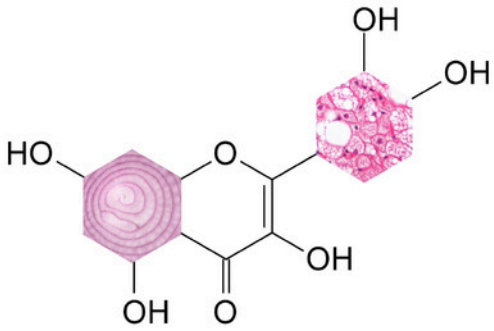

IX Workshop **INSA-UB**

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EXCELENCIA MARÍA DE MAEZTU 2023-2027

UNIVERSITAT DE BARCELONA

La ciència dels bioactius

Funcionalitat, fonts dietètiques i impacte en la salut i la societat

Dijous 20 de Novembre 2025 – Campus Alimentació de Torribera
Universitat de Barcelona

Pàgina Web Workshop

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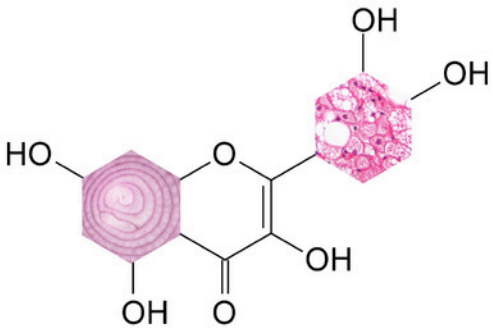

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OBERTURA

8:30 – 9:00h Lliurament de la documentació
9:00 – 9:15h Benvinguda institucional

SESSIÓ 1

9:15-10:00 h Ponència inaugural INSA-UB Cristina Andrés, *Bioactius en Acció: Biomarcadors, Metabolòmica i Dissenys Clínics per intentar decodificar el vincle Dieta i Salut en Nutrició de Precisió.*
10:00-11:20h Presentació dels resultats del Programa FRI i INTERACT INSA 2023
Modera: *Míriam Martínez i Raquel Martin (INSA-UB)*
11:20–12:00h Esmorzar i Sessió de pòsters

SESSIÓ 2

12:00-13:15h Molècules d'impacte: perspectives sobre el potencial dels compostos bioactius.
Isabel Odriozola (UdL), Patricia Martorell (ADM), Aleix Sala Vila (IMIM).
Modera: *Maria Pérez i Oriol Comas (INSA-UB).*
13:15-14:00h Comunicacions Orals. Modera: Montse Riu i Anallely López (INSA-UB)
14:00-15:30h Dinar
14:45–15:30h Sessió de pòsters

SESSIÓ 3

15:30-16:15h Taula Rodona: Compostos Bioactius i Ciència Ciutadana
Rosa Solà (URV), Isabelle Bonhoure (UB) Salvador Ferré (Eduscopi), Marina Pérez-Llorca (INSA-UB).
Modera: *Jordi Gascón (INSA-UB)*
16:15-17:00h Comunicacions Orals. Modera: Eulalia Gutiérrez i Karla Rio (INSA-UB).
17:00-17:30h Tast de xocolata – Kina Chocolates
17:30-17:45h Cloenda i lliurament de premi

UNIVERSITAT DE BARCELONA Facultat de Farmàcia i Ciències de l'Alimentació

Campus de l'Alimentació Universitat de Barcelona

SANTA COLOMA CIUTAT universitària

MASTER BUILDERS SOLUTIONS

KINA CHOCOLATES

STADA

O1 - Bridging Archaeology and Food Science: Polyphenolic and Volatile Changes in Wines Fermented in Pitch-Coated Ceramics

Clara Abarca-Rivas[1,2*], Julián Lozano-Castellón[1,2], Anna Vallverdú-Queralt[1,2], Maria Pérez[1,2], Marina Corrado[1,2], Andrea Zifferero[3], Riccardo Chessa[4], Daniele Rosellini[5], Paul Reynolds[6], Rosa M. Lamuela-Raventós[1,2] and Alessandra Pecci[7]

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[6] *ERAAUB, IA-UB, Universitat de Barcelona, Spain.*

[7] *ERAAUB, IA-UB, INSA-UB, Universitat de Barcelona, Spain.*

Background and objectives:

An increasing number of winemakers and consumers are showing renewed interest in wines produced using traditional methods. Among these, the use of ceramic vessels and Pinaceae pitch coating- which were very common during the Roman period- have gained attention for their ability to influence the chemical profile of wine. Despite the great interest, there is currently very little scientific evidence on this subject. We will present the first study to investigate the impact of Pinaceae pitch coating on the chemical composition of wine when fermented in coated and uncoated ceramic vessels.

Methodology:

Vinification was carried out in clay vessels, either pitch-coated or uncoated (control). Polyphenolic and other chemical differences were assessed using ultra-performance liquid chromatography coupled with tandem mass spectrometry (UPLC–MS/MS) in targeted and untargeted modes. Volatile compounds were analyzed by HS-SPME coupled with GC–MS.

Results and conclusions:

Pitch-coated vessels significantly changed wine composition. Polyphenols such as anthocyanins, coumaric acid, and tartaric acid were higher, while procyanidins decreased compared to controls. Volatile profiles showed marked differences, highlighting the influence of coating on fermentation dynamics and aroma development. Several pitch-derived volatile compounds, including specific biomarkers, were detected exclusively in coated-vessel wines, confirming its direct migration. Coating also affected the abundance of esters, acids, and alcohols, likely due to changes in micro-oxygenation and yeast metabolism. These findings provide the first evidence that pitch-coated ceramics substantially modify polyphenolic and volatile patterns, laying the foundation for future research into their role in wine quality and sensory attributes.

Acknowledgements:

This study was made possible thanks to the financial assistance provided by INSA (Recognized as a Maria de Maeztu Unit of Excellence grant (CEX2021-001234-M) funded by MICIU/AEI/FEDER, UE, the I+D project RACAMed II (PID2020-113409GB-I00), the ERAAUB (2021 SGR 00696), the Dipartimento di Scienze Storiche e dei beni culturali of the University of Siena and C. Abarca-Rivas was the recipient of a doctoral fellowship PRE2022-104187 funded by MICIU/AEI/10.13039/501100011033 and FSE+. M. Corrado thanks the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No. 101105493. RMLR to ICREA academia

P1- Impact of Packaging and Storage Duration on the Sensory Attributes of Corbella Extra Virgin Olive Oil

Mohamed M. Abuhabib [1,2*], Maria Pérez [1,2,3], Francesc M. Campins-Machado [1,2], Antònia Ninot [4], Agustí Romero-Aroca [4], Rosa M. Lamuela-Raventós [1,2,3], and Anna Vallverdú-Queralt [1,2,3]

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[4] *Institute of Agrifood Research and Technology (IRTA), Fruit Production Program, Centre Mas Bové, 43120, Constantí, Spain*

Background and objectives:

The sensory quality of extra virgin olive oil (EVOO) determines its market value and consumer preference, but it is highly influenced by storage conditions. This study aimed to evaluate how storage duration and packaging type affect the sensory quality of Corbella EVOO and to identify correlations between phenolic compounds and sensory attributes.

Methodology:

Corbella EVOO was stored for 6 and 12 months in two packaging systems, bag-in-box (BIB) and stainless-steel containers with nitrogen headspace. Sensory analysis was conducted by the Official Tasting Panel of Catalonia following EU and IOC standards, assessing fruitiness, bitterness, pungency, astringency, and green notes using a 10 cm intensity scale. Correlations between sensory descriptors and phenolic compounds were determined using Pearson's coefficient.

Results and conclusions:

Initial Corbella EVOO was classified as "extra virgin," showing robust pungency (6.0), fruitiness (4.9), and bitterness (4.6). After storage, all sensory attributes declined, especially in stainless steel packaging, where pungency and astringency decreased markedly. BIB packaging better preserved the sensory profile, maintaining higher intensities of key positive attributes. Significant correlations were found between oleocanthal and pungency ($r = 0.81$), oleacein and astringency ($r = 0.86$), and oleuropein aglycone with bitterness ($r = 0.44$). These findings emphasize the importance of packaging in preserving EVOO's sensory and phenolic integrity during storage.

Acknowledgements:

Mohamed M. Abuhabib is grateful for the predoctoral scholarship FI-SDUR (REU/551/2022) from the Agency of Management of University and Research Grants (AGAUR), Generalitat de Catalunya (GC). Authors would like to thank Oli Migjorn for their collaboration and supplying the Corbella olives and EVOO.

P2- Authenticating Pistachio Geographical Origins through Unsaponifiable Fraction Fingerprinting

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[2]*Institut de Recerca en Nutrició i Seguretat Alimentària, Universitat de Barcelona, 08921 Santa Coloma de Gramenet, Spain*

Background and objectives:

Pistachio nuts are extensively used worldwide in both culinary applications and the food industry. Over the past decades, global pistachio production has expanded markedly, resulting in notable quality differences among nuts from different geographical origins. Such variability, combined with disparities in food safety regulations and high import/export activity, has heightened the risk of economically motivated food fraud. Therefore, there is an increasing demand for reliable analytical methods to verify the geographical origin of pistachios. This study proposes a fingerprinting-based analytical approach for pistachio geographical authentication.

Methodology:

The unsaponifiable fraction from 118 pistachio samples originating from Spain, the United States, and Iran was analysed by gas chromatography–mass spectrometry (GC–MS). Partial Lest Squares Discriminant Analysis (PLS-DA) was applied to discriminate among "Spanish" and "non-Spanish" classes, and to further classify "non-Spanish" samples into Iran or USA pistachios. The models were validated both internally and externally.

Results and conclusions:

PLS-DA score plots demonstrated satisfactory clustering across all categories. The internal and external validation showed percentages of correct classification above 87% and 84%, respectively. These results demonstrated the method's strong potential for pistachio geographical authentication and its suitability as a screening tool to support official controls and reduce fraud in the pistachio sector.

Acknowledgements:

This work is part of the LOCALPISTACHIO project (CNS2023-145490) funded by MICIU/AEI /10.13039/501100011033 and by the European Union NextGenerationEU/PRTR.

The Institut de Recerca en Nutrició i Seguretat Alimentària (INSA-UB) is recognised as a Maria de Maeztu Unit of Excellence (grant CEX2021-001234-M) funded by MICIU/AEI /10.13039/501100011033.

P3- Targeted LC–MS-based exposomic profiling of urinary polyphenolic metabolites in phenylketonuria

Blanca Barrau-Martinez[1,2,3*§], Cristina Del Burgo-Gutiérrez[4§], Arnau Gonzalez-Rodriguez[1,2,3], Adriana Pane[5], Daniele Del Rio[4], Rosa Maria Lopez[6,7]; José Fernando Rinaldi de Alvarenga[4], Ana Matas[8], Mariona Guitart-Mampel[6,7], Dolores Garcia-Arenas[9], Cristina Montserrat[10], Aida Ormazabal[7,9,11,12], Rafael Llorach[1,2,3,14,¥], Pedro Mena[4,¥], Pedro Moreno[8], Gloria Garrabou[7,10,13], Mireia Urpi-Sarda[1,2,3,14], Consortium PKU.cat.

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[6]Fundació Clínic per la Recerca Biomèdica (FCRB), Institut d'Investigacions Biomèdiques August Pi Sunyer (IDIBAPS), 08036 Barcelona, Spain
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§ *equal contribution*; ¥ *corresponding authors*

Background and objectives:

Phenylketonuria (PKU) is an inherited disorder of phenylalanine (Phe) metabolism managed through restriction of natural protein intake according to individual protein tolerance. This dietary management increases the consumption of fruits and vegetables, major contributors to (poly)phenol intake. These bioactive compounds are metabolized by host phase II enzymes and the gut microbiota before being excreted in urine.

This study aims to quantify urinary (poly)phenol catabolites and their conjugated metabolites in individuals with PKU and matched healthy controls.

Methodology:

This observational case–control study included 178 participants: children (n = 62) and adults (n = 62) with PKU, and age- and sex-matched healthy controls (n=54). (Poly)phenol catabolites and

their phase II metabolites were analyzed in urine through a UPLC-ESI-QqQ-MS/MS targeted approach.

Results and conclusions:

Up to 450 (poly)phenol-related compounds were monitored in MRM mode, covering multiple chemical families including benzoic and cinnamic acid derivatives, flavonoids, phenylalkyl acids, phenyl-γ-valerolactones, and hippuric acids. Quantification was based on calibration curves of authentic standards or, when available, on the most structurally similar compound.

This approach offers a detailed characterization of (poly)phenol metabolism in PKU and aligns with a nutritional exposomics perspective, contributing to a better understanding of diet–microbiota interactions and their potential implications in metabolic health.

Acknowledgements:

This research was supported by grant PID2024-156020OB-I00 funded by MICIU/AEI/ 10.13039/501100011033 and, by FEDER, UE. BB-M thanks AGAUR-Generalitat de Catalunya (2022 FI_B 01012). INSA-UB recognized as a María de Maeztu Unit of Excellence (Research Institute of Nutrition and Food Safety, INSA-UB, University of Barcelona), Grant CEX2021-001234-M, funded by MICIU/AEI/10.13039/501100011033.

P4- LEPTIN PEPTIDE ANALOGUES WITH IMPROVED IN VITRO METHABOLIC STABILITY: TOWARDS NOVEL THERAPEUTICS FOR ALZHEIMER'S DISEASE

Francesca Barrera*[1], Fairuz Anatasya Ihsanti*[1], Helena Bland,[2] Dr Cristina Pubill Ulldemolins[1,2,3]

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Background and objectives:

Alzheimer's disease (AD) is a significant global health concern, affecting 55 million people worldwide. With current treatments only symptomatic in nature, there remains a need for a novel therapeutic that can both alleviate symptoms and prevent disease progression. Recent studies have indicated that short leptin peptide sequences are able to restore cognition and prevent the detrimental effects of amyloid-β accumulation in laboratory AD models. However, due to their low in vivo metabolic stability these native leptin peptides must be chemically modified if they are to be developed into orally available drugs.

In our multidisciplinary research group, we have focused on synthesizing a series of leptin peptide analogues with incorporated unnatural amino acids (UAAs) with the inicial goal of imporving their metabolic stability.

Methodology:

Through rational design, synthetic organic methods such as functional group transformations, chemical modifications, Solid-Phase Peptide Synthesis (SPPS) using Fmoc-protected amino acids, and *in vitro* enzymatic assays we evaluated how structural modifications of native peptides enhance their metabolic stability.

Results and conclusions:

At this IX INSA-Workshop, our latest work on the design and synthesis of leptin peptide analogues incorporating halogenated Aas, D-Aas and N-methylated will be presented. The digestion experiments determined possible cleavage sites at the cysteine, tryptophan and serine residues in the three Human leptin peptides under study. Excitingly No digestion was observed for (D-)CHLP(D-)WA(D-)SGL, peptide 9 (PC9).

Acknowledgements:

We thank the Generalitat de Catalonia for the FI-STEP predoctoral fellowship;

Grant 2025 STEP 00483, MICIU and cofounded by the European Union , AEI.

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Wellcome Trust Institutional Strategic Support Fund Pilot Fund round 3 (ISSF R3).

P5- COMPREHENSIVE PROFILING OF ARSENOSUGARS IN ALGAE USING UHPLC-HRMS AND UHPLC-IMS-Q-TOF

Alba Morales-Rodríguez[1,2,3], Àngels Sahuquillo[1,4], José Fermín López-Sánchez[1,4], Encarnación Moyano[1,4], Dolores Barrón[2,3]*

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Background and objectives:

Arsenic is a toxic environmental contaminant whose health effects are strongly influenced by its chemical speciation. Among the various arsenic compounds, arsenosugars (As-sugars) are predominant in algae, which are increasingly consumed for their nutritional value. Although As-sugars are generally considered non-toxic, concerns about their potential chronic effects have highlighted the need for accurate identification and structural characterization.

Methodology:

A comprehensive analytical strategy was developed using ultra-high-performance liquid chromatography coupled to high-resolution mass spectrometry (UHPLC-HRMS), employing both Q-Orbitrap and IMS-Q-TOF platforms and operating under both positive and negative electrospray ionization modes.

Results and conclusions:

Separation was achieved with a zwitterionic hydrophilic interaction liquid chromatography column (HILIC-Z). This approach enabled the identification of four major As-sugars: Gly-Sug, PO_4-Sug, SO_3-Sug, and SO_4-Sug. High-resolution mass spectra and detailed fragmentation patterns were obtained, allowing the proposal of fragmentation pathways for each compound.

For the first time, collision cross section (CCS) values were determined for these As-sugars, providing an additional dimension of structural information. The integration of ion mobility spectrometry with HRMS enhances confidence in compound identification and opens new avenues for arsenic speciation in complex biological matrices.

Acknowledgements:

This work was carried out within the framework of the projects PID2021-122743NB-I00 funded by MICIU/AEI/10.13039/501100011033 (Spanish Ministry for Science, Innovation and Universities) and co-financed by FEDER, EU. Additional authors acknowledge the recognition as consolidated research groups, 2021-SGR01342 and 2021-SGR00281, awarded by AGAUR (Agency for Management of University and Research Grants, Generalitat de Catalunya, Spain).

P6- Impact of a maternal diet rich in fiber and polyphenols on plasma lipid profiles of mothers and their offspring across early and late life stages

Elsa Blanco-Ferran[1,2*], Sergi Casanova-Crespo[1,2], Daniela Ceballos-Sánchez[1,2], Maria José Rodríguez-Lagunas[1,2], Malén Massot-Cladera[1,2], Margarida Castell[1,2,3], Garyfalia Kapravelou[1,2], Karla Rio-Aige[1,2], Francisco José Pérez-Cano[1,2]

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Background and objectives:

Maternal nutrition during the perinatal period is a key driver of fetal programming, with long-lasting effects on the offspring metabolic health. In the context of the growing obesity epidemic, diets rich in fiber and polyphenols have shown beneficial effects due to their anti-inflammatory, antioxidant, and lipid-regulating properties. Little is known about their influence in the absence of a high-fat challenge. The objective of this study is to evaluate the impact of a maternal diet enriched in fiber and polyphenols, administered during different perinatal stages, on the plasma lipid profiles of Wistar rat dams and their offspring at weaning and adulthood.

Methodology:

Two diets were used: a control diet and the intervention diet enriched with fiber and polyphenols. Plasma lipid profiles were characterized by LC-MS.

Results and conclusions:

Specific changes were observed in certain lipid species and minor subclasses such as altered bile acid profiles in dams following the intervention diet. In their offspring, a higher relative proportions of the hydroxylated fatty acids and a lower ratio of omega-6/omega-3 fatty acid and reduced total cholesterol and LDL concentrations were detected compared to the control group.

These findings indicate that maternal intake of fiber and polyphenols can have some influence on the lipid metabolism of the mothers and their offspring, highlighting the potential of early nutritional strategies in shaping metabolic health

Acknowledgements:

The authors acknowledge the support of the Spanish Government's MCIN/AEI for funding the project PID2023-151804OB-I00, and recognizes INSA-UB as a María de Maeztu Unit of Excellence (CEX2021-001234-M).

P7- Should probiotics be recommended for managing genitourinary syndrome of menopause? An evaluation of the quality, methodological soundness, and credibility of recommendations

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Background and objectives: The genitourinary syndrome of menopause affects nearly half of postmenopausal women. Instagram has emerged as a widely used source of health and nutrition information; however, much content lacks scientific support, with probiotics frequently promoted despite limited evidence. This study aims to evaluate the quality, methodological soundness, and credibility of Instagram posts related to probiotics for managing genitourinary symptoms in menopausal women.

Methodology: Using the NutriWomen platform, a scientifically grounded framework was applied to systematically assess nutrition-related health claims on Instagram. A retrospective content analysis of posts was conducted, evaluating both the informational quality and the methodological robustness and interpretability of supporting evidence according to predefined criteria.

Results and conclusions: Instagram posts promoting probiotics for menopause were largely descriptive and lacked scientific support, with a mean quality score of 8 using the NutriWomen 14-item scale. Posts often omitted quantitative data, references, and discussion of potential adverse effects. The systematic review cited as supporting evidence demonstrated moderate quality. These findings indicate that both social media messages and current clinical evidence provide limited and uncertain support for using probiotics to manage genitourinary symptoms in menopausal women.

Acknowledgements: This work was supported by the NUTRIFRAIL project (PID2022-141067OA-I00, MICIU/AEI/FEDER, EU) and the Maria de Maeztu Unit of Excellence grant (CEX2021-001234-M, MCIU/AEI/ERDF). MR acknowledges support from grant RYC2021-034349-I (MICIU/AEI/NextGenerationEU/PRTR).

P8- Ultra-high-pressure homogenization (UHPH) treatments in donor human milk preserve its lysozyme activity

Kimia Jalali[1], Vanessa Pleguezuelos[2], Ángel David Camargo[3*], Marina Girbal-González[3], Belén Pastor-Villaescusa[4,5], Katherine Flores-Rojas[4,6], Antonio J. Trujillo-Mesa[1], M. Manuela Hernández-Herrero[1], Artur X. Roig-Sagués[1], Francisco J. Pérez-Cano[3], Àngels Franch-Masferrer[3]

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Background and objectives:

Donor human milk (HM) is usually processed by Holder pasteurization (HoP) to ensure microbiological safety; however, this treatment can compromise several bioactive factors. Among these, lysozyme plays a key role in providing passive innate immunity to newborns, yet its activity is reduced after HoP. This study aimed to evaluate the potential of ultra-high-pressure homogenization (UHPH) as an innovative alternative to HoP, focusing on its ability to preserve lysozyme activity.

Methodology:

Donor HM samples were obtained from the Human Milk Bank of the Reina Sofía University Hospital (Córdoba, Spain) and the Banc de Sang i Teixits (Catalonia, Spain). Samples were either left untreated or subjected to HoP or UHPH at 200–300 MPa, with inlet temperatures of 30 and 40 ◦C (n= 6/treatment). During UHPH, the valve temperature ranged from 75 to 130 ◦C (< 0.5 s). Lysozyme activity was quantified by a fluorescence-based assay using *Micrococcus lysodeikticus* cells.

Results and conclusions:

HoP treatment reduced lysozyme activity to about 35% of raw HM. UHPH at 200 MPA (75 ◦C) and 250 MPa (85 ◦C) preserved approximately 95 and 85% of the basal lysozyme activity, respectively, whereas 300 MPa (up to 130 ◦C) causes losses similar to HoP. These findings demonstrate that UHPH at moderate pressures effectively preserves lysozyme activity, representing a promising alternative to HoP for maintaining the immunological quality of donor HM.

Acknowledgements:

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P9- Investigating the metabolomic shifts in extra virgin olive oil through different cooking methods

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Background and objectives:

Extra virgin olive oil (EVOO), the main fat source in the Mediterranean diet (MedDiet), plays a central role in its well-documented health benefits. These effects are largely attributed to EVOO's unsaponifiable fraction, which can be modified by heat exposure. Although EVOO is mostly consumed raw, it is also commonly used in cooking applications involving temperature.

Methodology:

EVOO "coupage" samples from the same 2020 harvest (Mateo S.A.) were used to evaluate three cooking techniques: confit (Crock-pot®), deep frying (domestic fryer), and air-frying (Moulinex®). Cooking conditions were optimized for each method and performed in triplicate. Raw and cooked oils were analyzed by UHPLC-HRMS, and principal component analysis (PCA) was conducted in Simca® based on putatively identified compounds.

Results and conclusions:

Thirty compounds were putatively identified at level 2A in EVOO samples after cooking, including phenolics, aldehydes, ketones, and alcohols. PCA revealed that confit induced minimal chemical alterations, clustering closely with the raw control. Conversely, air-frying caused the largest metabolomic shifts in EVOO, followed by deep frying. Particularly, phenolic compounds were markedly degraded under domestic heating conditions, showing a significant decrease in EVOO, especially after air-frying.

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P10- Dietary fats rich in medium-chain fatty acids: Chicken meat lipid quality and composition

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Background and objectives:

Fats rich in medium-chain fatty acids (MCFA) are of interest for broiler feeding as energy sources and to improve the birds' intestinal health. On the other hand, the use of fat by-products to replace soybean oil (SO) in feeds is of current interest to reduce reliance on edible oils. This study aimed to evaluate the effects of using MCFA-rich fats [palm kernel oil (PKO), a by-product of its refining (fatty acid distillates, PKFAD), splitted palm kernel oil (SPKFAD), and black soldier fly larvae oil (BSFLO)], as main added fats in broiler diets on meat composition and quality.

Methodology:

Broilers were fed with diets containing 6% of SO, PKO, PKFAD, SPKFAD or BSFLO (8 cages per diet). From each chicken, one breast was taken (raw meat), and the other one was cooked in a steam oven (95°C, 59 min) (cooked meat). Tocopherol content, fatty acid profile, pH, cooking loss, texture profile, and sensory acceptance were determined.

Results and conclusions:

The inclusion of all MCFA fats significantly increased MCFA levels in meat. Polyunsaturated fatty acids in BSFLO meat were higher than in the other MCFA meats, but lower than in SO meat. The α-tocopherol content after cooking was higher in BSFLO meat. No significant differences were observed in pH, cooking loss, or consumer acceptance, but PKFAD showed lower hardness values.

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O2- Immunoprogramming by Maternal Fiber and Polyphenol Intake Enhances Humoral Systemic and Mucosal Immunity in Adult Offspring

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Background and objectives:

Maternal diet is an element of the exposome that could shape the immune development in their offspring. Although diets containing fiber or polyphenols are known for their direct immunomodulatory properties, their influence on the immune status in the adult offspring from mothers following such diet remains unclear. This preclinical study aimed to establish whether maternal consumption of a fiber- and polyphenol-enriched (FP) diet before gestation and until the end of lactation modulates the immune response to a specific antigenic challenge in the offspring later in life.

Methodology:

For this, offspring from dams fed either a standard or FP diet, were immunized with ovalbumin (OVA) in adult life and plasma and intestinal specific antibodies were quantified after 4 weeks.

Results and conclusions:

Offspring from FP-fed mothers exhibited a higher humoral immune response in both systemic and mucosal compartments than offspring from dams fed standard diet. This increase was particular relevant in those antibodies associated with T-helper (Th) 2 immune response. In addition, offspring from FP dam exhibited changes in the lymphoid composition in both spleen and mesenteric lymph nodes. These findings provide evidence that maternal diet enriched with fiber and polyphenols can durably program offspring immunity, enhancing their capacity to mount a more efficient humoral systemic and mucosal responses in the adulthood.

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O3- Effects of an Energy-Reduced Mediterranean Diet on Endothelial Microparticle Procoagulant Activity in Adults with Metabolic Syndrome

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Background and objectives:

Microparticles are involved in vascular injury and thrombosis, contributing to cardiovascular disease (CVD). The Mediterranean diet (MedDiet) has cardioprotective effects due to its bioactive compounds, such as olive oil polyphenols. This study aimed to assess the impact of an intensive lifestyle intervention combining an energy-reduced MedDiet (eMedDiet) and physical activity promotion on endothelial microparticle procoagulant activity in adults with metabolic syndrome (MetS).

Methodology:

A total of 132 older adults with overweight/obesity and MetS (49% women; mean age 67.8 ± 4.2 years) from the PREDIMED-Plus trial (Hospital Clínic–IDIBAPS center, ISRCTN89898870) were included. Plasma microparticle procoagulant activity was determined at baseline and after 12 months using the Zymuphen™ MP-ACTIVITY assay. Thrombin generation was measured spectrophotometrically at 405 nm, and microparticle concentration was expressed as nanomoles (nM) of phosphatidylserine (PS) equivalents.

Results and conclusions:

After 12 months, plasma microparticle concentration increased from 15.7 ± 1.0 to 24.7 ± 2.5 nM PS ($p < 0.001$) in the eMedDiet group and from 17.1 ± 1.1 to 29.5 ± 1.5 nM PS ($p < 0.001$) in controls. The mean change was significantly lower in the eMedDiet group (−4.8 ± 2.2; *P* for interaction = 0.042). Participants following the eMedDiet exhibited a smaller increase in microparticle release and procoagulant activity compared with controls. These findings suggest that adherence to an energy-reduced Mediterranean diet combined with physical activity may mitigate endothelial dysfunction and thrombogenic risk in individuals with MetS.

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P11- Maternal high-fiber and polyphenol diet during perinatal periods in rats modulates intestinal immunity, barrier and microbiota composition.

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Introduction and objectives:

Diet plays a key role in maintaining intestinal integrity and regulating immune responses, partly through the modulation. This study aimed to evaluate whether high-fiber, high-polyphenol (HFP) diet, administered during different perinatal periods, could modulate the small intestine defensive capacity in rats.

Methodology:

Animals received the diet during pregestation, gestation and/or suckling periods. At the end of suckling, samples for mucosal immunoglobulin A (IgA) quantification, histological analysis, gene expression and microbiota composition were obtained. IgA was evaluated by ELISA, the expression levels of Tlr2, Tlr4, Tlr7, Tlr9, Muc2, Muc3, Ocln, Zo1 genes were quantified by Real Time, normalized to Gusb, and expressed relative to the reference (R) group, and microbiota composition by 16S sequencing

Results and conclusions:

Although no changes were consistently found among groups regarding the dietary intervention in terms of IgA and intestinal arquitecture some changes were observed in terms of gene expression of Tight junction as and toll like receptors. In addition, the microbiota composition was influenced by the high fibre and polyphenol diet. Overall, this study highlights the role of diet composition in modulating the intestinal interface, suggesting that a fiber- and polyphenol-rich diet may influence pathways involved in immune regulation.

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O4- A Novel Natural Ingredient to Enhance the Safety and Quality of Plant-Based Fermented Foods

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Background and objectives:

In industrialized countries, up to 30% of vegetables are lost during primary production, partly due to the strict aesthetic standards. Fermentation extends shelf life and provides added nutritional value, but it can also lead to the accumulation of biogenic amines, compromising the quality and safety of fermented foods. Although several hygienic and technological strategies have been developed, controlling amine formation remains challenging, particularly in plant-based fermented foods. This study aimed to evaluate the effect of a plant-based active ingredient from legume sprouts with diamine oxidase activity to control biogenic amine accumulation during fermentation.

Methodology:

A laboratory-scale study was conducted using sauerkraut. Ten batches were supplemented with 250 mg/kg of biogenic amines (histamine, putrescine, cadaverine, tyramine or combinations), half of which received 4% (w/w) of the active ingredient (lyophilized green pea sprouts). A control batch without amines or active ingredient was included. Biogenic amine content was analyzed by UHPLC-FL and proper fermentation over 7 days was verified by pH decrease.

Results and conclusions:

The addition of lyophilized green pea sprouts significantly reduced all added amines, particularly cadaverine (80%) and putrescine (70%). Histamine decreased from 250 mg/kg to 190 mg/kg, while tyramine was reduced by 11%. In a scenario with all four amines present, the active ingredient halved the total amine content (from 250 mg/kg to 130 mg/kg). These results demonstrate the effectiveness of this plant-based ingredient with diamine oxidase activity in controlling biogenic amines during fermentation. This innovative approach could contribute to the production of safer, higher-quality fermented plant-based foods, benefiting individuals with histamine intolerance.

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O5- Interim Analysis of Metabolomic Changes and Cognitive Improvements in Older Subjects with Mild-Cognitive Impairment: Mediterranean Diet vs. a Low-Fat Diet

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Background and objectives:

Cognitive decline varies among individuals and depends on modifiable risk factors including socioeconomic status, lifestyle, diet, and comorbidities. Nutrimetabolomics plays a key role in understanding the processes by which dietary interventions could decrease the progression of mild cognitive impairment (MCI) to dementia through the analysis of the plasma metabolome. The study aims to compare the diet effects and metabolic changes of Mediterranean Diet (MD, with or without probiotics) versus the low-fat diet (WHO) on cognitive health through nutrimetabolomics.

Methodology:

From a previously reported randomized controlled intervention trial, 47 plasma samples (aged≥ 60 years old, 42.6% women) collected at baseline, visits 1 and 2 were analyzed using a quantitative LC-MS/MS targeted assay. To assess the impact of diet on plasma metabolome and explore associations between the changes in metabolite profiles, multivariate methods were employed in parallel with cognitive scores evaluated through ADAS-Cog-11 and neuropsychological test battery.

Results and conclusions:

Compared to the low-fat diet, our results showed that MD increased the levels of several metabolites associated with the Krebs cycle and decreased the levels of branched-chain amino acids (BCAAs). It also promoted ketone body production and enhanced the availability of Krebs cycle intermediates, suggesting improved metabolic flexibility in older adults with MCI. These findings suggest that targeted dietary

strategies aimed at enhancing metabolic flexibility may play a significant role in preventing the progression of MCI.

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P12- Insect Consumption as Alternative Protein: Knowledge Level and Social Perceptions Among Food Science Professionals and Students

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Background and objectives:

Insect consumption (entomophagy), promoted by FAO since 2003, is gaining attention due to its benefits: low land, water, and feed use; fewer emissions; high feed conversion. Nutritionally, insects offer 35–60% protein (dry weight), unsaturated fats, fiber, vitamins (e.g., B12), and minerals (iron, zinc). This study aimed to develop and validate a questionnaire to assess food and nutrition professionals' perceptions, opinions, and attitudes toward insect consumption as an alternative protein source.

Methodology:

A cross-sectional quantitative study was conducted with students, teachers, researchers, and professionals in food sciences. Eight experts validated the questionnaire using the Content Validity Index (CVI; clarity, relevance, simplicity, ambiguity). A pilot test with 29 convenience-sampled participants, similar to the target audience, evaluated comprehension, coherence, and functionality in real conditions.

Results and conclusions:

A structured questionnaire with 26 Likert and multiple-choice questions was developed. Most items reached a CVI ≥0.78, meeting validity criteria; only four needed clarity adjustments. Among 29 respondents (aged 22–82, 72% women), 90% recognized insects as a sustainable protein source, but only 20% felt comfortable eating them. Main barriers were unappealing appearance (92.3%) and concerns about safety and hygiene (76.9%). However, 63.3% were willing to consume processed foods with insect protein (e.g., pastries), and 73.3% would eat meat or fish fed with insect-based feed.

Although insects are positively valued for their low environmental impact, willingness to consume them remains low—even among experts—mainly due to sensory barriers. Findings highlight the gap between environmental awareness and actual behavior, influenced by taste, familiarity, and culture.

Acknowledgements:

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O6- ENHANCED VIROLOGICAL ANALYSIS OF LEAFY GREENS AND BERRIES: COMPARING NOVEL AND REFERENCE METHODS

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Background and objectives:

Viruses commonly associated with illness from consuming leafy greens and berries include human noroviruses (HuNoV) and hepatitis A virus (HAV), which can lead to acute gastroenteritis and hepatitis, respectively. The aim of this work is to develop novel optimized HuNoV and HAV concentration methods and compare them to the reference methods.

Methodology:

Two alternative virus concentration methods: aluminum hydroxide adsorption-precipitation ($AlCl_3$) and the Concentrating Pipette Select (CP), were evaluated against ISO and FDA reference protocols. Six matrices (lettuce, spinach, baby leaf, strawberries, raspberries, blueberries) were spiked with HAV and HuNoV GI and GII. After RNA extraction, viruses were quantified by RT-qPCR (ISO 15216-1). HAV infectivity was assessed by $TCID_{50}$ and HuNoV by the HIE assay.

Results and conclusions:

Mean recoveries in leafy greens were 26.5%, 64.1%, 14.0% and 50.9% for $AlCl_3$, CP, ISO and FDA; in berries, 24.7%, 32.5%, 3.5% and 8.4%. CP outperformed $AlCl_3$ in 5/6 matrices, ISO in all, and FDA in up to 3/6. CP showed low LoD_{95} and fast processing. Screening of 20 berries found HuNoV GI in 5% and GII in 15%. This work provides novel alternative methods to facilitate virological analysis of food. These efforts will improve the safety of food products, protect public health, and minimize financial losses due to viral contamination of foods.

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P13- Associations of Walnut-Derived Biomarkers with Cognitive Performance in Adolescents: Insights from the WALNUTs Smart-Snack Randomized Controlled Trial

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Background and objectives:

Adolescence is a key stage of brain maturation, sensitive to nutritional factors. Walnuts are rich in (poly)phenols and α-linolenic acid (ALA), both proposed to support brain health. The present study aimed to examine the relationship between walnut-derived biomarkers, ALA and urolithins, and cognitive performance in adolescents.

Methodology:

The WALNUTs Smart-Snack trial was a 6-month, randomized controlled trial including 278 adolescents (13.8 ± 0.9 years; 49% girls) from Barcelona high schools. Participants received either 30 g/day of walnuts or a diet abstaining from walnuts. Urinary urolithins and red blood cell ALA were determined at follow-up by LC-HRMS and gas chromatography, respectively. Associations between in urinary urolithins, ALA and cognitive performance were analyzed.

Results and conclusions:

Participants in the walnut group exhibited higher concentrations of ALA and urolithins. UroA, UroC, and their glucuronides were positively associated with ALA, whereas UroB glucuronide was not. ALA was related to better global cognition [β = 0.677 (0.134; 1.220), p = 0.035], while UroA and UroC glucuronide were associated with improved working memory [β = 0.175 (0.088; 0.261), p = 0.003; β = 0.172 (0.070; 0.274), p = 0.008]. These findings suggest that walnut-derived ALA and microbial (poly)phenol metabolites act synergistically through complementary mechanisms to support adolescent cognition.

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P14- Comparative Effects of Different Selenium Sources on *Lactobacillus plantarum* Growth and Glutathione Peroxidase 1 (GPX1) Gene Expression

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Background and objectives:

The use of selenium-enriched probiotics has gained attention due to their potential health benefits and nutritional value. However, the form of selenium provided can strongly influence microbial uptake, metabolism, and overall viability. We evaluate growth and GPX1 gene expression of *Lactobacillus plantarum* (LP) cultures exposed to selenium sources.

Methodology:

LP was incubated with both organic (selenomethionine, SM) and inorganic (sodium selenite, SS) selenium forms at two concentrations (5 and 250 μM). OD_{600} was measured at 24, 48, 72, and 96 hours to construct growth curves, and colony-forming units (CFUs) were determined at 48 and 96 hours. Gene expression of the selenoprotein GPX1 was assessed after 48 hours of incubation.

Results and conclusions:

At 48 hours, a reduction in growth was observed for the LP-SM250 group; however, by 96 hours, no significant differences in OD were detected between all treatments, indicating recovery of growth over time. Additionally, an increase in GPX1 expression was observed in the higher selenium concentrations (LP-SM250 and LP-SS250) compared with the unsupplemented control (LP0). These results suggest that although elevated organic selenium concentrations may initially inhibit LP growth, they also stimulate antioxidant defense mechanisms. Understanding how different selenium sources affect bacterial physiology is key to optimizing probiotic formulations and selenium biofortification strategies.

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P15- Vectorial release of novel MLB Human Astrovirus in polarized intestinal enteroids

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Background and objectives:

Human astroviruses (HAstV) are a recognized cause of gastroenteritis in children, the elderly, and immunocompromised individuals, but some novel clades (MLB and VA) have also been associated with neurological disorders. Unlike classic HAstVs, their association with gastroenteritis and their pathogenic determinants at the gastrointestinal tract remain unclear. For other enteric viruses association of virions to extracellular vesicles (EVs) may facilitate non-lytic virion egress from cells and further dissemination to other tissues. This study aimed to investigate the infection dynamics of MLB2 HAstV in human intestinal enteroids (HIEs) and to characterize the process of virus egress and the phenotype of released virions.

Methodology:

Differentiated and polarized HIEs cultured on transwells were infected with HAstV MLB2. Viral replication, cell viability, vectorial release and integrity of tight junctions were evaluated. Released particles were analyzed by iodixanol density gradient to determine their association with EVs.

Results and conclusions:

MLB2 HAstV productively infect differentiated HIEs without causing significant cell death or lysis. Virion release occurs mainly through the apical membrane, predominantly associated with EVs (density 1.10–1.13 g/cm³). A fraction of higher-density virions (1.17–1.20 g/cm³) is also detected at the basolateral compartment, even without a significant disruption of tight junctions. These findings indicate that MLB2 can infect and cross the intestinal epithelium without causing significant cell damage, supporting their potential for extraintestinal dissemination. HIEs thus represent a physiologically relevant model to study HAstV pathogenesis.

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P16- Celiacase: a new gluten-degrading enzyme for the prevention of celiac disease

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Background and objectives:

Celiac disease (CD) is a chronic autoimmune enteropathy triggered by gluten intake in genetically predisposed individuals. Currently, the only available treatment is a strict gluten-free diet. The aim of this study is to evaluate the preventive effect of a new gluten-degrading enzyme, named "Celiacase" on the development of CD.

Methodology:

To induce a well-established preclinical model of CD, DQ8-Dd-villin-IL-15tg mice were used. Animals were divided into four groups and fed for 25 days either a gluten-free diet (REF), a gluten-containing diet supplemented with a 20 mg gliadin three times per week (GLI), or the latter combined with Celiacase treatment at enzyme:gliadin ratios of 1:100 or 1:500, administered 5 minutes before gliadin (Cel).

Results and conclusions:

Dietary gliadin exposure in susceptible mice (GLI) induced a significant autoimmune antibody (autoAb) response. However, Celiacase administration minimized the production of anti-gliadin and anti-transglutaminase 2 autoAbs at both intestinal and plasma levels (IgG and IgA). Celiacase also reduced intestinal villus atrophy in response to gliadin, reflected by a higher villus height to crypt depth ratio (Vh:Cd) in both Celiacase-treated groups and the REF group compared to the GLI group. These results demonstrate the effectiveness of Celiacase in preventing intestinal damage and the autoimmune response induced by gluten in CD.

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P17- Urinary Metabolomic Changes Induced by Flywheel Russian Belt Deadlift in Untrained Physically Active Women

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Background and objectives:

Flywheel Russian Belt Deadlift (FRBD) exercise, characterized by high eccentric load and hamstring activation with injury-prevention potential, has been associated with oxidative and structural muscle damage. Metabolomics, within the emerging field of *sportomics*, offers new opportunities to identify metabolite indicators of exercise response. The aim of this work is to elucidate and analyze differences in the urinary metabolome of 15 healthy untrained and physically active females at baseline and after performing a FRBD exercise session.

Methodology:

Untargeted urinary metabolomics was performed using HPLC-QTOF-MS, and data were statistically analyzed through MetaboAnalyst 6.0.

Results and conclusions:

T-test analysis (FDR < 0.05) revealed 139 significant features, with 86 upregulated after the FRBD session. Hierarchical clustering heatmaps differentiated pre- and post-exercise samples based on these features, highlighting distinct metabolic responses. These preliminary findings suggest that untargeted urinary metabolomics can capture exercise-induced alterations, and further compound identification may reveal metabolites associated with muscle damage and recovery.

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P18- Functional MRI Reveals Extra Virgin Olive Oil Effects on Brain Connectivity in Healthy Adults: An Exploratory Randomized Crossover Trial

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Background and objectives:

Extra virgin olive oil (EVOO) is a food rich in antioxidants, particularly (poly)phenols. However, the impact of diets high in these compounds on functional MRI outcomes remains scarcely explored. This pilot study investigated whether daily consumption of a (poly)phenol-rich EVOO modulates resting-state brain activity compared to regular olive oil, and to explore associations between brain activity and urinary (poly)phenol metabolites specific to olive oil.

Methodology:

In a randomized crossover trial (n=9), participants consumed 0.7 g/kg/day of EVOO or regular olive oil for one month. Resting-state functional MRI and 24-hour urine samples were collected pre- and post-intervention. Brain activity was analyzed by independent component analysis, and urinary hydroxytyrosol glucuronide was quantified by high-resolution mass spectrometry.

Results and conclusions:

Functional MRI revealed increased occipital network activity following EVOO intake ($\beta = 0.20$; 95% CI: 0.03, 0.37; $p = 0.016$), particularly in the left lateral occipital cortex, correlating with urinary HT-glucuronide concentrations ($\beta = 1.24$; 95% CI: 0.13, 2.35; $p = 0.02$). These findings suggest a dose-dependent neuromodulatory effect of EVOO and dietary modulation of sensory cortical networks. Further research and larger, long-term clinical trials are needed to confirm these findings.

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P19- Clavulanic Acid and Promethazine: Potential Triggers for Histamine Intolerance?

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Background and objectives:

Histamine intolerance is a disorder of histamine homeostasis, mainly from dietary sources, due to reduced diamine oxidase (DAO) enzyme activity at the intestinal level. The accumulation of histamine in the bloodstream can trigger various gastrointestinal and extraintestinal symptoms. Although commonly used drugs such as promethazine and clavulanic acid (CA) have been proposed as DAO inhibitors, the scientific evidence is limited, outdated and often lacks thorough experimental validation. This study aimed to evaluate their inhibitory effect on DAO activity through a multidisciplinary approach combining computational and *in vitro* analyses.

Methodology:

To analyze the structure-activity relationship between the enzyme and the drugs, three human DAO 3D structures (PDB IDs: 3HI7, 3HIG, and 3HII) and a porcine DAO structure generated by homology modelling were selected. Virtual molecular docking was performed to assess binding affinity. In parallel, DAO activity (porcine kidney protein extract) was determined *in vitro* in the presence of three drug concentrations (100, 50, and 10 μM) bu UHPLC-FL. Kinetic parameters (Km and Ki) and inhibition type were characterized.

Results and conclusions:

The computational study predicted that CA binds to the DAO active site, while promethazine interacts allosterically. *In vitro* assays confirmed that CA exerts competitive inhibition and promethazine non-competitive inhibition, consistent with computational results. Both drugs significantly reduced DAO activity in a dose-dependent manner, reaching inhibition levels of 65% and 40% at 100 μM. These results suggest that administering CA or promethazine could be a potential cause or aggravating factor for histamine intolerance, increasing the number of individuals susceptible to adverse reactions after intake of dietary histamine.

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O7- Differential effects of two doses of tomato juice on systolic and diastolic blood pressure: results from a randomized trial

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Background and objectives:

Tomato juice (TJ), a rich source of lycopene, polyphenols, carotenoids, and antioxidant vitamins, has been linked to multiple cardiovascular benefits. Its regular consumption has been shown to improve endothelial function, enhance lipid profiles, and reduce oxidative stress and inflammation, thereby contributing to cardiovascular and metabolic health. This study aimed to evaluate the effects of two daily doses of TJ (low and high) on clinical and 24-hour ambulatory blood pressure (BP), compared with a control group, after a 4-week intervention in individuals with hypertension or at high cardiovascular risk.

Methodology:

Randomized, controlled, crossover trial in adults aged 55–80 years with hypertension and high cardiovascular risk. Participants (n=26, 66% females) consumed low (200 mL/day) or high (400 mL/day) doses of TJ, or water (control), for 4 weeks each, separated by 3-week washouts. BP and biochemical parameters were measured pre- and post-intervention.

Results and conclusions:

After 4 weeks of intervention, both the low and high doses significantly reduced systolic and diastolic BP compared to baseline ($p < 0.05$). In the between-group analysis, both doses showed lower daytime and 24-hour systolic values compared to the control ($p < 0.05$), with no differences between doses. No significant changes in diastolic pressure were observed between groups. These results confirm a mainly systolic hypotensive effect of TJ.

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P20- ISOLATION OF ARSENOSUGARS EXTRACTED FROM ALGAE: COMPARISON OF CURRENT STRATEGIES

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Background and objectives:

Arsenosugars, ribose derivatives of arsenic, are becoming more significant because of their predominance in algae and the increasing incorporation of such vegetal products into the diet. Although these compounds do not appear to be acutely toxic, they have potential for mild chronic toxicity. Therefore, given the increasing consumption of algae, assessment of arsenosugars exposure becomes a need. The analysis of these compounds is hampered by their similar physical and chemical properties and the difficulty to obtain the calibration standards needed for their unambiguous identification and quantification.

Methodology:

Four approaches assessed in our research group to achieve the isolation of arsenosugars, the first based on the use of high-resolution preparative chromatography (Hamilton PRP-X100 column using a mobile phase containing ammonium formate, the second based on solid-phase extraction (anion exchange cartridges), the third based on the dispersive solid-phase extraction (anion exchange and HILIC sorbents) and the last one based on countercurrent chromatography in centrifugal partition mode (CPC, using the 1-BuOH/EtOH/sat.$(NH_4)_2SO_4$/water solvent system,).

Results and conclusions:

The results obtained show that it is possible to isolate anionic arsenosugars using the proposed techniques, although further improvements are still required. Among the four approaches tested, preparative HPLC yields the best compound purity (better than 99% in all cases) but the isolated fractions present a low concentration. These may be considered the first steps toward achieving the analytical standards for arsenosugars that are demanded in the literature from different research fields, such as toxicology, environment, and food sciences.

O8- Lycopene and prostate cancer prevention in men at high cardiovascular risk

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Background and objectives:

Lycopene has been suggested as a protective bioactive compound against prostate cancer. Given that prostate cancer and cardiovascular disease share metabolic and inflammatory pathways, this study aimed to evaluate the association between lycopene intake and prostate cancer risk in a Mediterranean population at high cardiovascular risk.

Methodology:

The analysis included 2970 men aged 55–80 years from the PREDIMED trial. Lycopene intake was estimated using repeated food-frequency questionnaires. Cancer cases were confirmed through medical records and death certificates. Cox proportional hazards models were applied to assess prostate cancer risk across quartiles of lycopene intake. Restricted cubic spline regression models were used to evaluate the dose–response relationship.

Results and Conclusions:

In this Mediterranean cohort, the mean lycopene intake was 3.9 mg/day, with tomato and tomato-based products as the main sources (69.6%). During a mean follow-up of 5.8 years, 104 prostate cancer cases were documented. Men in the highest quartile of lycopene intake had a significantly lower prostate cancer risk than those in the lowest (HR = 0.46; 95% CI: 0.23–0.95; p-trend = 0.035; mean intake: 6.1 ± 1.9 vs. 1.7 ± 0.6 mg/day, respectively). Restricted cubic spline analysis showed a protective effect at intakes above 4.9 mg/day.

Higher lycopene intake was associated with a lower incidence of prostate cancer in men at high cardiovascular risk. These findings highlight the relevance of dietary bioactives and their food sources in chronic disease prevention.

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P21- Edible microalgae *Chlorella vulgaris* plus algal EPA/DHA improves mitochondrial respiration capacity and gut microbiota in trained rats

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Background and Objectives: *Chlorella vulgaris* and algal bioactive compounds, as EPA and DHA modulate gut microbiota and metabolism, especially under exercise-induced stress. This study aimed to determine the possible additive effects of *C. vulgaris* plus EPA/DHA in the physiology and endurance of trained rats, and find the role of gut microbiota on these activities.

Methodology: Male Wistar rats were fed a standard diet modified (or not, for comparison) with 10% *Chlorella vulgaris* plus EPA/DHA (1:2, 16.6 g/kg feed) for 10 weeks. Half of the animals were trained 5 days/week following an Endurance Training Protocol (ETP). Pre- and Post-Exercise Maximal Workload Incremental Test (MWIT), biometrical and hematological parameters, and mitochondrial respiratory capacity in skeletal muscles were determined, as well as gut microbiota composition and short-chain fatty acid (SCFAs) profiles in fecal samples.

Results and conclusions: Neither *C. vulgaris* + EPA/DHA supplementation nor exercise induced significant changes in biometric or hematological variables. The MWIT showed that the combination of *C. vulgaris* + EPA/DHA diet and exercise induced significant improvements in maximum speed and total time until exhaustion, suggesting an additive effect. Microbiota profiling revealed a significant increase in the fecal abundance of Gammaproteobacteria, Alphaproteobacteria, and Lactobacillales in the *C. vulgaris* + EPA/DHA diet when animals were exercised. The *C. vulgaris* + EPA/DHA diet, with or without exercise, increased fecal concentrations of butyrate and valeric acid, indicating beneficial modulation of gut microbiota. In skeletal muscle, *C. vulgaris* + EPA/DHA diet and exercise significantly increased mitochondrial respiration, in states D, PM, G, and U, indicating enhanced oxidative capacity and mitochondrial health in EDL fibers.

These findings suggest that *C. vulgaris* together with algal EPA/DHA, particularly when combined with exercise, enhances physical performance and supports gut physiological health.

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P22- Glycemic impact of a liquid formula: a controlled pilot study

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Background and objectives:

Carbohydrates are a key source of energy, but their metabolic effects depend on the rate of digestion and absorption. The glycemic index (GI) and glycemic load (GL) are used to assess the glycemic response of foods. Diets with high GI and GL values increase the risk of type 2 diabetes and cardiovascular diseases. This study aimed to determine the GI and GL values of a special medical-purpose liquid formula, using monohydrated glucose (MG) as the reference (GI = 100).

Methodology:

A pilot, crossover, controlled nutritional intervention was conducted following ISO 26642:2010(E). Ten healthy, normal-weight adults participated (50% male, aged 20–32 years, mean BMI 24.4 kg/m²). Each participant served as their own control, consuming on separate days monohydrated glucose (MG) as the reference food (twice) and a special medical-purpose liquid formula designed for patients with renal insufficiency (once). After an overnight fast of at least 10 hours for each session, participants were provided with 25 g of available carbohydrates in the form of MG and the liquid formula (138.9 g). During each intervention, capillary glucose levels were recorded at different time points (baseline, 15, 30, 45, 60, and 120 minutes).

Results and conclusions:

MG showed higher glucose absorption and a sharper glycemic peak during the first 30–45 minutes. In contrast, the formula produced an almost flat curve. The calculated GI for the formula was low, at 40, and the GL was 14, indicating a moderate value. These results suggest that this formula induces a low and controlled glycemic response, which may be beneficial for individuals with metabolic risk or diabetes.

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P23- Gut microbiota remodeling by SDP links to reduced neuroinflammation and cognitive decline

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Background and objectives:

Aging has been linked to intestinal dysbiosis and low-grade chronic inflammation, both of which can contribute to brain dysfunction. Spray-dried porcine plasma (SDP) has prebiotic effects in weaned animals and anti-inflammatory effects in senescent mice. We aimed to study the relationship between the prebiotic effects of SDP and the neuroinflammation and cognitive decline associated to senescence.

Methodology:

Experiments were performed with 2-month-old SAMP8 mice (reference young) and 6-month-old SAMP8 mice fed either control or SDP (8%) for 4 months. The outcomes assessed included cognitive, inflammatory, oxidative, barrier, colonic and microbiota. The analysis of associations among variables was conducted using both correlation and network analysis methods.

Results and conclusions:

Aging increased cognitive impairment, oxidative stress and brain permeability in senescent mice (all $p<0.05$); effects that were attenuated by SDP ($p<0.05$). Furthermore, senescence promoted the production of pro-inflammatory cytokines (cortex and plasma), while SDP also reduced them, thereby reducing brain and systemic inflammation (all, $p<0.05$). The microbiota profiling revealed a shift towards taxa associated with health, with higher levels of *Lactobacillus* (*Pediococcus* and *Acetobacterium*) and lower levels of *Erysipelothrix* ($p<0.05$). Correlation and network analyses showed that *Lactobacillus* correlated positively with memory indices and negatively with brain/systemic cytokines, whereas *Erysipelothrix* showed the inverse pattern. Collectively, the data support a gut–brain axis mechanism whereby microbiota remodeling induced by SDP aligns with reduced neuroinflammation and improved barrier integrity.

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P24- Smartphone-Based Green Approach for Rapid Classification of Chocolate

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Background and objectives:

Chocolate quality depends on multiple factors such as geographical origin, cocoa variety, and processing steps, which influence its chemical profile, sensory properties, and perceived consumer value. Traditional methods for assessing chocolate chemistry are time-consuming and resource-intensive. This study aimed to develop a green and rapid screening method combining smartphone digital imaging and chemometrics to discriminate chocolate samples based on variety, type and chemical characteristics.

Methodology:

Fourty commercial chocolate samples with different origin and processing attributes were analyzed using their ethanolic extracts, both directly and after applying Folin–Ciocalteu colorimetric reactions to highlight phenolic differences. Images were captured under controlled and optimized conditions using a smartphone. RGB data were extracted, preprocessed, and transformed into alternative color spaces. Chemometric analyses were performed in R using both unsupervised and supervised models.

Results and conclusions:

Results revealed clear trends associated with cocoa content and chemical composition, enabling discrimination between bitter and bittersweet chocolate samples. Supervised models successfully classified samples by variety, achieving accuracies above 85%. Variables such as blue index, brightness, and saturation were the most relevant for discrimination. The proposed approach is fast, low-cost, solvent-minimized, and environmentally friendly, demonstrating strong potential as a green chemometric tool for rapid assessment of chocolate extracts and their chemical characteristics.

Acknowledgements:

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P25- A comparative study of metabolite fingerprinting, elemental and isotope analysis for almond authentication

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Background and objectives: Almonds are key crop in major producing areas such as the United States (USA), Spain, and Australia. As geographical origin strongly affects commercial value, this sector is increasingly exposed to fraudulent labelling. Ensuring reliable analytical approaches to verify provenance has therefore become essential. This work compares two strategies for almond authentication: analysis of trace elements and stable isotopes, based on standardized and widely accepted methods, and metabolic fingerprinting, which reflects subtle compositional differences through a wide range of metabolic markers.

Methodology: The first approach analyzed bulk $\delta^{18}O$ by Thermal Conversion/Elemental Analyzer-Isotope Ratio Mass Spectrometry (TC/EA-IRMS), $\delta^{2}H$ and $\delta^{13}C$ in fatty acid methyl esters by Gas Chromatography-IRMS (GC-IRMS) and B, Sr and Rb concentration by Inductively Coupled Plasma Mass Spectrometry (ICP-MS). Metabolic fingerprinting focused on the unsaponifiable lipid fraction, analysed by GC-MS. Classification and validation were performed using Partial Least Squares-Discriminant Analysis (PLS-DA).

Results and conclusions: Geographical classification of Nonpareil almonds from Spain, USA, Portugal, and Australia (n=100) achieved 71% external validation accuracy with isotopic analysis versus 91% with the metabolic approach. Combining trace-element and isotopic data for a subset of 40 samples yielded 100% correct classification. Metabolic fingerprinting also enabled cultivar discrimination (Nonpareil, Guara, Vairo, Ferragnes, n=94), with 90% external validation accuracy. These findings demonstrated the strong potential of both approaches as effective tools for almond authentication.

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P26- Design and Evaluation of Functional Formulations Against Obesity.

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Background and objectives: Obesity and its associated comorbidities are rising globally. Evidence indicates that bioactive compounds in functional foods can support weight management and help prevent obesity-related metabolic complications. This work is part of the CPP2022-009688 project, which aims to develop and validate plant-based ingredients for the formulation of functional foods designed to help prevent and manage childhood overweight. This interdisciplinary project involves food industry companies (FRUSELVA and INGREDALIA) and research groups from the University of Barcelona and the University of the Balearic Islands. In this context, our specific objective is to assess the antiobesogenic potential and underlying mechanisms of action of some bioactive compounds-enriched formulations in a mouse model of diet-induced obesity.

Methodology: Eighty C57BL/6J four week-old male mice were randomly distributed to one of seven dietary groups for sixteen weeks: a control group fed with standard chow diet (CHOW n=11), a high-fat diet group (HFD n=11), a HFD + apple group (n=12), and four HFD + apple groups supplemented with either maqui (n=12), purple sweet potato (PSP, n=11), a mixture of anthocyanins (ACN, n=12) or sulforaphane (SFN, n=11). Body weight, food and drink intake were recorded weekly. A glucose tolerance test was performed once during the intervention. Tissues were collected for biochemical and molecular analyses.

Results and conclusions: Our data show that dietary supplementation with maqui, PSP, and SFN results in reduced body weight gain, without affecting food or water intake. Moreover, improved glucose tolerance was observed in maqui- and ACN- supplemented mice. These results support the potential of specific bioactive compounds to exert beneficial effects on energy metabolism and glucose homeostasis under obesogenic conditions.

Acknowledgements: Ministerio de Economía, Industria y Competitividad, España. Associació Catalana de la Diabetis. Secretaria Nacional de Ciencias, Tecnologia e Innovación (SENACYT), Panama.

O11- Dietary Medium Chain Fatty Acids Rich Fats and Their Effect on Meat Composition and Oxidation in Broiler Chickens

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Background and objectives:

Fats and oils are commonly added to poultry diets as energy sources. Medium-chain fatty acids (MCFA) are particularly valued for their positive impact on gut health. In recent years, there has been increasing interest in identifying sustainable alternatives, including the use of fat by-products. This study aimed to evaluate the effects of including palm kernel oil (PKO), palm kernel fatty acid distillates (PKFAD), splitted palm kernel fatty acid distillates (SPKFAD) and black soldier fly larvae oil (BSFO) as dietary fat sources for broiler chicken on meat composition and oxidation, in comparison with a commercial control diet based on soybean oil (SO).

Methodology:

Chickens were distributed into 25 cages (5 treatments x 5 replicates). The animals were fed with experimental diets (starter diet and grower diet) with 4 and 6% of one of the five experimental fats, respectively. For raw meat sampling, two breasts were pooled, ground, vacuum packed and stored at -20°C. For cooked meat sampling, two breasts were placed in a bag, cooked in a steam oven, and then ground, vacuum packed and stored at -20°C.

Results and conclusions:

Compared to SO meat, meat from BSFO and PK fats presented an increase in saturated FA and MCFA and a reduction of polyunsaturated FA being less pronounced in BSFO. Regarding lipid oxidation in raw meat, TBA values did not differ. However, after cooking, lower TBA values were reached in the MCFA diets. Also, the control diet presented higher values in some volatile compounds, but overall sensory acceptability did not vary.

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P28- Exploring the Variability of Diamine Oxidase (DAO) Serum DAO activity: A constant factor beyond circadian fluctuations and day-to-day variations

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Background and objectives: Histamine intolerance is a clinical disorder associated with the accumulation of exogenous plasma histamine due to reduced activity of the enzyme diamine oxidase (DAO). Although serum DAO measurement is used as a complementary diagnostic tool alongside the presence of symptoms in two or more organs or systems, its validity has been questioned due to the lack of consensus on reference values and potential variations throughout the day. The objective of this study is to evaluate serum DAO activity throughout the day (intra-day) as well as across different days (inter-day) in healthy individuals without symptoms of histamine intolerance.

Methodology: A multicentric study was conducted in 30 healthy volunteers. Blood samples were collected at three times of the day (fasting, mid-morning, and afternoon) and on three different days. DAO activity was determined using a radioenzymatic method (DAO-REA) and its differences were analysed using a paired Student's t-test.

Results and conclusions: Mean DAO activity values were stable at different times of the day and across several days ($p>0.05$). However, significant differences were observed among individuals in the study, with values ranging from 5.7 to 45.9 U/mL ($p<0.05$). The results indicate that serum DAO activity remains constant within the same individual, both throughout the day and across different days. Nevertheless, significant interindividual variations in enzyme levels were observed. Further studies with a larger population sample are required to confirm these findings.

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__ **Oral**

P29- Associations of dietary (poly)phenols with frailty transitions in Mediterranean older adults: Evidence from the InCHIANTI study

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Background and objectives: Frailty is a dynamic geriatric syndrome characterized by transitions between robust, pre-frail, and frail states. Diet is a key modifiable factor in the prevention and progression of frailty. Although polyphenol-rich dietary patterns have been associated with a reduced risk of frailty, their association with frailty transitions remains unclear. This study aims to evaluate whether dietary (poly)phenols are associated with a higher probability of frailty transitions towards robustness over nine years of follow-up in a population-based cohort of older adults.

Methodology: We used longitudinal data from the InCHIANTI study, a cohort of community-dwelling adults aged ≥ 65 years in Italy. Habitual dietary (poly)phenol intake was assessed at baseline, 3-, 6- and 9-years of follow-up using a validated food frequency questionnaire and an in-house software linked to the Phenol-Explorer database. Frailty status at each visit was defined using the Fried criteria. Associations between dietary (poly)phenol intakes and frailty transitions over 9 years were estimated using proportional intensity models within a multistate framework.

Results and conclusions: Higher intake of dihydrochalcones was associated with an increased probability of transitioning from pre-frail to robust, mainly driven by apple consumption. Significant associations were also observed for hydroxyphenylacetic acids, hydroxyphenylpropanoic acids, and tyrosols, with olives as the main contributor. For flavonols, a significant association was observed, but only apples showed a significant effect among major food sources. Overall, these findings in a Mediterranean population suggest that specific (poly)phenols from apples and olives may play a protective role against frailty, particularly in its early stages.

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P30- Probiotic Supplementation Ameliorates Antibiotic-Induced Diarrhea by Improving Fecal Parameters and Intestinal Gene Expression in Rats

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Background and objectives: Antibiotic treatment is a common cause of intestinal dysbiosis, which can lead to antibiotic-associated diarrhea (AAD). Probiotics are widely used to prevent or mitigate AAD. The aim of this study was to evaluate the protective effect of a probiotic in a rat model of AAD.

Methodology: Wistar rats were divided into three groups: reference (R), amoxicillin–clavulanic acid (A), and amoxicillin–clavulanic acid plus probiotic (AP). For seven days, groups A and AP received the antibiotic by oral gavage to induce diarrhea. Throughout the 14-day experimental period, group AP received the probiotic, and groups R and A received maltodextrin as a vehicle. Fecal samples were collected daily to assess water content, pH, and diarrhea severity. At the end of the study, gene expression was analyzed by RT-qPCR.

Results and conclusions: Antibiotic administration increased fecal water content and diarrhea severity throughout the experimental period, while probiotic supplementation significantly reduced fecal humidity after day 7 and prevented the increase in severity score after day 4, maintaining values below the diarrheic threshold. At gene expression level, A group upregulated Cldn1 and downregulated Cldn4, effects that were partially reversed by the probiotic. Additionally, AQP1 expression was enhanced in the AP group, while AQP8 downregulation observed in the A group was partially prevented by probiotic administration. Correlation analysis revealed positive associations between fecal water content, severity, and Cldn1 expression, and negative correlations with Cldn4, AQP3, and AQP8. In conclusion, probiotic treatment attenuated antibiotic-induced diarrhea and regulated gene expression of tight junction and water transport proteins, highlighting its potential to counteract gut barrier dysfunction associated with antibiotic therapy.

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P31- Raspberry leaf extract modulates locomotor activity and neurotoxicity-related genes in zebrafish embryos

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Background and objectives:

Approximately 70% of pregnant and lactating women in Catalonia consume herbal products (HPs) orally, a prevalence higher than that reported in other European countries. Raspberry leaf (RL) is one of the most commonly used HPs during the third trimester of pregnancy with the aim of stimulating and shortening labor. However, its biological activity may vary depending on the type of preparation and the gestational stage. Despite its widespread use, the potential effects of RL on developmental neurotoxicity (DNT) have not been evaluated. This study aimed to analyze the effects of raspberry leaf extract (RLext) on neurodevelopment using zebrafish as an experimental model.

Methodology:

RLext was prepared according to the traditional method described in the European Medicines Agency monograph. Zebrafish embryos were exposed to RLext, and toxicity parameters were evaluated, along with behavioral effects following short and prolonged exposures using the Touch-Evoked Response (TER) and Light/Dark Transition (L/D) assays at 72 and 120 hours post-fertilization (hpf), respectively. Additionally, gene expression markers related to DNT were analyzed by qPCR.

Results and conclusions:

Prolonged exposure to RLext produced marked locomotor hypoactivity in behavioral assays, even at low concentrations. In short-term exposures, effects on motor activity were less pronounced, although persistent. qPCR analysis revealed upregulation of grin1a and hsp11 at the highest tested concentrations. Overall, these findings suggest that RLext induces locomotor alterations at realistic exposure levels (1–3 cups per day), while changes in gene expression occur at high doses.

O9- Effect of Organic Amendments on the Nutritional and Sensory Quality of a Long-Shelf-Life Tomato Variety

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Background and objectives: Tomato quality is a key determinant of market value and consumer preference, particularly in traditional long-shelf-life varieties, known for their postharvest durability, nutritional richness, and resilience to water stress. This study evaluated how different organic amendments –compost, a nitrogen-rich fertilizer (N-rich), and ramial chipped wood (RCW) applied at high and low doses (RCW-HD and RCW-LD, respectively) – influence the physicochemical, sensory, and volatile profiles of long-shelf-life tomatoes at harvest and after two months of storage.

Methodology: The tomatoes were harvested in August 2024. Physicochemical analyses, sensory evaluation, and volatile compound profiling by gas chromatography–mass spectrometry (GC–MS) were performed to assess the impact of amendments and storage time on fruit quality and ripening behaviour.

Results and conclusions: No significant differences in yield were observed, although organic amendments affected ripening, acidity, and sensory attributes. Storage significantly influenced colour, with intensity changing as the fruit matured. Acidity interacted significantly with amendment and time: RCW-LD tomatoes' initial acidity decreased after 2 months, while Compost, N-rich, and RCW-HD maintained it, preserving the sugar-acid balance. Compost and RCW-HD also enhanced sweetness, aroma, and overall flavour complexity. A total of 161 volatile compounds were identified, showing a characteristic ripening pattern with a decrease in alcohols and an increase in aldehydes, esters, and lactones after storage. In conclusion, Compost and RCW-HD improved aromatic complexity and sensory perception without compromising yield, underscoring the value of sustainable soil management practices in enhancing traditional Mediterranean tomato quality.

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P32- Designing an *in vitro* study using the INFOGEST digestion model to explore how cooking oils influence carotenoid bioaccessibility in sweet potatoes

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Background and objectives: Orange-fleshed sweet potatoes (OFSP) are rich in carotenoids, which are bioactive compounds providing health benefits; however, their health effects are dependent on the release from the food matrix during digestion and absorption. Since OFSP are mainly consumed cooked and oils facilitate carotenoid solubilization, assessing how different oils affect their bioaccessibility is essential. This study aims to compare the effects of extra virgin olive oil (EVOO), olive oil (OO), and sunflower oil (SFO) on the micellar incorporation of OFSP carotenoids.

Methodology: In preliminary tests, OFSP were cooked with and without OO. Carotenoid content was quantified in both samples by UPLC-DAD, and bioaccessibility was assessed for the oil-free cooked samples using the standardized static *in vitro* digestion model INFOGEST. In the ongoing phase, OFSP will be cooked with EVOO, OO and SFO and subsequently subjected to simulated digestion. Micelle particle size will be measured by laser diffraction.

Results and conclusions: Preliminary results show that cooking OFSP enhances carotenoid release, but bioaccessibility decreases after digestion. The addition of OO increased extraction by ~106%. Monounsaturated fatty acid (MUFA)-rich oils, such as EVOO and OO, are expected to promote higher carotenoid micellization and stability than polyunsaturated fatty acids (PUFA)-rich oils, such as SFO. Moreover, EVOO is expected to better preserve carotenoid integrity during digestion due to its high antioxidant content. Evaluating the effects of SP processing and oil addition on carotenoid micellization during digestion will contribute to maximizing the potential of this underutilized vegetable.

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P37- Dietary Polyamines: Innovations and Applications in Food and Health

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Background and objectives:

Polyamines, putrescine, spermidine, and spermine are aliphatic molecules found in all living organisms. In humans, they play essential roles in biological processes such as cell proliferation, differentiation, gene protection, and autophagy activation. Notably, polyamines exhibit strong antioxidant properties, helping to mitigate oxidative damage to lipids, nucleic acids, and proteins which is crucial in preventing chronic inflammatory diseases and reducing lipid peroxidation. Evidence suggests that increasing polyamine intake contributes to the prevention of chronic inflammatory diseases and age-related conditions. In this sense, the objective is to explore the emerging evidence on the health-promoting effects of dietary polyamines, emphasizing their antioxidant properties and potential to reduce lipid oxidation in food matrices. Additionally, it investigates the feasibility of enriching foods with polyamine-rich ingredients to support healthy aging.

Methodology:

A systematic review of previously published literature was conducted, emphasizing the role of spermidine in aging. To assess practical applications, a breadstick with satisfactory sensory characteristics, enriched with *Boletus edulis*, a mushroom high in polyamines, was developed in the Campus Culinary Laboratory. Results concerning of a durability study based on oxidation parameters will be presented.

Results and conclusions:

Thirteen clinical studies, eight observational and five interventional, were identified, all consistently linking spermidine intake with improved markers of healthy aging. The enriched breadsticks showed greater resistance to oxidation, highlighting the potential of polyamine-rich ingredients in functional food development. These findings support the integration of molecular nutrition and food technology to promote health and longevity through innovative dietary strategies.

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P33- Gastronomic Upcycling of Agri-Food By-Products for the Development of New Value-Added Products: a Transdisciplinary Approach

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Background and objectives:

Nearly one third of the food produced worldwide by the agri-food industry is lost or wasted each year, leading to severe consequences for health, food security and the environment. Many of these by-products are rich in nutrients and bioactive compounds, so innovative valorization strategies must be considered. In this context, the project aims to establish convergence among gastronomy, health science and sustainability by exploring culinary techniques to transform agri-food by-products into innovative ingredients. As a practical example, Brewer's Spent Grain (BSG), the main residue of the brewing industry (85% of its total waste), is used to demonstrate the potential of these approaches. BSG is rich in fiber (30-50%) and protein (19-30%), making it a suitable raw material for developing innovative gastronomic products. Through the application of innovative culinary techniques, such as enzymatic treatment, BSG can be transformed into a high-value ingredient in gastronomy and the food industry.

Methodology:

BSG was subjected to enzymatic treatment to break down fibers and release the maximum amount of simple sugars for the elaboration of a molasses-like product. Sugar composition was analyzed using High-Performance Liquid Chromatography with Refractive Index Detector (HPLC-RID).

Results and conclusions:

The enzymatic treatment proved effective: control samples showed low simple sugars levels, whereas treated samples showed an increase in total sugar concentration and the release of additional simple sugars. This method enhances the nutritional value of BSG, offering a potential natural substitute for refined sugars.

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P34- Volatilome Profiling in Phenylketonuria

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Background and objectives: Metabolomics provides insights into metabolic processes and precision nutrition. Volatile organic compounds (VOCs) reflect metabolic and dietary status. Characterizing the urinary volatilome of patients with phenylketonuria (PKU) may reveal novel aspects of disease pathophysiology and dietary management compared with controls.

Methodology: The cohorts of adult PKU patients (60 PKU diagnosed and 34 individuals as control group) were created in the framework of the PKU.Cat Consortium in 2021 thanks to the funded project La Marató TV3 Inherited diseases. The urine volatilome was analysed through HS-SPME GC-MS (Thermo Fisher Scientific, Barcelona, Spain) after optimizing methodology.

Results and conclusions: The HS-SPME GC-MS methodology was evaluated to analyze the urinary volatilome. Briefly, 100µl of urine samples were acidified at pH2 and spiked with deuterated internal standards. Identification of volatile organic compounds (VOCs) is being carried out using spectra from both authentic standards and the NIST library. More than 30 compounds have been identified including alcohols (ethanol), cetones (4-heptanone, 2-butanone, 2-pentanone), aldehydes (hexanal), phenols (2-methoxy-4-vinylphenol), and carboxylic acids (nonanoic acid). The proposed method appears to be promising for volatilomic PKU characterization.

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O10- Intervención educativa nutricional sobre conocimientos de nutrición deportiva en jugadoras de balonmano: un ensayo controlado aleatorizado

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Background and objectives:

Diversos estudios han evidenciado que las atletas femeninas presentan niveles de conocimientos nutricionales insuficientes y una ingesta inadecuada en relación a sus requerimientos nutricionales. Este estudio evaluó la eficacia de una intervención educativa nutricional sobre los conocimientos en jugadoras femeninas de balonmano en Barcelona (España), en comparación con un grupo control sin intervención.

Methodology:

Se realizó un ensayo comunitario controlado aleatorizado. La intervención consistió en un programa de educación nutricional de tres semanas, compuesto por tres sesiones presenciales de 30 minutos, impartidas por una dietista titulada. Participaron cuatro clubes deportivos, asignados aleatoriamente: dos al grupo control (GC) y dos al grupo intervención (GI). Al inicio se evaluaron los conocimientos nutricionales (NUKYA) y la adherencia a la dieta mediterránea (índice KidMed). En la fase post-intervención se volvió a aplicar el cuestionario NUKYA

Results and conclusions:

Se incluyeron 96 participantes (GC=36, GI=60), con edades entre 12 y 19 años (media 15,8 ± 1,2). Al inicio, no se observaron diferencias significativas en los puntajes del cuestionario de conocimientos nutricionales entre ambos grupos. Tras la intervención, el GI mostró un aumento de 19,8 puntos porcentuales en la puntuación total, mientras que el GC presentó un incremento de solo 4,8 puntos. El análisis mediante modelo lineal mixto indicó que la intervención educativa produjo una mejora significativa de 14,4 puntos porcentuales en los conocimientos nutricionales en comparación con el grupo control ($p = 0.002$). Respecto a la adherencia a la dieta mediterránea, el 84,75 % del GI y el 91,43% del GC necesitaban mejorar su patrón alimentario. Conclusiones: La intervención educativa nutricional fue eficaz para incrementar los conocimientos nutricionales en las jugadoras de balonmano.

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P35- MÉTODOS DE VALORACIÓN DE LA PERCEPCIÓN GUSTATIVA

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Background and objectives: Taste is one of the main organoleptic characteristics in the preference and consumption of certain foods, and it can be indicative of potentially harmful substances and spoilage (bitterness is associated with proteolysis and natural toxins). Furthermore, various taste assessment tests can be used to diagnose neurological, respiratory, and systemic diseases. Therefore, the objective of this research is to compare different taste perception tests based on parameters of objectivity, sensitivity, and reliability.

Methodology: A systematic review was conducted from 2024 using the following keywords: "Scale taste Food", "Evaluation taste Food", "Electrogustometry", "Taste Task", "EEG taste", and "Taste Detection Threshold". The "Rayyan" web management platform was used for screening and selecting articles.

Results and conclusions: After comparing subjective (n=4) and objective (n=8) methods, the most reliable were those based on brain signals from measurable stimuli. However, the most widely used methods are those that require panelist responses due to their price, accessibility, and availability, such as the taste strip methodology. On the other hand, objective methods offer very promising results, but the conditions of use must be improved so that they can be employed more routinely. In this regard, it is necessary to promote research aimed at developing more viable and suitable instrumental methods for taste assessment.

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P36- Meat and plant-derived protein hydrolysates showed sex-specific cardiometabolic benefits in Wistar rats fed a cafeteria diet

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Background and objectives:

Metabolic syndrome (MetS) is a major public health issue in Western societies, reaching epidemic levels and increasing healthcare costs. Protein hydrolysates (PHs) from agri-food byproducts represent a promising strategy for MetS prevention and industrial waste valorization within a circular economy. In a previous study, two hydrolysates (PH1 and PH2) obtained from meat- and plant-based byproducts showed blood pressure–lowering effects in spontaneously hypertensive rats (SHR). This study aimed to confirm their antihypertensive effects in a diet-induced preclinical model of MetS and evaluate additional metabolic outcomes.

Methodology:

Sixty-four 8-week-old Wistar rats (32 males, 32 females) were fed a standard (STD) or cafeteria (CAF) diet for 12 weeks. During the last 4 weeks, animals were assigned to four groups (n = 8/sex): (1) STD + vehicle (VH), (2) CAF + VH, (3) CAF + PH1, and (4) CAF + PH2. PHs were administered orally (55 mg/kg/day). Body weight gain and systolic blood pressure (SBP) were recorded weekly. Oral lipid (OLTT) and glucose tolerance (OGTT) tests were performed after 2 and 3 weeks of treatment, respectively.

Results and conclusions:

Both PHs significantly reduced SBP in CAF-fed rats from the first treatment week in both sexes. PHs showed beneficial, sex-dependent effects on CAF-induced alterations. In males, PH1 reduced lipid-induced hypertriglyceridemia, while PH2 decreased plasma leptin and tended to lower postprandial triglycerides. In females, PH2 improved glucose tolerance and reduced adiposity. These findings support the cardiometabolic potential of PH1 and PH2 and warrant further investigation into their mechanisms, particularly their interaction with gut microbiota.

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