ScienceQuest
CONNECTING MINDS, SHAPING TOMORROW

ABSTRACT BOOK

World Conference on

Food Innovation and Nutritional Science

Date:
November 17-19, 2025

Venue:
Tokyo Prince Hotel,
Tokyo, Japan

INDEX

Plenary session

Keynote session

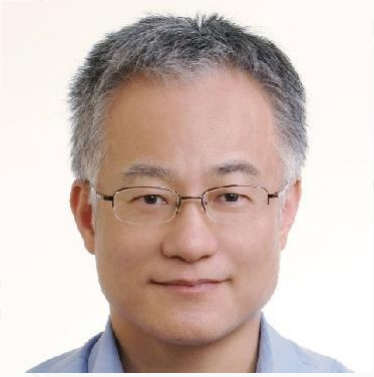
7	Title: Enzymatic hydrolysis as a valuable and efficient method for mitigating the potential allergenicity of Tenebrio molitor flour
	Carla Sílvia Silva Teixeira, *LAQV/REQUIMTE, Faculty of Pharmacy, University of Porto, Porto, Portugal*
8	"Title: Towards mitigating the allergenicity of sesame via enzymatic hydrolysis: potential for advancing hypoallergenic foods
	Caterina Machado Villa, *LAQV/REQUIMTE, Faculty of Pharmacy, University of Porto, Porto, Portugal*
9	Title: Impact of food processing on the allergenic properties of insect-derived proteins
	Joana Costa, *LAQV/REQUIMTE, Faculty of Pharmacy, University of Porto, Porto, Portugal*
10	Title: Molecular detection of lesser mealworm (Alphitobius diaperinus) flour as an emerging allergen in processed foods
	Isabel Mafra, LAQV/REQUIMTE, *Faculty of Pharmacy, University of Porto, Porto, Portugal*
11	Title: Understanding and Enhancing Pork Acceptance in School Meals through Culturally Tailored Nutrition Education at the U.S.-Mexico Border
	Juan Antonio Aguilera Mendoza, *UTHealth Houston School of Public Health in El Paso, USA*
12	Title: Assessment and correction of nutrition of adolescents in special medical groups
	Gulnur Doszhanova, *Astana Medical University, Kazakhstan*
13	Title: Fiber analysis of Shakes for seniors with added açaí seed pulp and flour
	Jorge Alberto Vieira Costa, *Federal University of Rio Grande, RS, Brazil*
14	Title: Chitosan nanospheres containing Spirulina sp. LEB 18 for the development of functional chocolate cake
	Michele Greque de Morais, F*ederal University of Rio Grande (FURG), Brazil*

Featured Talks

15	Title:A novel approach for the optimization of Shatavari
	Divya, *Indian Institute of Technology Delhi, India*
16	Title: Modulating Physicochemical, Textural, and Microstructural Properties of Wet-Spun Plant-Based Fibers with Different Protein Ratios
	Swati Kumari, *Gyeongsang National University, Republic of Korea*
17	Title: Assessing Motor Performance and Ankle Mobility in Pre-Adolescent Male Fencers
	Caner Aygoren, *Munzur University Turkey*
18	Title: Thymoquinone inhibits glutamate release from rat cerebrocortical nerve terminals through decreasing P/Q-type Ca2+ channels and protein kinase C activity
	Su-Jane Wang, *School of Medicine, Fu Jen Catholic University, Taiwan*
19	Title: Sensory and Analytical Evaluation of La Tienda Chabacano Gourmet Products
	Emeriza C. Luna, *Cavite State University Cavite City Campus, Research and Extension Coordinator*
20	Title: Advancing Halal Compliance in the Food Industry Through AI and Digital Innovation
	Reem ALShamsi, *Sultan Qaboos University, Sultanate of Oman*
21	Title: Thermophilic Microorganisms as a Source of Thermostable Glutenases: Isolation, Characterization, and Biotechnological Potential
	Nicolas Amaya Zambrano, *National Polytechnic Institute-Center for Research in Applied Biotechnology, Tlaxcala, Mexico*
22	Title: Oral Calcium Butyrate Attenuates Colonic and Cerebral Inflammation and Tissue Pathology Across Aging in Rats
	Sevim Kandis, Dokuz Eylul University, *Faculty of Medicine, Department of Physiology*

23 Title: Development of GABA-Enriched Functional Ice Cream Using Fermented Black Soybean Okara

Yi-Chung Lai, *Taiwan*



Ho Yuan-Soon
National Taiwan University, Taiwan

Phloretin increases anti-HER2 antibody drug affinity for cancer cells as an adjunct therapy for drug-resistant tumors in HER2-positive breast cancer

Despite the clinical benefits of trastuzumab for HER2-positive breast cancer patients, about 23% of them experience recurrence within 10 years. This study explores how phloretin, an apple polyphenol, inhibits type II glucose transporter (GLUT2) activity to reduce cancer cell glucose uptake, potentially improving the effectiveness of anti-HER2 antibody therapy. Real-time PCR confirmed the overexpression of both GLUT1 ($p=0.014$) and GLUT2 ($p=0.041$) mRNA in paired human breast tumor tissues ($n=107$). Interestingly, extensive population-based statistical analysis revealed that only the overexpression of GLUT2 mRNA is associated with poorer survival rates in breast cancer patients ($p<0.001$). Treatment with Phloretin (Ph) was observed to increase the interaction between GLUT2 and HER2 proteins in the HER2-positive breast cancer cells (HCC1419, HCC1954) using Förster resonance energy transfer analysis. Additionally, Ph treatment increased the binding affinity of anti-HER2 antibody drugs to target human breast cancer cells, as indicated by flow cytometry analysis. Furthermore, the cell-derived xenograft (CDX) tumor animal model reaffirmed the efficacy of the combination therapy involving Ph and antibody drugs in suppressing the growth of trastuzumab-resistant HER2+ breast cancer. These findings suggest that using Ph in combination with anti-HER2 antibody drugs by inhibiting the activity of GLUT2 may help control the growth of

drug-resistant breast cancer. These discoveries offer valuable insights for enhancing tumor treatment strategies and may contribute to developing more effective therapies.

Biography:

Distinguished Professor Yuan-Soon Ho graduated from the Institute of Biochemistry of National Taiwan University and is committed to studying the carcinogenesis of breast cancer induced by smoking. Since graduating from the research institute, he has published over 180 scientific papers. He is currently a Distinguished Professor at the Institute of Biochemistry and Molecular Biology of China Medical University (2022-). Professor Ho currently serves on the editorial boards of several international journals, including PLOS One, Scientific Reports, Food Science & Human Wellness, and The Journal of Food and Drug Analysis (Associate Editor). Served as society cadres such as: Director of the 6th, 7th, 8th and 9th Taiwan Tea Association (2012~), Executive Director of the Cancer Medical Society of the Republic of China (2015~2017), Director of the Cancer Medical Society of the Republic of China (2017-2019), Republic of China Academic member of the Cancer Medical Society (2021~), director of the Toxicology Society of the Republic of China (2020~). Professor Ho's primary research focuses on understanding the molecular mechanisms underlying breast cancer formation, carcinogenesis, and the development of anticancer therapeutics. In collaboration with clinical researchers, Professor Ho has contributed to studies on smoking-induced carcinogenesis, interactions among carcinogenic membranous proteins, and associated signaling pathways.

Min-Hsiung Pan

Institute of Food Sciences and Technology, National Taiwan University

Bisdemethoxycurcumin and curcumin alleviate inflammatory bowel disease by maintaining intestinal epithelial integrity and modulating gut microbiota compostion

Curcuminoids, found in turmeric (Curcuma longa L.), include curcumin (CUR), demethoxycurcumin (DMC), and bisdemethoxycurcumin (BDMC). Although CUR and DMC are well-studied, the anti-inflammatory effects of BDMC remain less explored. Recent studies highlight BDMC's stronger NF-*K*B inhibition compared to CUR and DMC in cell models, along with its ability to target pathways associated with inflammatory bowel disease (IBD) in DSS-induced colitis mice, reflected by lower disease activity scores and reduced inflammation. This study assessed CUR and BDMC in a DSS-induced colitis mouse model. Dietary administration of CUR or BDMC strengthened tight junction (TJ) proteins, reduced inflammatory cytokine secretion, and attenuated intestinal inflammatory protein expressions, thereby alleviating DSS-induced IBD in mice. Furthermore, gut microbiota and short-chain fatty acid analyses revealed that CUR and BDMC effectively regulated gut microbial imbalance and promoted the relative abundance of butyrate-producing bacteria. Furthermore, CUR showed low absorption and was primarily excreted in feces, while BDMC had higher absorption levels. In conclusion, while both BDMC and CUR have the potential as adjunct therapies for IBD, BDMC at a concentration of 0.1% showed strong anti-inflammatory effects and enhanced TJ proteins, suggesting that BDMC, even at lower concentrations than

CUR, holds promising therapeutic potential and prospects..

Biography:

Min-Hsiung Pan received the PhD degree from Biochemistry and Molecular Biology, College of Medicine, National Taiwan University, in 2000. He is currently a Distinguished Professor at the Institute of Food Science and Technology, National Taiwan University. His main interests include the natural dietary compounds, plant derived exosome-like nanoparticles, cancer chemoprevention, metabolism disorder, gut microbiota, circadian rhythm.

Dr. Jeanne ANDARY

Faculty of Health Sciences, Modern University for Business and Science, Lebanon

Furans in Lebanese Bread: Occurrence, Risk Assessment, and Formation Mechanisms

Introduction:
Furans are a class of compounds that can be found in various foods, primarily forming during thermal processing. Studies have shown that furan levels can vary significantly across different food products. Bread, coffee, sauces, and soups also show high levels of furan. This heterocyclic compound is formed during the heating of certain foods, particularly those rich in carbohydrates.

Importance:
Furan has been categorized as "possibly carcinogenic to humans" by the International Agency for Research on Cancer (IARC). The European Food Safety Authority (EFSA) has reaffirmed health concerns about furan exposure, underscoring the possibility of long-term liver damage from consuming furan-containing foods.

Objectives:
This study aims to investigate the formation and concentration of furans in traditional Lebanese bread during different stages of baking. Four types of bread are assessed: 1) authentic Lebanese white bread, 2) authentic Lebanese brown bread, 3) Saj (Lebanese flatbread), and 4) Tannour bread. The focus is on furan quantifi-

cation in the crust, where levels are typically highest.
Analysis is conducted using automated headspace static gas chromatography–mass spectrometry (HS-GC-MS), with enhanced sensitivity achieved through headspace trap (HS-trap) GC-MS techniques.

Results:
This study (in progress) seeks to quantify furan and derivative concentrations, compare results with international safety standards, and identify potential mitigation strategies to reduce furan levels in bread. Preliminary insights suggest that baking temperature and time play a critical role in furan formation.

Perspective:
The results of this research will provide valuable data for rsearchers, bakers, regulatory bodies, and consumers, supporting efforts to improve food safety. Future studies will extend this investigation to other traditional Lebanese food items, including coffee, to better understand dietary exposure to furans in the region.

Biography:

Dr. Jeanne Andary earned a Ph.D. in Analytical Chemistry and Chemometrics from AgroParisTech, France (2011), focusing on olive stone valorization and monitoring of neoformed molecules. She has taught Food Chemistry, Food Analysis, and Processing at several Lebanese universities (MUBS, AUST, LGU, ULF). Since 2023, she has been an Associate Professor and

Laboratory Coordinator at MUBS.

Dr. Andary has supervised numerous research projects nationally and internationally. Her work centers on antibiotic residues in food, olive oil authentication, and furan compounds. She is ISO 22000 and HACCP certified and serves as a reviewer for the Journal of Ethnopharmacology and Bioresource Reports.

She is also a member of the Global Food Regulatory Science Society (GFoRSS) and the Association of Oficial Analytical Chemists (AOAC), with a strong commitment to advancing food quality and safety

Ramona Massoud[1], Armita Massoud[2]

[1]*Department of Food Science and Technology, Iran National Standard Organization, Tehran, Iran*

[2]*Department of Medicine, Tehran University of Medical Sciences, Tehran, Iran*

Biodecontamination in Food industry

Food contamination from various sources, such as chemicals, remains one of the most prevalent global food safety concerns. Typically, food technology is designed to prevent the occurrence of contamination in food products. This involves assessing the potential risk of spoilage in the raw materials and processing stages to deliver safe foodstuffs to consumers. However, the rise in pollution due to human activities, particularly in the use of essential food ingredients and water, can lead to ecological imbalances (and even disasters), have toxic effects on entire ecosystems, and impact food safety. The impact of agricultural additives and food processing ingredients on consumer health highlights the pressing need for changes in the food industry's practices.

Current chemical and physical detoxification methods can be time-consuming, and costly, and result in a loss of nutrition. Biodecontamination exhibit extensive specificity and effectiveness, with different microorganisms used in detoxification process. They are potential biological techniques that have proven effective in detoxifying hazardous pollutants in food. Different microorganisms are used to remove contaminants from water and food; among them bacteria are a large useful group. Probiotics are a suitable option for bio-decontamination in the food industry since they are on the generally recognized as safe (GRAS) list. Their health benefits include supporting immunity, reducing cholesterol levels, preventing di-

arrhea, inhibiting colon cancer, inhibiting intestinal and gut pathogens, and having anticarcinogenic and antimutagenic effects. Probiotics can decontaminate food using viable or non-viable microorganisms. Certain probiotics can even adhere to intestinal cells to form complexes with toxins or heavy metals, which then rapidly pass through the gastrointestinal tract. This book reviews the role of probiotics and potential probiotics, as beneficial microorganisms, in the reduction and inactivation of different toxins and heavy metals in various food products, such as dairy products, drinking water, cereals and nuts, fruits and fruit-based products.

Biography:

Ramona has completed her PhD from Science and Research Branch, Islamic Azad University, Tehran, Iran. She is working in department of Food Science and Technology, Iran National Standard Organization since 2007 and she is the top researcher of Iran National Standards Organization, Tehran, Iran. She has published more than 80 papers in reputed journals and has been serving as an editorial board member of repute. She has had about 20 international oral presentations. She is a member of Iran's National Elites Foundation since 2021 and she is also teaching (Food science courses) in university since 2018.

Ayidh Almansour
University of Arkansas, Saudi Arabia

Whole Genome Sequencing of Listeria species Isolated from Ready-to-Eat Food Samples Imported to Saudi Arabia

Listeria monocytogenes is a critical foodborne pathogen responsible for listeriosis, a disease that can range from mild illness in healthy individuals to severe complications in high-risk populations. It is commonly associated with ready-to-eat (RTE) foods and has been implicated in numerous outbreaks globally, particularly through contaminated meat, fish, and dairy products. Regulatory bodies enforce microbiological criteria to ensure food safety and public health, particularly for RTE food products. In this study, a total of 100 imported RTE food samples were collected and analyzed in accordance with ISO 11290-1:2017 standards for Listeria spp. isolation. Detection and identification were performed using selective culturing, Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry (MALDI-TOF), and real-time PCR for confirmation. Whole genome sequencing (WGS) and downstream bioinformatics analyses were used to characterize genetic traits, resistance profiles, and virulence markers of the isolates. Out of the tested samples, 10% were positive for Listeria spp., with the following species identified: L. innocua (5), L. monocytogenes (3), L. grayi (2), and L. welshimeri (1). Contamination was predominantly observed in RTE meat and smoked fish products. Genomic analysis revealed diverse sequence types (STs) and plasmid content, including plasmids pLM33 and pLI100 in L. innocua, and N1-011A in L. monocytogenes. Key virulence factors were detected exclusively in

L. monocytogenes, notably Listeria Pathogenicity Island 1 (LIPI-1) and internalin genes such as inlA. Conserved domains within inlA (LRRNT and LPxTG) were identified, essential for host cell invasion, although mutations within the LRR and B-repeat regions may influence functional activity. Phenotypically, the majority of isolates exhibited resistance to ciprofloxacin and gentamicin. Genotypic analysis further revealed a wide spectrum of antimicrobial resistance and stress response genes. These findings underscore the importance of enhanced food safety surveillance and regulation of imported products. The integration of advanced genomic tools demonstrated strong utility in characterizing Listeria isolates, facilitating high-resolution risk assessment, and informing public health interventions. This study contributes valuable genomic insights into Listeria epidemiology and emphasizes the need for sustained molecular surveillance to support food safety and consumer protection.

Yilun Weng

School of Agriculture and Food Sustainability, University of Queensland, Australia

Advanced encapsulation technology for food industry

The incorporation of bioactive compounds such as vitamins, essential oils, peptides, and enzymes into food systems presents considerable challenges due to their inherent instability. Many of these ingredients are sensitive to heat, light, oxygen, and pH fluctuations, which can lead to significant degradation during processing and storage. Additionally, their bioavailability is often limited due to solubility issues or poor protection through the gastrointestinal tract. To address these limitations, this study explores an advanced encapsulation strategy using spray drying technology for both hydrophobic (e.g., vitamin A, vitamin E, β-carotene, essential oils) and hydrophilic (e.g., vitamin B12, peptides, and enzymes) bioactive food ingredients.

Spray drying was selected for its scalability, cost-effectiveness, and compatibility with food-grade materials. Tailored wall materials, including combinations of proteins, polysaccharides, and emulsifiers, were optimized to form protective matrices around the active ingredients. For hydrophobic compounds, emulsification prior to spray drying was critical to ensure uniform dispersion. For hydrophilic compounds, formulation strategies focused on minimizing water activity and stabilizing charge interactions. Encapsulation efficiency ranged from 80% to 95%, with the final powders demonstrating improved physicochemical characteristics including low moisture content (<5%), high dispersibility, and particle sizes suitable for

rehydration and blending in various food matrices. Thermal and oxidative stability tests revealed that encapsulated compounds retained over 90% of their activity after 60 days of storage at elevated temperature and under light exposure, compared to rapid degradation in unencapsulated controls. In vitro digestion studies showed enhanced bioaccessibility for both hydrophilic and lipophilic compounds, with an increase in estimated absorption. Notably, encapsulated enzymes such as phytase retained activity post spray-drying and during simulated gastric conditions, indicating the potential for functional food applications beyond fortification—such as improved digestion or nutrient utilization.

This work highlights the versatility and effectiveness of spray drying as a platform encapsulation technology suitable for stabilizing a wide range of bioactive ingredients. Compared to traditional unencapsulated delivery, this method not only extends shelf life and improves nutrient retention during processing, but also reduces ingredient wastage, thereby offering substantial cost savings. Furthermore, the enhanced bioavailability of micronutrients supports more efficient food fortification strategies, particularly important in public health nutrition. These findings demonstrate the potential of scalable encapsulation systems to meet the increasing demand for functional and fortified foods. The approach outlined here offers a promising route to develop next-generation food products with improved health benefits, shelf stability, and formulation performance.

Biography:

Dr Yilun Weng is a food-focused chemical engineer specialising in encapsulation and spray drying technologies. His research develops innovative solutions to stabilise and deliver sensitive bioactive ingredients—such as vitamins, enzymes, and oils—for food and feed applications. With a PhD in Chemical Engineering from The University of Queensland, Dr Weng's work enhances nutrient shelf life, bioavailability, and processing eficiency, supporting next-generation food fortification and functional ingredient delivery. He has published so far greater than 20 papers in Advanced Materials, Food Hydrocolloids, Food Chemistry, etc. with a citation over 300.

Carla Sílvia Silva Teixeira

LAQV/REQUIMTE, Faculty of Pharmacy, University of Porto, Porto, Portugalx

Enzymatic hydrolysis as a valuable and efficient method for mitigating the potential allergenicity of Tenebrio molitor flour

Tenebrio molitor larvae (yellow mealworm) was the first insect receiving approval as a novel food by the European Union. However, due to their genetic proximity to shellfish species, insects may pose notable allergy risks due to potential cross-reactivity with shellfish panallergens, particularly tropomyosins. This study aimed at investigating the application of enzymatic treatments (papain, alcalase, and neutrase), commonly used in the food industry, to reduce the potential allergenicity of T. molitor protein flour.

Yellow mealworm flour was treated with variable concentrations of papain, alcalase, and neutrase, buffer-to-sample ratios, temperatures and incubation periods. SDS-PAGE (non-denaturing conditions) was used to determine protein profiles, while the IgE-binding capacity of extracts was evaluated by immunoblotting and ELISA using sera from crustacean-allergic patients. Immunoblotting results indicated that papain was the most effective enzyme in eliminating IgE-reactive epitopes, as no reactive bands were observed, regardless of enzyme concentration or treatment conditions. In contrast, alcalase and neutrase treatments still showed faint bands around ~37 kDa even at high enzyme concentrations. ELISA results confirmed the immunoblotting data, showing that papain eliminated 94.8–99.6% of IgE-binding of mealworm allergens. The application of neutrase and alcalase

did not exhibit a clear correlation between enzyme concentration and IgE-binding capacity reduction. For alcalase, the decrease in the IgE-binding ranged from 78.1% to 89%, while for neutrase, the reduction ranged from 59.7% to 95.6%.

In summary, enzymatic hydrolysis can effectively mitigate the potential allergenicity of mealworm flour, with papain revealing the best performance in minimizing T. molitor IgE-reactivity when tested with sera from crustacean-allergic patients. These finding represent a step forward for the development of hypoallergenic insect ingredients. However, further studies are necessary to assess whether this IgE-binding reduction translates into a clinically relevant decrease in allergenicity.

Funding:
This work was funded by national funds (FCT) through projects ALLEVIATE (2023.12193.PEX), IMMUNOGATE (COMPETE2030-FEDER-00848700), and the strategic funding of UIDB/50006/2020) from FCT/MCTES.

Biography:

Carla S. S. Teixeira completed her PhD in Chemistry, with a specialisation in theoretical chemistry and molecular modelling, in 2021, from the Faculty of Sciences, University of Porto. In 2022 she initiated her research in the field of food safety and quality as a post-doctoral fellow at the Associated Laboratory for Green Chemistry (LAQV)/Rede de Química e Tecnologia (REQUIMTE), Faculdade de Farmácia, Universidade do Porto (FFUP). Her research has focused on the exploitation of bioactive peptides from novel foods and in their allergenicity assessment/mitigation, combining her expertise on molecular modelling with immunochemical and molecular characterisation methodologies. She is the principal investigator of one research project and participated as a member in several research projects and Cost Actions. She has published ~30 papers in international peer-reviewed scientific journals, 3 book chapters, and conducted 19 oral and 29 poster presentations at international and national conferences and meetings (h-index: 10).

Caterina Machado Villa

LAQV/REQUIMTE, Faculty of Pharmacy, University of Porto, Porto, Portugal

Towards mitigating the allergenicity of sesame via enzymatic hydrolysis: potential for advancing hypoallergenic foods

Sesame (Sesamum indicum) is an oilseed crop that is cultivated all over the globe, being valued for its nutritional properties and diverse applications. The growing demand for healthier foods has boosted the interest in sesame, but it has also raised the concerns about its potential to cause severe allergic reactions, including anaphylaxis in a large number of patients. To address this problem and protect the health of sesame-allergic patients, the development of effective food treatments capable of mitigating sesame allergenicity without affecting its nutritional and bioactive properties are needed. Enzymatic hydrolysis is a well-established, safe and effective processing strategy for reducing the allergenicity of food ingredients. The aim of this study is to evaluate the potential of enzymatic hydrolysis to reduce the IgE-binding capacity of sesame proteins. For this purpose, the commercial enzymes – alcalase and neutrase – were tested under different incubation conditions of time, temperature, sample-buffer ratio and enzyme concentration. Protein profiles of hydrolysates were evaluated by SDS-PAGE, while their IgE-binding capacity was assessed through immunoblotting and ELISA, using sera from sesame-allergic patients. The results demonstrated that alcalase was efficient in degrading black/white sesame proteins with a significant reduction in their IgE-binding potential at a maximum concentration of 5%, when incubated at 45 ºC for 6 h. These findings were further supported by in silico analysis, which demonstrated

that alcalase significantly affected most of the predicted linear epitopes, potentially hindering their IgE-recognition. On the other hand, neutrase exhibited lower efficiency in all tested conditions, as most white and black sesame proteins remained intact, with higher IgE-binding intensity following the enzyme catalytic activity.

The application of alcalase proved to be an effective method for reducing sesame protein allergenicity. To achieve the complete elimination of allergenicity, future studies should explore the effectiveness of combining alcalase with other enzymes and/or additional food processing technologies.

Funding:
This work was funded by national funds (FCT) through projects ALLEVIATE (2023.12193.PEX), IMMUNOGATE (COMPETE2030-FEDER-00848700), and the strategic funding of UIDB/50006/2020) from FCT/MCTES.

Biography:

Caterina Villa has a BSc degree in Applied Biology (University of Minho), MSc degree in Quality Control (FFUP) and PhD degree in Sustainable Chemistry (FCUP). Since 2013, C. Villa has been working on food research field, namely food quality and authentication, GMO detection, food as a source of bioactive compounds, and food allergens. Her principal focus consist in the development of strategies for the reduction of food allergenicity and the establishment of DNA-based methods for allergen detection in foods. Presently she is Junior researcher at REQUIMTE-LAQV/FFUP. C. Villa has several publications in international peer-reviewed journals (42), book chapters (9), oral/poster communications in international conferences (87), participation in national/international projects and COST actions (14) and supervisions of bachelor and master's students (7). H-index: 17.

Joana Costa

LAQV/REQUIMTE, Faculty of Pharmacy, University of Porto, Porto, Portugal

Impact of food processing on the allergenic properties of insect-derived proteins

The practice of consuming insects (entomophagy) has been gaining interest in Western contries, particularly following the European Union's recent authorisation allowing the introduction of four insect species for human consumption: Tenebrio molitor, Alphitobius diaperinus, Acheta domesticus, and Locusta migratoria. While considered safe, insects may pose a health risk to food-allergic individuals, either by acting as primary sensitisers or through cross-reactivity with allergens from shellfish (crustaceans and molluscs) and house dust mites (HDM). This study had two main objectives: (i) to enhance the extraction of allergenic proteins from the four insect species and (ii) to investigate how food processing influences the allergenic properties of these proteins and their potential cross-reactivity with shellfish and HDM allergens.

For this purpose, sixteen different extraction methods were tested, and protein profiles were analysed using SDS-PAGE. IgE-binding potential was assessed using sera from individuals allergic to shellfish. The most efficient protein extraction protocol involved a single-step incubation using 100 mM Tris-HCl with 4% SDS at pH 7.6, heated to 60°C for 2 hours, which yielded high-quality allergen isolates. Several insect proteins exhibited IgE reactivity with sera from shellfish-allergic individuals, indicating possible cross-reactivity with allergens from crustaceans,

molluscs, and HDM. Thermal food processing methods (boiling, roasting, baking, frying, grilling) generally increased the allergenicity of both shellfish and insects, particularly for tropomyosin, a well-known panallergen. This increase may be linked to structural changes caused by heat, which can expose epitopes and enhance proteins' IgE-binding capacity. Conversely, a commercial flour of A. diaperinus showed no IgE reactivity with shellfish-allergic sera. This fact might be linked to the intensive processing suffered by the A. diaperinus flour, leading to the potential mitigation of protein allergenicity. Overall, this work highlights the potential clinical cross-reactivity between insects and shellfish in allergic individuals, while increasing the knowledge into how thermal processing can impair insect allergenicity that could prompt the advance of hypoallergenic insect-based foods.

Funding:
This work was funded by national funds (FCT) through projects ALLEVIATE (2023.12193.PEX), IMMUNOGATE (COMPETE2030-FEDER-00848700), and the strategic funding of UIDB/50006/2020) from FCT/MCTES.

Biography:

Joana Costa has an European PhD in Pharmaceutical Sciences at Faculdade de Farmácia Universidade do Porto (FFUP, 2013), MSc in Quality Control (FFUP, 2009) and BSc in Biochemistry at (FCUP, 2004). Currently, she is an Assistant Researcher at REQUIMTE-LAQV/FFUP with research activities related to food allergen detection/characterisation, food authentication and GMO detection. She has 105 publications in peer-review international journals (h-index: 34), 8 papers in national journals, and 7 articles in proceeding conferences, 11 book chapters and 1 edited book, JC actively participates in several COST Actions, CA18227 (COMFA), CA23110 (INFOGUT), CA23127 (GIN-TONIC) and she is member of INFOGEST WG3-C. JC participated as PI or researcher member in several inter-/national projects (n=32), co-/supervised 2 Post-Doc researchers, 3 PhD, 8 MSc and 10 undergraduate students and colaborates as lecturer in several disciplines at FFUP (MSc in Pharmaceutical Sciences course).

Isabel Mafra

LAQV/REQUIMTE, Faculty of Pharmacy, University of Porto, Porto, Portugal

Molecular detection of lesser mealworm (Alphitobius diaperinus) flour as an emerging allergen in processed foods

The inclusion of insects as novel foods provides sustainable and nutritionally valuable alternatives to traditional protein sources. Among them, Alphitobius diaperinus (lesser mealworm) has recently been approved for human consumption under Regulation (EU) No 2015/2283, representing a significant milestone in the introduction of edible insects into the European Union (EU). However, introducing insects into the human diet raises safety concerns, especially regarding potential allergenicity, due to cross-reactivity in individuals allergic to other species like crustaceans and house dust mites. This work aims at developing a novel real-time PCR method for the detection and quantification of A. diaperinus larvae flour in food products.

For this purpose, reference mixtures were prepared as model foods (nugget mixture) containing known amounts of A. diaperinus flour, ranging from 25% to 0.0001% (w/w), subjected to thermal treatment to simulate processing. DNA extraction was performed using the NucleoSpin Food Kit, followed by UV spectrophotometry for DNA quantification. Following in silico studies and successful sequencing of genetic targets, species-specific primers and TaqMan probe were designed in the cytochrome c oxidase subunit I gene (COI) for the development of a real-time PCR method. The method demonstrated high specificity against 53 non-target species

and achieved an absolute limit of detection (LOD) of 0.1 pg of insect DNA and a relative LOD of 0.001% (w/w) of insect flour in model food matrices. Calibration curves using unprocessed and processed reference mixtures met the performance criteria of PCR efficiency, correlation coefficient within a concentration range of 25-0.001% (w/w). Both calibration models were effectively validated with blind mixtures, demonstrating the method's ability to quantify A. diaperinus flour with acceptable accuracy and reproducibility parameters. Applicability of method was also demonstrated using commercial samples of food and feed.

This method will support food labelling, allergen risk assessment and consumer protection as insect-based foods become more commercially available. Additionally, it will contribute to assess the influence of the process conditions in the method detection and quantification.

Funding:

This work was funded by national funds (FCT) through projects ALLEVIATE (2023.12193.PEX), IMMUNOGATE (COMPETE2030-FEDER-00848700), and the strategic funding of UIDB/50006/2020) from FCT/MCTES.

Biography:

Isabel Mafra has a degree in Food Engineering from the Portuguese Catholic University, a MSc in Biological Engineering from the University of Minho and a PhD in Chemistry from the University of Aveiro. She is currently Principal Investigator at the associated laboratory REQUIMTE/LAQV at the Faculty of Pharmacy, University of Porto, where she is a research group leader in food quality and safety, focusing on molecular biology methods applied to assess of food authenticity, GMO detection and analysis/characterization of food allergens. She has coordinated/participated in over 35 research national/international projects and published over 140 articles in international peer-review journals (H-index 41). She supervised several students, including Post-Doc (3), PhD (8) and MSc (20).

Juan Aguilera
Stanford University, USA

Understanding and Enhancing Pork Acceptance in School Meals through Culturally Tailored Nutrition Education at the U.S.-Mexico Border

Pork is a high-quality, nutrient-rich protein that remains underrepresented in school meal programs despite its potential to support child nutrition. In communities along the U.S.-Mexico border, cultural food practices and parental perceptions play a critical role in shaping students' food choices. However, little is known about how these factors influence the acceptance of pork in school nutrition, particularly in Hispanic-majority settings.

This study explored how parental perceptions of pork—including beliefs related to food safety, health, sustainability, and cultural relevance—influence student meal selection and consumption. Conducted in a border-region elementary school, the study utilizes a mixed-methods design, combining cafeteria point-of-sale data, direct observation, bilingual parental surveys, and focus groups.

In addition to examining baseline patterns of pork selection compared to alternative protein sources, the study introduces a bilingual, culturally tailored educational approach. Materials highlighting pork's nutritional profile, compliance with USDA school meal standards, and sustainability practices were developed in collaboration with school food service staff and community partners. These materials are being distributed to parents as part of an effort to assess whether targeted messaging can influence attitudes and support for pork inclusion in school meals.

We will present preliminary findings on student meal selection patterns and insights from parental surveys and focus groups. The intervention's potential to shift attitudes will be assessed using pre- and post-intervention data, with the goal of identifying promising strategies for engaging families and improving meal acceptance through culturally informed communication.

This research responds to a gap in the literature around protein diversity in school nutrition and the role of culturally tailored education in food acceptance. By focusing on pork—a widely consumed yet often overlooked protein in school settings—this study contributes to broader conversations on equitable and evidence-based approaches to enhancing school meals. It also highlights the value of interdisciplinary collaboration between public health researchers and educational experts in designing inclusive interventions that reflect the cultural contexts of the communities they serve.

Biography:

Dr. Juan Aguilera is an Assistant Professor at UTHealth Houston School of Public Health and former Director of Translational Environmental and Climate Health at Stanford University. His research focuses on the intersection of nutrition, environmental health, and health equity. He has published widely and been featured in national media for his expertise on climate and public health.

Gulnur Doszhanova
Astana Medical University, Kazakhstan

assessment and correction of nutrition of adolescents in special medical groups

Proper nutrition is a fundamental determinant of health, particularly during adolescence, a period of rapid growth and increased physiological demands. Ensuring adequate dietary intake is critical for adolescents in special medical groups, whose health status often requires tailored nutritional strategies to support optimal development and functional capacity. Data from the 2023 Annual Report for Kazakhstan indicate an alarmingly high proportion of adolescents facing health issues. Only a small fraction is classified as having optimal health, with a significant majority exhibiting risk factors for chronic diseases. Key contributors to these negative trends include inadequate physical activity levels and suboptimal dietary patterns, with national assessments highlighting concerns over both undernutrition and excessive weight gain. Recognizing these pressing issues, promoting proper nutrition and an active lifestyle are essential strategies for safeguarding the well-being and overall quality of life of school-aged children in Kazakhstan. This study aimed to assess the dietary patterns of adolescents classified into special medical groups to develop targeted medical and organizational interventions for optimizing their nutrition and physical activity. The cross-sectional research was conducted in Astana, Kazakhstan, in the fall of 2024, involving 162 adolescents aged 15–19 years (mean: 17.8±0.41 years). Dietary data were collected using the WHO-recommended 24-hour recall method. Nutrient intake was subsequently assessed against na-

tional dietary recommendations and FAO/WHO standards.The findings indicate significant dietary imbalances among adolescents in special medical groups. Participants showed an excessive intake of animal-based lipids and rapidly digestible carbohydrates, which was coupled with a substantial deficiency in complex carbohydrates, fiber, and essential micronutrients. Specifically, significant deficiencies were noted in fat-soluble vitamins (retinol, cholecalciferol, tocopherol) and water-soluble vitamins (thiamine, pyridoxine, folic acid, ascorbic acid), alongside a markedly low intake of key minerals. These nutritional imbalances, often compounded by insufficient overall caloric intake and pre-existing health conditions, were linked to reduced physical capacity, particularly in endurance and flexibility. Furthermore, many adolescents demonstrated a concerning lack of awareness regarding the link between nutrition and physical performance, often preferring high-fat, salty, and preservative-rich foods. The study successfully identified critical macro- and micronutrient deficiencies and suboptimal dietary habits within the targeted adolescent group. These results underscore the urgent need for targeted nutritional education programs combined with structured physical activity interventions to promote healthier habits and improve overall fitness. Addressing these nutritional gaps through comprehensive, multidisciplinary public health strategies is crucial for enhancing the well-being and functional capacity of adolescents in special medical groups in Kazakhstan.

Biography:

Gulnur Doszhanova, PhD, is a Chief Researcher at the Scientific Research Institute of Preventive Medicine named after Academician Y.D. Dalenov, Astana Medical University, Kazakhstan. A postdoctoral fellow and a hygienist-epidemiologist, she specializes in healthcare management and has over 12 years of experience. Her current research focuses on nutrition hygiene, pre-clinical diagnostics of health, and healthcare organization, particularly studying the quality of life in target population groups. Dr. Doszhanova holds more than 15 certificates of authorship and has successfully participated in over six scientific-educational projects since 2011.

Jorge Alberto Vieira Costa
Federal University of Rio Grande, RS, Brazil

Fiber analysis of Shakes for seniors with added açaí seed pulp and flour

According to the World Health Organization, in 2019, the number of people aged 60 and over reached 1.0 billion, and projections indicate that this number will reach 1.4 billion by 2030 and 2.1 billion by 2050. With increasing life expectancy, there is a rise in age-related diseases, such as chronic noncommunicable diseases, type 2 diabetes, cancer, and hypertension. The inclusion of bioactive compounds in the diet, such as phenolic compounds, pigments, vitamins, and fiber, helps protect the health of older adults. Açaí (Euterpe oleracea Mart.), native to the Amazon region (Brazil), has several nutritional and functional properties, which has earned it recognition as a "superfruit." The açaí seed, considered an agro-industrial waste, accounts for 90% of the fruit's total weight. It contains a high fiber content (~75%), mainly insoluble fiber, proteins, and lipids, with a predominance of oleic and linoleic fatty acids. However, few studies address the use of açaí seed flour in the development of new foods. Therefore, these raw materials present themselves as promising sources of nutrients for the enrichment of foods intended for the elderly. Given the above, this study aimed to evaluate the fiber content of shakes for the elderly enriched with freeze- dried açaí pulp and açaí seed flour. The shakes with the addition of 7.5% freeze-dried açaí pulp and 5% açaí seed flour and the control formulation (7.5% freeze-dried açaí pulp + 5% oat flour) were evaluated for their insoluble and soluble fiber content. The shakes with the addition of 7.5%

freeze- dried açaí pulp and 5% açaí seed flour had fiber contents of 8.1% insoluble fiber and 4.3% soluble fiber, approximately 2.5 and 6.1 times higher, respectively, than the control formulation with the addition of 5% oat flour. Therefore, the incorporation of açaí seed flour into the shake resulted in an increase in the product's fiber content. Adequate fiber intake is associated with reduced cholesterol levels, prevention of cardiovascular disease, and improved intestinal transit, contributing to the maintenance of health in the elderly population. Furthermore, the use of açaí seeds, a low-cost agro- industrial waste with high nutritional potential, represents a sustainable alternative that adds value to the açaí production chain.

Biography:

Jorge Alberto Vieira Costa completed his doctorate in Food Engineering at the State University of Campinas in 1996. He is currently a full professor at the Federal University of Rio Grande (FURG) - Brazil, advisor of the Graduate Program in Bioprocess Engineering and Biotechnology at the Federal University of Paraná, and deputy coordinator of the Food Science area at CAPES. He holds a Research Productivity Grant 1-A from CNPq. He is considered one of the most important researchers in Food Engineering and Science in Brazil and Latin America, ranking among the 100 most important in the world, according to the AD Scientific Index. He has published 367 articles in specialized journals and over 1,000 papers in conference proceedings. He has published 61 book chapters, 26 technological products, and 44 patents (five granted). He has received 55 awards and honors.

Michele Greque de Morais
Federal University of Rio Grande (FURG), Brazil

Chitosan nanospheres containing Spirulina sp. LEB 18 for the development of functional chocolate cake

Spirulina is a microalga widely recognized as a “superfood” because of its very high protein content (up to 80 % by mass) and its rich composition of essential amino acids, vitamins, fatty acids and minerals. In addition, Spirulina contains bioactive compounds that exhibit antioxidant and anti- inflammatory activities, which support its use as a functional ingredient in food and nutraceutical applications. Consequently, it can be added to foods such as cakes, which are consumed by all age groups, especially children, turning them into functional foods. However, the direct addition of Spirulina biomass (SB) to cakes induces undesirable sensory changes in color, odor, and taste; nanoencapsulation can physically isolate SB from the food matrix, effectively masking its characteristic color and odor and thus improving sensory acceptance. Therefore, nanotechnology can be employed to nanoencapsulate SB using polymers such as chitosan, developing polymeric nanocapsules with Spirulina (NCS) through techniques such as needleless electrospraying. This process forms a barrier that prevents SB from dissolving in the food matrix, avoiding undesirable sensory alterations. Additionally, the barrier protects SB from protein denaturation and bioactivity loss by preventing direct contact with environmental factors, thereby preserving heat-sensitive proteins and bioactive compounds during processing and storage. Chitosan increases the degradation temperature of NCS and allows them to dissolve only after ingestion, upon reach-

ing gastric juice, a feature that supports targeted nutrient delivery following consumption. Thus, the objective of this study was to develop polymeric nanocapsules containing Spirulina sp. LEB 18 using the needleless electrospraying technique and to enrich chocolate cake. The NCS were produced using needleless electrospraying, presenting an average diameter of 216 ± 56 nm and composed of 20 % (w w-1) chitosan and 80 % (w w-1) SB. The encapsulation efficiency obtained was 95 %, which indicates effective retention of Spirulina within the carrier. Thermogravimetric analysis showed that the NCS have a degradation temperature of 220°C and no residual solvent. Chocolate cakes enriched with 10 % (w w-1) SB nanoencapsulated showed an increase of 35 % in protein, 52 % in minerals, and 42 % in lipids. Therefore, the addition of NCS turns the chocolate cake into a functional food by increasing its protein and mineral content; consequently, NCS fortification enhances nutritive value while minimizing sensory impact. This widely consumed food among children enables the intake of 25 g of protein and 4 g of minerals per portion (100 g), making it a healthier option for school snacks.

Biography:

Michele Greque de Morais is Associate Professor at the Federal University of Rio Grande (FURG), Brazil, and head of the Microbiology and Biochemistry Laboratory. She holds a Ph.D. in Food Engineering and Science from the Federal University of Rio Grande, including a 10-month internship at Philipps-Universität Marburg, Germany, and postdoctoral fellowship at UCSD. Her research focuses on microalgal biotechnology with contributions to CO_2 capture, nanotechnology, food processing, and Spirulina applications. Michele's work has received international recognition: in 2025 she was listed among the World's Top 2% Scientists as most influential over the career and most influential in 2024 based on Elsevier's database; she was also named among the world's most influential researchers in 2023 by Elsevier and Stanford, and received Silver for Best Paper Presented at AlgaEurope 2024. She serves as Associate Editor of Bioresource Technology and advances sustainable biotechnological innovation by integrating microbiology and engineering, and mentoring graduate students.

Divya
Indian Institute of Technology Delhi, India

A novel approach for the optimization of Shatavari (Asparagus racemosus Willd.) plant-based low alcohol nutra beverage production using Saccharomyces cerevisiae (NCIM 2428) in conjunction with artificial neural network and genetic algorithm (ANN-GA)

Introduction: This study focused on optimizing the fermentation conditions of Shatavari plant-based roots using an artificial neural network and response surface methodology. The aim was to identify the optimal independent variables and corresponding responses by comparing experimental and predicted responses. The experimentation was validated using a genetic algorithm, determining the best temperature, pH, and inoculum parameters.

Material and Methods: In this study, we used the Shatavari (Asparagus racemosus Willd.) plant's root as their primary raw material and subjected it to treatment with α amylase and gluco-amylase enzyme (EC 232-885-6) which exhibited a remarkable activity level ranging from 8000 to 12,000 U/mg The resulting hydrolysate was fermented using Saccharomyces cerevisiae (NCIM 2428) culture. To determine the optimal combination of input variables a Central Composite Rotatable Design was implemented, facilitated by the Design Expert software (Version 11.0.3.0 by Stat-Ease Inc.),.

Result and conclusion: The optimal conditions for the experiment were found to

be a temperature of 32 °C, pH of 4.0, and inoculum concentration of 10% (v/v). The Artificial Neural Network (ANN) model was able to successfully predict the response variables with a marginal relative error rate of 8.722% and 24.312% for ethanol production and antioxidant activity, respectively. The fermented Shatavari-based low-alcohol Nutra beverage contained only fructose. The validation of Shatavari juice using the ANN model showed an enhanced ethanol yield of 3.21% and 421.47 µg/L antioxidant activity during fermentation. The experimental and predicted outcomes from the Artificial Neural Network—Genetic Algorithm (ANN-GA) model matched, proving its predictive precision.

Keywords: Shatavari (Asparagus racemosus Willd).
- Fermentation
- Enzyme hydrolysis
- Process optimization
- ANN-GA
- Sugar analysis.

Biography:

Dr. Divya is a Food Technologist specializing in functional foods, fermentation, and sustainable food innovation. She earned her Ph.D. in Food Technology from the Indian Institute of Technology Delhi, where she developed a patented Shatavari-based Nutra-beverage with demonstrated antioxidant and gut health benefits. Her interdisciplinary research spans plant and dairy protein structuring, dietary fiber modification, and valorization of agro-industrial waste. She is proficient in advanced analytical techniques (LC-MS, GC-MS, HPLC) and fermentation optimization using ANN-GA and RSM. Divya's work contributes to developing nutrient-rich, safe, and affordable food products through bioactive compound recovery, bio-preservation, and microbial safety interventions. She collaborates with premier institutes like CIMAP and IIT Delhi and is currently advancing her research in Singapore. Her current focus includes bio-preservation using lactic acid bacteria, antimicrobial compounds, and intelligent packaging systems for enhanced food shelf life and consumer health.

Swati Kumari

Gyeongsang National University, Jinju 52852, Republic of Korea

Modulating Physicochemical, Textural, and Microstructural Properties of Wet-Spun Plant-Based Fibers with Different Protein Ratios

The development of fibrous meat alternatives that closely resemble the architecture of animal tissue is required to meet the demand for sustainable and texturally acceptable plant-based meat substitutes. The purpose of this study was to use a wet-spinning process to create fibres made from sodium alginate (SA), wheat protein (WP), and pea protein isolate (PPI) in different compositions. Zeta potential, pH, and viscosity measurements were used to evaluate the fibres' physicochemical characteristics, while texture profile analysis (TPA), Warner-Bratzler shear force (WBSF), moisture content, and objective colour analysis (CIE L*, a*, b*) were used to evaluate their functional characteristics. Because of the unique surface charge behaviour of proteins, increasing the percentage of PPI produced a higher negative zeta potential, suggesting increased electrostatic repulsion. variations in protein interactions were also reflected with the variations in viscosity. Textural research showed that while higher PPI levels improved chewiness, formulations with higher WP content showed greater cohesion and hardness. Although the moisture content fluctuated between samples, it was still within a range that was suitable for fibre stability. As PPI increased, colour analysis showed a change towards greater lightness (L*) and yellowness (b*), which reflected structural and compositional variations.

These results show that altering the proportion of wheat to pea proteins has a major impact on the physicochemical and textural characteristics of plant-based fibres. The knowledge acquired facilitates the logical development of protein-based fibrous materials for meat substitutes that are more palatable to consumers and have better structural integrit.

Caner AYGOREN
Munzur University Turkey

Assessing Motor Performance and Ankle Mobility in Pre-Adolescent Male Fencers

Ankle mobility plays a critical role in dynamic stability and propulsion during fencing-specific actions. However, its relationship to performance metrics in young athletes remains unclear. This study aimed to investigate the relationship between ankle range of motion (ROM), acceleration, and jump height in pre-adolescent male fencers, as well as to examine bilateral differences in ankle mobility between the front and rear foot. Fifteen fencers (age 10.86 ± 0.91 years) were assessed for ankle ROM (dorsiflexion, plantar flexion, inversion, eversion) using a goniometer. Performance tests included a 7 m sprint lunge (acceleration) and countermovement jump. Significantly large correlations were observed between front and rear foot ankle plantar flexion range of motion and both acceleration ($r = 0.625–0.628$, $p < 0.05$) as well as vertical jump height ($r = 0.579–0.647$, $p < 0.05$). Rear foot ankle plantar flexion range of motion significantly predicted acceleration ($r2 = 0.335$, $p < 0.05$) and jump height ($r2 = 0.418$, $p < 0.05$). In contrast, no meaningful associations were found between dorsiflexion, inversion, or eversion range of motion and performance metrics. Additionally, bilateral comparisons revealed significantly greater dorsiflexion in the front foot ankle and greater eversion in the rear foot ankle ($p < 0.05$). Plantar flexion ROM is a key contributor to acceleration and jump capacity in youth fencers. Incorporating ankle mobility training may support physical development in this population.

Biography:

Caner Aygören Munzur University Turkey. He is a specialist in exercise science and sports physiology. He also works on chronic diseases and exercise. He also continues to work on sports biochemistry and studies athletic performance in elite athletes.

Su-Jane Wang
School of Medicine, Fu Jen Catholic University, Taiwan

Thymoquinone inhibits glutamate release from rat cerebrocortical nerve terminals through decreasing P/Q-type Ca^{2+} channels and protein kinase C activity

Thymoquinone (TQ; 2-isopropyl-5-methyl-1,4-benzoquinone) is a monoterpene compound derived from the essential oil of Nigella sativa seeds, traditionally used as a culinary spice to flavor vegetables, curries, bread, and salads worldwide. TQ has shown neuroprotective effects in various animal models of brain injury and is associated with improved cognitive function. This study examined the effects of TQ on glutamate release from rat cerebrocortical synaptosomes and elucidated the underlying mechanisms. TQ inhibited 4-aminopyridine (4-AP)-evoked glutamate release in a concentration-dependent manner, with an estimated IC50 of 8.1 μM. This inhibition was absent under Ca^{2+}-free conditions and was blocked by bafilomycin A1, a vesicular glutamate transporter inhibitor, indicating that TQ acts through a Ca^{2+}-dependent exocytotic pathway. Consistent with this, TQ significantly reduced 4-AP-induced uptake of synaptotagmin 1 luminal domain antibody (syt1-L ab), further supporting the suppression of synaptic vesicle exocytosis. TQ also attenuated 4-AP-induced intraterminal Ca^{2+} elevation without affecting synaptosomal membrane potential. Notably, its inhibitory effect on glutamate release was abolished by P/Q-type Ca^{2+} channel blockers or PKC inhibitors. Western blot analysis revealed that TQ decreased 4-AP-induced phosphorylation of PKC, SNAP-25, and Munc18-1 in synaptosomes. Together, these findings suggest that

TQ inhibits glutamate exocytosis from cerebrocortical synaptosomes by suppressing Ca^{2+} influx through P/Q-type channels and downregulating the PKC/SNAP-25/Munc18-1 signaling pathway. These results provide novel insights into the neuropharmacological properties of TQ and suggest a potential mechanism for its anti-excitotoxic effects in the brain.

Biography:

She earned her Ph.D. at the age of 27 from the Institute of Basic Medical Sciences, National Cheng Kung University, and subsequently conducted postdoctoral research in the Department of Pharmacology at University College London. Over the past 27 years, she has published nearly 137 SCI-indexed papers as first or corresponding author and has been awarded five patents.

Emeriza C. Luna

Cavite State University Cavite City Campus, Research and Extension Coordinator

Sensory and Analytical Evaluation of La Tienda Chabacano Gourmet Products

This study evaluated the sensory and analytical qualities of four La Tienda Chabacano gourmet products to promote the preservation of Cavite City's culinary heritage. Sensory evaluation showed all products were acceptable in taste, aroma, appearance, and texture, with Ginataang Alamang and Pork rated "highly acceptable." Microbiological analysis confirmed safety, with aerobic plate counts ranging from <10 to 90 CFU/g, coliform levels <1.8 MPN/g, and yeast and mold counts between <10 to 70 CFU/g—all within FDA standards. Physico-chemical results varied: Champorado had the highest moisture content (69.74 g/100g) and water activity (0.98), indicating higher spoilage risk, while Ginataang Alamang and Pork had lower moisture (29.68 g/100g) and water activity (0.9628), enhancing shelf stability. pH levels ranged from 5.31 to 7.07, classifying most products as low-acid foods. Recommendations include improved thermal processing for high-moisture products and reformulation of Champorado to reduce water activity.

Biography:

She currently pursuing her Doctors in Hospitality Management at Philippine Womens University Taft Manila. She is the current Research and Extension Coordinator of Cavite State University Cavite City Campus. She has just published 1 paper in scopus indexed journal for the last 3 years.

Reem Musabah Sultan AL Shamsi
Food Safety and Quality Center Ministry of Agriculture, Fisheries Wealth and Water Resources Sultanate of Oman

Advancing Halal Compliance in the Food Industry Through AI and Digital Innovation

The demand for halal food products is rapidly increasing worldwide, driven not only by Muslim consumers but also by non-Muslims who appreciate the purity, safety, and ethical standards associated with halal-certified products. However, traditional halal certification processes face challenges related to efficiency, transparency, and fraud prevention. This study explores the integration of artificial intelligence (AI), blockchain, and digital technology into halal certification, focusing on their role in enhancing accuracy, security, and regulatory compliance.

Methods
This study adopts a quantitative research approach, including a thorough literature review and an analysis of AI and blockchain implementation in halal certification. Data is collected through interviews with key industry stakeholders and surveys assessing the effectiveness and potential impact of these technologies.

Results
Findings indicate that AI, blockchain, and digital technology significantly enhance the halal certification process:

- AI automates error detection, improves accuracy, and streamlines compliance procedures.

- Blockchain prevents fraud through immutable records, ensuring transparency in supply chains.
- Digital technology facilitates real-time tracking, strengthening regulatory oversight.

The integration of these technologies has the potential to revolutionize halal certification by increasing trust, reducing fraud, and improving efficiency. Additionally, this digital transformation, if adopted, positions the Gulf Cooperation Council (GCC) as a global leader in halal certification, reinforcing its influence in shaping international halal compliance frameworks.

Conclusion

The adoption of AI, blockchain, and digital technology is reshaping halal compliance by improving accuracy, transparency, and operational efficiency. As global demand for halal products continues to rise, leveraging these innovations will be essential for maintaining trust, ensuring regulatory compliance, and strengthening the integrity of halal certification in the food industry.

Biography:

Reem Al Shamsi is a Biotechnology Specialist at the Food Safety and Quality Center, Ministry of Agriculture, Fisheries Wealth and Water Resources, Oman. She earned her B.Sc. degree in Biotechnology from Sultan Qaboos University in 2017 and is a certified trainer in Human Development, Food Safety, and Quality. Reem began her career at Mazoon Dairy Company as a microbiologist and Quality Assurance oficer, where she gained practical experience in laboratory testing, HACCP implementation, and food quality systems. Since 2025, she has been engaged with Atyab International Services, contributing to halal certification audits, ISO and HACCP compliance, and the development of food regulatory frameworks in collaboration with SMEs and governmental bodies. She has participated in multiple conferences and exhibitions, including the Oman International Food Safety Conference and COMEX Global Technology Exhibition. Reem has presented research on advancing halal compliance in the food industry through the integration of Artificial Intelligence and Blockchain technologies.

Nicolas Amaya Zambrano

National Polytechnic Institute-Center for Research in Applied Biotechnology, Tlaxcala, Mexico

Thermophilic Microorganisms as a Source of Thermostable Glutenases: Isolation, Characterization, and Biotechnological Potential

Gluten is a glycoprotein composed of gliadin and glutenin. In recent years, gluten-related disorders (GRDs) have increased significantly, and the only effective treatment remains a strict gluten-free (GF) diet. Enzymatic hydrolysis represents a promising strategy for developing GF products; however, the limited availability of thermostable enzymes poses a major challenge. This study aimed to isolate and identify thermophilic microorganisms capable of producing thermostable glutenases. Sampling was conducted at El Geiser, Río Grande, Hidalgo, from water and sediment sources at temperatures of 70°C and 85°C. A total of 36 thermophilic microorganisms were isolated. Screening for glutenase activity was carried out using MCG-1 medium supplemented with gluten, selecting strains that produced degradation halos larger than 10 mm. Gluten hydrolysis was evaluated spectrophotometrically by measuring absorbance at 275 nm, followed by quantification of free amino acids at 570 nm. Glutenase activity at 70°C was confirmed in bacterial strains Geobacillus kaustophilus and Geobacillus thermodenitrificans, and fungal strains Aspergillus uvarum and Aspergillus fumigatus, which produced free amino acid concentrations of 28.61 ± 0.9, 21.72 ± 0.9, 20.84 ± 1.2, and 20.56 ± 0.9 µg/mL, respectively. Simultaneously, the pH and temperature optimum of the enzyme were pH 5, 4, 5, 5, and temperatures of 80°C for Geobacillus strains and 65°C for Aspergillus strains. Gliadin degradation was further confirmed by SDS-PAGE

(10%). These findings highlight the biotechnological potential of thermophilic microorganisms for enzymatic gluten degradation and provide a foundation for developing industrial GF processing solutions.

Biography:

He is a third-semester student in the Master's program in Productive Biotechnology at the Center for Research in Applied Biotechnology of the National Polytechnic Institute. His research focuses on the enzymatic degradation of immunogenic gluten components using thermostable extremoenzymes, with the objective of developing applications in the industrial sector. He holds a Bachelor's degree in Biotechnology, with a thesis entitled "Evaluation of the Antifungal Activity of Bacillus subtilis Metabolites." His academic background includes specialization in the production of microbial metabolites, the optimization of culture media, and their application at the industrial level to generate goods and services. His current focus on food biotechnology and enzymology provides valuable tools that he aims to apply within the bakery industry.

Sevim Kandis

Dokuz Eylul University, Faculty of Medicine, Department of Physiology

Oral Calcium Butyrate Attenuates Colonic and Cerebral Inflammation and Tissue Pathology Across Aging in Rats

The microbiota–gut–brain axis has emerged as a key focus due to its critical role in health and disease. Short-chain fatty acids are essential microbial metabolites produced through anaerobic fermentation, with butyrate serving as the primary energy source for colonocytes and exerting anti-inflammatory, antioxidant, and anti-apoptotic effects. Aging alters microbiota composition, immune responses, and epithelial barrier integrity, leading to reduced microbial diversity, increased intestinal permeability, and inflammation. In this study, calcium butyrate (300 mg/kg daily for 21 days) was administered to young adult (12–14 weeks) and aged (12–14 months) Wistar rats to investigate age-related changes in inflammation and intestinal barrier function. Intestinal tight junction proteins (OCLN, ZO-1), neuroinflammatory markers (GFAP, Iba-1, NeuN), and inflammatory cytokines (TNF-α, IL-10, IL-1β, IL-6) were analyzed. Calcium butyrate increased IL-10 and decreased TNF-α in hippocampal and colonic tissues, indicating anti-inflammatory effects predominantly in the hippocampus of young rats and the colon of aged rats. NeuN expression was significantly elevated in calcium butyrate groups compared to controls, whereas GFAP and Iba-1 expression were markedly reduced. Colonic ZO-1 and OCLN expression were also significantly upregulated, with more pronounced effects observed in aged rats. Collectively, these findings demonstrate that 21 days of oral calcium butyrate supplementation enhances intestinal tight junction protein

expression and mitigates neuroinflammatory and systemic inflammatory parameters in both young adult and aged rats.

Biography:

She graduated from Ankara University, Faculty of Veterinary Medicine, where she also completed her first PhD. She obtained her master's degree and a second PhD at Dokuz Eylul University, Faculty of Medicine. Between 2022 and 2023, she held a post-doctoral research position at Madrid Autónoma University with a competitive scholarship. Currently, she is working as an Assistant Professor in the Department of Physiology at Dokuz Eylul University, Faculty of Medicine. Her academic background reflects strong interdisciplinary expertise bridging veterinary and medical sciences, with research interests focusing on neuroinflammation, gut–brain axis, and functional nutrition.

Yi-Chung Lai
Taiwan

Development of GABA-Enriched Functional Ice Cream Using Fermented Black Soybean Okara

This study explores the application of GABA-enriched black soybean okara, produced via solid-state collaborative fermentation with Rhizopus oligosporus and Yarrowia lipolytica, as a functional ingredient in ice cream formulation. Building upon previous research that optimized GABA production, the fermented okara was incorporated into dairy-based ice cream to enhance its nutritional profile and promote sustainable food waste utilization. The integration of this fermented ingredient not only improves the functional value of ice cream but also supports circular economy principles by valorizing agro-industrial byproducts. The presentation will cover fermentation optimization, product formulation, sensory evaluation, and sustainability implications.
In addition to the oral presentation, I would also like to submit a poster presentation on the same topic to further share the technical details and engage with fellow researchers during the poster session.
Please let me know the next steps for submitting the poster abstract and any required materials.

Looking forward to participating in this exciting event.