ICSAF

International Conference on
Sustainable Global Agriculture & Food

6th INTERNATIONAL CONFERENCE ON SUSTAINABLE GLOBAL AGRICULTURE AND FOOD 2026 (ICSAF 2026)

ABSTRACT BOOK

6th INTERNATIONAL CONFERENCE ON SUSTAINABLE GLOBAL AGRICULTURE AND FOOD 2026 (ICSAF 2026)

Emerging Innovations and Trends in Food Biotechnology for a Sustainable Future

Program and Technical Abstracts

Message from Conference Chair

ICSAF2026 – 6th International Conference on Sustainable Global Agriculture & Food

On behalf of Theophane Venard School of Food Biotechnology and Innovation, Assumption University, it is my great honor to welcome you to the 6th International Conference on Sustainable Global Agriculture & Food (ICSAF2026), to be held on **5–6 March 2026** at Assumption University, Hua Mak campus, Bangkok, Thailand.

This year's conference, themed *"Emerging Innovations and Trends in Food Biotechnology for a Sustainable Future"*, brings together a vibrant network of scholars, researchers, students, and industry professionals from across Asia and beyond. Co-organized by four leading universities—Assumption University (Thailand), Saigon Technology University (Vietnam), Fujen Catholic University (Taiwan), and Soegijapranata Catholic University (Indonesia)—ICSAF2026 continues its mission to foster regional and global collaboration in sustainable agri-food innovation.

The program will feature keynote addresses by distinguished experts, plenary sessions, oral and poster presentations, and interactive forums that explore cutting-edge topics. We warmly invite you to join us in Bangkok to exchange ideas, build partnerships, and contribute to shaping the future of sustainable agriculture and food biotechnology.

With sincere appreciation and anticipation,

Asst. Prof. Dr. Patchanee Yasurin

Chair, ICSAF2026
Dean of Theophane Venard School of Food Biotechnology and Innovation
Assumption University

March 05, 2026		**Room**
8.00 – 8.30	**Registration**	Salle d' Expo (A Building)
8.30 – 9.00	**Opening Remark** by **Assoc. Prof. Dr. Chanintorn Jittawiriyanukoon** *Vice President for Research and Academic Services*	
	Plenary Lectures	
9.00 – 9.15 PL-1	Microplastics in Asian Food Systems: Evidence and Food Safety Implications ***Asst. Prof. Dr. Inneke Hantoro*** *Faculty of Agricultural Technology, Soegijapranata Catholic University, Indonesia*	
9.15 – 9.30 PL-2	From Genome to Flavor: Transforming Traditional Fish Fermentation with Starter Culture Technology ***Prof. Jirawat Yongsawatdigul*** *School of Food Technology, Suranaree University of Technology, Thailand*	
9.30 – 9.45 PL-3	Improving Alzheimer's Disease in Rats with Cinnamon Leaf Nanoemulsion and Byproducts ***Prof. Bing-Huei Chen*** *Department of Food Science at Fu Jen Catholic University, Taiwan*	
9.45 – 10.00 PL-4	Valorization of Lignocellulosic Biomass through Biorefinery Approches ***Assoc. Prof. Malinee Sriariyanun*** *Sirindhorn International Thai-German Graduate School of Engineering (TGGS), King Mongkut's University of Technology North Bangkok, Thailand*	
10.00 – 10.15	Coffee Break	
10.15 – 10.30 PL-5	Designing Healthier Sausages Using Germinated Mung Beans and Transglutaminase: From Novel Plant-Based Proteins to Consumer Acceptance ***Prof. Kim Anh Hoang*** *Faculty of Food Technology, Saigon Technology University, Vietnam*	
10.40 – 11.00 PL-6	Embracing AI in Agricultural and Food Technology ***Prof. Glenn M. Young*** *University of California, Davis, US*	
11.00 – 11.20 PL-7	Engineering the Circular Bioeconomy: From Biomass to Sustainable Food Systems ***Asst. Prof. Dr. Pattaraporn Posoknistakul*** *Department of Chemical Engineering, Faculty of Engineering, Mahidol University, Thailand*	
11.20 – 11.40 PL-8 *(online)*	From seed oil bodies to edible emulsions: a plant-inspired engineering strategy ***Asst. Prof. Dr. Toya Ishii*** *Faculty of Agriculture, Kagawa University, Japan*	
11.40 – 12.00 PL-9 *(online)*	Thermotolerant Yeasts for Climate-Resilient Food and Fermentation Systems: Molecular Characterization and High-Temperature Performance of Indigenous Strains ***Dr. Maduka Subodinee*** *Department of Food Science and Technology, University of Ruhuna, Sri Lanka*	

12.00 – 13.30	Lunch	Sky Lounge (C Building)
13.00 – 13.30	**Poster session**	Salle d' Expo
13.30 – 16.40	**Parallel Sessions (A-D)**	Salle d' Expo (Session A, B) & A91(Session C, D)
16.40 – 17.00	**Awards & Closing Ceremony** by **Asst. Prof. Dr. Patchanee Yasurin** *Dean, Theophane Venard School of Food Biotechnology and Innovation*	Salle d' Expo

March 06, 2026		
10.00 – 11.00	Advisory Board Committee Meeting	A91
11.00 – 11.30	Coffee Break	

ORAL AND POSTER PRESENTATION

ORAL PRESENTATION

Session A: Food Innovation & Future Agri-Food Systems (FI)

Session B: Food Engineering

Session C: Agriculture and Food Biotechnology

Session D: Governance, Circularity & Digital Transformation (GCD)

REMARK

Oral Presentation:10 minutes including Q&A

Session A: Food Innovation & Future Agri-Food Systems (FI) - Room 1 (Salle d' Expo)

Chair: Assoc. Prof. Malinee Sriariyanun

13.30 – 13.40	Protein Profile of Vegetal Milk from Velvet Bean (Mucuna pruriens) and Jack Bean (*Canavalia ensiformis*)
FI-1	Steffi Agustine Chandra Faculty of Agricultural Technology, Soegijapranata Catholic University, Indonesia
13.40 – 13.50	A Qualitative Exploration of Consumer Acceptance of Valorised Sesame Functional Noodles in Bangkok
FI-2	Atittaya Tandhanskul Theophane Venard School of Food Biotechnology and Innovation, Assumption University, Thailand
13.50 – 14.00	Valorizing Broken Rice Flour for Sustainable Food Packaging
FI-3	Nguyen Vu Hoang Phuong Faculty of Food Technology, Saigon Technology University, Vietnam
14.00 – 14.10	Implementation of Sustainable Practices and Their Determinants in Indonesian Food Industries
FI-4	Novita Ika Putri Department of Food technology, Faculty of Agricultural Technology, Soegijapranata Catholic University, Indonesia
14.10 - 14.20	Gen Z Consumer Purchase Intention Towards Blockchain-enabled Traceable Coffee - A Study in Bangkok
FI-5	Yunmei Wang MSME Business School, Department of Marketing, Assumption University, Thailand
14.20 – 14.30	Valorization of Defatted Black Sesame Cake in Noodle Products: A Sensory Evaluation Study
FI-6	Luoluo Li Theophane Venard School of Food Biotechnology and Innovation, Assumption University, Thailand
14.30 – 14.40	Effects of Nutrient Addition on Phytoplankton Growth in the Coastal Waters of Kagawa Prefecture, Japan
FI-7	Theppitak Vipulakom School of Food Biotechnology and Innovation, Assumption University, Thailand
14.40 – 14.50	Exploring Farmer Regeneration Through Life-Frame Values: Evidence from a Farmer Community in Japan
FI-8	Musria Nurfauzia The United Graduate School of Agricultural Sciences, Ehime University, Japan
14.50 – 15.00	Turning Food Waste into Feed Value: Performance, Egg Quality, and Profitability of Japanese Quail Fed Diets Supplemented with Chicken Bone Meal
FI-9	Richelle A. Niepes College of Environment and Life Sciences, Mindanao State University at Naawan, Philippines
15.00 – 15.10	Coffee Break

Session B: Food Engineering (FE) - Room 1 (Salle d' Expo)

Chair: Dr. Janjira Tangsanthatkun

15.10-15.20	Supercritical Fluid CO_2-Extracted Black Seed (*Nigella sativa*) Oil Nanoemulsion: Optimization, Phytochemical Screening, and Stability Evaluation
FE-1	Yohanes Alan S.P. Department of Food Technology, Soegijapranata Catholic University, Indonesia
15.20-15.30	Development and Characterization of Whey Protein-Based Hydrogels for Sugar-Free High-Protein Rose Jam Applications
FE-2	Peeranut Khaimook Department of Food Technology, Faculty of Engineering and Industrial Technology, Silpakorn University, Thailand
15.30 – 15.40	Effect of Extraction and Solvent Removal Methods on Oil Yield of Sterculia quadrifida Seeds
FE-3	Mery Rambu B. Djoru Theophane Venard School of Food Biotechnology and Innovation, Assumption University, Thailand
15.40 – 15.50	Development and Feasibility Study of Coconut Sugar Tablets with Cocoa-Malt Flavor: Physical Properties and Consumer Acceptance
FE-4	Sasikan Wattanabowon Department of Food Technology, Faculty of Engineering and Industrial Technology, Silpakorn University, Thailand
15.50 – 16.00	Adsorption of Polyethylene (PE) Microplastics in Electrolyzed Drinking Water using Modified Porous Silica Material
FE-5	Mellia Harumi Faculty of Agricultural Technology, Soegijapranata Catholic University, Indonesia
16.00 – 16.10	Development and characterization of reduced-fat mayonnaise formulated with polysaccharides extracted from mangosteen as a fat replacer
FE-6	Nhu Bich Ma Faculty of Food Technology, Saigon Technology University, Vietnam

Session C: Agriculture and Food Biotechnology (AFB) - Room 2 (A91)

Chair: Dr. Roungdao Klinjapo

13.30 – 13.40 AFB-1	Effects of Ecoenzyme and Black Cumin (*Nigella sativa*) By-Product–Based Organic Fertilizer on Tomato Quality Natassia Clara Sita Department of Food Technology, Soegijapranata Catholic University, Indonesia
13.40 – 13.50 AFB-2	CNN-LSTM for Meat Quality Assessment using NIR Spectroscopy Somporn Tiacharoen Electronics Engineering Technology College of Industrial Technology, King Mongkut's University of Technology North Bangkok, Thailand
13.50 – 14.00 AFB-3	Fabrication of Lime Essential Oil Nanoemulsion using The Emulsion Inversion Point Method: Properties, Antioxidant Capacity and Stability Ngo Kim Ngan Faculty of Food Technology, Saigon Technology University, Vietnam
14.00 – 14.10 AFB-4	Nutraceutical Loaded Hydrogels with Enhanced Water Retention for Functional Food Delivery Myat Thiri Khaing Theophane Venard School of Food Biotechnology and Innovation, Assumption University, Thailand
14.10 – 14.20 AFB-5	Effects of Germination Conditions on Nutritional Composition and Antioxidant Capacity of White Hyacinth Bean (*Dolichos lablab*) Ngoc Hieu Tran Faculty of Food Technology, Saigon Technology University, Veitnam
14.20 – 14.30 AFB-6	Deep Learning Classification of Healthy and Sick Chickens Somporn Tiacharoen Electronics Engineering Technology College of Industrial Technology, King Mongkut's University of Technology North Bangkok, Thailand
14.30 – 14.40	Coffee Break

Session D: Governance, Circularity & Digital Transformation (GCD) - Room 2 (A91)

Chair: Asst. Prof. Dr. Waralee Watcharin

14.50 – 15.00 GCD-1	Presence of Food Contaminant Aflatoxin M1 in Pasteurized Milk from Local Markets in Albania Marjeta Daja (Buzi) Department of Chemistry, Faculty of Natural Sciences, University of Tirana, Albania
15.00 – 15.10 GCD-2	Determinants of Participation in Livelihood Strategy among Coconut-Based Farmers in Camiguin, Philippines Regie Lloren Camiguin Polytechnic State College, Institute of Agriculture, Philippines
15.10 – 15.20 GCD-3	Strengthening Sustainability through Green Consumer Behavior: Insights from Gen Z for Skincare Choices Della Angelica Entrepreneurship Department, BINUS Business School, Bina Nusantara University, Indoensia
15.20 – 15.30 GCD-5	Farm-Level Efficiency of Digital Agri-Food Technologies under Water Scarcity: Evidence from the Aral Sea Region Bakhit Mambetnazarov Department of Economics and Finance, University of Innovation Technologies, Uzbekistan
15.30 – 15.40 GCD-6	Agriculture and Regenerative Systems, Food Waste Valorization and Circular Bioeconomy Bakhit Mambetnazarov University of Innovation Technologies, Uzbekistan

POSTER PRESENTATION

13.00 – 13.30

	From Pigmented Rice to Functional Rice Noodles: Nutritional Benefits and Quality Improvements via Potato Starch
PO-4	Ta, Le Quoc An Food Technology Faculty, Saigon Technology University, Vietnam
	Development and Evaluation of Sugar-Free Maqui Berry Gummies with Preserved Antioxidant Activity
PO-6	Salemata Mamady Nabe Theophane Venard School of Food Biotechnology and Innovation, Assumption University, Thailand

PLENARY SPEAKERS

Dr. Inneke Hantoro
Dean, Faculty of Agricultural Technology, Soegijapranata Catholic University, Indonesia

Dr. Inneke Hantoro earned her Doctorate in Food Toxicology and Safety from the Open Universiteit in the Netherlands, following her Master's in Food Science from the University of Melbourne, Australia, and a Bachelor's in Food Technology from Soegijapranata Catholic University. She has served in multiple senior leadership roles, including Vice Rector and Vice Dean, and currently leads the Faculty of Agricultural Technology. Her research focuses on food safety, microplastic contamination, sustainable food systems, and community-based resilience. She has directed numerous national and international projects, including collaborations under the Erasmus+ Programme and initiatives funded by UNEP, BRIN, HIVOS, and the Indonesian Ministry of Higher Education, Science and Technology.

Prof. Jirawat Yongsawatdigul

Interim Dean, Institute of Agricultural Technology, Suranaree University of Technology, Thailand

Prof. Jirawat Yongsawatdigul earned his Ph.D. in Food Science and Technology from Oregon State University in 1996, following degrees from the University of Wisconsin–Madison and Chulalongkorn University. With nearly three decades of academic leadership and research, his work spans food biotechnology, protein chemistry, and fermentation science. He has authored influential book chapters and a comprehensive Thai textbook on fish proteins, and his recent research explores bioactive peptides, protein hydrolysates, and innovative processing technologies. He has served as Vice Rector for Research and Technology Development, Head of the School of Food Technology, and as editor for leading journals in the field.

Prof. Bing-Huei Chen received his Ph.D. in Food Science and Technology from Texas A&M University in 1988 and has since built a distinguished career at Fu Jen Catholic University. His expertise spans lipid and pigment chemistry, food toxicology, functional foods, botanical drug development, and nanotechnology. He has received numerous honors, including the National Invention Gold Medal Award (2018), IAAM Scientist Award (2020), and International Outstanding Inventor of Biotechnology (2019). Prof. Chen developed the nano-product *Lycopene Chylomicron*, which successfully completed phase III clinical trials in Taiwan and the USA. He currently serves as Editor-in-Chief of *Recent Patents on Food, Nutrition and Agriculture* and holds leadership roles in multiple scientific associations.

Prof. Bing-Huei Chen
Distinguished Chair Professor,
Fu Jen Catholic University, Taiwan

Assoc. Prof. Dr. Malinee Sriariyanun
King Mongkut's University of Technology North Bangkok (KMUTNB), Thailand

Assoc. Prof. Dr. Malinee Sriariyanun earned her Ph.D. in Plant Pathology from the University of California, Davis, USA. She is Assistant to the President for Special Affairs and International Relations at KMUTNB and a lecturer in Chemical and Process Engineering at TGGS. Her research focuses on biorefinery, biomass utilization, microbial metabolic engineering, and bio-based materials, with applications in biofuels, petrochemical derivatives, and industrial enzyme production. She has led numerous high-impact projects bridging fundamental science with industrial applications, advancing Thailand's role in bioeconomy research.

Assoc. Prof. Dr. Kim Anh Hoang earned her PhD in Food Technology from Vietnam National University Ho Chi Minh City in 2003, following studies in Russia and Germany. Her research focuses on plant-based proteins, algae-derived ingredients, protein functionality, and functional food development. She has led multiple national and international projects, authored over 70 publications, and received two Ho Chi Minh City Science and Technology Innovation Awards. She is a member of the Executive Committee of the Vietnam Association of Food Science and Technology and the Food Technology Development Council of Ho Chi Minh City.

Prof. Dr. Kim Anh Hoang
Vice Rector, Saigon Technology University (STU)

Prof. Glenn M. Young
Professor Emeritus, University of California, Davis, USA

Prof. Glenn M. Young earned his Ph.D. in Food Science and Microbiology from Washington State University and served over two decades at UC Davis, where he advanced food safety research and education. His work has focused on the molecular biology and physiology of foodborne pathogens such as *E. coli*, *Salmonella*, *Listeria monocytogenes*, *Yersinia*, and *Bacillus* species. He has led internationally collaborative research, hosted visiting scholars, and contributed significantly to understanding pathogen survival in food systems. Prof. Young continues to share his expertise globally, including recent lectures and collaborations in Asia, exemplifying his commitment to advancing food safety and mentoring future professionals.

Asst. Prof. Dr. Pattaraporn Posoknistakul
Faculty of Engineering, Mahidol University, Thailand

Asst. Prof. Dr. Pattaraporn Posoknistakul is Deputy Dean for International Relations and Special Affairs at the Faculty of Engineering, Mahidol University. She earned her Ph.D. in Biomaterial Sciences (Wood Chemistry) from the University of Tokyo, Japan, where she was awarded the Dean's Gold Medal for outstanding academic performance. Her research focuses on lignin chemistry, nanocellulose, biobased materials, and sustainable engineering applications, with contributions spanning air filtration, wastewater treatment, and biomedical platforms. She has published extensively in leading international journals and continues to advance innovations in biomass utilization and green technologies.

Asst. Prof. Dr. Toya Ishii
Faculty of Agriculture,
Kagawa University, Japan

Asst. Prof. Dr. Toya Ishii is Assistant Professor in the Department of Applied Biological Science at Kagawa University, Japan. He earned his Master's and Doctoral degrees in Agriculture from Kyoto University, specializing in food processing, colloid science, and interface science. His research focuses on the physicochemical properties of food systems, emulsification, and colloidal interactions, with applications in improving food quality, safety, and functionality. He has published extensively in peer-reviewed journals, advancing innovations that bridge fundamental science with practical applications in food technology and sustainable processing.

Dr. Maduka Subodinee
Head, Department of Food Science and Technology,
University of Ruhuna, Sri Lanka

Dr. Subodinee earned her Ph.D. in Fermentation and Microbiology from Kagoshima University, Japan, following her M.Sc. in Food Science and Technology from the University of Sri Jayewardenepura and B.Sc. in Agriculture from the University of Ruhuna. She currently serves as Head of the Department of Food Science and Technology at the University of Ruhuna, where she has been a lecturer since 2012. Her research focuses on food fermentation, microbial tolerance, food safety, and product innovation, including rice-based emergency meal bars, fermented vegetable products, and functional foods. She has led and collaborated on numerous national and international projects, with publications spanning yeast physiology, food safety risk assessment, and sustainable food product development.

ABSTRACTS

PLENARY SESSION (PL)

ORAL PRESENTATION

Session A: Food Innovation & Future Agri-Food Systems (FI)

- Future Food and Food Innovation, Plant-based Foods
- Functional Foods, Alternative Foods, Food Packaging
- Agriculture and Regenerative Systems, Food Waste Valorization

Session B: Food Engineering (FE)

- Food Engineering and Artificial Intelligence Technology
- Food Processing and Engineering
- Food Safety and Quality Engineering

Session C: Agriculture and Food Biotechnology (AFB)

- Agricultural Biotechnology
- Food Biotechnology
- Nanotechnology in Agriculture and Food Systems

Session D: Governance, Circularity & Digital Transformation (GCD)

- Digital Transformation in Agri-Food Systems
- Circular Bioeconomy
- Food Safety and Security, Sustainable Food Governance

POSTER PRESENTATION (PO)

PL-1	Microplastics in Asian Food Systems: Evidence and Food Safety Implications

Inneke Hantoro

Faculty of Agricultural Technology, Soegijapranata Catholic University, Indonesia
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Microplastics (MPs) are no longer simply an environmental pollution issue drifting in oceans and rivers; they are increasingly embedded within Asian food systems. From 2020 to 2026, growing evidence has documented MP contamination across marine and freshwater ecosystems, seafood, staple foods, and beverages throughout Asia. The question is no longer whether MPs are present, but what their presence means for food safety governance and public health protection. MPs have been reported in numerous commercially and ecologically important fish species across the region. Studies from India, Indonesia, and Malaysia confirm their occurrence not only in gills and gastrointestinal tracts but also in edible tissues, raising concerns about translocation and direct dietary exposure. Whole-consumed bivalves represent particularly high-exposure matrices, with annual intake estimates in Vietnam and Thailand reaching hundreds to thousands of particles per person. Crustaceans show similar contamination patterns. Beyond seafood, MPs are detected in rice, salt, sugar, fish sauce, seaweed, and soft drinks, demonstrating that exposure pathways extend into everyday dietary staples. However, documenting contamination is only the first step. A structured case study from coastal Indonesia illustrates the need to move from occurrence data to risk-based interpretation. By integrating environmental monitoring, dietary exposure modeling across 982 respondents of different age groups, and toxicological evidence, the study demonstrates that exposure is shaped not only by environmental concentrations but also by dietary reliance, consumption frequency, and socioeconomic context. Risk assessments that overlook such local exposure patterns may misrepresent vulnerability and produce incomplete or inequitable policy responses. Although several ecological assessments suggest low immediate risk, reliance on single indicators may underestimate cumulative and long-term implications. MPs must therefore be governed not only as environmental waste, but as contaminants within food systems, requiring harmonized methods, region-specific exposure assessment, and precautionary, context-sensitive food safety governance across Asia.

Keywords: microplastics; food system; Asia; food safety; risk assessment

PL-2	From Genome to Flavor: Transforming Traditional Fish Fermentation with Starter Culture Technology

Jirawat Yongsawatdigul

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Traditional fermented fish products such as plara and fish sauce are valued for their distinctive sensory characteristics but are still largely produced by natural fermentation, which often results in variability in quality, long fermentation periods, and limited process control. These challenges hinder consistency and reduce the competitiveness of fermented fish products in regional and global markets.

The use of defined starter cultures has been proposed as a practical approach to improve fermentation consistency; however, starter performance in fermented fish systems. In this study, potential starter cultures were isolated from Thia fermented fish, plara, which were identified to be *Bacillus* sp. BKSM4, *Ligilactobacillus acidipiscis* NKMC3. In addition, *Virgibacillus* sp. SK37 was isolated from Thai fish sauce. Functional genome annotation revealed that BKSM 4 harbors key extracellular proteolytic enzymes, including subtilisin and peptide-processing proteases, supporting its role as a primary protein hydrolysis driver. Genes associated with heavy-metal resistance and stress adaptation further indicated strong environmental robustness during high-salt fermentation. In contrast, NKMC 3 encoded multiple aminotransferases, racemases, and oxidative stress defense systems linked to amino acid conversion, organic acid production, and flavor development.

Controlled fermentation experiments confirmed genomic predictions. Starter-inoculated and mixed-culture treatments significantly increased TCA-soluble oligopeptides and umami-related nucleotides compared with spontaneous fermentation. Volatile aroma profiling demonstrated elevated savory and pleasant flavor compounds alongside a marked reduction in rancid notes. Safety assessments showed low biogenic amines and heavy metals well below international limits. Nutritional quality was enhanced through high retention of omega-3 fatty acids, particularly DHA and EPA. Sensory evaluation further validated improved umami intensity and overall consumer acceptance.

Keywords: whole-genome sequencing; starter cultures; fermented fish sauce; *Bacillus pumilus*; *Lactobacillus acidipiscis*; proteolysis; volatile compounds

FI-1

Protein Profile of Vegetal Milk from Velvet Bean (*Mucuna pruriens*) and Jack Bean (*Canavalia ensiformis*)

Steffi Agustine Chandra[1*], Christiana Retnaningsih[1], and Alberta Rika Pratiwi[1]

Faculty of Agricultural Technology, Soegijapranata Catholic University, Jl. Rm. Hadisoebeno Sosro Wardoyo, Jatibarang, Kec. Mijen, Semarang, Central Java, Indonesia

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Velvet bean (*Mucuna pruriens*) and jack bean (*Canavalia ensiformis*) are two kinds of legumes that are generally grown in tropical area, including Indonesia. The seeds of these beans contain high protein, and can be utilized as substitute for soybean, due to soybean's status as imported goods in Indonesia. These beans are also reported to exhibit health benefits, such as antioxidant, antidiabetic, antihyperlipidemic, antihypertension activities, and acting as neuroprotective agent, due to the presence of bioactive components inside those beans. In this research, these beans are processed into vegetal milk as functional food, and their protein profile was observed. This research was done with the objective to understand and compare the protein profiles of vegetal milks from velvet bean and jack bean, including total protein content and amino acid composition. Total protein content of vegetal milk made from 100% velvet bean, 100% jack bean, and mixture of 50% velvet bean 50% jack bean varies from 53.033 – 57.126% dry weight. Essential amino acids such as isoleucine, leucine, lysine, and threonine were identified in the milk samples. Furthermore, non-essential amino acids that play role in human health such as arginine, proline, serine, glutamic acid and aspartic acid are also observed.

Keywords: *Mucuna pruriens*; *Canavalia ensiformis*; vegetal milk, amino acid; functional food

FI-2

A Qualitative Exploration of Consumer Acceptance of Valorised Sesame Functional Noodles in Bangkok

Atittaya Tandhanskul [1], Donyawan Chantokul [2], Luoluo Li [1], Jing Guo [2], and Bing Zhu [2]*

1 Theophane Venard School of Food Biotechnology and Innovation, Assumption University of Thailand
2 Martin de Tour School of Management and Economics, Assumption University of Thailand
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This study aims to understand how consumers respond to valorised sesame functional noodles, enriched by a constellation of product cues. For this purpose, within the Stimuli-Organism-Response (SOR) framework, a semi-structured in-depth interview was conducted in Bangkok from December 2025 to January 2026 with 10 interviewees by using a purposive sampling technique. NVivo was applied to analyze qualitative interview data. The results show that at the stimulus level, the consumers are attracted to valorised sesame functional noodles through product packaging, product form, and claims. These external stimuli are processed through health-related cognition, including health goals and health concerns, which serve as a central psychological lens through which consumers interpret the value of sesame functional noodles. At the response level, participants outlined their responses relevant to meal context, family-oriented consumption and convenience-seeking. In this context, consumer acceptance of sesame function noodles becomes conditional and contextual. By integrating food valorisation with consumer behaviour theory, this study contributes to both functional food marketing and sustainable consumption literature.

Keywords: Food valorisation; Sesame functional noodles; Consumer acceptance;

FI-3

Valorizing Broken Rice Flour for Sustainable Food Packaging

Nguyen Vu Hoang Phuong[1]*

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This study aimed to investigate the film-forming ability and compare the characteristics of biodegradable films produced from two rice varieties Tài Nguyên Chợ Đào (CD) and IR504 (IR) using both whole and broken rice via the casting method. The resulting films were transparent, easy to handle, and mechanically stable. Elongation at break ranged from 4.17% to 12.90%, while tensile strength was between 8.62 MPa and 12.56 MPa. Films made from IR exhibited mechanical strength approximately 1.5 times higher than those from CD. Notably, films made from broken-form demonstrated higher mechanical strength than those from whole-form. The result of HPSEC revealed that the mechanical properties was effected not only by the amount of amylose but also the amount and their distribution of each fraction in the film matrix system. These findings indicating that using broken rice flour for biodegradable film production and highlight its potential application in food preservation, especially for mitigating oxidative processes.

Keywords: biodegradable film; amylose content; rice flour; mechanical properties

FI-4

Implementation of Sustainable Practices and Their Determinants in Indonesian Food Industries

Novita Ika Putri*, Axel Nathaniel Lianajaya, Steven Daniel Thendy, and Probo Yulianto Nugrahedi, Hugo Ferdinand Sutrisno, and Budi Widianarko†

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The global climate crisis places strong pressure on the food system, which is exacerbated by the contribution of food industry to the greenhouse gas emissions, high energy and water use, and waste generation. In Indonesia, food manufacturing contribute largely to the national economy but this create major environmental impacts. Therefore, sustainability practices are a strategic need to balance economic growth with environmental protection. However, many factors determine the implementation of these practices, both positively and negatively. Identification of these factors are essential in the policy and strategy formulation. The study involved nine companies representing major segments of Indonesia's large-scale food industry. Data were collected through one in-person focus group discussion (FGD), one online FGD and one semi-structured interview session. Data collected were transcribed and analyzed using inductive thematic analysis, including coding, theme development, and interpretation. Three main themes were identified: drivers, barriers, and incentives. Key drivers include stronger corporate reputation, external pressures from the international market, compliance with government policies, and leadership within companies. Major barriers include high investment costs, limited data, inconsistent regulations, low priority of sustainability in company strategies, and limited technological readiness. Companies also expect strong incentives, especially financial support from financial institution and regulatory disincentives from the government to create fair competition. Sustainability practices in Indonesia's food industry are expected to become stronger and more effective, supporting national sustainability goals and reducing environmental impacts. The findings provide a basis for a proposed model for sustainability practice implementation for the sector.

Keywords: *sustainability practices; food industry; Indonesia; determinants*

FI-5

Gen Z Consumer Purchase Intention Towards Blockchain-enabled Traceable Coffee - A Study in Bangkok

Yunmei Wang [1*], Tanvir Hakim [1] , Bing Zhu [1]

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As the use of blockchain technology in the food sector has soared in recent years, it is imperative to examine how consumers respond to this novel practice. For this purchase, this study aims to understand the factors influencing consumers' purchase intention for blockchain-traceable coffee. As a hub of coffee consumption in Southeast Asia, Bangkok has advanced in the application of QR code-based traceability in the coffee sector. Consequently, this research employs the Stimulus–Organism–Response (SOR) framework as a theoretical foundation to carry out a survey study, and specifically, consumer blockchain knowledge (BK) is treated as stimulus, consumer trust in blockchain (BT) is treated as organism and consumer purchase intention (INT) is regarded as response. Mainly, this study examines the role of BT in mediating BK's impact on INT. An online survey was conducted from September to October 2025, and respondents were recruited by using a purposive sampling technique. For the statistical analysis, Hayes' PROCESS macro (model 4) was applied to analyse the mediating effect of trust in blockchain. The results revealed that BK significantly affect BT ($\beta=0.503$, $p<.001$), and BT significantly predict INT ($\beta=0.815$, $p<.001$), Although the direct effect of BK on INT is not significant ($\beta=0.032$, $p=.458$), the indirect effect of BK on INT was confirmed ($\beta=0.410$) with 95% bootstrapped confidence interval that zero did not exist [0.317, 0.503]. Thus, a full mediation of BI is exhibited. The results support the S-O-R logic, which holds that stimuli influence consumer behavioural responses by shaping their psychological states.

Keywords: Blockchain, Coffee; Trust; Consumer Knowledge; Purchase Intentions; Process Macro;

FI-6

Valorization of Defatted Black Sesame Cake in Noodle Products: A Sensory Evaluation Study

Luoluo Li[1]* and Atittaya Tandhanskul[1]

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Reducing food waste through the valorization of agro-industrial by-products has become an important challenge in sustainable food systems. At the same time, functional noodles have attracted increasing attention as a convenient staple food platform for delivering added nutritional and health-related benefits. In this study, defatted black sesame cakes, a by-product generated after oil extraction, was repurposed as an ingredient in noodle formulations to evaluate its sensory feasibility. Three different common carbohydrate-based noodle sources were studied to examine the applicability of defatted black sesame cake in different noodle matrices. To achieve this objective, three different common carbohydrate-based noodle sources were studied. Sensory data were analyzed using one-way analysis of variance (ANOVA), followed by Tukey's honestly significant difference (HSD) test for post hoc comparisons. Based on sensory evaluation, the preferred level of defatted sesame was 5% in wheat-based noodles, 10% in rice-based noodles, and 5% in semolina-based noodles, with mean liking scores of 7.67±0.98, 6.00±1.51, and 6.87±1.68, respectively, on a 9-point hedonic scale. These selected formulations were further evaluated by 15 panelists with respect to color, softness, chewiness, overall taste, and overall liking. Significant differences among formulations were observed for selected sensory attributes, with color ($p<0.01$) and overall liking ($p<0.05$) showing particularly strong variation across samples. Overall, the results suggest that defatted black sesame cake can be incorporated into noodle formulations without compromising sensory acceptability, indicating its potential application in the development of functional noodle products.

Keywords: Defatted black sesame cake; Sensory evaluation; Functional noodles

FI-7

Effects of Nutrient Addition on Phytoplankton Growth in the coastal waters of Kagawa Prefecture, eastern Seto Inland Sea, Japan

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This research explores the effects of nutrient addition on phytoplankton growth. In marine ecosystems, nutrients indicate dissolved inorganic nitrogen (DIN), phosphorus (DIP) and dissolved silica (DSi). These nutrients often directly limit the growth of phytoplankton–the main primary producer and the fundamental food source for higher trophic organisms in marine ecosystems. This study comprised nutrient addition experiments on phytoplankton growth in the Seto Inland Sea (SIS), an area currently facing oligotrophication due to rapid seawater quality improvement, which may be affecting phytoplankton species composition and contributing to a decrease in fisheries yields. Seawater was incubated in enrichment experiments over 48 hours for each nutrient, with chlorophyll *a* (Chl-a) measured as an indicator of phytoplankton biomass. This research identified nitrogen as the limiting nutrient. Results showed increased phytoplankton growth in nitrogen-enriched samples, while DIN was insufficient when compared to other essential nutrients.

Keywords: phytoplankton; nutrient addition; dissolved inorganic nitrogen (DIN); dissolved inorganic phosphorus (DIP); dissolved inorganic silica (DSi)

FI-8

Exploring Farmer Regeneration Through Life-Frame Values: Evidence from a Farmer Community in Japan

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Food security has become a major global concern due to the combined impacts of climate change on natural resources and agricultural production. At the same time, demographic shifts in rural areas – where most agricultural land is located – have led to aging farming populations and increasing challenges in farmer regeneration. These environmental and demographic pressures pose serious risks to the long-term sustainability of food systems. This study applies the IPBES life-frame of values framework to explore the life-value orientations associated with people who choose to engage in farming. The research focuses on a farmer group in Japan, a country experiencing significant demographic challenges in agriculture. Japan's farming population has declined sharply, with younger core agricultural workers aged 49 and under accounting for only 11.2% (125,000) of the total, while those aged 65 and over comprise 71.7% (799,000) (MAFF report, 2024/2025). The analysis is based on a questionnaire survey and focus group discussions (FGDs) conducted with farmers at J-Wing Farm, who come from diverse backgrounds prior to entering agriculture. The findings show that farmer regeneration at J-Wing Farm is driven most strongly by values related to "Living with Nature," including land restoration, community building, and sustainability. Economic consideration ("Living from Nature") and cultural or identity-based values ("Living as Nature") are less dominant but remain important. This study offers an understanding on farmer regeneration by demonstrating how value-based motivations, beyond economic factors alone, play a central role in attracting new farmers and supporting sustainable agriculture futures.

Keywords: Food security; Farmer regeneration; Aging farming population; Sustainable food system; Life-frame of values

FI-9

Turning Food Waste into Feed Value: Performance, Egg Quality, and Profitability of Japanese Quail Fed Diets Supplemented with Chicken Bone Meal

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The study investigated how chicken bone meal (CBM) made from fast-food waste affects the growth performance, laying performance, egg production, egg quality, and profitability of Japanese quail (*Coturnix coturnix japonica*). Converting fast-food waste into CBM provides an environmentally friendly waste management solution while serving as a mineral source for poultry feed. The study evaluated different CBM inclusion levels to determine the optimal level for quail production. A total of 60 quails were randomly assigned to four dietary treatments containing 0%, 2%, 4%, and 6% CBM. The experiment lasted 30 days and assessed growth performance, laying performance, egg quality, and profitability. Results showed that quails fed the control diet had the highest weight gain and best feed efficiency, while higher CBM inclusion, particularly at 6%, negatively affected growth and feed conversion. No significant differences were observed among treatments in terms of laying performance, including total egg production and daily laying rate. However, quails fed 4% CBM produced the largest eggs, although this treatment also showed the poorest feed conversion ratio for egg production. CBM supplementation improved egg quality: the 2% CBM diet produced heavier eggs, while the 4% and 6% CBM diets resulted in stronger eggshells, thicker shells, higher mineral content, and improved internal egg quality. Economic analysis showed that CBM inclusion did not reduce profitability, indicating economic viability. Overall, the study suggests that 4% CBM supplementation yields favorable production outcomes by improving egg quality while promoting efficient waste utilization.

Keywords: calcium; economics, mineralization, sustainability

FE-1

Supercritical Fluid CO_2-Extracted black seed *(Nigella sativa l.)* Oil Nanoemulsion : Optimization, Phytochemical Screening, and Stability Evaluation

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Nigella sativa L. (black cumin) seeds contain oil rich in bioactive compounds and have long been used as a characteristic spice in Middle Eastern cuisine for their sharp bitter taste and distinctive aroma, they are also known in traditional medicine for treating conditions such as asthma, bronchitis, and rheumatism. Conventional extraction methods risk leaving harmful chemical residues and are less environmentally friendly, whereas supercritical CO_2 fluid extraction yields oil of higher purity with a lower environmental impact. Black cumin oil is hydrophobic and exhibits low oral bioavailability, formulating it as a nanoemulsion can improve its solubility for food and pharmaceutical applications. This study aimed to develop an optimized black cumin oil nanoemulsion with favorable physicochemical characteristics and good stability. Black cumin seeds were extracted by Supercritical Fluid Extraction CO_2 and formulated into nanoemulsions with varying oil : Smix ratios and cosurfactant. Physical was performed using a Particle Size Analyzer. Formulation optimization was conducted using Response Surface Methodology with a FC-CCD approach. Stability testing was carried out by storing nanoemulsions at three temperatures, refrigerated, air conditioned room, and ambient room for 3 weeks. Stability analyses included pH, absorbance, turbidity, % transmittance, and antioxidant activity (% inhibition). All statistical analyses were performed in R Studio. All formulations produced black cumin oil nanoemulsions with particle sizes ranging from 90 to 150 nm, PDI values from 0.1 to 0.2, and zeta potentials from −17 to −26 mV. The optimal formulation was predicted to yield a desirability value > 0.7. During storage, particle size and PDI increased while indicating insignificance destabilization. Nevertheless, the systems remained within the nanoscale and demonstrated better functional stability at the moderate temperature,

Keywords: Supercritical fluid CO2 extraction, nanoemulsion, *Nigella sativa L*, optimization, stability evaluation

FE-2

Development and Characterization of Whey Protein-Based Hydrogels for Sugar-Free High-Protein Rose Jam Applications

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The growing demand for sugar-free and high-protein fruit preserves has driven interest in alternative structuring systems development that provide both desirable texture and nutritional benefits. This study aimed to develop and characterize whey protein isolate (WPI)–based hydrogels in combination with low methoxyl pectin (LM-pectin) and to evaluate their potential application in sugar-free, high-protein rose jam. WPI was incorporated at various concentrations (1, 3, and 5% w/v), and the effects on gel strength, water-holding capacity (WHC), and rheological properties were systematically investigated. The results demonstrated that increasing WPI concentration significantly enhanced gel strength and WHC, indicating improved network formation and water retention within the hydrogel matrix. Rheological analysis revealed typical shear-thinning behavior with dominant elastic characteristics (G' > G"), confirming the formation of stable viscoelastic gels. The synergistic interaction between WPI and LM-pectin contributed to improved structural integrity. Application in sugar-free rose petal jam demonstrated that WPI-based hydrogels successfully provided jam-like texture, acceptable spreadability, and enhanced protein content without added sugar. These findings highlight the potential of WPI–LM pectin hydrogels as a functional and sustainable ingredient for the development of sugar-free fruit-based products, supporting innovation in health-oriented food formulations.

Keywords: whey protein isolate; low methoxyl pectin; hydrogel; rose jam; gel strength

FE-3

Effect of Extraction and Solvent Removal Methods on Oil Yield of *Sterculia quadrifida* R. Br Seeds

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Sterculia quadrifida R.Br seeds have potential as a novel source of plant oil for food and functional applications. The oil yield obtained from plant seeds is strongly influenced by the extraction technique and solvent removal process. This study aimed to evaluate the effect of different extraction and solvent evaporation methods on the oil yield of *Sterculia quadrifida* R.Br seeds. Two extraction approaches were applied using n-hexane as the solvent: Soxhlet extraction followed by rotary evaporation, and maceration followed by distillation for solvent removal. The oil yield was calculated based on the dry weight of the seed material. The results showed that the maceration and distillation method produced a higher oil yield (34.90%) compared to the Soxhlet and rotary evaporation method (30.65%). The observed differences may be associated with variations in extraction temperature, duration of solvent matrix contact, and solvent removal conditions, which could influence oil recovery efficiency. These findings indicate that the combination of extraction and solvent removal methods plays an important role in determining the oil yield of *Sterculia quadrifida* R.Br seeds. This study provides preliminary information that may support further optimization of extraction processes for the utilization of *Sterculia quadrifida* R.Br seed oil in food and functional applications.

Keywords: *Sterculia quadrifida* R.Br; Faloak; seed oil; Soxhlet extraction; vegetable oil extraction.

FE-4

Development and Feasibility Study of Coconut Sugar Tablets with Cocoa-Malt Flavor: Physical Properties and Consumer Acceptance

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This research aimed to develop a cocoa-malt flavored coconut sugar tablet to meet the growing demand in the innovative confectionery market. The study focused on formulation optimization, physical property characterization, and consumer acceptance, alongside an evaluation of production, financial, and marketing feasibility. The primary ingredients included coconut sugar, bulking agents, anti-caking agents, lubricants, cocoa powder, and malt, processed using an electric tablet press machine. The results indicated that the optimal formulation consists of 58% bulking agent, 30% coconut sugar, 7% cocoa, 3% malt, 1.5% anti-caking agent, and 0.5% lubricant. The resulting tablets weighed 1 gram each, with a diameter of 20 mm and a thickness of 4 mm. Regarding physical properties, the tablets exhibited a hardness range of 82–91 N and water activity (a_w) values between 0.40 and 0.46, ensuring microbial stability. Sensory evaluation—assessing appearance, color, texture, hardness, aroma, taste, and overall liking—was conducted using a 9-point Hedonic scale and a 5-point Just About Right (JAR) scale with 50 untrained panelists. The optimized formula received the highest overall liking score of 7.0. This study demonstrates the commercial potential of cocoa-malt coconut sugar tablets in adding value to local raw materials and establishing a viable position in the functional confectionery market.

Keywords: Coconut sugar; compressed tablet; cocoa-malt; physical properties, sensory evaluation

FE-5

Adsorption of Polyethylene (PE) Microplastics in Electrolyzed Drinking Water using Modified Porous Silica Material

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Microplastic contamination (1–5000 μm) in drinking water has been reported worldwide. The ingestion of microplastic-contaminated water poses potential health risks due to the accumulation of microplastics in human blood, placenta, and breast milk. This study aims to design and develop a sustainable porous silica-based filter (pore size 50-100 μm) with the capacity to adsorb microplastics from drinking water effectively. Synthesis of porous silica material was prepared using $CaCl_2$ as template prior to the modification process with 3-aminopropyltriethoxysilane (APTES). The synthesis was controlled to produce micron scale of pores for polyethylene microplastic adsorption. Six contact time variations (10, 25, 40, 60, 120, and 1,440 minutes) were evaluated to determine the optimal adsorption time of PE in electrolyzed drinking water (pH = 7.8), controlled using a water electrolysis machine. The pore structure and morphology of the silica were analyzed using SEM-EDX, while changes in surface functional groups resulting from modification and adsorption were characterized by FTIR. Surface analysis following adsorption showed carbon-rich agglomerates which confirmed that polyethylene particles formed bonds with the silica network. The removal of PE particles after adsorption has been identified by flowcytometry analysis and the result showed that APTES-modified porous silica has successfully removed 34,000 microplastic particles/L within 24 hours of adsorption. The synthesized porous silica materials promote sustainable drinking water treatment method that environmentally friendly and non-toxic materials.

Keywords: microplastics; drinking water; porous silica; electrolysis

FE-6

Development and characterization of reduced-fat mayonnaise formulated with polysaccharides extracted from mangosteen as a fat replacer

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Polysaccharides extracted from mangosteen peels (MPPS) were employed as fat replacer to develop reduced-fat mayonnaise. The partial oil substitution of 25, 35, 45, and 55%, designating the samples as MP25, MP35, MP45 and MP55, was conducted and their chemical composition, caloric value, microscopic image, oil droplet distribution, emulsion stability, rheological and textural properties, sensory preference and oxidative stability were investigated in comparison with those of full-fat mayonnaise. The oil-substituted mayonnaise had reduced calories of 25.6 to 67.4%, which could be classified a "light" product, according to Codex Alimentarius standards. MP25 and MP35 still possessed the monodisperse oil droplets with narrow size distribution like that of the control while MP45 and MP55 displayed polydisperse distribution. Rheological analyses revealed that increasing the level of oil replacement in mayonnaise led to the decrease in its viscosity, storage modulus and loss modulus. However, MP25 and MP35 still kept the similar viscoelastic characteristic of the control with the solid-like behavior in the tested frequency range of 0.01 to 10 Hz. The reduced-fat mayonnaise had paler yellow with lower b^* values (18.83-19.60) than the control (20.25), leading to lower liking scores for appearance in MP35, MP45 and MP55. However, the full fat content of the control caused the highest stickiness, leading to the sticky mouth feeling and its lower liking score for taste. This trade-off perception resulted to no significant difference in overall acceptability among MP25 (7.53), MP35 (7.45) and the control (7.28). In addition, more oxidative stability was observed for all MPPS-incorporated mayonnaise samples stored at both refrigerated and ambient temperatures. In conclusion, MPPS could be a novel fat replacer to be further explored in food industry.

Keywords: oil substitution, polysaccharides, rheological, texture, lipid oxidation, size distribution

AFB-1

Effects of Ecoenzyme-and Black Cumin (*Nigella sativa* L.) By-Product–Based Organic Fertilizer on the Quality of Tomato

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Tomato (*Solanum lycopersicum* L.) is an important horticultural commodity rich in nutrients and antioxidants. The rising demand for healthy and practical foods in urban areas has increased interest in minimally processed tomato products; however, postharvest quality degradation, including physicochemical and vitamin losses, remains a major challenge. Fertilizer type plays a crucial role in crop performance, and excessive chemical fertilizer use can reduce soil fertility and cause harmful residues, highlighting the need for sustainable organic alternatives. Black cumin (*Nigella sativa* L.) by-products contain bioactive compounds, fiber, and minerals, making them a potential organic fertilizer source. Ecoenzyme, produced through the fermentation of fruit and vegetable waste, contains enzymes and beneficial microorganisms that enhance nutrient availability. The combination of these materials is expected to improve tomato growth and quality, especially in urban farming systems such as rooftop gardens. This study evaluated the effects of ecoenzyme–and black cumin by-product–based organic fertilizer on tomato growth and quality. The experiment was conducted in a rooftop garden using a Completely Randomized Design with seven treatments and three replications. Quality parameters included color, texture, moisture content, total soluble solids, vitamin C, and sensory attributes. Data were analyzed using one-way ANOVA followed by Duncan's Multiple Range Test at a 5% significance level. The results showed that the combination of ecoenzyme and black cumin by-products increased the number of tomato leaves. This study is expected to provide recommendations for herbal waste–based organic fertilizers to support sustainable urban farming and the production of high-quality, nutritious horticultural products.

Keywords: black cumin; ecoenzyme; minimally processing; tomato; urban farming

AFB-2

CNN-LSTM for meat quality assessment using NIR spectroscopy

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This research presents a machine learning framework for finding meat freshness classification by near-infrared (NIR) spectroscopy. A hybrid CNN-LSTM architecture that captures spectral sequences to detect spectral features and spoilage time patterns. The CNN-LSTM consists of a 1D convolutional module to mine specific wavelengths for biomarkers, water absorption at 1450 nm, and lipid oxidation peaks at 1210 nm. After that, the LSTM module predicts microbial degradation properties at spectral segments. The Python language is performed for evaluated systems. A real dataset for beef freshness NIR and the behavior of spectra spoilage progression (900–1700 nm range) are simulated by Python programming. The simulation results show that the CNN-LSTM obtains 92.4% accuracy and a 0.91 F1 score in the classification of three classes (fresh, medium, and spoiled). The purpose of the architecture approach is a nondestructive test without chemical reagents and a fast quality assessment. The final model, preprocessing scalers, class encoders, and trained weights are saved to cloud storage for recall deployment in industrial applications. This research has shown that hybrid CNN-LSTM architecture modeling for spectral sequences outperforms high freshness detection, providing a scalable solution for real-time meat quality monitoring. The future work is adapted to another hyperspectral imaging and multi-meat species classification for enhanced food safety applications and supply chains.

Keywords: CNN-LSTM; meat; freshness; spectroscopy; NIR

AFB-3

Fabrication of Lime Essential Oil Nanoemulsion using The Emulsion Inversion Point Method: Properties, Antioxidant Capacity and Stability

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Nano-encapsulation technology was carried out to overcome low solubility and high sensitivity to environmental factors of lime essential oil (LEO) in food and pharmaceutical applications. The objective of this study was to fabricate a LEO nanoemulsion using the emulsion inversion point (EIP) method and to evaluate its properties, antioxidant capacity, and stability. The essential oil extracted from lime (*Citrus limonia* Osbeck) peel contained 57 volatile compounds with major components including D-limonene, γ-terpinene, L-β-pinene, α-pinene, β-myrcene. The nanoemulsion was prepared using 10% oil-phase (LEO and coconut oil at a 6:4 ratio) and 10% mixture emulsifier (Tween 80:lecithin at an 8:2 ratio) under 1200 rpm stirring. The resulting LEO nanoemulsion exhibited a mean particle size of 76.79 ± 1.25 nm, a polydispersity index (PDI) of 0.316 ± 0.0003, a zeta potential of -50.8 ± 1.75 mV, and a encapsulation efficiency (EE) of 83.82 ± 0.06%. The antioxidant capacity was effectively preserved after nanoemulsion encapsulation, with IC_{50} values of 33.51 ± 1.11 mg/mL and 29.00 ± 0.36 mg/mL for DPPH and ABTS assays, respectively, compared to 32.63 ± 0.02 mg/mL and 45.67 ± 0.58 mg/mL of pure LEO. During a 28-day storage period, the particle sizes of the LEO nanoemulsion slightly increased, the PDIs decreased, whereas the zeta potential remained unchanged. The EE decreased marginally to 77.94 - 78.31%, with 47 volatile compounds retained. The results indicate that LEO nanoemulsion effectively preserved antioxidant capacity and key volatile compounds while maintaining good stability, which demonstrates its potential for application in food and pharmaceutical products.

Keywords: Lime essential oi; Nanoemulsion; Emulsion inversion point method; Antioxidants

AFB-4

Nutraceutical Loaded Hydrogels with Enhanced Water Retention for Functional Food Delivery

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Developing sustainable biopolymer matrices is essential for advancing functional food innovation. This study optimizes composite hydrogels formulated from sodium alginate and silk cocoon extract by comparing aqueous and hydro-ethanolic extraction systems. A comparative analysis of methodologies for extracting silk cocoon bioactive compounds revealed that aqueous extraction yielded a superior profile to hydro-ethanolic methods. The aqueous extract achieved a protein concentration of 30.41 ± 1.54 mg/L and demonstrated a DPPH radical scavenging capacity of 32.91 ± 7.26%, linking the functional bioactivity performance to its specific phytochemical composition. The macro-structural performance of formulated hydrogels—plain hydrogel (PH) versus extract-loaded hydrogel (EH) was evaluated *via* swelling, syneresis, and cryo-stability assays. Network hydration behavior was sensitive to environmental pH; at neutral pH (7.0), extract-loaded variant (EH) exhibited a controlled expansion with a maximum swelling ratio of 67.85±4.89%, lower than that of the plain hydrogel (PH). Syneresis analysis revealed a stabilized liquid-phase retention in EH formulation (57.23 ± 1.46%) compared to PH formulation (48.91±15.10%) demonstrating superior stability against syneresis of EH. Following freeze-thaw cycles, both hydrogels exhibited high structural integrity, with recovery rates of 84.35 ± 3.94% and 97.68 ± 0.28% for EH and PH, respectively. These findings establish a scalable framework for the effective formulation of nutraceutical composite hydrogel with superior water retention, reduced syneresis, and enhanced cryo-stability, demonstrating the potential of aqueous extraction to boost nutritional density and shelf-stability in health-promoting food products.

Keywords: Alginate Hydrogel; Silk Cocoon Extract; Antioxidant; Macro-Structural Performance

AFB-5

Effects of Germination Conditions on Nutritional Composition and Antioxidant Capacity of White Hyacinth Bean (*Dolichos lablab*)

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Hyacinth bean (*Dolichos lablab*) is one of the most widely cultivated legume crops in Vietnam. Germination is a simple, low-cost, and easily applicable method that does not require specialized techniques and can effectively enhance the nutritional value of legumes. The objective of this study was to determine suitable germination conditions to achieve a high germination rate and flour recovery yield. Changes in protein content, starch content, total phenolic content, and antioxidant capacity of bean flour under different germination conditions were also evaluated. Soaking conditions were varied, including temperature, soaking time, and the ratio of soaking water volume to seed weight. The germination stage was further investigated under different conditions of temperature, duration, and light exposure. When seeds were soaked at a ratio of 100 g seeds to 500 mL water at 30°C for 4 h, followed by incubation in moist cloth for 40 h at 30–35°C under either light or dark conditions, the germination rate exceeded 90% and the flour recovery yield reached nearly 70%. The biochemical composition and antioxidant capacity of germinated beans changed significantly; protein content increased to approximately 30%, while total phenolic content and antioxidant capacity reached 495 mg GAE/100 g and 24 µmol TE/g, respectively. These values represented increases of 90% and 50%, respectively, compared to ungerminated beans.

Keywords: *Dolichos lablab*; total phenolic content; recovery yield; antioxidant capacity; germination rate

AFB-6

Deep Learning Classification of Healthy and Sick Chickens

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Automated health monitoring of chickens is critical for disease prevention and meat production. This research develops a deep learning model for classifying chickens as healthy or sick using video. Three models are compared using the Broiler Chicken Healthy and Sick dataset: (1) Pure CNN, (2) CNN-LSTM, and (3) CNN-LSTM with simulated optical flow sequences. All models were made with Python with TensorFlow/Keras, and performance was assessed using a confusion matrix. Experiments demonstrate that Pure CNN achieves better performance compared to CNN-LSTM variants. Mainly, LSTM layers provide meaningful benefits for temporal modeling that requires genuine sequential data. Our Pure CNN model equals Roboflow's YOLOv8 classification baseline in accuracy with greater customization flexibility. The research establishes that for single-image chicken health assessment, tiny CNN architectures are optimal—LSTM integration should be for video-based behavioral analysis. The pipeline includes dataset conversion from open source data, three training models, inference code, and evaluation processes. Practical implementation guidelines: Pure CNN for monitoring via cameras and CNN-LSTM for behavioral anomaly detection via video clips. The contributes a validated process for cost-effective chicken health monitoring in resource-constrained farming environments.

Keywords: chicken health monitoring; CNN-LSTM; image classification; deep learning; precision farming; Roboflow

GCD-1

Presence of food contaminant aflatoxin M1, in pasteurized milk from local markets in Albania

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Objectives: Dairy products are a vital part of the human diet and directly impact health. Due to its high nutrient density, milk also plays a recognized role in the diets of adolescents and adults. Cow milk is a primary food source in Albanians' diets. Human exposure to food contaminants varies; among them, mycotoxins are particularly important. Assessing aflatoxin M1 (AFM1), a metabolite of the potent carcinogen aflatoxin B1, is essential for food safety. Methodology: This study evaluated AFM1 contamination in pasteurized milk sold in Tirana, Albania, during the Autumn and Winter seasons of 2025 and 2026. Seventy-six milk samples were analyzed using High-Performance Liquid Chromatography with Fluorescence Detection (HPLC-FLD). Results: Contamination levels ranged from the limit of detection (LOD) to 0.248 µg/l, with a mean of 0.145 µg/l. The study found that 59.5% of the milk samples tested positive for AFM1, with 17.1% surpassing the EU maximum residual level (MRL) of 0.05 µg/l. These results emphasize the importance of ongoing monitoring to protect consumer health. Additionally, addressing AFB1 contamination in animal feed is critical.

Keywords: Food safety, cow milk, Aflatoxin M1, dietary exposure, Albania

GCD-2

Determinants of participation in livelihood strategy among coconut-based farmers in Camiguin, Philippines

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Benefits and opportunities of coconut agroforestry adoption are widely studied in literature, especially on its role in conservation initiatives. This study aimed to address the gap in understanding why farmers participate in a livelihood strategy in coconut-based agroforestry and how demographic, economic, and farm attributes influence their participation. The study utilized a quantitative, cross-sectional research design. The study was administered to 391 respondents in Camiguin, Northern Mindanao, Philippines. The collected data was analyzed using free software R 4.5.1 and RStudio. Results revealed that livelihood diversifications positively influenced off-farm, non-farm, and self-employment. Men tend to engage in non-farm employment, while women tend to engage in self-employment. Land ownership had positive influence on on-farm employment and a negative influence on off-farm employment. The study recommends facilitating the expansion of skills development and strengthening mechanisms for micro-enterprise support for men and women. Also, the design of conservation programs may be integrated to existing livelihood strategies to ensure effective conservation outcomes. Further studies may be conducted to assess the relationship between agroforestry practices in coconut-based farms and the farmer's livelihood assets. Moreover, it is relevant to evaluate gender and generational differences of farmers in the agroforestry practices they employ in respective to their livelihood assets.

Keywords: livelihood strategy, coconut-based farms, agroforestry, participation

GCD-3

Strengthening Sustainability through Green Consumer Behavior: Insights from Gen Z for Skincare Choices

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Environmental concerns have gained increasing public attention, encouraging people especially young generations to adopt eco-friendly lifestyle and demand sustainable products. In Indonesia, beauty and cosmetic is rapidly grow and changing beauty trends towards an eco-friendly lifestyle. The purpose of this study aims to explore Gen Z consumers on their willingness to pay premium for green skincare products, that is affected by green advertising, corporate social responsibility, and green packaging with green brand image as a mediating variable. In response to increasingly significant environmental issues, today's consumers, especially Gen Z, demonstrate sustainable consumption values, by aligning their product consumption values with market trends. This study employed a quantitative methodology, using Partial Least Squares Structural Equation Modeling (PLS-SEM). Data were collected via a questionnaire survey of 216 Gen Z respondents, majority aged from 21 to 25, to explore their opinions and preferences regarding green skincare products. The result of this study shows that green advertising, corporate social responsibility (CSR) and green packaging may have limited impact to willingness to pay premium unless they are converted through green brand image.

Keywords: Green Advertising; Corporate Social Responsibility (CSR); Green Packaging; Green Brand Image; Willingness to Pay Premium

GCD-5

Farm-Level Efficiency of Digital Agri-Food Technologies under Water Scarcity: Evidence from the Aral Sea Region

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Water scarcity seriously limits agricultural productivity in arid and semi-arid regions. The Aral Sea basin is one of the regions with the most acute manifestations of this problem. This study was conducted on the basis of empirical data obtained from the Aral Sea region of Uzbekistan. In this case, the impact on technical efficiency at the level of digital farms under conditions of limited water supply is assessed. The main goal of the research is to determine the effectiveness of resource use in irrigated agriculture using digital tools.

The data coverage analysis (DEA) model was used to measure the technical efficiency of farms. The main factors of production included land, labor, water, and energy. The yield indicator was indicated by the value of the crop yield. In the study, digital irrigation planning systems were analyzed. Efficiency indicators were compared between farms using digital technologies.

The obtained results show that farms using digital agri-food technologies achieve high technical efficiency. They also use water efficiently. They also improve the decision-making process in conditions of water scarcity. In general, the results confirm the importance of digital transformation in strengthening the sustainability of agriculture. The study presents important policy proposals for the development of sustainable agri-food systems in areas experiencing increasing water scarcity.

Keywords: digital agriculture; water scarcity; technical efficiency; farm-level analysis; Aral Sea region

GCD-6

Agriculture and Regenerative Systems, Food Waste Valorization and Circular Bioeconomy

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In Uzbekistan, water use in agriculture accounts for about 90% of total freshwater consumption, while irrigation efficiency in many farming systems remains below 55-60%. This study, based on empirical data from the Aral Sea region, examines the impact of digital agri-food technologies on efficiency at the farm level under conditions of water scarcity.

The analysis is based on farm-level survey data collected from 120 agricultural enterprises, including farms that use and do not use digital technologies. To assess technical effectiveness, the input-oriented Data Coverage Analysis (DEA) model is used, in which the input indicators of land, labor, water, and energy are taken, and the value of crop products is taken as the main output indicator.

The results show that farms using digital agri-food technologies achieve an average of 15-22 percent higher technical efficiency compared to those that do not. Among the users of digital technologies, the efficiency of water use will increase by about 18 percent, while energy consumption will decrease by almost 12 percent without reducing the level of production. In addition, the digital irrigation planning system reduces water losses by up to 20%, which helps to more accurately distribute resources in conditions of water scarcity. These results show that digital transformation plays an important role in increasing the efficiency of agriculture and supporting regenerative agricultural systems.

Keywords: Digital agriculture; water scarcity; farm-level efficiency; DEA; regenerative agriculture

PO-4

From Pigmented Rice to Functional Rice Noodles: Nutritional Benefits and Quality Improvements via Potato Starch

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The aim of this study is to investigate the potential of pigmented rice for rice noodle production and the role of potato starch (PS) supplementation in enhancing product quality. Comparative analyses of five pigmented rice varieties and two white rice controls revealed that pigmented rice exhibited substantially enhanced nutritional values compared with white rice, including 1.2–1.4-fold higher protein, 2–3-fold higher lipid, 6–10-fold higher fiber, and approximately sevenfold more ash. In addition, total phenolic content (5.25-15.30 mg/100g), anthocyanin content (3.36–9.86 mg/100 g) and antioxidant capacity (146–1137 μmol TE/g) were dozens to hundreds of times greater. Starch granules of both pigmented and white rice exhibited similar morphology and A-type crystallinity. High-amylose pigmented rice demonstrated pasting and gel stability suitable for noodle production, similar to white rice, whereas low-amylose pigmented rice formed weaker gels. Application trials with Luc Do (LD) colored rice showed that noodles had significantly greater nutritional and bioactive values than white rice noodles, including 13–17-fold higher fiber and up to 330 mg/100 g anthocyanins, but required starch modification to improve texture and cooking quality. Incorporating 10% PS with LD rice flour and modified cassava starch optimized amylose content and starch granule swelling power, reduced cooking loss, improved hardness and chewiness, and yielded noodles most comparable to white rice in texture and sensory acceptance. Overall, high-amylose pigmented rice, combined with appropriate starch supplementation, offers a promising strategy for developing nutritious, antioxidant-rich rice noodles with desirable technological and sensory attributes.

Keywords: antioxidant capacity, pigmented rice, physicochemical properties, rice noodle, sensory acceptance.

PO-6

Development and Evaluation of Sugar-Free Maqui Berry Gummies with Preserved Antioxidant Activity

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Maqui berry (Aristotelia chilensis) is recognized for its high polyphenol and anthocyanin content, which contribute to strong antioxidant and antimicrobial properties. This study aimed to develop maqui berry–enriched gummy formulations at different concentrations (20%, 25%, and 30%) and to evaluate their antioxidant activity, microbiological quality, water activity, and sensory acceptability for potential functional food applications. Antioxidant capacity was determined using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay. Microbiological quality was assessed by total viable aerobic counts using Plate Count Agar following serial dilution in 0.1% peptone water. Water activity (aw) was measured to evaluate product stability and microbial risk. Sensory evaluation was conducted using a 9-point hedonic scale to assess appearance, aroma, taste, texture, and overall acceptability. The results demonstrated that increasing maqui berry concentration enhanced antioxidant activity, with the 25% and 30% formulations showing substantially higher radical scavenging capacity compared to the 20% formulation. Microbial analysis indicated lower total viable counts in the 30% formulation compared to the 25% formulation, suggesting a concentration dependent antimicrobial effect of maqui berry polyphenols. Water activity values increased with higher maqui berry concentration, with the 30% formulation exhibiting the highest aw, indicating a potential trade-off between functional efficacy and product stability. Sensory evaluation revealed that the 25% maqui berry gummy achieved the highest overall acceptability score on the 9-point hedonic scale, reflecting an optimal balance between functional properties and consumer preference. Overall, this study highlights the importance of formulation optimization when developing functional gummies enriched with bioactive compounds.

Keywords: Maqui berry; DPPH assay; antioxidant activity; functional gummy; water activity; microbial quality; 9-point hedonic scale; polyphenol

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