-Pluta led a project on the use of A2A2 milk in the production of yogurt and ripened cheese, and is currently the coordinator at WULS of the project Research network of natural science universities for the development of the Polish dairy sector - research project (SUP-RIM). coordinator at WULS.

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Sustainable valorization of Kentichi date (*Phoenix dactylifera L.*) into low-sugar jam: Physicochemical and sensory characterization

This study aimed, first, to develop a healthy food product with high nutritional value namely, a low-sugar date jam, and second, to evaluate the effect of different processing treatments on the physicochemical and sensory characteristics of the final product. This work is a part of broader effort to identify food alternatives that better suit current consumers demand for healthy product requirements. The study was carried out at the CARAJUS cannery factory over a 35-days period under refrigerated storage conditions. For this purpose, three jam samples were prepared, using the Algerian local date variety *Kentichi:* a control jam (untreated), a fermented date jam, and a jam made from roasted dates. All formulations were formulated with reduced sugar content in order to enhance their nutritional profile. The experimental approach focused on monitoring key physicochemical parameters throughout the storage by measuring pH, acidity, soluble solid content (°Brix), and consistency. In parallel, a sensory evaluation was conducted on freshly produced jams to determine consumer perception in term of color, sweet taste, aftertaste, consistency, spreadability, odor, acidity, aroma, and overall preference. The results showed that all formulations maintained physicochemical characteristics within acceptable limits and meet the standard quality requirements. The sensory evaluation revealed a generally high level of consumer acceptance, with a marked preference for the formulation based on roasted dates, likely due to its enhanced flavor and aroma profile. Overall, this study highlights the potential valorizing local dates variety and their transformation into a healthy, value-added food product. It also supports efforts to diversify market offerings while promoting improved nutritional quality.

Keywords: Dates (Phoenix dactylifera L.), Kentichi Variety: Jam, Physicochemical Quality, Sensory Evaluation.

Biography

Benmeziane Farida is a professor in the Department of Agronomic Sciences, University of Chadli Bendjedid, El-Tarf, Algeria. Benmeziane has published and co-worked up to 40 papers in reputed national and international journals and many national and international communications, and has been serving as an editorial board member of the International Journal of Food and Biosystems Engineering and as associate editor in the North African Journal of Food and Nutrition Research (Algeria). This area of interest has been natural and new food development, food chemistry, food technology, food safety and bioactive natural molecules.

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Synergistic effect of ultrasound and citric acid on physicochemical, structural and functional properties of oca starch

Oca (*Oxalis tuberosa Molina*), a starch-rich tuber, remains largely unexplored for industrial applications. This study evaluated the effects of individual and combined ultrasound and citric acid treatments on the structural, physicochemical, rheological, and digestibility properties of oca starch, as well as its performance as a fat replacer in reduced-fat white sauces. The starch was modified using ultrasound (S_{US}), citric acid esterification (S_{CA}), and a combination of both treatments (S_{Dual}). The dual-modified starch presented the highest degree of substitution (0.42 ± 0.08), suggesting a synergistic interaction between the two treatments. Structural changes included ester bond formation, as confirmed by FTIR, and increased granule porosity. The modified starch exhibited improved techno-functional properties compared to native starch, including increased solubility, swelling power, and water retention capacity, while digestibility shifted toward a higher proportion of slowly digestible starch. In application, S_{Dual} sauces exhibited desirable pseudoplastic behavior, enhanced viscosity, improved structural stability, and higher sensory acceptability. These findings support dual-modified oca starch as an effective clean-label fat replacer for healthier food formulations.

Biography

Consuelo Lobato-Calleros is a Professor of Agro-Food Science and Technology, and Chemistry at Universidad Autónoma Chapingo, Mexico, where Lobato-Calleros has worked for more than 30 years. Lobato-Calleros received a PhD in Biological Sciences from Universidad Autónoma Metropolitana, Mexico, in 1997, has over 15 years of experience in Food Science and Technology research, and is the author of more than 50 scientific publications. One of the main research areas is the evaluation of novel, non-traditional sources of biopolymers.

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In vitro evaluation of neuronal responses to conditioned medium generated during LAB-intestinal epithelial cell interactions

Food-derived Lactic Acid Bacteria (LAB) may contribute to the Microbiota–Gut–Brain Axis (MGBA) communication not only through microbial metabolites, but also indirectly through interactions with intestinal epithelial cells and the generation of bioactive soluble factors capable of influencing neuronal function. Therefore, this study aimed to evaluate the neuroactive potential of conditioned medium generated by a defined mixture of food-derived LAB interacting with intestinal epithelial cells, using SH-SY5Y cells as an in vitro neuronal model.

Three food-derived LAB strains, *L. paracasei* OS4, *L. plantarum* M3.3, and *L. plantarum* O24, were combined in equal proportions to prepare a multi-strain LAB mixture (LAB MIX). Caco-2 intestinal epithelial cells were exposed for 24 h to LAB MIX at 10^6 CFU/mL, and the resulting cell-free conditioned medium (CM-LAB) was subsequently applied to SH-SY5Y neuronal cells. Differentiated SH-SY5Y cells were treated with CM-LAB, and transcriptional responses were assessed by RT-qPCR, focusing on genes related to antioxidant defense (NFE2L2, SOD1, SOD2, and GPX1), apoptosis regulation (BAX and BCL2), and neurotrophic support (BDNF). Cell viability and intracellular ROS levels were also evaluated, and exploratory profiling of the NF-κB pathway-related proteome was performed in SH-SY5Y cells.

CM-LAB generated following Caco-2 exposure to LAB MIX at 106 CFU/mL elicited a distinct transcriptional response in SH-SY5Y cells. Expression of the antioxidant-associated genes NFE2L2, SOD1, SOD2, and GPX1 was significantly increased compared with the conditioned-medium control ($p<0.05$). In parallel, BAX expression was reduced, whereas BCL2 and BDNF

expression increased, resulting in a markedly lower BAX/BCL2 ratio ($p<0.05$). CM-LAB did not induce significant increases or decreases in MTT-derived cell viability or intracellular ROS levels, both of which remained comparable to their respective conditioned-medium controls. Exploratory proteome profiling further indicated selective changes in NF-κB- and stress-related signaling. CM-LAB was associated with higher relative signals of RelA/p65 and its phosphorylated form RelA/p65 [pS529], accompanied by higher IκBα and IκBε signals, suggesting changes in both NF-κB-associated signaling components and their regulatory proteins. In addition, c-Rel, TLR2, JNK2, and cIAP2/BIRC3 were detected only in CM-LAB-treated cells, indicating broader differences in proteins associated with pattern recognition, MAPK-related signaling, and cell survival regulation.

Overall, these findings indicate that soluble factors generated during LAB–intestinal epithelial cell interactions can modulate antioxidant-associated, apoptosis-related, and neurotrophic transcriptional responses in SH-SY5Y cells, together with selective changes in NF-κB- and stress-related protein profiles. Importantly, these molecular responses occurred without significant alterations in cell viability or intracellular ROS levels relative to the conditioned-medium control. In this in vitro epithelial–neuronal model, the results support the potential of food-derived LAB to indirectly influence neuronal responses through soluble factors generated at the intestinal epithelial interface.

Biography

Dorota Zielińska, PhD, DSc, is an Associate Professor at the Warsaw University of Life Sciences (SGGW), Institute of Human Nutrition Sciences, Poland. Zielińska's research bridges food technology, nutrition and health sciences, focusing on microbiological food safety, probiotics and prebiotics, gut microbiota, fermented foods and in vitro digestion. Zielińska has authored or co-authored many scientific publications which explore functional microorganisms and their potential role in improving food quality, safety and human health.

Gabriela Carrillo-Sancén[1], Eleazar Aguirre-Mandujano[1,2]*, Blanca Elizabeth Hernández-Rodríguez[1,2], Consuelo Lobato-Calleros[1,2], Hugo Espinosa-Andrews[3]

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The insects as a novel protein source: Nutritional, physicochemical properties and allergenicity of Mexican *Sphenarium purpurascens*

The edible grasshopper *Sphenarium purpurascens* has emerged as a sustainable source of protein in Mexico. This study characterized the morphometric parameters (weight, length, width, and thickness), pH, physicochemical properties, and allergenicity of adult specimens collected from three locations in central Mexico (State of Mexico: M, Puebla: P, and Tlaxcala: T). Significant differences ($p \leq 0.05$) were observed in size and weight among grasshoppers from the three regions, with specimens from P being heavier and longer than those from T. There was no difference in pH values among the samples (5.71–5.78), suggesting a minimal impact of geographic origin on acidity. The protein content on a dry matter basis was 70–79%, ash 4.0–4.3%, fat 7.5–11.5%, fiber 7.8–10.1%, and carbohydrate 1.2–7.1% in the different grasshoppers; these results suggest a significant impact of location. The proteomic profile of *S. purpurascens* identified 37 proteins with allergenic potential, predominantly muscle proteins (myosin, tropomyosin, and troponin), which is consistent with their biological function and nutritional value, given that these proteins are rich in essential amino acids and contribute significantly to the overall desirable protein content in edible insects. A comparative analysis revealed that 86.5% of these proteins were present in all populations, suggesting that the allergenic profile is

independent of geographic origin. It is noteworthy that peptidyl-prolyl cis-trans isomerase was detected exclusively in M, while hexamerins, tropomyosins, and myosins were present in all samples. Reports indicate the presence of these allergens in edible insects and arthropods, associated with potential cross-reactivity risks. These results contribute to understanding the variability in the composition and properties of S. purpurascens and provide data for risk assessment, offering reference information for its incorporation into insect-based foods. The results also highlight the importance of regional selection for standardizing proteins from this insect for food applications.

Biography

Dr. Aguirre-Mandujano is a professor of Chemistry and Agri-Food and Technology at Universidad Autónoma Chapingo, México, for more than 40 years. Aguirre-Mandujano graduated as PhD in Biotechnology at Universidad Autónoma Metropolitana, México, in 2009, has over 20 years of experience in Food Science and Technology research, and is the author of more than 25 scientific publications in SCI journals. The principal research area is the obtention and characterization of novel functional ingredients for foods.

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Use of various micro-or macro-algae extracts as encapsulating agents for the formulation of novel food supplements for metabolic syndrome prevention

Micro- or macro- algae have attracted the interest as they present a rich content of valuable compounds such as lipids and antioxidants, which are beneficial for metabolic syndrome prevention. Lipids and antioxidant extracts from selected micro- or-macro- algae were obtained using ecofriendly extraction techniques and will further be encapsulated through novel encapsulation strategies in order to be protected and sustained released after their incorporation in novel food supplement.

The recovery of valuable substances from *Chondracanthus* and *Spirulina Platensis* was carried out using ultrasound assisted extraction and microwave assisted extraction as well as Accelerated Pressure Extraction and non-toxic extraction media including water/ethanol, ethanol/ethylacetate/water or sunflower oil. The optimization of extraction yield was achieved based on the following extraction parameters solid/liquid ratio, solvent system, time and power. The recovered substances were characterized using High-Pressure-Liquid Chromatography, Gas-liquid chromatography, while their Total Phenolic Content, their antioxidant activity (DPPH assay) and their protein content were also determined.

For the extractions with conventional solvents, Folch and Bligh-Dyer methods were applied, while for the green extractions, the Green Bligh-Dyer method was carried out in different ratios and an optimal extraction time of 10 min. Comparison of the different systems revealed sunflower oil as the optimal extraction solvent due to its natural compatibility with fatty acids with a recovery of 5-6%. The results reveal that Chondracanthus teedei algae present significant profile of monosaturated and polysaturated fatty acids such as ellagic acid and linoleic acid. Natural lipid-based microparticles will be developed and the suitable lipids and

surfactants through various techniques. The obtained micro-encapsulation system in a next step will be characterized and thereafter will be used as food ingredient for the development of innovative food supplement.

The research project was supported by the Hellenic Foundation for Research and Innovation (H.F.R.I.) under the 4rd Call for H.F.R.I. Research Projects to support Post-Doctoral Researchers (Project Number: 28708).

Biography

Dr. Eleni N. Kavetsou is an Assistant Professor at the Department of Food Science and Human Nutrition at the Agricultural University of Athens. Kavetsou is a Chemical Engineer (NTUA), holds a Master's degree in Techno-Economic Systems (MBA) and a PhD in Synthetic Organic Chemistry and Nanotechnology (NTUA, supported by scholarships), and also carried out part of the research activity at the Royal Institute of Technology in Stockholm (KTH University) in 2021. In 2026, Kavetsou received research funding from HFRI (2026–2028), serving as the Principal Investigator. From 2019 to 2025, Kavetsou worked on 18 national and European research projects and as a COST member, while also contributing to the development of new innovative commercial products based on natural products, in collaboration with Greek companies. These research interests focus on: (a) the synthesis of natural product analogues; (b) the optimization of innovative extraction methods for natural products; and (c) the development of micro-/nanomaterials for biomedical applications, cosmetics, and food applications. Kavetsou has an h-index of 13 and >650 citations, and 70 national and international conferences.

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Fatty acid composition in avocado by-products: Effect of rootstock and variety

The cultivation of avocado (*Persea americana*) has experienced remarkable growth in the Canary Islands in recent decades, becoming a crop of increasing economic and agronomic relevance. This expansion has been further reinforced by the recent recognition of Canary Islands avocado with a Protected Geographical Indication (PGI), which highlights not only its production value but also its distinctive sensory identity and quality.

In this context, the valorization of avocado by-products has gained increasing attention as part of circular bioeconomy strategies. Peel and seed, often considered waste, represent a promising source of valuable compounds, including lipid fractions with potential functional applications. Therefore, the main objective of this study was to determine the fatty acid content in peel and seed from Hass and Lamb Hass avocados using Duke 7 and Toro Canyon as rootstocks. Fruits were harvested between September 2023 and January 2024 and selected at a commercial maturity stage corresponding to 24% dry matter.

The results revealed a clear influence of rootstock on fatty acid composition, strongly dependent on the variety. In Hass, the Toro Canyon rootstock significantly enhanced fatty acid content in peel by-products compared to Duke 7, with increases ranging from approximately 1.8- to 2.4-fold. In contrast, no significant differences were observed in seed extracts. Notably, higher levels of palmitic, palmitoleic, oleic, and linoleic acids were detected, with oleic acid exhibiting the greatest increase (≈2.4-fold) in peel by-products. These findings suggest a greater capacity of Toro Canyon peel by-products to promote lipid accumulation in this variety. In Lamb Hass, however, the rootstock effect was less pronounced and more variable. In some cases, peel by-products from Duke 7 showed higher levels of certain fatty acids, particularly palmitic and palmitoleic acids (≈1.8-fold), while only minor differences were observed for oleic

acid and negligible differences for linoleic acid. These results indicate a different physiological response compared to Hass.

When comparing varieties under the same rootstock (in both by-products), Hass showed higher fatty acid contents than Lamb Hass under Toro Canyon, whereas under Duke 7, the differences between varieties were reduced, resulting in more similar lipid profiles. Overall, these findings highlight a significant rootstock×variety interaction, with Hass being more influenced by rootstock selection—particularly under Toro Canyon—while Lamb Hass exhibited a more stable and less responsive behavior.

From an application perspective, these results are highly relevant, as avocado by-products have been identified as promising sources of bioactive lipids. Previous studies have demonstrated their potential for developing functional ingredients, including lipid extracts with antioxidant and biological activity. The presence of key fatty acids such as oleic, linoleic, and α-linolenic acids further supports their nutritional and technological value.

In this context, the fatty acid profiles observed in this study reinforce the potential of avocado peel and seed as sustainable raw materials for food, nutraceutical, and cosmetic formulations. Their exploitation not only contributes to generating high-value products but also supports circular bioeconomy approaches aimed at reducing agro-industrial waste and improving the sustainability of avocado production systems.

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Hidden salt in the Italian diet: The contribution of artisanal bread and bakery products

Bread is a staple food in Italy, as well as in many European countries, and represents a major source of dietary salt (NaCl). Italian consumers mainly eat fresh, unpackaged artisanal bread and bakery products such as focaccia, breadsticks, and taralli. According to Regulation (EU) No 1169/2011, nutritional labeling is not required for these unpackaged products; consequently, their salt content is not declared.

The aim of this study was to determine the NaCl content in artisanal unpackaged bakery products and to compare it with the NaCl content (as declared on the label) of industrially produced packaged bakery products.

Fresh unpackaged products generally exhibited higher NaCl values (approximately 1.84 g/100 g) compared to packaged products (approximately 1.65 g/100 g). An exception was observed for focaccia, for which packaged products showed markedly higher salt concentrations than unpackaged ones (2.65 vs 1.78 g/100 g, respectively). Low-moisture products (breadsticks, taralli, and crackers) displayed salt contents of approximately 2% in both artisanal and industrial samples.

Current dietary recommendations suggest not exceeding 2.0 g/day of sodium intake, which corresponds to approximately 5 g/day of NaCl. Considering that the average consumption of bread in Italy is about two servings per day (approximately 100 g), the contribution of bakery products to overall salt intake should be carefully considered, and the NaCl content in these products should possibly be reduced.

Biography

Dr. Gabriella Giovanelli is an Associate Professor of Food Technology at the University of Milan, teaching the courses Unit Operations in Food Engineering and Catering Technology. Giovanelli's recent research focuses on the antioxidant properties of fresh and processed products as affected by thermal processing and storage; the effects of cooking on the nutritional and sensory characteristics of foods; and the design and implementation of food safety systems in catering. These research findings have been reported in more than 70 papers published in national and international journals, conference proceedings, reviews, and textbooks for students.

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Comparative bioactivity of sequentially purified *Spirulina maxima* extracts for cosmeceutical applications

Spirulina maxima, a microalga rich in bioactive pigments, proteins, and polysaccharides, has attracted increasing attention as a sustainable source of natural ingredients for skincare and cosmeceutical formulations. However, the extent to which purification affects the biological activities of Spirulina-derived compounds remains insufficiently understood. This study therefore compared the chemical characteristics and skin-related functional activities of crude and purified Spirulina extracts. Five samples were prepared through sequential processing steps involving water extraction, buffer extraction, dialysis, ammonium sulfate precipitation, and ion-exchange chromatography. Pigment and polysaccharide contents were determined to characterize the major bioactive constituents, while the purity and molecular characteristics of phycocyanin were assessed using Sodium Dodecyl Sulfate–Polyacrylamide Gel Electrophoresis (SDS–PAGE) and UV–Vis spectrophotometry. The functional properties of the samples were evaluated in RAW 264.7 macrophages, B16-F10 melanoma cells, and human dermal fibroblasts (HDFa), representing cellular models relevant to oxidative stress, melanogenesis, and skin aging. Among the tested samples, the water extract exhibited the strongest intracellular Reactive Oxygen Species (ROS) scavenging activity. It also significantly inhibited the expression of the Tyrosinase Gene (TYR), suggesting potential anti-melanogenic and skin-whitening activity, while enhancing the expression of Collagen Type I Alpha 1 Chain (COL1A1) in dermal fibroblasts. Furthermore, under UVB-induced oxidative stress conditions, the water extract effectively suppressed Matrix Metalloproteinase-1 (MMP1) expression, indicating its potential to protect collagen from UVB-associated degradation and prevent wrinkle formation. Notably, these functional effects were greater than those observed for the purified phycocyanin fractions, suggesting that multiple water-soluble constituents may act additively or synergistically. Collectively, these findings demonstrate that simple water extraction can preserve multifunctional bioactive compounds from S. maxima and provide

antioxidant, whitening, and anti-aging activities. The water extract may therefore serve as a natural, sustainable, and cost-effective functional ingredient for future cosmeceutical applications.

Biography

In-Yung Sunwoo is a postdoctoral researcher at the Jeju Bio Research Center of the Korea Institute of Ocean Science and Technology (KIOST), Jeju-si, Korea. Sunwoo holds a Ph.D. in bioenergy and previously conducted postdoctoral research at Umeå University, Sweden. Sunwoo's research focuses on sustainable marine biotechnology, including microalgal and seaweed cultivation, bioactive compound extraction, functional biomaterials, and biorefinery development.

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Effect of flaxseed mucilage as a stabilizer on the physicochemical and structural properties of A2 milk ice cream

The growing demand for clean-label and functional dairy products has increased interest in both A2 milk and plant-derived stabilizers as innovative ingredients in frozen desserts. This study investigated the effect of flaxseed mucilage as a natural stabilizer on the physicochemical, rheological, and structural properties of ice cream manufactured from A2 milk (β-casein A2A2 genotype). Ice cream mixes were prepared using either conventional milk or A2 milk and supplemented with flaxseed mucilage at 0.2% and 0.4% (w/w). The mixes were evaluated for composition, pH, apparent viscosity, and flow behavior. The resulting ice cream was analyzed for overrun, melting resistance, and penetration properties.

The addition of flaxseed mucilage significantly increased the apparent viscosity of the mixes ($p<0.05$) and promoted pronounced pseudoplastic behavior. Ice cream made from A2 milk had a lower melting rate than conventional milk samples. The incorporation of 0.4% mucilage slightly reduced overrun relative to the control, likely due to increased mix viscosity. The penetration test showed a significantly lower maximum penetration force ($p<0.05$) and reduced adhesiveness in A2 milk samples enriched with mucilage, indicating a softer and more deformable structure.

These findings suggest a potential synergistic interaction between β-casein A2 proteins and flaxseed-derived polysaccharides, contributing to improved structural stability and technological quality of clean-label ice cream.

Research financed by the Ministry of Science and Higher Education of Poland as part of the targeted subsidy Research network of natural science universities for the development of the Polish dairy sector - research project (SUP-RIM) (MEiN/2023/DPI/2866).

Biography

Dr. Jarosław Wyrwisz is an Associate Professor at the Institute of Food Sciences, Warsaw University of Life Sciences (SGGW), Poland. Wyrwisz's research focuses on food technology and engineering, with particular emphasis on the physicochemical properties, texture, and quality of dairy and plant-based products, specializing in the application of innovative ingredients and processing methods to improve functional and sensory attributes of foods. Wyrwisz has authored numerous peer-reviewed scientific publications and is actively involved in research and development projects in collaboration with industry partners.

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Zero waste methods for utilizing post-extraction soybean meal in the food industry

The increasing global demand for plant-based proteins has prioritized the isolation of protein and functional components from legumes. While soybean processing typically focuses on oil and protein extraction, the remaining post-extraction meal—often treated as a low-value byproduct—contains significant nutritional potential. Processing soybean seeds into high-quality isolates is a complex procedure involving grinding, extraction, separation, and purification. To align with circular economy principles, it is essential to manage and process streams that are typically discarded.

The aim of this study was to develop a comprehensive processing method for post-extraction soybean meal that ensures full raw material utilization and the creation of high-value-added food products. By implementing a model fractionation process, three distinct, products were obtained, each exhibiting different functional properties compared to the base material.

The soy protein obtained through this no-waste process exhibited the high purity levels characteristic of commercial protein isolates, making it suitable for both conventional food production and specialized clinical nutrition. The post-coagulation supernatant was converted into seasoning sauce, characterized by a desirable sensory profile (umami) and high microbiological stability. The remaining solid fibrous residue was subjected to fermentation, resulting in a functional ingredient that can be incorporated into food products, such as fillings in farinaceous dishes. This model demonstrates that the comprehensive fractionation of soybean meal not only eliminates industrial waste but also generates a diverse portfolio of functional ingredients for the modern food market.

This work was performed with the financial support of The Polish Ministry of Agriculture and Rural Development (Research task 220-08).

Biography

Joanna Le Thanh-Blicharz, a Food technologist Associate professor at Institute of Agricultural and Food Biotechnology. Graduated as D.Sc. at Poznan University of Life Sciences, Faculty of Food Science and Nutrition. Main scientific interests include; food technology, food chemistry, starch technology and food texture. Author of over 50 internationally scientific papers as well authors of several patents in the area of food science and technology. Awarded with Medal of Honor Merit for Agriculture by the Ministry of Agriculture and Rural Development.

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Functional low-fat ice creams using starch-protein and sesame oil-based bigels as a fat substitute

A novel method for the formulation of reduced-fat functional foods is the use of Bigel Systems (BG). Their high versatility allows progress toward the development of healthier foods while maintaining the conventional characteristics of food products, but with reduced caloric content. Bigels, as biphasic OleoGel–HydroGel (OG:HG) systems, were formulated at a 20:80 ratio. The hydrogel phase was prepared using cassava starch and whey protein isolate (CS:WPI, 1:0.25), while the oleogel phase consisted of sesame oil structured with beeswax (5%). Reduced-fat ice cream formulations were prepared by replacing milk fat at 25%, 50%, and 75% through the incorporation of bigels, along with a control ice cream containing 100% milk fat. Microstructural analysis of the ice cream emulsion showed a homogeneous dispersion of fat globules in the control ice cream and in the formulation with 75% fat substitution, whereas ice creams with 25% and 50% substitution exhibited denser structures. All ice cream samples exhibited pseudoplastic behavior, with improved viscosity observed at 50% fat replacement. Bigel incorporation increased total solids content and maintained titratable acidity values≤0.27% lactic acid. Overrun was lower in reduced-fat ice creams, indicating a reduced air incorporation capacity. However, reduced-fat formulations exhibited greater melting resistance, with lower melting rates compared to the control. In addition, reduced-fat ice creams showed improved textural properties, indicating greater product stability. The use of bigeles reduces the caloric content of ice cream by 9.42%, 17.75% and 28.22% with a fat substitution percentage of 25%, 50% and 75%, respectively. Overall, these results demonstrate that bigels are an effective fat replacement alternative, capable of mimicking the rheological and textural properties of ice cream and promoting the development of food products with a healthier composition.

Biography

M.Sc. Julia De Los Santos Trinidad holds a Bachelor's degree in Biotechnology from the Interserrana University of Puebla–Ahuacatlán and a Master's in Biotechnology from the Metropolitan Autonomous University, Iztapalapa Unit (UAMI), where De Los Santos received the University Merit Medal, and is currently pursuing a Ph.D. in Biotechnology at UAMI. This research focuses on the extraction, modification, and physicochemical characterization of proteins and carbohydrates using emerging technologies, such as ultrasound, to enhance their functional properties in food systems. The doctoral work investigates the formulation of reduced-fat ice cream using bigel systems. De Los Santos has published articles and participated in national conferences.

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Institute of Agricultural and Food Biotechnology – State Research Institute, Poland

Production and use of soy protein concentrate as an ingredient in vegan foods

In the modern food industry, soy protein serves as a premier functional ingredient owing to its exceptional amino acid profile, high digestibility, and versatile techno-functional properties, such as gelation, emulsification, and water-binding capacity. In the pursuit of sensorially appealing alternatives to traditional animal-based products, such as cheesecakes and pâtés, research was conducted on the application of soy protein concentrate, obtained via sustainable zero-waste technology, as a primary structural agent. The aim of this study was to evaluate the influence of varying ratios of soy protein s on the texture, color, physical stability, and sensory characteristics of high-protein vegan food analogues. The experimental methodology encompassed a comprehensive instrumental and organoleptic approach. The mechanical properties of the developed matrices were evaluated using Texture Profile Analysis to determine parameters such as hardness, cohesiveness, and springiness.

Instrumental color measurements were performed in the CIE L*a*b* system to evaluate the visual impact of protein blending. Furthermore, the kinetic stability of the formulations and non-destructive destabilization mechanisms were precisely monitored using a Turbiscan DNS analyzer based on static multiple light scattering. In particular, the Turbiscan Stability Index was calculated over time. Finally, a quantitative descriptive sensory analysis was conducted with a trained panel to assess attributes like appearance, flavor, and overall palatability. The results indicate that the specific concentration of soy protein is a critical factor in defining the structural integrity, physical stability, and mouthfeel of vegan substitutes. Higher ratios of soy protein concentrate were found to significantly improve the texture profiles and long-term stability of the final products, minimizing phase separation. These findings provide a solid technological foundation for optimizing recipes, ensuring that plant-based alternatives meet the high sensory expectations of modern consumers while maintaining a balanced nutritional profile.

This work was performed with the financial support of The Polish Ministry of Agriculture and Rural Development (Research task 220-08).

Biography

Karolina Rybarska – graduate of Adam Mickiewicz University in Poznań, Master of Science in Chemical Analytics, chromatographer, research and technical specialist at Institute of Agricultural and Food Biotechnology, author of publications in the field of food analysis.

Laribi-Habchi Hassiba

Laboratory of Functional Analyzes of Chemical Processes, University Blida 1, Algeria

Laboratory of Energy Applications of Hydrogen, University Blida 1, Algeria

Development and study of the behavior of a new material based on PVA/Chitosan: Use as food film

The preservation of a foodstuff consists in maintaining its hygienic, nutritional and organoleptic qualities for as long as possible by acting on the various deterioration mechanisms to slow down or eliminate their effects. There are compatibility problems between plastic packaging and food. Indeed, interactions between plastic and food are inevitable. They sometimes lead to quality defects both on the organoleptic and toxicological levels. The best known of these problems is the migration of residual monomers or adjuvants that can be released by the packaging and contaminate the food. The aim of this work is to develop biodegradable films from chitosan and Poly Vinyl Alcohol (PVA) as basic biopolymers for food packaging. In this work, two steps were carried out: first, the preparation of chitosan by deacetylation of chitin extracted from squid feathers after demineralization and deproteinization. The obtained product was characterized by infrared spectroscopy (FTIR) and Scanning Electron Microscopy (SEM). Then, the elaboration of membranes based on pure chitosan and pure PVA and mixing of chitosan with polyvinyl alcohol (PVA) at different percentages. The results obtained in this study show that the incorporation of PVA can improve the water resistance of the chitosan film indicated by the decrease in the kinetics of water adsorption and the increase in the value of the contact angle. The analysis by IR-TF spectroscopy showed that there are no specific interactions between chitosan and PVA in the mixture. However, the films of the chitosan/PVA mixture can be made up to 30% PVA thanks to the emulsifying quality of chitosan. The effectiveness of incorporated PVA in decreasing the water sensitivity and improving the water vapor barrier of chitosan was confirmed.

Keywords: Beta Chitosan, Food Films, Biopolymer, PVA, Food Safety.

Biography

Laribi-Habchi Hassiba is a Professor at SAAD Dahlab Blida 1 University, where an Habilitation to Direct Research (HDR) was obtained. Laribi holds a Doctorate and a Magister in Environmental and Pharmaceutical Biotechnology obtained respectively in 2013 and 2005 at the National Polytechnic School of Algiers and a state engineer diploma in Biological Engineering in 1990 at the University of Technological Sciences of Algiers. Professor Laribi has supervised and supported several doctoral students and has produced numerous scientific works on biomolecules of microbial, animal and plant origin, such as international patents of invention (WIPO) and renowned international publications, and their application in the pharmaceutical, beekeeping, biochemical, enzymatic, molecular biology and environmental .

Lidia Stasiak-Różańska*, Monika Garbowska
Warsaw University of Life Sciences, Institute of Food Sciences, Department of Food Technology and Assessment, Poland

The effect of chia seeds addition on selected quality features of fermented sheep's milk

The aim of the study was to investigate the effect of chia seed addition on selected features of fermented sheep milk. Milk from organic farming was used for the research, the starter cultures were: *Streptococcus salivarius subsp. thermophilus, Lactobacillus delbrueckii subsp. bulgaricus*. The following milk variants were obtained: 0.5%, 1.0%, 1.5%, 2.0%, and 2.5% of the chia additive, control sample without the additive. All variants were obtained in three independent replication series. The milk was analyzed immediately after obtaining, as well as 24 hours and 7 days after. Adding chia seeds to yogurt increased the product's protein content. The addition of chia also resulted in an increase in fat content compared to the control sample. The fat content of fermented milk without the addition was on average 6.44%, while that with 1% and 2% chia was 6.58% and 6.56%, respectively. The dry matter content in the fermented milk with the addition of 2% and 2.5% chia seeds was higher than in the remaining samples and it was 18% and 18.15%, respectively (while in the control sample this value was approximately 17%). The lowest hardness parameter was observed in the control samples (1.46N) and those with 1% chia (1.45N). The highest hardness was observed in the sample with 2% chia (3.38N). The adhesiveness values of individual variants of fermented milks did not differ statistically significantly. The lowest value was found in the control sample (5.47 mJ), while the highest in the variants with 0.5% and 2.5% chia added (11.13 mJ and 11.07 mJ, respectively). The individual variants of fermented sheep milks did not differ statistically significantly in terms of springiness (ranged from 2.92 mm for the sample with 1% chia seed addition to 4.13 mm for the control). Single-factor analysis of variance revealed no significant differences in organoleptic characteristics between the individual variants after either one or 10 days of storage ($p<0.05$). After one day of storage, appearance and aroma were rated as very good in all variants. Consistency was rated as very good and good, with the highest rating for the sample with 2% chia. Taste also received the highest ratings for this sample. On the

first day of storage, the highest average rating was given to the sample with 2% chia added. After 10 days of storage, appearance and aroma were also rated as very good in all samples. In terms of consistency, the sample with 2% chia added received the highest rating, while the sample with 1.5% chia added received the lowest. Taste after 10 days of storage was rated as very good and good. The sample with 2% chia added received the highest average rating. In summary of the obtained results it can be concluded that, the addition of chia seeds did not significantly affect the fermentation process of sheep's milk. Fermented sheep's milk with chia was very well-rated by respondents in a sensory survey. Therefore, it's likely that such a product would find supporters and could be a valuable source of nutrients in the daily diet.

Biography

Lidia Stasiak Rozanska Research focuses mainly on food microbiology, food technology, and the dairy industry. One of the scientific field is also obtaining bacterial cellulose from various organic sources, characterizing this biopolymer, and exploring new application possibilities in various industries. Didactic activities at the University of Life Sciences include lectures and practical classes in the field of milk technology, food safety, commodity evaluation of products, trends in the food industry, characteristics of raw materials and products of animal origin and more.

Magdalena Zalewska*, Elżbieta Górska-Horczyczak, Monika Marcinkowska-Lesiak, Klara Żbik, Wiktoria Jasionek, Jarosław Wyrwisz, Marcin Kurek
Warsaw University of Life Sciences, Poland

Effect of dried beetroot, tomato and kale powders on the physicochemical and sensory properties of yogurt

The aim of this study was to evaluate the effect of adding dried vegetable powders from beetroot (*Beta vulgaris L.*), tomato (S*olanum lycopersicum L.)* and kale (*Brassica oleracea var. sabellica*) at levels of 0.2%, 0.5% and 1.0% on the physicochemical and sensory properties of fermented yogurts, as well as their changes during storage. The vegetable powders were obtained by convective drying and added to milk prior to fermentation. Analyses were performed after 1, 7 and 14 days of refrigerated storage. The physicochemical parameters determined included pH, titratable acidity, viscosity, degree of syneresis, color parameters (L*, a*, b*), total antioxidant activity, vitamin C, lycopene and β-alanin. Volatile compound profiles were assessed using an electronic nose (e-nose) system combined with multivariate data analysis. In addition, a sensory evaluation covering appearance, texture, odor, taste and overall acceptability was conducted.

The results showed that both the type and concentration of vegetable powder, as well as storage time, significantly affected the properties of the yogurts. Prolonged storage resulted in a further decrease in pH and an increase in titratable acidity, with more pronounced changes observed in samples containing 1.0% vegetable powders. Viscosity increased during storage, particularly in yogurts supplemented with beetroot and kale powders. Color changes intensified with storage time, with tomato powder providing the greatest color stability. Sensory evaluation indicated that yogurts containing 0.2% and 0.5% vegetable powders and stored for 7 days achieved the highest consumer acceptability, whereas a decline in sensory scores was observed after 14 days of storage, especially in samples with 1.0% kale powder.

The findings suggest that dried beetroot, tomato and kale powders can be successfully used as functional ingredients in yogurt, with an optimal addition level of up to 0.5%, ensuring desirable physicochemical and sensory quality during 14 days of refrigerated storage.

Research financed by the Ministry of Science and Higher Education of Poland as part of the targeted subsidy Research network of natural science universities for the development of the Polish dairy sector - research project (SUP-RIM) (MEiN/2023/DPI/2866).

Biography

Magdalena Zalewska is an assistant professor at the Warsaw University of Life Sciences (SGGW). These scientific interests mainly concern the influence of technological processes on the quality of food products, food packaging and storage, investigation of physicochemical and nutritional properties of food products, and shelf life extension.

María J. Petrón*, Ana I. Andrés, Marisa Timón
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Aqueous extraction of almond skin phenolics and their application as natural antioxidants in pork patties

The increasing volume of by-products generated by the almond industry offers valuable opportunities for upcycling, particularly given that almond skin contains 60–80% of the nut's total phenolic compounds. While most previous studies have relied on organic solvents for phenolic extraction, the need for greener and food-safe methodologies remains. This study assessed the use of water as an environmentally friendly solvent to obtain phenolic extracts from four almond cultivars (Antoñeta, Guara, Soleta, Belona) and evaluated their potential as natural antioxidants in pork patties stored under modified atmosphere packaging. Aqueous extraction, performed accordint to the method described by Andrés et al. (2020) (20 mL/g, 30 °C, 60 min) produced phenolic-rich extracts with measurable antioxidant capacity, with Antoñeta showing the highest phenolic content (2.25 mg GAE/g) and a strong correlation with antioxidant activity (DPPH, $r=0.891$; $p<0.01$). HPLC-DAD analysis revealed isorhamnetin-3-O-rutinoside, catechin, and protocatechuic acid as the most abundant compounds. When incorporated into pork patties, the Antoñeta extract reduced weight loss during storage but did not substantially improve color stability or microbial counts. Regarding lipid oxidation, its effect was limited compared with sodium ascorbate, which consistently achieved the lowest TBARS values throughout storage. Overall, aqueous extraction proved viable and sustainable for recovering phenolic compounds from almond skin, though optimization of extract concentration or combined extraction techniques is needed to enhance its technological performance in meat products.

Biography

Maria Jesus Petron Teston is a Full Professor at the School of Agricultural Engineering, University of Extremadura. Petron Teston's academic expertise lies in the valorization of

agricultural and industrial by-products, championing circular-economy principles and applying green processing and analytical characterization to convert waste streams into high-value functional ingredients and eco-friendly materials.

Marcin A. Kurek*, Patryk Pokorski, Magdalena Zalewska, Jarosław Wyrwisz

Department of Technique and Food Development, Institute of Human Nutrition Sciences, Warsaw University of Life Sciences, Poland

Casein–whey Pickering microcapsules for improved thermal stability and controlled release of curcumin in heat-processed foods

Background: Curcumin is a bioactive polyphenol with remarkable antioxidant and anti-inflammatory potential, yet its poor water solubility and thermal instability limit its application in processed foods. Protein-based Pickering systems represent a promising clean-label route to stabilize such compounds without synthetic surfactants.

Objective: We aimed to design hybrid microgels composed of sodium caseinate (NaCas) and Whey Protein Isolate (WPI) as food-grade Pickering stabilizers for curcumin-loaded oil-in-water emulsions and to evaluate their performance in heat-processed matrices (e.g. baked rolls).

Methods: NaCas/WPI complexes were produced via pH-induced aggregation (pH 5.8–6.2) followed by enzymatic crosslinking and Ca^{2+} bridging to form soft colloidal microgels (300–800 nm). These microgels served as solid stabilizers for curcumin-dispersed oil droplets (medium-chain triglycerides) in O/W emulsions. Interfacial activity, particle wettability, and droplet stability were assessed by ζ-potential, contact angle, and confocal microscopy. Oxidative and thermal stability of curcumin was examined during simulated baking (180–200 °C, 15 min), and in-vitro digestion was modelled.

Results: The NaCas/WPI Pickering emulsions exhibited excellent resistance to creaming and coalescence, maintaining particle size<2 μm after thermal treatment. Curcumin degradation during baking decreased by 55–65% compared with non-encapsulated curcumin oil dispersions. Spectroscopic and HPLC analyses revealed that the protein–curcumin binding and reduced oxygen permeability of the Pickering systems interface were responsible for

the enhanced protection. Controlled release in the intestinal phase followed Weibull kinetics (b≈0.7), indicating diffusion-controlled release linked to proteolytic breakdown of the wall.

Conclusions: Casein–whey Pickering microgels enable efficient encapsulation and thermal stabilization of curcumin in food matrices, providing a viable strategy for functional bakery applications. The system combines natural biopolymers, high process tolerance, and controlled bioaccessibility making it attractive for commercial and academic development in clean-label functional foods.

Research financed by the Ministry of Science and Higher Education of Poland as part of the targeted subsidy Research network of natural science universities for the development of the Polish dairy sector - research project (SUP-RIM) (MEiN/2023/DPI/2866).

Biography

Marcin Kurek is a Professor at the Warsaw University of Life Sciences (SGGW). Kurek's research focuses on protein–polyphenol interactions, microencapsulation, and intelligent packaging, and has led projects on Pickering emulsions and coacervation for stabilizing bioactive compounds such as anthocyanins, DHA, and curcumin in heat-processed foods. Kurek has co-authored numerous publications and coordinated interdisciplinary teams working on analytical chemistry and colloid science aspects of food systems.

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From food experiences to nutrition interventions in ageing populations: Insights from the NutriSenior 2030 project

Population ageing represents a major public health challenge worldwide, particularly in relation to nutrition and diet-related chronic diseases. In Spain, more than 20% of the population is over 65 years old, a demographic group especially vulnerable to nutritional imbalances, food insecurity, and barriers to healthy eating. However, many nutrition interventions targeting older adults fail to consider the everyday food experiences and decision-making processes that shape dietary behaviors. The NutriSenior 2030 project aims to address this gap by developing practical tools to promote healthy and sustainable eating among older adults using a participatory and user-centered approach.

This study adopted an exploratory qualitative research design based on in-depth interviews. Semi-structured interviews were conducted with a sample of twenty older adults (N=20), selected through convenience and snowball sampling. Participants were men and women aged between 65 and 89 years living in both urban and rural contexts of the region of Extremadura (Spain). Interviews were structured around six thematic blocks: daily life and meals, food and health, food purchasing decisions, household food economy, food preservation and safety, and technology use. Transcriptions were analysed through iterative qualitative coding to identify recurrent themes and patterns.

Based on this analysis, three experience maps were developed to represent the most relevant behavioural archetypes identified in the study. The maps analysed food practices through five analytical pillars: daily life, health, sustainability and purchasing decisions, food labelling and access to information, and technology use. The maps captured three key user profiles within the sample: the traditional female household food manager, the male profile with

delegated food responsibilities, and the digitally active older woman. This approach allowed a more integrated understanding of the social, nutritional, economic and technological factors shaping food behaviours among older adults.

Results identified ten key challenges affecting food practices. Priority issues included low hydration, inadequate food safety practices, confusion about food labeling, risk of nutritional imbalance linked to economic constraints, and lack of structured meal planning. Social and gender dynamics also influenced food management roles, while varying levels of digital literacy affected the accessibility of technology-based solutions.

These findings are guiding the development of two practical tools within the NutriSenior 2030 project: an accessible food planning guide and a pilot digital application designed to support healthy dietary behaviors and food autonomy in older populations.

Biography

ML Timon is a researcher in Food Science and Technology with a sustained academic career focused on both basic and applied research, as well as university teaching innovation. This work addresses agro-food by-product valorization, natural bioactive compounds and antioxidants, emerging processing technologies, and the improvement of quality, safety, and shelf life in meat and plant-based foods. Timon has also developed a strong line of educational innovation, particularly in project-based learning and competency-based assessment, and has participated continuously in competitive R&D&I projects at regional, national, and European levels, contributing to food authentication, sustainable diets, healthy ageing, and circular economy approaches.

Monika Garbowska*, Lidia Stasiak-Różańska
Warsaw University of Life Sciences, Institute of Food Sciences, Department of Food Technology and Assessment, Poland

The effect of white mulberry addition on selected quality features of fermented milk

The aim of this study was to determine the effect of white mulberry addition on selected features of fermented milk. Fermented milks were prepared using a thermostatic method under laboratory conditions in the following variants: without white mulberry addition (control sample) and with 0.5%, 1.0%, 1.5%, 2.0%, and 2.5% white mulberry fruit. To obtain the fermented milks, a starter culture containing the following microorganisms: *Streptococcus salivarius subsp. thermophilus, Lactobacillus delbruecki subsp. bulgaricus,* was added to commercial UHT milk (Łaciate 3.2% of fat, Mlekpol) as well as, depending on the variant, previously ground organic dried white mulberry fruit. All variants were obtained in three independent replication series. The average protein content in the tested fermented milks ranged from 3.67% to 4.04%. The lowest protein content was found in the fermented milk with 2.5% white mulberry addition and the highest in the control fermented milk. Whereas the average fat content in the fermented milks ranged from 3.03% for the milk with 2% white mulberry to 3.47% for the milk without addition of white mulberry (control). The addition of white mulberry increased the dry matter content in the fermented milks. The average pH values of the tested fermented milks ranged from 4.49 to 4.77. Fermented milk without added white mulberry had the highest average pH. With the increase in the content of added white mulberry, the pH value in fermented milks decreased. The addition of white mulberry lowered the pH value of fermented milks immediately after their receipt as well as after 10 days of storage in refrigerated conditions. White mulberry fruit also influenced the color parameters of the fermented milks. With the increase in the content of mulberry added to fermented milks, the brightness of fermented milks decreased and the color parameters a* (red-green) and b* (blue-yellow) increased. White mulberry fruit had a significant effect on the textural properties of the tested fermented milks. The highest hardness among the examined fermented milks was found in the milk with addition of 0.5% white mulberry (1.54

N), while the lowest hardness was found in the milk with 2.5% white mulberry addition (0.84 N). The lowest adhesiveness characterized the milk with 2.5% white mulberry added (3.53 mJ), while the highest adhesiveness was found in the control milk (7.39 mJ). Fermented milk containing 0.5% white mulberry fruit was characterized by the highest hardness and adhesiveness compared to the other milks containing white mulberry. As the white mulberry content increased, the hardness and adhesiveness of the fermented milks decreased. Based on statistical analysis, no significant effect of white mulberry addition on the appearance, aroma, or consistency of the fermented milks was found in the organoleptic evaluation, both immediately after production and after 10 days of storage. In terms of taste, the fermented milk with 1.5% white mulberry fruit was rated the best. The addition of white mulberry fruit allowed us to obtain a new, sensorially attractive fermented milk, which may have a positive effect on the human body, considering the bioactive properties of white mulberry.

Research financed by Ministry of Science and Higher Education, Poland, Research network of life science universities for the development of the Polish dairy sector - research project SUP-RIM

Biography

Monika Garbowska, Research focuses mainly on food technology, food microbiology, and the dairy industry. To the main interests include all aspects related to the quality, production and presence of bioactive substances, mainly in the ripening cheeses. One of the scientific field is also obtaining bacterial cellulose from various organic sources, characterizing this biopolymer, and exploring new application possibilities in various industries. Didactic activities at the University of Life Sciences include lectures and practical classes in the field of milk technology, food safety, commodity evaluation of products, trends in the food industry, characteristics of raw materials and products of animal origin and more.

Walsh O. S.*, Flory E., Bishop C., Rathore J., Kumari S., Khulal A.
Virginia Polytechnic Institute and State University, United States

Does bundling of inorganic fertilizer with compost tea improve nitrogen uptake and grain production in wheat and corn?

The objective of the study was to assess the potential benefits of bundling traditional N fertilizer with compost tea application for performance of wheat and corn under various N levels. Field trials were conducted in 2025 at 3 experimental locations in Virginia: Blacksburg (BB), Blackstone (BS), and Orange (OR). Nitrogen was split-applied: between preplant and top-dress as Urea Ammonium Nitrate (UAN; 28-0-0) to achieve 50%, 75%, and 100% of recommended N. The effects of 75 and 100% N treatments were evaluated with and without compost tea - Super Compost Tea (Gardenersbud, Towanda, KS) foliar-applied at a rate of 5 gal/ac. Wheat yields ranged from 60 to 114 bu/a. No significant differences in wheat yield associated with treatments were observed at any of the locations. At BB, the highest N rate + compost tea resulted in the lowest wheat yield. At BS and OR, the medium N rate without compost tea treatment yielded the lowest. At all locations, the highest N rate without compost tea resulted in the highest wheat yields. No apparent wheat yield benefit was noted for bundling N with compost tea at any location. Corn yields ranged from 152 to 258 bu/a. Significant differences in corn yield were observed at BS, but not at BB or OR. The highest corn yields were obtained with the highest N rate + compost tea at both BS and OR. At BB, the highest corn yield was achieved with medium N rate without compost tea. No apparent corn yield benefit was noted for bundling N with compost tea at BB. Corn yields were improved numerically by bundling the highest N rate + compost tea. Analysis of multiple supplementary data is currently being carried out to deepen our understanding of treatment effects.

Biography

Olga Walsh earned a Ph.D. in Soil Science, Oklahoma State University, 2009; an M.S. in Soil Science, Oklahoma State University, 2006; and a B.S. in Soil Science, St. Petersburg State University, 1997. Walsh's research aims to increase productivity, resiliency, agronomic, socio-economic, and environmental sustainability of agricultural systems. These research goals lie in finding research-based answers for problems ag producers are experiencing across the state of Virginia, the Mid-Atlantic and Southeastern regions, and beyond. Walsh is especially interested in interdisciplinary projects aiming to sustainably increase productivity of cropping systems. Crop diversification and developing grower recommendations for grain crops with strong yielding potential are within the scope of this work. Water and nutrient efficient crops grown for grain and/or forage offer many opportunities to improve growers' bottom line while conserving water, fertilizer, and enhancing soil health long term.

Walsh O. S.*, Bishop C., Flory E., Rathore J., Kumari S., Khulal A.
Virginia Polytechnic Institute and State University, United States

Plant population impact on corn yield

The objective of this study was to assess the performance of tall (traditional) and short-statured corn hybrids under a range of plant population densities and various N levels. Field trials were conducted in 2025 at 2 experimental locations in Virginia: Blacksburg (BB), and Mt. Holly (MH). Twelve treatments (combination of 4 plant population levels x 3 N rates) were replicated 4 times at each location. A4861 hybrid (TC) was evaluated at 25,000 (Low=LP), 28,000 (Medium=MP), 32,000 (High=HP), and 36,000 (Very High=VHP) plants per acre. PR116-20RIB hybrid (SC) – at 28,000 (LP), 32,000 (MP), 36,000 (HP), and 40,000 (VHP) plants per acre. Performance of both hybrids was assessed at 3 N levels: check (no additional N applied=Low (LN), 30 lb N/a=Medium (MN), and 60 lb N/a=High (HN). Nitrogen was side-dressed as liquid urea ammonium nitrate (UAN; 28-0-0). Corn yields ranged from 145 to 319 bu/a. Average yields were higher at BB (285 bu/a) compared to MH (211 bu/a). Yields for TC were higher compared to SC at both locations: on average at BB, TC yielded 23 bu/a more, and at MH – 48 bu/a more than SC. Lower yields were obtained with LN for both locations, except for SC at MH (lowest yield observed with HP+HN). At both locations, highest yields were observed for VHP+HN treatment, except for TC at BB (higher yield was obtained with LP+HN). Yields of TC were more stable across locations, growing conditions and treatments. Research will be continued over multiple locations and years to develop grower recommendations.

Biography

Olga Walsh earned a Ph.D. in Soil Science, Oklahoma State University, 2009; an M.S. in Soil Science, Oklahoma State University, 2006; and a B.S. in Soil Science, St. Petersburg State University, 1997. Walsh's research aims to increase productivity, resiliency, agronomic, socio-economic, and environmental sustainability of agricultural systems. These research goals lie in finding research-based answers for problems ag producers are experiencing across the

state of Virginia, the Mid-Atlantic and Southeastern regions, and beyond. Walsh is especially interested in interdisciplinary projects aiming to sustainably increase productivity of cropping systems. Crop diversification and developing grower recommendations for grain crops with strong yielding potential are within the scope of this work. Water and nutrient efficient crops grown for grain and/or forage offer many opportunities to improve growers' bottom line while conserving water, fertilizer, and enhancing soil health long term.

V. Grifoll[1]*, P. Bravo[1], S. Hilali[2], Malterre[2], J. Tchoumtchoua[2], M. Pérez-Clavijo[1]

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From waste to ingredient: Valorization of edible mushroom stems through optimized protein recovery

The rising global demand for sustainable and resource-efficient food systems has intensified the search for alternative protein sources. Agro-industrial by-products, specifically the stems of edible mushrooms such as Pleurotus spp. and Lentinula edodes, represent a promising yet underexplored reservoir of high-quality proteins. Transforming these discarded residues into functional ingredients supports the principles of the circular economy while offering novel solutions for the food industry. Framed within the European project LIKE-A-PRO, which aims to mainstream alternative proteins, this study focuses on the valorization of mushroom stems. In this context, the objective of the study was to optimize the protein extraction process from Pleurotus ostreatus and Lentinula edodes by-products at laboratory scale and to evaluate its subsequent scalability for potential industrial applications.

Mushroom stems were dehydrated at 50°C for 48 h and milled to a particle size of 1 mm to obtain the starting flours. Protein extraction was carried out using a solid-to-solvent ratio of 1:20 (w/v). The study focused on optimizing the critical parameters of the extraction process, the alkaline solubilization pH (ranging from 8 to 13) and the isoelectric precipitation pH (ranging from 2 to 4).

Lab-scale optimization showed that protein extractability was significantly influenced by pH. For Pleurotus, the maximum yield of 2.49 g/100 g flour was achieved at pH 13 (solubilization) and pH 4.0 (precipitation). Under these conditions, the protein content increased from an initial 11.11% in the raw flour to 52.73% in the final extract. Similarly, Lentinula reached its optimal yield of 2.89 g/100 g at the same pH values, increasing the protein concentration from 19.37% in the flour to 40.55% in the extract. Although LE showed slightly higher recovery at pH 3.0, pH 4.0 was selected as the optimal point to standardize the process for both species and to prevent equipment corrosion and high neutralization costs during industrial scale-up.

The optimization of pH parameters successfully identified the conditions for maximum protein recovery and enrichment. The process effectively increased the protein concentration by 4.7-fold for Pleurotus and 2.1-fold for Lentinula compared to the initial flours. These parameters were subsequently validated in scale-up trials. The first upscaling was performed in a 60 L tank, processing 5 kg of mushroom stems, followed by a second upscaling in a 400 L tank treating 30 kg of raw material. At pilot scale, to enable processing of larger quantities, the solid-to-solvent ratio was adjusted to 1:10 (w/v). For Lentinula edodes, the yield was 8.3 g/100 g with a protein content of 36.63% at 60 L, and 7.0 g/100 g with a protein content of 39.23% at 400 L. For Pleurotus ostreatus, the yield was 3.4 g/100 g with a protein content of 38.45% at 60 L, and 6.0 g/100 g with a protein content of 20.10% at 400 L. The results demonstrated process robustness from laboratory to semi-pilot scale, confirming that the upcycling of mushroom stems is a technically viable strategy for producing concentrated alternative protein ingredients at an industrial level.

This work has received funding from the European Union under Grant Agreement No 101083961

Keywords: Pleurotus ostreatus, Lentinula edodes, Mushroom By-Products, Alternative Proteins, Alkaline Extraction, Upcycling, Valorization.

Biography

Vanessa Grifoll holds degrees in Chemistry and Biochemistry, with specialized Master's degrees in Occupational Risk Prevention and Food Safety. After beginning a research career in nutrigenomics in 2007, Grifoll joined CTICH in 2012 as a health and nutrition researcher. This work focuses on evaluating the health benefits of mushrooms and identifying bioactive fungal metabolites, with key applications in the pharmaceutical, food, and cosmetic industries. Grifoll's extensive background bridges the gap between academic research and industrial innovation in functional nutrition.

Wioletta Mosiej*, Marcin Kruk, Tomasz Królikowski, Michał Oczkowski, Klaudia Glegoła, Dorota Zielińska

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Functional and psychobiotic potential of a food-derived multi-strain lactic acid bacteria consortium

The Microbiota-Gut-Brain Axis (MGBA) plays a pivotal role in cognitive function, positioning psychobiotics as a promising strategy for managing neurodegenerative diseases. Lactic Acid Bacteria (LAB) isolated from traditional fermented foods represent a valuable source of candidate strains, and multi-strain consortia may offer enhanced therapeutic efficacy through synergistic effects.

This study evaluated the functional and psychobiotic potential of three Lactic Acid Bacteria (LAB) strains isolated from fermented foods, assessed as monocultures and a multi-strain consortium (MIX). The research encompassed an initial screening of the individual strains and the MIX for mucin adhesion, stability in a static in vitro digestion model, and amino acid profiling. Subsequently, the LAB MIX underwent long-term evaluation in a dynamic gastrointestinal model (SHIME®) inoculated with microbiota from a patient with Alzheimer's Disease (AD), during which alterations in gut microbiota composition and the metabolism of selected amino acids and organic acids (SCFA and BCFA) were analyzed.

Results showed that the LAB MIX exhibited high stability under digestive stress and effective mucoadhesive properties. Furthermore, the consortium demonstrated a distinct metabolic signature, driving enhanced functional effects that complemented or exceeded those observed in individual monocultures. In the SHIME® model, the MIX induced significant, site-specific shifts in microbial composition, notably increasing lactobacilli abundance. These taxonomic changes correlated with an enriched metabolic profile, including elevated levels of GABA precursors and amino acids with antioxidant potential, which are critical for MGBA modulation. SCFA and BCFA profiles remained stable, with a slight increase in propionic acid and a decrease in isobutyric acid in the arm supplemented with the MIX.

These results identify the LAB consortium as a compelling psychobiotic candidate. Further in vivo and clinical studies are now required to validate its therapeutic potential for MGBA modulation.

Biography

Wioletta Mosiej is a PhD candidate in the discipline of Food Technology and Nutrition at the Institute of Human Nutrition Sciences, Warsaw University of Life Sciences, Poland. Graduated in Dietetics, with a particular interest in gut microbiota, food-derived lactic acid bacteria, probiotics, psychobiotics, and the microbiota-gut–brain axis.

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Food-grade C-phycocyanin produced at pilot scale: A natural blue food colorant with potential functional food applications

C-phycocyanin (C-PC), a natural blue phycobiliprotein produced by *Arthrospira maxima* (spirulina), has attracted increasing attention as a natural blue food colorant and a potential functional food ingredient because of its antioxidant properties and natural origin. As consumer demand for clean-label foods and bioactive food ingredients continues to grow, the development of sustainable and economically viable production systems for food-grade C-PC has become increasingly important. However, large-scale production of C-PC in mid-latitude regions remains challenging because seasonal fluctuations in natural light reduce biomass productivity and pigment accumulation. In this study, a previously optimized red:blue (8:2) LED lighting strategy was applied to pilot-scale (5,000 L) greenhouse raceway ponds to establish a stable production platform for food-grade C-PC. Biomass concentration and C-PC productivity were evaluated over four cultivation seasons under natural sunlight, continuous LED supplementation, and nighttime LED supplementation. The produced C-PC was characterized using high-performance liquid chromatography (HPLC) and Fourier-transform infrared spectroscopy (FTIR). Pigment purity was determined spectrophotometrically, antioxidant activity was evaluated using DPPH and ABTS radical scavenging assays, and the economic feasibility of supplemental LED operation was also assessed.

Nighttime LED supplementation increased C-PC production by 1.7- to 2.5-fold compared with natural sunlight cultivation while maintaining pigment productivity comparable to continuous LED illumination. HPLC chromatograms confirmed the characteristic α- and β-subunits of C-PC, and FTIR spectra demonstrated structural characteristics comparable to those of a commercial C-PC standard. The produced C-PC exhibited a purity index of 0.75, satisfying the food-grade criterion (purity index≥0.7). Furthermore, C-PC demonstrated strong DPPH

and ABTS radical scavenging activities, indicating that its antioxidant activity was retained following pilot-scale production. Economic analysis further demonstrated that nighttime LED supplementation reduced energy consumption while maintaining high pigment productivity, providing greater cost-effectiveness than continuous LED illumination.

These findings demonstrate that nighttime LED supplementation provides a sustainable and economically viable strategy for the pilot-scale production of food-grade C-PC under mid-latitude conditions. The proposed production platform supports the commercialization of microalgae-derived C-PC as a natural blue food colorant and highlights its potential as a functional food ingredient for future clean-label and health-promoting food applications.

Biography

Won-Kyu Lee is a postdoctoral researcher at the Jeju Research Center of the Korea Institute of Ocean Science and Technology (KIOST), Republic of Korea. Lee received a Ph.D. in Marine Biotechnology, with research focused on the cultivation of microalgae and macroalgae, the optimization of production systems, and the development of sustainable biomass utilization technologies. Lee's current research interests include natural food colorants, potential functional food ingredients, and the large-scale production of high-value algal bioproducts for food and biotechnology applications.

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Potential of *Spirulina*-derived phycocyanin as a functional food ingredient for protection against UVB-induced skin oxidative stress

Phycocyanin (PC) is a natural blue pigment–protein derived from Spirulina and has received considerable attention as a food-derived bioactive compound because of its antioxidant and health-promoting properties. This study investigated the potential of Spirulina-derived PC as a functional food ingredient for supporting skin health by evaluating its inhibitory effects on skin aging-related enzymes and its protective effects against ultraviolet B (UVB)-induced oxidative stress in human keratinocytes. The inhibitory activities of PC against elastase and collagenase were evaluated using in vitro enzyme assays. HaCaT keratinocytes were pretreated with PC and subsequently exposed to UVB radiation. Intracellular reactive oxygen species (ROS) accumulation was assessed using a fluorescence-based assay. The effects of PC on Mitogen-Activated Protein Kinase (MAPK) signaling were evaluated by western blot analysis, while the mRNA expression levels of nuclear factor erythroid 2-related factor 2 (Nrf2) and heme oxygenase-1 (HO-1) were determined by quantitative real-time PCR. PC inhibited both elastase and collagenase activities in a concentration-dependent manner. In UVB-stimulated HaCaT cells, PC pretreatment reduced intracellular ROS accumulation and attenuated UVB-induced activation of MAPK signaling. Furthermore, PC upregulated the mRNA expression of Nrf2 and HO-1, suggesting that antioxidant defense-related responses may contribute to its protective activity. Collectively, these findings indicate that Spirulina-derived PC may alleviate UVB-induced oxidative stress by reducing intracellular ROS accumulation, modulating MAPK signaling, and regulating antioxidant-related gene expression. Our findings suggest that Spirulina-derived PC enhances cellular antioxidant defense responses against UVB-induced oxidative stress in HaCaT keratinocytes, highlighting its potential as a functional food ingredient for supporting skin health. Further in vivo studies are required to establish the efficacy and bioavailability of PC for functional food and cosmetic applications.

Biography

Yeon-Ji Lee received an M.S. degree in Marine Biology from Jeju National University in 2017. Lee has been conducting marine biotechnology research at the Korea Institute of Ocean Science & Technology (KIOST) for the past 10 years, with a particular focus on the extraction of bioactive compounds and the evaluation of their biological activities through cell-based assays.

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