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8th Conference on Innovations in

NUTRITION AND FOOD SCIENCE

Sep 07 - 08, 2023 at Rome, Italy



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Day-1 (September 07, 2023)

HALL : PARIOLI 3 + 4

Moderator:
Kwadernica C. Rhea,
Louisiana State University, USA

Registrations Open (09:00-09:40)

Opening Ceremony (09:40-09:50)

Keynote Talks

Robert H. Lustig, *University of California, USA*	**09:50-10:25**	The metabolic matrix: re-engineering ultraprocessed food for health
Robert van Merkestein, *Calix Limited, Australia*	**10:25-11:00**	Novel mesoporous magnesium oxide - potential to mitigate antimicrobial resistance and improve food production sustainability

Group Photo & Refreshment Break (11:00-11:20)

Technical Session-I

THEMES: Nutrition and Health
Nutritional Biochemistry, Nutrigenomics and Metabolomics

Session Chairs:
Robert van Merkestein, *Calix Limited, Australia*
Nicolas Radomski, *IZSAM, Italy*

Kwadernica C. Rhea, *Louisiana State University, USA*	**11:20-11:40**	Development and validation of the Eating and Food Literacy Behaviors Questionnaire with young adult university students

Nicolaus Dahlmann, *Universitätsklinikum Schleswig-Holstein, Germany*	**11:40-12:00**	The Dahlmann-Body-Analysis system to estimate body composition: Comparison with a bioelectrical impedance consumer device in consideration of the skeleton frame
Claudia Crosio, *University of Sassari, Italy*	**12:00-12:20**	Cyanotoxins and Neurodegeneration
Lada Timotijevic, *University of Surrey, UK*	**12:20-12:40**	Open Community for Food Consumer Science (COMFOCUS)
Jaijeong Choi, *CHA University School of Medicine, South Korea*	**12:40-13:00**	Experience of development and management of IPE courses. A case study of an IPE Center CHA IPE Bridge

Lunch Break @ Restaurant (13:00-14:00)

Technical Session-II

Session Chairs:
Eric T. Boie, *Mayo Clinic, USA*
Tafirenyika Mafugu, *University of the Free State, South Africa*

Eric T. Boie, *Mayo Clinic, USA*	**14:00-14:20**	Survival after self-poisoning with sodium nitrite: A case report
Adiba M. Matin, *Mayo Clinic, USA*	**14:20-14:40**	Food-related toxic ingestions
Nicolas Radomski, *IZSAM, Italy*	**14:40-15:00**	Highly precise cgMLST typing of Listeria monocytogenes
José A. Cano-Buendía, *UNAM, Mexico*	**15:00-15:20**	Evaluation of the microbiological quality, physicochemical characteristics and sensory profile of strawberries treated with Neutral Electrolyzed Water

Ruiqi Chu, *University of Leeds, UK*	**15:20-15:40**	Exploring Consumer Perspectives on Packaging for Portion Control and Value-Driven Portion Decisions: A Photo-Elicitation Study
Tafirenyika Mafugu, *University of the Free State, South Africa*	**15:40-16:00**	Challenges encountered in the school nutrition programme in South Africa

Refreshment Break (16:00-16:20)

Pannel Discussions

Day-2 (September 08, 2023)

Technical Session-III

HALL : PARIOLI 3 + 4

Session Chairs:
Paolo Formaggioni, *University of Parma, Italy*
Roberto Cannataro, *University of Calabria, Italy*

Kieran F. Scott, *Western Sydney University, Australia*	**09:00-09:20**	Anti-cancer potential of synergistic phytochemical combinations are influenced by the genetic profiles of prostate cancer cell lines.
M. Catherine DeSoto, *University of Northern Iowa, USA*	**09:20-09:40**	Is heritability for nutritional effects becoming more important due to the uniformity of COVID social stress?
Antonio Domenico Marsico, *CREA-VE, Italy*	**09:40-10:00**	Native vineyard non-saccharomyces yests used for biologila control of botrytis cinerea in stored table grape

Paolo Formaggioni, *University of Parma, Italy*	**10:00-10:20**	Composition and physico-chemical properties of milk from indoor feeding versus pasture at different altitudes in the production of Formaggella della Valle di Scalve cheese in Bergamo province
Michael Prophet, *University of Northern Iowa, USA*	**10:20-10:40**	Optimal Pricing for Promoted Health-food Products
Refreshment Break (10:40-11:00)		
Flores Naselli, *Università di Palermo, Italy*	**11:00-11:20**	Nutrigenomic potentials of food molecules: the fifteen years-experience of our lab
Minsun Kim, *Sejong University, South Korea*	**11:20-11:40**	An analysis of the panel's perceptions on cooking in "Metaverse Kitchen"
Roberto Cannataro, *University of Calabria, Italy*	**11:40-12:00**	AGEs determination in nutritional bars
Technical Session- IV **12:00-13:00 - Poster Viewing**		
Posters **Judge: Kieran F. Scott,** *Western Sydney University, Australia*		
Yui Kuramochi, *Yokohama University of Pharmacy, Yokohama, Japan*	**P-1**	A change-point regression approach for estimating no observed adverse effect level from a systematic review
Kohsuke Hayamizu, *Yokohama University of Pharmacy, Yokohama, Japan*	**P-2**	Application of weighted change-point regression approach for evaluating food function.

Nuria Martínez Navarrete, *Universitat Politècnica de València, Spain*	**P-3**	Nutritional profile, total bioactive compounds content and antioxidant capacity of fava bean *(Vicia Faba L.)* pod
Nuria Martínez Navarrete, *Universitat Politècnica de València, Spain*	**P-4**	Free and bound phenolic content of fava bean *(Vicia faba l.)* pod. their contribution to the antioxidant capacity
Priscila Claudino de Almeida, *University of Brasília, Brazil*	**P-5**	Food neophobia in Brazilian children with autistic spectrum disorder
Cristiane Batista Salgado, *Federal Institute of Brasília, Brazil*	**P-6**	Antimicrobial coating based on Tahiti lemon essential oil and green banana flour to preserve the internal quality of quail eggs
Vinícius Machado dos Santos, *Federal Institute of Brasília, Brazil*	**P-7**	Rice flour coating plus rosemary essential oil: an edible antimicrobial coating to preserve the internal quality of quail eggs

Lunch Break @ Restaurant (13:00-14:00)

VIRTUAL

PROGRAM

(CET- ROME - ITALY)

Join Zoom Meeting

Meeting ID: 861 3316 9918
Pass code: 198293

Virtual Session Sep 08-2023
CET- ROME - ITALY

ZOOM Meeting
ID: 861 3316 9918
Passcode: 198293

Ran Li, *The Second Affiliated Hospital of Chongqing Medical University, China*	**14:00-14:20**	The Nursing Effect of Individualized Management on Patients With Diabetes Mellitus Type 2 and Hypertension
Takuji Miyamoto, *Niigata University, Japan*	**14:20-14:40**	Reducing the amount of nitrogen fertilizer applied as top-dressing to rice plants enhances steamed rice digestion and alcohol fermentation in sake brewing
Laily Rinda Ardani, *Andalas University, Indonesia*	**14:40-15:00**	Lactic acid bacteria and yeast strains isolated from fermented fish (Budu) identified as candidate ruminant probiotics based on in vitro rumen fermentation characteristics
Georgios A. Fragkiadakis, *Hellenic Mediterranean University, Greece*	**15:00-15:20**	Promotional actions for higher consumption of carob products: Greek- consumers' views
Katharina Willenbücher, *Max Rubner-Institut, Germany*	**15:20-15:40**	Phage Genome Diversity in a Biogas-Producing Microbiome Analyzed by Illumina and Nanopore GridION Sequencing
Emanuele Batistela Dos Santos, *University of Brasília, Brazil*	**15:40-16:00**	Sustainability assessment instrument for school food services: evaluation of interobserver reproducibility
Nancy Hock, *Western Michigan University, USA*	**16:00-16:20**	Pinch force required for adults over 50 years of age to open several types of food containers

Liborija Lugovic-Mihic, *University Hospital Centre Sestre Milosrdnice, Croatia*	**16:20-16:40**	Altered gut microbiota composition in patients in patients with chronic urticaria

Closing Remarks

DAY -1

KEYNOTE TALKS



The metabolic matrix: re-engineering ultraprocessed food for health

Robert H. Lustig, MD, MSL

Emeritus Professor of Pediatrics, University of California, San Francisco, USA

Ultraprocessed food is a metabolic disruptor which increases adiposity, reduces mitochondrial efficiency, drives insulin resistance, alters growth, and contributes to human morbidity and mortality. However, the harms of ultraprocessed foods are far more complex than any single component, and are not ameliorated by simple substitutions or reformulations. Over the past two years, a Scientific Advisory Team (SAT) working with the Kuwaiti Danish Dairy Company (KDD) conducted a comprehensive scientific evaluation of their entire commercial food and beverage portfolio. Assays of macronutrients, micronutrients, additives, and toxins contained in each of their products was undertaken to determine the precise nature of each product's ingredients as well as the health impacts of processing. The SAT developed a tiered "Metabolic Matrix" founded in three science-based principles: 1) protect the liver, 2) feed the gut, and 3) support the brain. The Metabolic Matrix categorizes each product and provides the criteria, metrics, and recommendations for reformulation or re-engineering. These changes take into account ingredients, processing, packaging, and data science. This scientific exercise has established the groundwork for improving the health, well-being, and sustainability of KDD's entire product line, while maintaining flavor, economic, and fiscal viability. Of the 180 items in KDD's portfolio, 18 (10%) have been introduced to the public. The key aim of this work is to not only make ultraprocessed food healthier, but to urge other food companies to implement similar analysis and re-engineering of their product lines to improve the metabolic health and well-being of consumers worldwide.

Biography:

Robert H. Lustig, M.D., M.S.L. is Emeritus Professor of Pediatric Endocrinology, and the Institute for Health Policy Studies at UCSF. He is a neuroendocrinologist, with expertise in metabolism, obesity, and nutrition. He is one of the leaders of the current "anti-sugar" movement that is changing the food industry. Dr. Lustig graduated from MIT in 1976, received his M.D. from Cornell University Medical College in 1980, and his Masters of Studies in Law (MSL) degree at UC College of the Law SF in 2013. He is the author Fat Chance (2012), The Hacking of the American Mind (2017), and Metabolical (2021).



Novel mesoporous magnesium oxide - potential to mitigate antimicrobial resistance and improve food production sustainability.

Robert van Merkestein, Dr Duy Nguyen

Calix Limited, Australia

The development of antimicrobial resistance (AMR) in agriculture, human and animal health highlights the limitations of conventional and typically lethal antibiotic, pesticide and biocide treatments, and the need for novel approaches that are efficacious and sustainable.

Calix, together with industry and academic collaborators, is developing mesoporous MgO (MOP) to drive a reduction in typically lethal but necessary chemicals and pharmaceuticals to extend their useful life and improve the sustainability of food production. Applications for MOP being developed include on-crop application for pest and pathogen control and animal hygiene and health in intensive livestock production. Post-harvest applications to reduce food spoilage are planned.

MgO is designated by the US FDA as generally regarded as safe (GRAS) and not persistent, bio-accumulative, or toxic (nPBT). MOP materials are produced from natural magnesium carbonate (MgCO3) ore and may be characterized as micron scale particles with internal pores of between 2 – 50 nm. Acute MOP toxicity studies indicate the material is benign for mammals and beneficial honeybee's. MOP does not induce phytotoxicity.

While MgO is already widely used in agriculture to address magnesium deficiency, MOP has been observed to also provide non-lethal, broad-spectrum suppression of economically damaging sucking insect pests and both fungal and bacterial pathogens. Applied in integrated pest management (IPM) programs, an MOP based product has been observed to facilitate substantial reductions in conventional pesticide use without compromising yield or yield quality. An MOP based non-lethal insecticide has now been registered for use in Australia, where field studies continue to support label extension to include economically damaging fungal/oocyte and bacterial pathogen.

While MgO is currently widely used in human and animal health as a dietary supplement to augment Mg deficiency, and for its antacid and laxative properties, in-vitro studies on drug susceptible and resistant strains of *Staphylococcus aureus, Klebsiella pneumonia, Escherichia coli, Acinetobacter baumannii* and *Pseudomonas aeruginosa* indicate MOP has intrinsic and broad-spectrum antibacterial activity (MIC90: 1.28 mg/mL – 2.56 mg/mL) and critically, very low resistance development potential.

This antimicrobial efficacy and benign nature of MOP together constitute highly desirable material attributes which offer promise for a reduction in the reliance on pesticides, biocides and antibiotics. It is suggested reducing their use will coincide with reduced AMR development and improve the sustainability of food production.

Biography:

Robert van Merkestein, B.App.Sci. (Chem), Business Manager; bioactive materials.
Within the Calix group, Robert leads the Biotech business line and manages product and application development and, registration and commercialization activity associated with bioactive and mesoporous MgO and derivatives.

DAY -1

ORAL PRESENTATIONS

Development and validation of the Eating and Food Literacy Behaviors Questionnaire with young adult university students

***Kwadernica C. Rhea, PhD[1]; Melissa W. Cater, PhD[2,]; Kevin McCarter, PhD[3]; Georgianna Tuuri, PhD, RD[4]**

[1] School of Nutrition and Food Sciences, Louisiana State University, Baton Rouge, LA and Centers for Disease Control and Prevention, 1600 Clifton Rd, Atlanta GA, 30329; USA

[2] Department of Agricultural and Extension Education and Evaluation, Louisiana State University, and Louisiana State University Agricultural Center, Baton Rouge, LA

[3] Department of Experimental Statistics, Louisiana State University, Baton Rouge, LA

[4] School of Nutrition and Food Sciences, Louisiana State University, and Louisiana State University Agricultural Center, Baton Rouge, LA

Young adulthood marks a pivotal time in human development where lasting nutrition-related behaviors are formed.1 Food literacy describes practical elements of healthy eating and broadly refers to understanding the impact food choices have on health.2 Food literate adults often demonstrate better diet quality and engage in more healthful food decisions.3,4 Tools capable of assessing food literacy recently emerged, including The Eating and Food Literacy Behaviors Questionnaire (EFLBQ). The EFLBQ was developed to define and measure perceived food literacy and behaviors during formative years. A total of 1,896 university students, aged 18-30 years, were recruited. Data from 1,813 responses were analyzed. Exploratory factor analysis, test re-test reliability, confirmatory factor analysis, and structural equation modeling were performed to establish validity. Exploratory factor analysis returned a five-factor model with acceptable internal structure. Test re-test reliability coefficients ranged from 0.63-0.92. Confirmatory factor analysis suggested the five-factor model was an appropriate fit for the data ($x2 = 588.05$; degrees of freedom = 142; root mean square error of approximation = 0.06; comparative fit index = 0.98; Tucker-Lewis Index = 0.97; standardized root mean square residual = 0.05). Structural equation modeling revealed relationships between health and nutrition and food preparation (0.25, $P < .001$), planning and/or decision-making (0.57, $P < .001$), taste (0.14, $P < .001$), and convenience (0.31, $P < .001$), demonstrated adequate fit (adjusted goodness of fit = 0.91; comparative fit index = 0.93; non-normed fit index = 0.91; root mean square error of approximation = 0.06; and standardized root mean square residual = 0.07), and a significant chi-square test ($x2 = 628.92$; degrees of freedom = 171, $P < .001$). The EFLBQ provides a valid instrument for measuring food literacy behaviors in young adults based on health and nutrition, food preparation, planning and decision-making, convenience, and taste with potential to guide behavior change interventions.

References

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Biography:

Kwadernica (Kwan) Rhea, PhD is a former graduate of the School of Nutrition and Food Sciences at Louisiana State University (LSU) in Baton Rouge, LA. She earned her PhD in Nutrition and Food Sciences from the LSU College of Agriculture in August 2019. Kwan currently works with the Centers for Disease Control and Prevention in Atlanta, GA as a Program Analyst. Her current research interests include health equity, nutrition and health, and food literacy.

The Dahlmann-Body-Analysis system to estimate body composition: Comparison with a bioelectrical impedance consumer device in consideration of the skeleton frame

Nicolaus Dahlmann[1]*, Dietrich Klingmüller[2]

[1] *Institut für Klinische Chemie, Universitätsklinikum Schleswig-Holstein, Germany*

[2] *Endokrinologie, Diabetologie und Stoffwechselmedizin, Universitätsklinik Bonn, Germany*

Background: The present study refers to an anthropometric model, Dahlmann-Body-Analysis (DBA), including the variables abdomen and hand circumference to calculate the individual percentage fat mass (%FM). The present work sets out to investigate, whether %FM computed by the DBA model compares to BIA measurements, notably under conditions of heavy obesity.

Subjects/Methods: In 103 adults (37 males, 66 females, age 42,5 ± 12,5 years, BMI 38,2 ± 4,8 kg/m^2) %FM was estimated by a tetrapolar BIA device and compared to results derived by the DBA system. Bland-Altman and simple linear regression analyses were used to determine agreement between methods.

Results: The mean %FM estimates of men (women) ± SD were 36,1 ± 4,8 (49,7 ± 4,5) for BIA and 36,7 ± 4,2 (49,1 ± 4,9) for DBA measurements. Pearson correlation coefficients (r) and Lin's concordance correlation coefficient (CCC) were r = 0,86 and CCC = 0,84 for men and r = 0,85 and CCC = 0,83 for women, respectively. Bland-Altman plot showed limits of agreement between DBA and BIA %FM that ranged from 5,5 % to -4,3 % for men and 4,6 % to – 5,7 % for women, respectively. Correlations between values measured by both methods were high and no systematic error was found. The DBA system overestimates FM by 0,63 ± 4,98 (2SD) % for men and underestimates FM by -0,56 ± 5,28 (2SD) % for women, respectively, compared to the BIA results. Over all, there is a strong concordance and reproducibility between the DBA and BIA data sets.

Conclusions: The implementation of the abdomen circumference into the DBA model as a proxy for body fat and the hand circumference as a proxy for the skeleton frame resulted in a strong concordance with BIA measurements. These findings indicate that the DBA model may reflect the body shape of severely obese white European patients with regard to body composition.

Cyanotoxins and Neurodegeneration

Claudia Crosio, Paola Sini, Cristina Ciampelli, Grazia Galleri, Antonella Lugliè, Bachisio Padedda and Ciro Iaccarino

Dept of Biomedical Science, University of Sassari, Italy

The prevalence of neurodegenerative disease (ND) is increasing, partly owing to extensions in lifespan, with a larger percentage of members living to an older age, but the ND aetiology and pathogenesis are not fully understood, and effective treatments are still lacking. Neurodegenerative diseases such as Alzheimer's disease, Parkinson's disease, and Amyotrophic Lateral Sclerosis (ALS) are generally thought to progress as a consequence of genetic susceptibility and environmental influences. Up to now, several environmental triggers have been associated with NDs, and recent studies suggest that some cyanotoxins, produced by cyanobacteria and acting through a variety of molecular mechanisms, are highly neurotoxic, although their roles in neuropathy and particularly in NDs are still controversial.

We used pure L-BMAA and Microcystis aeruginosa crude extracts (LCS-MaCe), a cyanobacterial strain isolated from Coghinas lake (Italy, Sardinia) as environmental toxicity triggers on both cellular and animal models. In details as ALS cellular models we used neuronal (human neuroblastoma SH-SY5Y cells) and non-neuronal (patient's fibroblast) cell lines, while as animal model we used Drosophila melanogaster. We demonstrate a dose-dependent toxicity upon L-BMAA or LCS-MaCe exposure, exacerbated by over-expression of A382T mutation in ALS-causing gene TDP-43 (TAR DNA-binding protein 43 OMIM #605078). By immunofluorescence and biochemical analysis performed on ALS cellular model, we highlight TDP-43 delocalization and aggregation, ER stress and cellular ROS production but not apoptosis. RNA-seq analysis on ALS patient's fibroblast exposed to L-BMAA or LCS-MaCe was performed and revealed complex and partially overlapping panel of both upregulated and downregulated genes directly linked to neurodegenerative diseases. Our results add new pieces to the molecular mechanisms of ALS pathogenesis, highlighting the relationship among Cyanotoxin exposure and ALS.

Biography:

2005-today: Associate Professor at the University of Sassari, Italy. Mechanisms operating in the pathogenesis of Amyotrophic Lateral Sclerosis and Parkinson Disease.

2003-2005: PostDoctoral Researcher IRCCS S.Lucia, Rome, Italy. Mechanisms operating in the pathogenesis of Amyotrophic Lateral Sclerosis (ALS).

1998-2003: post-doctoral training IGBMC, Strasbourg, France. Role of modifications occurring on histone tails, contributing to the dynamic process of chromatin remodelling, in a variety of cellular processes and model systems;

1994-1998: Ph.D. training at the University of Rome "Tor Vergata". Ribosome biogenesis: genomic organization and expression of ribosomal protein genes and snoRNA intron-encoded.

Open Community for Food Consumer Science (COMFOCUS)

Dr Lada Timotijevic[1], Prof Hans Van Trijp[2], Dr Ellen van Kleef[2] , Ms Karin Zimmerman[2], Prof Barbara Korousic-Seljak[3], Prof Ellen Horska[4], Dr Wil van Dommelen, Prof Liisa Lähteenmäki, Dr Machiel Reinders[2]

[1] *School of Psychology, Faculty of Health and Medical Sciences (FHMS), University of Surrey, UK*

[2] *Wageningen University and Research, The Netherlands.*

[3] *Jozef Stefan Institute, Slovenia*

[4] *Nitra University, Slovakia*

[5] *Aarhus University, Denmark*

Background: The current food system has reached a crisis point, producing a range of undesirable outcomes such as health inequalities, obesity, loss of biodiversity, and environmental degradation. Understanding food consumption and people's relationship with food is a major step towards food systems transformation. Food consumer science is addressing this problem as a discipline that aims to understand how people come to learn about, desire, acquire, use, and dispose of foods, food products and services, and activities available in the marketplace to satisfy their needs. However, food consumer science is currently fragmented, its data are scattered and its approaches insufficiently harmonised, which impacts its ability to deliver impactful results.

Method: The European project COMFOCUS mission is to advance the open food consumer science community beyond its current level of fragmentation that prevents it from being a user-relevant data-rich science it could be in support of healthy food choice public policies and private strategies. The project is developing a research infrastructure that will enable **open access to institutions and COMFOCUS Knowledge platform; open data that will be standardised and comply with FAIR and RRI standards; and open community** fostered through networking and long-term strategy for European behavioural and social scientists interested in people's relationship with food.

Results: : It brings together social and computer scientists to harmonise constructs, measurements and develop standards for new modes of research. It will develop data structures, ontologies and services for data extraction, as well as appropriate data governance approaches. This will facilitate open food consumer science through open data, open protocols, open facilities and open knowledge.

Biography:

Dr Lada Timotijevic, BSc, PhD, CPsych, AFBPS Lada is an Associate Professor within the Food Consumer Behaviour and Health Research Centre, School of Psychology, University of Surrey. She trained as a social psychologist and has specialised in food policy and food choice, addressing the issues such as risk perception and communication, health nutrition policy, the governance in food innovation systems from the multi- actor system perspective and participatory decision-making. Her most recent interests are relevant to the current international efforts to establish new science data governance regimes. She is a member of advisory boards of a number of national and international projects. She published widely in international journals such as European Journal of Clinical Nutrition, Food Policy, Social Science and Medicine, British Journal of Nutrition, Public Health Nutrition.

Experience of development and management of IPE courses. A case study of an IPE Center CHA IPE Bridge

Jaijeong Choi

Department of Medical Humanities, CHA University School of Medicine, Pochon South-Korea.

Since the WHO began recommending Interprofessional Education (IPE) in 2007, it has been applied to all fields of health care related education worldwide. There is an emerging need for IPE especially in the context of developing strategies for continuous quality control and improvement of medical services in hospitals and institutions of healthcare. The main advantage of the IPE curriculum is the convergence effect between various fields. This is a important keyword that would be required to adequately respond to the current and future health care environment, which is becoming increasingly globalized, especially the pandemic situation, emerging as a new type of disaster.

The aim of this study is to introduce 'CHA IPE Bridge', a Center for IPE that was established CHA University in Korea in 2018. CHA IPE Bridge develops IPE courses that go beyond the range of doctors and nurses to other occupations related to the field of health care including of 'food science'. The introduction of CHA IPE Bridge is expected to provide a positive stimulus to other universities worldwide. Various barriers must be overcome in order to apply IPE. First of all, a clear awareness of the crises facing us from experts in various professionals in the health care field is necessary, in order to practice education regarding all professional competencies in health care as 'problem-centered'. Secondly, curriculum development should be done in the backward direction so that convergent collaboration between occupations participating in the specific actual situation in the field of health care could be possible. In addition, it must be emphasized that Problem Based Learning (PBL), Team-Based Learning (TBL), Action Learning (AL), Flipped-Learning (FL), and Blended Learning (BL), which are mainly used in IPE, are very effective teaching methods that could be helpful in development of core competencies required in the future health care environment.

References

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Survival after self-poisoning with sodium nitrite: A case report

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Sodium nitrite ingestion poses a considerable public health threat. The incidence of sodium nitrite self-poisoning in the United States has been trending upward since 2017. Our case report describes an intentional sodium nitrite ingestion with favorable outcomes.We highlight the proper treatment of this ingestionwith intravenous methylene blue. Sodium nitrite is an oxidizing agent that is commonly found in processed meats, fish, and cheeses as a preservative, antimicrobial, and food coloring agent. It is an odorless, white crystalline powder that has been confused for table salt or granulated sugar. It has become more readily available in large quantities online. Unfortunately, online forums exist that detail how to dose sodium nitrite for suicide. Furthermore, it has been recently discussed in popular news streams after a celebrity died of an overdose. Sodium nitrite toxicity is capable of causing severe methemoglobinemia with high mortality. Prompt identification is crucial.We discuss the important implications in regard tomedia coverage, imitative suicide, and accessibility of sodium nitrite.

KEYWORDS

ingestion, methemoglobinemia, poisoning, sodium nitrite, toxicology

Highly precise cgMLST typing of *Listeria monocytogenes*

Federica Palma[1#], Iolanda Mangone[2#], Anna Janowicz[3], Alexandra Moura[4,5], Alexandra Chiaverini[6], Marina Torresi[6], Giuliano Garofolo[3], Alexis Criscuolo[7], Sylvain Brisse[1,8], Adriano Di Pasquale[2], Cesare Cammà[2], Nicolas Radomski[2*]

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[2] Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise "Giuseppe Caporale" (IZSAM), National Reference Centre (NRC) for Whole Genome Sequencing of microbial pathogens: data base and bioinformatics analysis (GENPAT), via Campo Boario 64100 Teramo TE, Italy

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[6] Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise "Giuseppe Caporale" (IZSAM), National Reference Labororatory (LNR) for Listeria monocytogenes, via Campo Boario 64100 Teramo TE, Italy

[7] Institut Pasteur, Université de Paris, Bioinformatics and Biostatistics Hub, 75015 Paris, France [8] Institut Pasteur, Université de Paris, Biodiversity and Epidemiology of Bacterial Pathogens, 75015 Paris, France `

Background. Core genome multi locus sequence typing (cgMLST) is widely used in surveillance of the pathogenic bacteria Listeria monocytogenes. Because of the heterogeneity of available cgMLST workflows, we identified parameters influencing the precision of cgMLST typing (i.e. identical alleles against reference circular genomes).

Methods. Based on three *L. monocytogenes* reference genomes from different phylogenetic lineages, we assessed the impact of in vitro (i.e. tested genomes, successive platings, replicates of DNA extraction and sequencing) and *in silico* parameters (i.e. targeted depth of coverage, depth of coverage, breadth of coverage, assembly metrics, cgMLST workflows, cgMLST completeness) on cgMLST precision made of 1 748 core loci. We tested six cgMLST workflows, including assembly based (BIGSdb[1], INNUENDO[2], GENPAT[3], SeqSphere[4] and BioNumerics[5]) and assembly free (i.e. kmer based MentaLiST) allele callers. We used Principal component analyses and generalized linear models to identify the most impactful parameters on cgMLST precision.

Results. The genetic background of isolates, cgMLST workflows, cgMLST completeness, as well as depth and breadth of coverage were the parameters that impacted most on cgMLST precision. All workflows performed well at ≥ 40X of depth of coverage, with high loci detection (> 99.54% for all, except for BioNumerics with 97.78%) and provided consistent cluster definitions using the reference cut off of ≤ 7 allele differences.

Conclusions. Bioinformatics workflows dedicated to cgMLST allele calling are largely robust when paired end reads are of high quality and when the sequencing depth is ≥ 40X[6].

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Biography:

Nicolas Radomski performed a PhD thesis about microbial genomics in the “Université Paris-Est” (France) in collaboration with “Virginia Polytechnic Institute and State University” (USA) (2008-2011). Then (2011-2015), he managed research projects in microbial genomics in the “Research Institute of the McGill University Health Centre” (Canada). Therefor (2015-2020), he implemented bacterial genomics in the food safety laboratory of “Agence nationale de sécurité sanitaire de l’alimentation, de l’environnement et du travail” and obtained the certification to manage research (France). In 2020, he started to work in the “Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise Giuseppe Caporale” as bioinformatics expert in microbial genomics.

Evaluation of the microbiological quality, physicochemical characteristics and sensory profile of strawberries treated with Neutral Electrolyzed Water.

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Strawberries are an excellent source of vitamin C, manganese, and potassium. They are rich in antioxidants and plant compounds like phenols which may have benefits for human health. Strawberries are a perishable fruit that could suffer tissue softening and physical damage caused by handling during harvesting and packaging, as well as being contaminated by pathogenic microorganisms. The storage temperature of the strawberry is 0 to 2 °C, which allows useful life periods of a maximum of 2 weeks; however, Salmonella spp can survive on the strawberry surface at different storage temperatures. Foodborne illnesses are linked to contaminated fruits consumption due with Salmonella spp and Escherichia coli O157:H7. That is why disinfection is important to ensure its safety and quality.

Sodium hypochlorite is the main used disinfectant because its low cost and high effectiveness, however, it is unstable, corrosive and, it is related to presence of carcinogenic compounds after reacting with organic matter.

Neutral Electrolyzed Water is a novel antimicrobial agent, it has been demonstrated bacterial reduction counts in fruits, it is safe for humans and environment. It has been shown to reduce E. coli O157:H7 and Salmonella enterica counts in tomatoes, apples, lettuce, cucumber, pork, chicken, beef, egg, and fish. HClO is the major bactericidal component and attacks the outside and inside of bacteria, disrupts normal cell functions by affecting metabolic reactions, ATP production, inhibits glucose oxidation, disrupts protein synthesis, and inhibits oxidative phosphorylation and oxygen uptake.

In the present work, the effect of NEW in contaminated strawberries with Salmonella spp and E. coli was evaluated. Physicochemical and sensory characteristics were analyzed, and the obtained results showed that NEW decreases the bacterial load without altering the physicochemical properties of the food matrix. Our results support that NEW can be used in strawberry disinfection to keep safety although more studies are required.

Biography:

José A. Cano-Buendía is a Full-time professor at School of Veterinary and Zootechnics – UNAM. He holds a PhD in Biotechnology (UNAM) and he performed his postdoctoral at Arizona State University and he was a visiting professor at University of California – Davis. He is author of various research documents and book chapters. He has been working with electrolyzed water since 2016. He worked in pharmaceutical companies too in the development of treatments for cancer.

Exploring Consumer Perspectives on Packaging for Portion Control and Value-Driven Portion Decisions: A Photo-Elicitation Study

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[2] *School of Psychology, University of Leeds, UK.*

Consumers are surrounded by low-cost, high-energy density (HED) foods presented in visually appealing packaging consumption of which contributes to excessive energy intake. Nudges to reduce HED intake and to encourage the consumption of food with a low-energy density and a high nutrient content. Food packaging can guide healthier food choices1. However, it is not clear to what extent consumers notice packaging features specifically to assist with habitual portion strategies. This study investigated consumers' insight on the food packaging using a participant-driven photo-elicitation (PDPE) approach with 25 adult consumers. Five photographs showcasing salient features and five photographs highlighting packaging attributes relevant to portion size were taken. During PDPE interviews, these images were discussed, as well as the ways in which participants interact with food packaging when making portion decisions. Thematic analysis was used until saturation was achieved. The findings revealed, themes related to salience, including trust building, appetising and self-identity. Furthermore, themes related to portion control included structural reminders, healthy prompts and portion awareness. Participants adopted varied approaches in using packaging to make portion decisions such as deliberate resistance to the serving size recommendation, reliance on the packaging attributes, permissive eating cues and individual feelings and circumstances. The study also uncovered the connection between packaging attributes and consumer values, specifically autonomy and control, convenience and healthiness perception, which played a significant role in influencing portion decisions. Also, packaging prompts to eat well spanned habits acquired over time, current situation to eat in real time and future focus on health. Proposed packaging design improvements ranged from enhancing portion reminders, to increasing the attractiveness of healthier food packaging, and improving portion-related communication. By recognising consumer values and address their needs for habitual, current and future concerns, food packaging can serve as a more supportive medium to effectively nudge consumers towards healthier portion decisions.

Keywords: portion decision; food packaging; photo-elicitation; consumer value

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Biography:

She is a PhD student of Design at the University of Leeds. She works on ways to promote healthy diet through packaging. Her expertise is in consumer behavior, behavior modification, and healthful food packaging design. Her research has published in journals including Appetite, Food Quality and Preference and Nutrition Bulletin.

Challenges encountered in the school nutrition programme in South Africa

Tafirenyika Mafugu & Cosmas Maphosa

University of the Free State, South Africa.

Background: School Nutritional Programmes (SNP) provide meals at school to reduce hunger, nutrient deficiencies and improve class alertness among children in poor communities. The purpose of the research was to determine the challenges encountered in implementing the SNP in KwaZulu-Natal Province, South Africa in 2017.

Design and methods: A cross-sectional study underpinned by a concurrent triangulation research design where interviews were used to collect qualitative data from stakeholders, and a questionnaire collected quantitative data from students. The set of qualitative data was thematically analysed. Descriptive and inferential statistics were used to analyse the quantitative data. Analysis of variance (ANOVA) and Tukey HSD test were used to compare the mean scores for food quality on different days of the week.

Results: Both the quality and quantity of food were affected by delays in payment of food suppliers, lack of training of stakeholders, and poor kitchen facilities. Health problems experienced by students after eating the food made them reluctant to consume meals on some days. The Tukey HSD test indicated that the mean score for the quality of food served on Wednesday (3.2 ± 1.3) was significantly higher than the mean score for the quality of the meal served on Friday (2.5 ± 1.3).

Conclusions: Late payment of food-suppliers and inadequate training of food-handlers affected the quality and quantity of the meals. The researcher recommends that the programme administrators should improve the frequency of payment for food suppliers, training of food handlers, and find alternative meals for students who do not consume the regular meals due to various reasons.

Biography:

Dr Mafugu is an esteemed senior lecturer at the prestigious University of the Free State in South Africa. Dr Mafugu's outstanding contributions to academia have not gone unnoticed, as he was honoured with prestigious awards in 2021 and 2022, recognising him as one of the top researchers in his institution, with over ten single- and co-authored articles in Scopus-indexed journals and conference proceedings from 2020 to 2023. Additionally, he takes pride in mentoring and guiding postgraduate students pursuing their master's and PhD degrees, nurturing the next generation of academic scholars in the field of science education.

DAY-2

ORAL PRESENTATIONS

Anti-cancer potential of synergistic phytochemical combinations are influenced by the genetic profiles of prostate cancer cell lines.

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[7] Departments of Health Sciences and Biological Sciences, Faculties of Applied Health Science, and Mathematics and Science, Brock University, St Catharines, Ontario, Canada.

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Despite strong epidemiological evidence that dietary factors modulate cancer risk, cancer control through dietary intervention has been a largely intractable goal for over sixty years. The effect of tumour genotype on synergy is largely unexplored. The effect of seven dietary phytochemicals, Quercetin (0-100 µM), curcumin (0-80 µM), genistein, indole-3-carbinol (I3C), equol, resveratrol and epigallocatechin gallate (EGCG) (each 0-200 µM), alone and in all paired combinations om cell viability of the androgen-responsive, pTEN-null (LNCaP), androgen-independent, pTEN-null (PC-3) or androgen-independent, pTEN-positive (DU145) prostate cancer (PCa) cell lines was determined using a high throughput alamarBlue® assay. Synergy, additivity and antagonism were modelled using Bliss additivism and highest single agent equations. Patterns of maximum synergy were identified by polygonogram analysis. Network pharmacology approaches were used to identify interactions with known PCa protein targets. Synergy was observed with all combinations. In LNCaP and PC-3 cells, I3C mediated maximum synergy with five phytochemicals while genistein was maximally synergistic with EGCG. In contrast, DU145 cells showed resveratrol-mediated maximum synergy with equol, EGCG and genistein, with I3C mediating maximum synergy with only quercetin and curcumin. Knockdown of pTEN expression in DU145 cells abrogated the synergistic effect of resveratrol without affecting the synergy profile of I3C and quercetin. Our study identifies patterns of synergy that are dependent on tumour cell genotype, are independent of androgen signaling but are dependent on pTEN. Despite evident cell-type specificity in both maximally-synergistic combinations and the pathways that phytochemicals modulate, these combinations interact with similar prostate cancer protein targets. Here, we identify an approach that, when coupled with advanced data analysis methods, may suggest optimal dietary phytochemical combinations for individual consumption based on tumour molecular profile.

Biography:

A/Prof. Kieran Scott trained in biochemistry and chemistry at Massey University, New Zealand, completing his PhD in genetics at the Australian National University in 1983. His research career has focused on the biochemistry of lipid mediator biosynthesis in models of acute and chronic inflammatory disease. In the last few decades, he has discovered, characterised and tested novel anti-inflammatory cyclic peptide experimental drugs to treat prostate cancer. More recently, A/Prof. Scott and colleagues have worked on identifying an approach that may enable individualised advice to prostate cancer patients on the optimal use of dietary phytochemicals to manage their disease, guided by the molecular profile of their tumour.

Is heritability for nutritional effects becoming more important due to the uniformity of COVID social stress?

Professor M. Catherine DeSoto, Ph.D.

University of Northern Iowa, USA

The importance of nutrition to proper neural functioning and mental health has become more accepted, but is still under recognized given the existent body of research. Moreover, the uniformity of social isolation, lack of exercise, and remaining indoors that overtook industrialized societies during 2020 are specific factors that could be expected to not only increase depression, but also to change the Gene x Environment interactions for anxiety and depression. It is hypothesized that sharp and sudden environmental changes can make genetic diatheses for nutritional deficiencies more problematic. The concept of G x E interaction will be dissected to clarify a non-intuitive scenario: *heritability may increase*, even when a sharp increase in prevalence of a pathology is fully due to environmental change (e.g., a secular shift in depressionogenic experiences). Key research on the functional significance of food and behavioral tendencies and mood is highlighted, with specific genetic alleles reviewed as likely vulnerabilities. Theoretical and practical implications regarding the heritability of depression in the aftermath of the COVID pandemic will be discussed.

Biography:

Catherine DeSoto's research involves investigating the influence of hormones, nutritional cofactors, and genetic variation on both normal behavior and psychopathology. Interested in how brain function affects behavior, she has conducted research involving various brain imaging techniques, including ERP's, optical imaging and fMRI. She is co-director of her university's Psychoneuronendocrinology Lab. She has published approximately 50 articles, as well as a recent (2022) book. Research includes the complexities of folic acid levels and neurodevelopment, genetics of Vitamin K cycle, immune modulating nutrients and COVID, the social and cognitive biases regarding COVID, as well as the functional significance of nutrition on mood and anxiety. She is uniquely qualified to speak on this issue.

Native vineyard non-saccharomyces yests used for biologila control of botrytis cinerea in stored table grape

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The most used strategy to prevent post-harvest table grape deterioration, caused by spoilage fungi, such as *Botrytis cinerea,* is the use of SO_2 generator pads. Excessive doses of SO2 can damage table grapes, causing early browning both of the rachis and skin, berry cracking and fruit injury. Furthermore, sulfur dioxide residues on fruit can cause allergies in consumers. For this reason, great attention has been recently focused on identifying Biological Control Agents (BCA) to implement biological approaches devoid of chemicals. In this study, four different *non-Saccharomyces* yeast strains, isolated from local vineyard in the South of Italy, was identified as possible BCA, against grey mold of table grape. Performing both *in vitro* and *in vivo assays* in semi-commercial conditions, we identified three *M. pulcherrima* and one *L. thermotolerans* strains able to largely antagonize the development of the *B. cinerea,* at both *in vitro* and *in vivo* conditions. The production of soluble enzymes and volatile organic substances have been hypothesized as the main mechanisms of action, which underlie the antagonistic activity of these yeast strains. Moreover, the ability of these yeast strains to detect relevant antagonistic effect also at low concentration, also against other plant pathogen fungi and their inability to lyse red blood cells, make theme excellent candidates for the development of new commercial products, which can be used both in organic agriculture and post-harvesting process.

Biography:

The research activity of Dr. Marsico Antonio Domenico and Dr. Maria Francesca Cardone has for years focused on the identification of BCAs against the main biotic plant diseases of table grapes, to implement biological approaches devoid of chemicals and to study at molecular level the mechanism of action of BCAs and the genotype-microbiome interaction.

Composition and physico-chemical properties of milk from indoor feeding versus pasture at different altitudes in the production of Formaggella della Valle di Scalve cheese in Bergamo province

Paolo Formaggioni[1*], Piero Franceschi[1], Valentina Zucchelli[2], Milena Brasca[3], Massimo Malacarne[1]

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The aim of the research was to study the physico-chemical and technological properties of milk destined to the production of Formaggella della Valle di Scalve, a semi-cooked traditional cheese, made from whole milk in a mountain area of Bergamo province (north of Italy). During two years, a total of 19 cheesemaking trials were conducted in summer for three different experimental theses: six milk sampling (S-milk) were kept from a farm rearing cows indoor (at valley floor, about 1000m a.s.l.), fed permanent meadow hay and grass. Six sampling (P-milk) were made in a farm still located at valley floor but raising cows at pasture. Seven sampling (A-milk) were made in a herd at mountain pasture (altitudes higher than 1000m up to 2300–2500 m). Chloride and somatic cells resulted higher in A-milk than in S-milk. Lactose and titratable acidity showed higher values (4.66 vs 4.50 g/100g; 3.28 vs 2.97 °SH/100mL; $P<0.05$) in S-milk than in A-milk. Moreover, fat of S-milk was characterised by higher percentages of medium-chain fatty acids (FA) (50.41% S vs 43.85% P vs 40.68 A; $P<0.001$). Furthermore, long-chain FA were higher in P- and A-milk than in S-milk (40.43% S vs 48.03% P and 51.42% A; $P<0.01$). Monounsaturated FA, and in general unsaturated FA, were higher in P- and A-milk, while saturated FA were higher in S-milk than in P- and A-milk (68.61% S vs 63.39% P and 60.98% A; $P<0.05$). Finally, CLA were higher in P- and A-milk, while Omega 3 in P-milk, compared to both S- and A-milk.

Biography:

Paolo Formaggioni works at Parma University (Agr19 SSD). He has a degree in Chemistry and another in Food Science and Technology, and a PhD in Animal Production. He's teacher of "Parmigiano Reggiano Cheese" course at the Department of Food Science and Technology of Parma University. His main research fields are: Milk and cheese quality; cheese yield and cheesemaking efficiency; cheese proteolysis and lipolysis; effect of animal breed, of milk cooling, and of milk somatic cells on milk quality for cheesemaking; milk of different species. He's author of 45 international publications indexed on Scopus, with 718 citations and h-index of 16.

Optimal Pricing for Promoted Health-food Products

Michael Prophet

University of Northern Iowa, Department of Mathematics, USA

In large supermarkets it is typical to find a section of the store devoted to products associated with (natural) health, fitness and well-being. And a manager of such a section has a vast array of items that can be chosen to include as inventory, from items of consumption to personal care. Many of the products are, periodically, `promoted' by the various distributors - where promotions can take the form of cash payments made to the store. For example, a promotion might state that if a retailer purchases 25 cases of beverage XL Energy then that store will receive $250. Such cash promotions can `leveraged' by the retailer to increase sales through retail price discounts. In this study, we describe a model to reveal optimal (retail) pricing of promoted items in a health-food store, where the store manager's goal is to maximize revenue. Our model employs mathematical elements from Calculus and Differential Equations to obtain analytic descriptions of pricing policies.

Biography:

I earned a Ph.D. in Mathematics from University of California, Riverside in 1993; since that I have been actively publishing in the area of Approximation Theory and Functional Analysis. In 2012 I founded the consulting company Global Optimization which has been worked on a variety of logistical problems within many different industries.

Nutrigenomic potentials of food molecules: the fifteen years-experience of our lab

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Nutrigenomics is broadly defined as the relationship between nutrients, diet, and gene expression. This new branch of genetics studies how diet molecules could influence the epigenetic state of genes and modulate their expression. The modification of gene expression could consequently influence the onset of diseases, such as cardiovascular syndrome, metabolic pathologies and even the onset of cancer. The epigenetic mechanisms by which food constituents may modify gene expression concern DNA methylation, histone modifications and microRNA regulation.

Our lab has been studying, for about fifteen years how phytochemicals influence DNA methylation, discovering among other, that Indicaxanthin (Ind), a betaxanthin contained in prickly pear, specifically modulates DNA methylation. Ind has antioxidant and anti- inflammatory activities, and it shows antiproliferative activities in intestinal tumor cells.

Furthermore, Ind treatment induce DNA demethylation in oncosuppresor genes that are silenced during tumor progression. After Ind treatment, they increase their expression in intestinal tumor cells, thus inducing cell cycle arrest and reducing tumor cell proliferation. More recent studies of our group also showed that resveratrol, contained in red wine, reverts the arsenic-induced morphologic damage, DNA strand breaks and genomic DNA demethylation.

It is now well known that plant cells release vesicles, affecting the extracellular environment. Previous studies of our lab have shown that plant derived vesicles lead to a reduction of tumor growth *in vivo1* .

Phytochemicals, may be contained or concentrated in vesicles.

This new research frontier could exploit vesicles as a natural container of biologically active phytocompounds. They could have an important role in nutraceutical applications in clinical or sports nutrition. Furthermore, it is reasonable to suppose their use as a carrier of molecule to interact with the genome, thus providing precision nutrition.

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Biography:

Dr. Naselli, currently an assistant professor at the University of Palermo, holds a PhD in Cell and Developmental Biology from the same university. She has worked at the Institute of Food Research in the UK and as a post-doctoral researcher at the universities of Palermo and Milan. Dr. Naselli has published over 12 scientific papers and holds a patent. She has extensive knowledge in biochemistry and genetics, gained from years spent in multidisciplinary laboratories. Dr. Naselli also worked as a nutritionist in Clinical and Sports Nutrition practice and is interested in nutrigenomics and the connection between nutrition and genome response.

An analysis of the panel's perceptions on cooking in "Metaverse Kitchen"

Minsun Kim

Sejong University, South Korea

This study uses the concepts of augmented reality, virtual reality, mirror world, and lifelogging to describe the "Metaverse Kitchen." The "Metaverse Kitchen" is defined as a space in the virtual world where users can cook the dishes they want using the meal kit regardless of location or time. This study examined expert's perceptions of cooking and food delivery services using "Metaverse Kitchen." In this study, a consensus opinion on the concept, expected advantages, and disadvantages of "Metaverse Kitchen" was derived from 20 culinary experts through the Delphi technique. The three Delphi rounds were conducted for one month, from December 2022 to January 2023. The resutls are as follows. First, users select and cook food after visiting the "Metaverse Kitchen" in the virtual space. Second,when a user cooks in "Metaverse Kitchen" in AR or VR, the information is transmitted to nearby restaurants. Third, the platform operating the "Metaverse Kitchen" assigns the order to the restaurant that can provide the meal kit cooked by the user in the virtual space first in the same way among these restaurants. Fourth, the user pays for the "Metaverse Kitchen", and the restaurant delivers the cooked meal kit to the user and then receives payment for the user's meal and delivery fee from the platform. Fifth, the platform company that operates the mirror world "Metaverse Kitchen" uses lifelogging to manage customers. They receive commissions from users and affiliated restaurants and operate virtual restaurant businesses using meal kits. Among the selection attributes for meal kits provided in "Metaverse Kitchen", the panelists suggested convenience, quality, and reliability as advantages, and predicted relatively high price as a disadvantage. "Metaverse Kitchen" using meal kits is expected to form a new food supply system in the future society. In follow-up studies, an empirical analysis is required targeting producers and consumers.

Biography:

Minsun Kim is a culinary researcher at Sejong University in Seoul, South Korea, currently pursuing a doctoral degree. She has a lot of academic interest in culinary research in meal kits, porridge, and metaverse, and has published papers and books related to them.

AGEs determination in nutritional bars

Roberto Cannataro and Erika Cione

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Every time there is an increase in blood sugar in our body, the process called "glycation of proteins" is triggered, ie: glucose binds to proteins in a stable manner; these proteins (glycated hemoglobin is a classic example) must be replaced because they are no longer active from a biochemical point of view (1). If they are not replaced and degraded (i.e. if they are produced too often and / or in high quantities), they can react further forming the Advanced Glycation End-Products (AGEs) on specific groups of amino acids (2,3). AGEs can also be produced in foods since it is a non-enzymatic reaction of reducing carbohydrates with lysine side chains and N-terminal amino groups of proteins. The reaction is called the Maillard reaction that adversely affect the functional properties of proteins, lipids and DNA. Therefore, foods that contain it in high quantities should be avoided or rarely consumed (4). Amongst the AGEs the compound known as N- epsilon- (carboxymethyl) lysine (CML) is the most representative (2-4). In this concern, it was reported in mice that consumption of AGE-rich diets is associated with elevated AGEs in tissue and blood circulation and increasing incidence of phenomena as atherosclerosis, vascular and kidney dysfunction, decreasing wound healing (4). Nevertheless, up today its was never reported AGEs-CML level in energy or protein bar used in athletic/sport practice. The purpose of this work was to evaluate the quantity of AGEs-CML in a series of bars present on the Italian market, as the simultaneous presence of carbohydrates and proteins makes possible candidates for the synthesis of AGEs; the production line of the bars provides for exposure to heat of varying intensity, as well as, albeit for a very short time (spry drying technology), to obtain the protein powder, a heat treatment is required.

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Biography:

Roberto Cannataro is nutritionist, food technologist and chemical engineer for over 25 years engaged in the field of nutrition, food supplementation and nutraceuticals, even before the term became common. He collaborates with private firms for the development of new products, he is a teacher in various universities and private structures in the field of nutrition and in particular food supplements. From 2016 he's CSO of the university spinoff Galascreen who deals with the evaluation of miRNAs and their function and possible application as a marker and as supplements. He is CSO of BlowC and Vita Vegan Excellence. He is part of scientific committee of Dynamical Business Science Society (DBSS) and director of the Master Course "Sports Analytics" at University of Calabria.

VIRTUAL

The Nursing Effect of Individualized Management on Patients With Diabetes Mellitus Type 2 and Hypertension

Ran Li

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It focused on clinical effects of individualized nursing and health education (INHE) on patients with diabetes mellitus type 2 (T2DM) and hypertension.. 68 patients were randomly rolled into two groups, 34 cases in the control group (group A) received routine nursing and remaining 34 cases in the experimental group (group B) received INHE. The disease knowledge mastery (DKM) and the effect of rehabilitation nursing of patients were compared. The results suggested that DKM of patients in group B was obviously greater ($P < 0.05$). The total effective rate (TER) in group B was 91.45%, which was observably greater than that (76.35%) in group A ($P < 0.05$). After nursing, the fasting plasma glucose (FPG), 2-hour postprandial glucose (2h PG), systolic blood pressure(SBP), and diastolic blood pressure (DBP) levels of all patients decreased, and those in group B were much lower ($P < 0.05$). Scores of the Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) of the two groups were 56.34 ± 8.12 points and 56.33 ± 8.01 points in group A, respectively; and those in group B were 42.52 ± 6.77 points and 41.71 ± 7.23 points, respectively; and they were all decreased and those in the group B were obviously smaller ($P < 0.05$). In summary, INHE can effectively improve the psychological cognition of patients with T2DM and hypertension and strengthen the control of blood pressure and blood sugar.

Reducing the amount of nitrogen fertilizer applied as top-dressing to rice plants enhances steamed rice digestion and alcohol fermentation in sake brewing

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The application of synthetic nitrogen (N) fertilizer can improve crop productivity. However, environmental pollution caused by the mass manufacturing and intensive use of N fertilizer is a serious concern. To establish a sustainable agricultural system, it is important to reduce the amount of synthetic N fertilizer used in crop production. In this study, we cultivated rice (Oryza sativa) plants with N fertilizer applied as top dressing at varying dosages and evaluated the impacts on the yield and quality of rice grains and the properties of sake, a Japanese traditional alcoholic beverage made from rice grains1. The yield, protein content, amylose content, and appearance quality of rice grains were significantly affected by the dosage of N fertilizer applied to rice plants, although the total starch content of rice grains was not affected. The digestibility of steamed polished rice grains and the alcohol fermentability of rice grains in a sake brewing test were enhanced when the rice plants were grown with a low level of N fertilizer applied as top dressing. Compared with rice grains from higher N-fertilizer treatments, those from the low-N-fertilizer treatment yielded a higher volume of sake with a higher alcohol concentration and lower amino acid concentrations. This information will be useful for the establishment of a rice and sake production system with reduced use of synthetic N fertilizer.

Reference:

1Miyamoto, T., Nishida, I., Ohtake, N., Hirata, D. (2023). Nitrogen fertilization of rice plants before flowering affects sake fermentation and quality. Cereal Chemistry, 100 (2), 277–283. DOI: 10.1002/cche.10603

Biography:

I am a specially appointed assistant professor at Sakeology Center of Niigata University. I have worked on identification and characterization of genes associated with nutritional element uptake and cell wall biosynthesis of rice. I am curious about how soil nutritional status of paddy fields changes rice endosperm characteristics and affects the quality of sake. My recent works aim to understand the impacts on sake quality by applying fertilizers to rice paddy fields.

Lactic acid bacteria and yeast strains isolated from fermented fish (Budu) identified as candidate ruminant probiotics based on in vitro rumen fermentation characteristics

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Background and Aim: Probiotic supplementation can assist with manipulating the rumen microbial ecosystem. Lactic acid bacteria and yeast from fermented fish (Budu) as the indigenous food from West Sumatra, Indonesia, are potential probiotics for livestock. This study aims to select the best candidate lactic acid bacteria and yeast strains from fermented fish as ruminant probiotics and evaluate the effect of their supplementation on the characteristics of rumen fermentation, feed digestion, and total gas production in vitro.

Materials and Methods: The substrate ratio comprised of 70% Pennisetum purpureum forage and 30% concentrate. Five lactic acid bacteria and three yeast isolates were used in this study. Treatments were as follows: T0: control (basal diet); T1: T0 + Lactobacillus parabuchneri strain 3347; T2: T0 + Lactobacillus buchneri strain 5296; T3: T0 + Lactobacillus harbinensis JCM 16178; T4: T0 + Schleiferilactobacillus harbinensis strain LH991; T5: T0 + L. parabuchneri strain 6902; T6: T0 + Pichia kudriavzevii strain B-5P; T7: T0 + P. kudriavzevii strain CBS 5147; and T8: T0 + commercial yeast *(Saccharomyces cerevisiae)*. The lactic acid bacteria inoculum contained 1.02×10^{11} colony-forming unit (CFU)/mL, while the yeast inoculum contained 1.5×10^{10} CFU/mL.

Results: The results showed that four lactic acid bacteria and three yeast produced a higher total gas yield (104–183.33 mL) compared to the control (103 mL. Meanwhile, the probiotic supplementation did not cause a significant change in the rumen pH (6.86–7.12). Supplementation with the lactic acid bacteria S. harbinensis strain LH991 consistently demonstrated the best results from the parameters of dry and OMD (70.29% and 71.16%, respectively), total VFA (121.67 mM), NH3 (16.83 mM), and total gas production (149.17 mL). The best results were observed from the yeast candidate P. kudriavzevii strain B-5P, where the results were dry and OMD (67.64% and 69.55% respectively), total VFA (96.67 mM), NH3 (13.42 mM), and total gas production (183.33 mL).

Conclusion: Based on the obtained results, lactic acid bacteria S. harbinensis strain LH991 and yeast P. kudriavzevii strain B-5P are attractive candidates to be utilized as probiotics for ruminants based on their potential to improve rumen fermentation in vitro. This probiotic supplementation can increase the digestibility of feed ingredients, production of total VFA and NH3, and total gas produced. Keywords: in vitro, lactic acid bacteria, probiotics, rumen fermentation, yeast.

Keywords: in vitro, lactic acid bacteria, probiotics, rumen fermentation, yeast.

Biography:

The presenter is a postgraduate student, Faculty of Animal Science, Andalas University, Padang, West Sumatra, Indonesia. The presenter was born on August 30, 1998. The presenter is currently pursuing a doctoral program and one of the youngest students who get a scholarship from the Ministry of Technology Research and Higher Education, Republic of Indonesia namely the PMDSU scholarship (Program Magister Menuju Doktor Untuk Sarjana Unggul). The presenter enjoy doing research in the fields of animal nutrition, ruminants, probiotics and applied microbiology. The presenter opened up as many opportunities as possible for other researchers to collaborate in the field of science, especially animal nutrition.

Promotional actions for higher consumption of carob products: Greek- consumers' views

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Research: Carob is a food rich in carbohydrates and low in fat, which contains multiple nutrients; a "superfood" (Papaefstathiou et al. 2018). Within the project "Actions for the optimal utilization of the potential of carob" which is financed-supervised by the Region of Crete, with the collaboration of Crete University and the Hellenic Mediterranean University, an online survey was carried out with the aim of evaluating dietary habits/views related to the consumption of carob products.

Results and conclusions: In this research, the opinions of consumers (n=251) are recorded regarding the current state of promotion of carob products in the area, as well as their opinions regarding the promotional actions that can be taken to increase carob-products consumption. Most of the consumers 61.4% believe that carob products are not promoted in the right way in the store from which they purchase them; 20.8% consider that they are promoted efficiently, while 16.2% consider that they are usually promoted efficiently. Concerning the opinions of consumers on factors that would lead to an increase in the frequency of consumption of carob products for the 33.6% is greater the main factors are the availability and access of these products in/to the market. For 21.2% of the consumers it is the offer of discounts, while for 18.9% it is the overall price-package set. A better positioning/placement of the carob products in the marketplace is important for 12.7% of the consumers. More detailed information on food labels was mentioned by 5.8%, and advertising by 5.4%, of the consumers. Other options were mentioned also, as improving the presentation of the products at the points of sale; mass media advertising while and information from dieticians.

Reference: Papaefstathiou E, Agapiou A, Giannopoulos S, Kokkinofta R. Nutritional characterization of carobs and traditional carob products. Food Sci Nutr. 2018 Oct 4; 6(8):2151-2161.

Biography:

Georgios A. Fragkiadakis: Associate Professor of "Nutrition and Metabolism", Hellenic Mediterranean University, School of Health Sciences, Department of Nutrition and Dietetics Sciences, Sitia, Crete, Greece (2003-). He holds a PhD in Biology, with subject specialty "Biochemistry", University of Crete (1996). His scientific interests focus on: "Comparative Biochemistry-Metabolism", "Food Preferences and Hygiene/Safety in Human Nutrition", "Nutrition of Vulnerable Population Groups, Children and the Elderly - Eating Habits and Health". He has published 38 articles in international peer-reviewed journals, of which he received about 1,000 hetero-references (h-index 14, i10-index 20). In addition, he has published 40 complete articles in conference proceedings.

Phage Genome Diversity in a Biogas-Producing Microbiome Analyzed by Illumina and Nanopore GridION Sequencing

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The microbial biogas network is complex and intertwined, and therefore relatively stable in its overall functionality. However, if key functional groups of microorganisms are affected by biotic or abiotic factors, the entire efficacy may be impaired. Bacteriophages are hypothesized to alter the steering process of the microbial network. In this study, an enriched fraction of virus-like particles was extracted from a mesophilic biogas reactor and sequenced on the Illumina MiSeq and Nanopore GridION sequencing platforms to shed light on this complex topic. Metagenome data analysis resulted in identifying 375 metagenome-assembled viral genomes (MAVGs). Two-thirds of the classified sequences were only assigned to the superkingdom Viruses and, with this, are most likely novel. The remaining third to the family Siphoviridae, followed by Myoviridae, Podoviridae, Tectiviridae, and Inoviridae. The metavirome showed a close relationship to the phage genomes that infect members of the classes Clostridia and Bacilli. Using publicly available biogas metagenomic data, a fragment recruitment approach showed the widespread distribution of the MAVGs studied in other biogas microbiomes. In particular, phage sequences from mesophilic microbiomes were highly similar to the phage sequences of this study. Accordingly, the virus particle enrichment approach and metavirome sequencing provided additional genome sequence information for novel virome members, thus expanding the current knowledge of viral genetic diversity in biogas reactors.

Biography:

I graduated in Biology from the Free University of Berlin and the University of Rostock. I am completing my PhD at the Technical University of Berlin and the Leibniz Institute of Agricultural Engineering and Bioeconomics, focusing on microbial communities, including bacteriophages in anaerobic systems like biogas reactors. Since 2023, I have been a postdoc at the Max Rubner Institute, Federal Research Institute of Nutrition and Food in the Department of Microbiology and Biotechnology, working in the Bacteriophage Competence Center research group. My work concentrates on phages that infect the host Listeria monocytogenes.

Sustainability assessment instrument for school food services: evaluation of interobserver reproducibility

Emanuele Batistela dos Santos*[1];Sueny Andrade Batista[2]; Julyana Nogueira Firme[2]; Priscila Claudino de Almeida[2]; Eduardo Yoshio Nakano[3]; Renata Puppin Zandonadi[2]; Raquel Braz Assunção Botelho[2].

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School feeding is characterized as a strategy for sustainability in nutrition1. Sustainability recommendations are included in school feeding policies in some countries2. In Brazil, these are represented by actions ranging from menu planning and food purchase to the role of food and nutrition education in approaching sustainability and the food system3. However, there is a lack of instruments for assessing practices that address the dimensions of sustainable nutrition (environmental, economic, social, cultural, and health) specific to school food services, making it difficult to carry out sustainable actions consistently in these places.

Objective: To evaluate the interobserver reproducibility of a checklist of sustainability practices in school food services.

Methods: The preliminary version was developed from the verification checklist of sustainability indicators in restaurants4. This version, consisting of 3 sections with 76 questions about energy, water, gas, menus, food, non-food waste, chemicals, building materials, and employees, underwent content validation and semantic evaluation by a panel of 20 area experts5. Two evaluators applied the checklist independently to 23 school food services to assess the interobserver reproducibility from September to December/2022. Agreements were verified using the Intraclass Correlation Coefficient (ICC). The study was approved by the Ethics Committee of the Faculty of Health Sciences of the University of Brasília (CAAE n° 03352918.6.0000.0030).

Results: Among the 23 schools, 14 were private and 9 public, with 53 to 1279 students, from kindergarten to high school. The checklist showed excellent reproducibility, with ICC>0.90 for the complete instrument and two sections. Only one section had ICC=0.88, which still reflects satisfactory reproducibility.

Conclusions: The analysis shows that the checklist is reproducible when applied by different evaluators. This new instrument will enable school food service nutritionists with the knowledge to carry out sustainability practices in the routine of these services.

Keywords: instrument; school food service; sustainability.

Acknowledgment: National Council for Scientific and Technological Development (CNPq).

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Biography:

Emanuele Batistela dos Santos has a degree in Nutrition and a Master in Biosciences from the Federal University of Mato Grosso, Brazil. She is currently a professor at the Faculty of Nutrition at the Federal University of Mato Grosso and Ph.D. student at the Postgraduate Program in Human Nutrition at the University of Brasília, under the guidance of Professor Raquel Braz Assunção Botelho. She works in the area of management of food services, with an emphasis on school feeding. The theme of the project focuses on sustainability in school food services.

Pinch force required for adults over 50 years of age to open several types of food containers

Nancy Hock, Ph. D.,

OTRL, CHT, USA

Many older adults have difficulty opening food packages, and even though they comprise the fasting growing segment of our population, the development of easy to open food packaging has been overlooked by the food industry (Costa & Jongen, 2010; Hensel, 2012). The ability to use pinch is required to open food packages, but there is limited evidence regarding how much pinch force is required for different types of food packaging. This study used sensor technology to identify the force required to open several types of food packages which are typically used by older adults. Individuals over the age of 50 opened 15 different food packages and the average force in pounds required to open each type was obtained. The average force employed differed by sex for many food products and ranged from 1.28 kg to 7.27 kg. The information obtained from this study is useful both for healthcare professionals working with older adults and individuals with pathology of the hand, and for the food packaging industry.

Biography:

Dr. Nancy Hock is the Program Chair of the Occupational Therapy Department at Western Michigan University where she has taught since 2011. She is a certified hand therapist with over 25 years of clinical experience with research interests in hand strength assessment, strength used to open food packages and the impact of osteoarthritis on hand strength.

Altered gut microbiota composition in patients in patients with chronic urticaria

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Recent studies have reported an altered gut microbiota composition in patients with chronic urticaria (CU). Thus, since the human immune system is in homeostasis with microbiota, and the composition of the microbiome regulates the function of the immune system, it is likely that an alteration of microbiota components (a dysbiosis) could influence the course of chronic spontaneous urticaria (CSU). Most studies that have looked at the gut microbiome of CSU patients have observed a loss of microbial diversity in its composition. Their results predominantly showed decreased relative abundance of beneficial bacteria (Firmicutes and Bacteroides), and increased relative abundance opportunistic bacteria (Enterobacteria and Proteobacteria). Therefore, it has been hypothesized that pro-inflammatory responses caused by alterations in the gut microbiome, mediated by the imbalance of Th1/Th2/Th17 cytokines, might contribute to the CSU pathogenesis. Additionally, recent evidence from human metabolomics has shown enteric dysbacteriosis in CSU patients compared to healthy subjects. Bacterial products seem to induce an imbalance in proinflammatory and anti-inflammatory T cell subsets in the gut leading to a shift towards a more proinflammatory phenotype. A proinflammatory response might be responsible for mast cell activation and, therefore, a higher symptom burden in CSU patients. By applying new knowledge on gut microbial communities and metabolomics, future CSU therapies could modify the microbiota composition using agents such as probiotics or other similar agents. Thus, uncovering potential causes of inflammation might provide new strategies for improving symptom control and minimizing the disease's burden on CSU patients.

Biography:

Prof. Liborija Lugović-Mihić, dermatologist-allergist is the head of the Unit for Allergology- Department of Dermatovenereology,Sestre Milosrdnice University Hospital Centre,Zagreb, and the head of the Poliklinika, and a professor at the School of Dental Medicine. She has been a mentor for 17 doctoral dissertations, mostly focusing on inflammatory/allergic skin diseases (urticaria, atopic dermatitis,etc.). She received the Ministry of Health Award for Most Efficient Dermatologist (2015), and was awarded by few other awards. She is the author of numerous scientific/professional publications and book chapters and has been cited by many authors (GoogleScholar-1934 citations). She participated in many congresses/symposiums and contributed to many national/international scientific projects.

POSTER

A change-point regression approach for estimating no observed adverse effect level from a systematic review

Yui Kuramochi, Kohsuke Hayamizu

Yokohama University of Pharmacy, Yokohama, Japan

Systematic reviews can be used not only to evaluate the efficacy and usefulness of a drug or food ingredient but also as a safety assessment method. One of the aims of safety assessment is to estimate the no observed adverse effect level (NOAEL) and the lowest observed adverse effect level. However, no methodology has been reported to statistically estimate the NOAEL from systematic review results. Estimation of the no observed adverse effect level involves a search for the dose above which adverse events occur is even an exploration of the thresholds in dose-response.

To search for the dose above which adverse events occur, we examined an estimation method using the weighted change-point regression model, which includes the weights of each study used for systematic reviews in the model.

$$\omega_i * y_i = \omega_i * \beta \mathrm{I}(\chi_i > \chi_{cp})(\chi_i - \chi_{cp}) + \omega_i * \varepsilon_i$$

where *yi* and *xi* are the risk difference and dose for the i-th study, respectively, and x_{cp} is the unknown change point or threshold. I(·) is an indicator function defined as $I(x_i > x_{cp}) = 1$ if $x_i > x_{cp}$ and is 0 otherwise. *ωi* is the weight of the i-th study.

This model could be applied to the safety data of an omega-3 study in the form of a systematic review. We demonstrated that the dose-response to omega-3 intake regarding adverse events had a threshold value and that the no observed adverse effect level could be estimated using the developed model.

This research was supported by the research program on the development of innovative technology grants from the Project of the Bio-oriented Technology Research Advancement Institution (BRAIN: JPJ007097-04013B2).

Biography:

Yui Kuramochi is a doctoral student in the field of health science at the Food Chemistry Laboratory of Yokohama University of Pharmacy. She graduated from the university in March 2019 with a bachelor's degree and started working as a pharmacist. The next year, she entered the university again.

Application of weighted change-point regression approach for evaluating food function.

Kohsuke Hayamizu[1]), Naotaka Yoshida[1]), Sumika Sato[1]), Yui Kuramochi[1]),Yasunori Akamatsu[2]), Kenji Uchida[2]), Shinpei Okada[3])

1) Yokohama University of Pharmacy, Yokohama, Japan

2) Food Function R&D Center, Nissui Corp, Tokyo, Japan

3) Physical Education and Medicine Research Foundation, Nagano, Japan

In intervention studies for functional foods, a study population is often a mixed group of healthy individuals and those who are not definitively diseased. For such heterogeneous populations, we propose an alternative approach to evaluate the efficacy of dietary supplements and functional foods based on a weighted change-point regression model (w-CPRM). The w-CPRM can be performed without stratified or subgroup analysis.

w-CPRM: Consider the following w-CPRM for between-group comparisons of RCT,

$$w_i y_i = w_i\alpha + w_i\beta_1 x_i + w_i\beta_2 I(x_i - x_{cp})(x_i > x_{cp})g_i + w_i\varepsilon_i \quad (i=1,2,3,\ldots n)$$

where n is the number of participants, y_i is the observation at the study's end of participant i or the change from baseline after treatment, x_i is the observation at baseline of participant i, x_{cp} is a constant, g_i is the group indicator (control = 0; treatment = 1), wi is the weight of participant i and $I(\cdot)$ is an indicator function defined as $I(x_i > x_{cp}) = 1$, and as 0 otherwise. Since x_{cp} is usually unknown, a process is needed to determine it. We have proposed a method for using AIC-based profile likelihood methods to determine x_{cp}, and inferences can be easily made with standard statistical software.

On the other hand, regression tree analysis has attracted attention as a method that can simultaneously search for covariates and estimate thresholds among them. In this report, we compare the maximum likelihood method and regression tree analysis for searching for change points and present their impact on the validity analysis with the data on the effect of Alaska pollack protein intake on muscle strength as an application.

This research was supported by the research program on the development of innovative technology grants from the Project of the Bio-oriented Technology Research Advancement Institution (BRAIN: JPJ007097-04013B2).

Biography:

Dr. Kohsuke Hayamizu, Doctor of Agriculture (Ph.D.- agriculture), now is a Professor at the Food Chemistry Laboratory and General Health Medical Research Center of Yokohama University of Pharmacy. He got his BSc and MSc in natural products chemistry at Nihon University, Agriculture Doctor's degree (Ph.D.) at Kyushu University in anti-obesity studies in animal and human study. He worked in Nippon Roche Clinical Research & Development, General Research Center FANCL Corp., and Human Life Science R&D Center Nippon Suisan Kaisha.

Nutritional profile, total bioactive compounds content and antioxidant capacity of fava bean *(Vicia Faba L.)* pod

Martínez-Navarrete, Nuria; Barrial-Luján, Abel; Villena, Julián; Camacho María del Mar & García-Martínez, Eva

Food Research and Innovation Group, Department of Food Technology, Polytechnic University of Valencia ,Spain

Most countries, especially in urban areas, face a huge problem of disposal of by-products generated by food industries, particularly those dedicated to vegetable processing. This volume of biomass, in many cases exceeding 50% of the raw material, has an interesting nutritional profile, especially rich in fiber, whose consumption is well below the 25 g/day recommended by the European Food Safety Authority. Therefore, valorizing these by-products into natural ingredients to formulate green-label foods capable of contributing to a balanced and sustainable diet, aligned with some of the SDGs, is a highly recommendable task. Compared to other agricultural by-products, the potential of fava bean pods (FBP) for use in human food is under- exploited. In this study, a proximate analysis of this by-product was carried out, and the water content, total sugars, protein, ash and fat were determined using AOAC methods. Fiber content was determined by difference. The results showed that FBP presented, by a gram of sample, despite 0.8930 ±0.0016 g water, a high fiber (0.0410 g), digestible carbohydrate (0.0402±0.0007 g) and protein (0.0180±0.0010 g) content, while it was low in fat (0.0010±0.0002 g), ash being 0.0068±0.0002 g. Additionally, FBP had a remarkable amount of total polyphenols (Folin-Ciocalteu, 4.39±0.13 mg GAE), vitamin C (HPLC, 0.50± 0.02 mg/g), chlorophyll (spectrophotometry, 0.128±0.007 mg/g) and carotenoids (AOAC method, 0.078±0.004 mg). The most important antioxidant potential, measured both to the hydrophilic (2.59±0.14, 4.2±0.4 mmol Trolox/100 g FBP) and the lipophilic extracts (0.0500±0.0015, 0.062±0.018 mmol Trolox/100 g FBP) according to DPPH and FRAP assays, respectively, was reached by the former. In general, the obtained data demonstrated that the agro-industrial by- product from fava bean could be recognized as a co-product with which to obtain a promising natural ingredient, rich in nutritive and bioactive compounds, to create novel functional foods with a significant potential market in the future.

Biography:

Nuria Martínez-Navarrete, PhD in Biology, Full Professor of Food Technology, and researcher of the Food Research and Innovation Group (Department of Food Technology, Polytechnic University of Valencia, Spain). Scientific career related to the physical/physicochemical properties of foodstuffs, with a focus on optimizing the control and development of processes and products, and the functional properties of plant-based foods, due to their micronutrients and phytochemicals. Main results of research activity: participation in more than 50 research/contracts projects, about 100 papers (JCR journals), 30 book chapters (international editorials), numerous international congresses, inventor in two patents and awarded a national Prize for Agricultural Research.

Free and bound Phenolic content of Fava Bean *(Vicia Faba L.)* Pod. their contribution to the antioxidant capacity

Martínez-Navarrete, Nuria; Barrial-Luján, Abel; Milenova, Yanitza; Carboni, Francesca; García-Martínez, Eva & Camacho María del Mar

Food Research and Innovation Group, Department of Food Technology, Polytechnic University of Valencia ,Spain

Fava bean production generates a high volume of by-product (pod) after processing into seed for human consumption, estimated at around 70% of the processed fava bean. This represents economic and environmental problems, as well as a loss of this by-product's nutritional and healthy value. Among the bioactive compounds the fava bean pod contains, a high content of phenolic compounds, with antioxidant capacity (AOC), can be highlighted. Phenols can be found free (FP) or bound (BP) to cell walls. Nevertheless, most studies on phenolic compounds and their AOC have been carried out mainly by determining FP compounds, which may lead to underestimating their physiological potential.

In this study, both FP and BP, of fava bean pods (FBP) and their AOC was analysed, before and after freeze-drying. FP was extracted with methanol at 30 °C (FP30) and 60 °C (FP60) and after a first basic and then acid hydrolysis, BFb and BFa fractions were respectively obtained. In each extract, the phenolic content was quantified (Folin-Ciocalteu method). AOC was determined by applying DPPH and FRAP methods.

The phenolic compounds content of the pods was 4687±119 mg GAE/100 FBP (db) (82% FP and 18% BP) and once freeze-dried it was 4407±387 mg GAE/100 FBP (db) (92% FP and 8% BP). Despite the lowest proportion of BP, this fraction cannot be neglected, especially considering the importance that compounds bound to cell walls can have on health by acting as prebiotics. These results show the convenience of applying more specific extraction methods than those conventionally used to extract, in addition to the FP, the BP, as the latter represent between 10% and 20% of the total. Moreover, the latter contributes significantly to the AOC of the product, 20 and 30% in the case of samples before and after freeze-drying, respectively.

Biography:

Nuria Martínez-Navarrete, PhD in Biology, Full Professor of Food Technology, and researcher of the Food Research and Innovation Group (Department of Food Technology, Polytechnic University of Valencia, Spain). Scientific career related to the physical/physicochemical properties of foodstuffs, with a focus on optimizing the control and development of processes and products, and the functional properties of plant-based foods, due to their micronutrients and phytochemicals. Main results of research activity: participation in more than 50 research/contracts projects, about 100 papers (JCR journals), 30 book chapters (international editorials), numerous international congresses, inventor in two patents and awarded a national Prize for Agricultural Research.

Food neophobia in Brazilian children with autistic spectrum disorder

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Food neophobia is the reluctance to eat or avoid eating unfamiliar or novel foods[1]. Due to typical behaviors in persistence on the same thing, an inflexible routine, resistance to change, and monotonous eating habits caused by the reactions regarding food taste, texture, smell, or appearance, autistic spectrum disorder (ASD) has been associated with food neophobia (FN)[2].

Objectives: To investigate and evaluate the relationship between ASD and FN among 4-to- 11-year-old Brazilian children.

Methodology: The FN-validated instrument[3] was used, and caregivers answered it in an online platform, Google Forms®. The FN instrument presented three domains: general, fruit, and vegetable neophobia. Children with ASD from Brazil (diagnosed by a physician using DSM-5)4 were grouped into two categories (4-7 and 8-11 years) and classified in levels of FN, following the cutting point of a previous study5. The FN scores for gender and age were compared using the independent Student's t-test. Two-tailed hypotheses and a significance level of 5% were considered for all tests. The study was approved by the Health Sciences Ethics Committee, University of Brasilia (no. 4.407.816).

Results: The final sample was 605 ASD children, mostly boys (n=485; 80.16%), with a mean age of 6.72 ± 2.31. The prevalence of high FN was 73.39% (n=444). A high FN in the domains was observed, being 75.54% in the first domain, 63.64% in the second, and 73.72% in the third. In general, children were equally neophobic in the FN general domain, FN vegetables, and in total FN. The older children were more neophobic for the FN in the Fruit Domain ($p < 0.01$).

Conclusion: There was no decrease in FN in older children. FN should be carefully evaluated in children with ASD, and the assessment through domains can help in future interventions.

KEYWORDS: food neophobia, autism, child.

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Biography:

Priscila C. Almeida is a dietitian who graduated from the University Center Unieuro, and has a master's degree in human nutrition in the Postgraduate Program in Human Nutrition at the University of Brasília. Under the guidance of Professor Raquel Braz Assunção Botelho, she is also a PhD student in the same area and program. In the master's degree, she developed a validated instrument to evaluate food neophobia (FN) among Brazilian children. In the Ph.D., she validated the instrument and evaluated the FN in several children.

Antimicrobial coating based on Tahiti lemon essential oil and green banana flour to preserve the internal quality of quail eggs

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Eggs are normally subjected to uncontrolled environmental conditions until they reach the consumer's home. Thus, egg coating emerged based on the knowledge that eggs need to be preserved during processing and marketing to ensure better quality and longer shelf life. This study evaluated the microbiological and internal quality of quail eggs coated with green banana flour and Tahiti lemon essential oil (GBF/TAH) stored for 21 days at room temperature. One hundred and sixty-two quail eggs were equally distributed into three treatments: 1) uncoated eggs, 2) eggs coated with green banana flour (GBF) and 3) eggs coated with GBF/TAH. On the 21st day of storage, eggs coated with GBF/TAH had significantly lower ($P < 0.05$) total counts of aerobic mesophilic bacteria in the shell and egg contents compared to the other treatments. GBF/TAH maintained low bacterial levels in the shell throughout storage, achieving the lowest load and the best microbiological quality of the eggshell on day 21. The Haugh unit of eggs was significantly lower ($P < 0.05$) in the third week for uncoated eggs (70.94 ± 1.63, grade A) compared to eggs coated with GBF/TAH (81.47 ± 2.38, grade AA). GBF/TAH coating is an effective blending approach to reduce the microbial load of the shell and egg contents and preserve the sensory and internal quality of the eggs.

Biography:

Cristiane Salgado has a PhD in Geography and is a professor at the Federal Institute of Brasília, Brazil. She also has experience in the field of Poultry Sciences, developing studies with edible coatings for eggs.

Rice flour coating plus rosemary essential oil: an edible antimicrobial coating to preserve the internal quality of quail eggs

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Preventing early egg wastage requires slower changes in internal egg quality. Coatings are a viable option for preserving internal egg quality, especially in poorer countries. Thus, rice flour coatings, reinforced or not with rosemary essential oil, were used to evaluate changes in the internal quality of quail eggs stored for 21 days at room temperature. Quality parameters (egg weight loss, Haugh unit, yolk index, albumen and yolk pH), microbiological (count of total aerobic mesophilic bacteria) and sensory (color, aroma, odor, texture, taste, and general acceptability) were evaluated during the experiment. Compared to the number of total aerobic mesophilic bacteria on the shell of uncoated eggs (2.02 ± 0.49; 1.78 ± 0.20 log10 CFU/mL^{-1}), coating based on rice flour plus rosemary essential oil exhibited significant inhibition ($P < 0.05$) effects for these bacteria on 0 (1.16 ± 0.25 log10 CFU/mL^{-1}) and 21 (0.84 ± 0.11 log10 CFU/mL^{-1}) days of storage at room temperature, respectively. On days 7, 14 and 21, rice flour coating without essential oil had no effect ($P > 0.05$) on Haugh unit ($P > 0.05$), but eggs coated with rice flour plus rosemary essential oil had significantly higher HU ($P < 0.05$) than uncoated eggs from day 14, maintaining grade AA (73.88 ± 2.67) on day 21 while uncoated eggs had grade A (68.90 ± 1.55). The rice flour coating reinforced with rosemary essential oil was a bioactive, efficient, and safe formulation for application based on internal quality, microbiological and sensorial aspects of quail eggs.

Biography:

Vinícius Santos has a PhD in Animal Science and is a professor of poultry at the Federal Institute of Brasília, Brazil. His research is focused on the development and evaluation of sanitizers for hatching eggs and edible coatings for eggs intended for consumption.

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