المؤتمر الدولي 2 للعلوم الغذائية

2nd International Congress on Food Sciences

CiSA 2025

Congrès International des Sciences Alimentaires

Sustainability, Innovation and Health

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Abstract Book

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	**Biotechnology & Food Quality Laboratory**
	**Agri-Food Engineering Laboratory**
	**Food, Nutrition and Health Laboratory**
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We organize the 2nd CISA 2025 under the slogan:

"Sustainability, Innovation and Health"

The congress thematics:

1. Food and Public Health 

2. Functional Foods and Health 

3. Innovative Products and Health 

4. Artificial Intelligence in Food Sciences 

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Message of the 2nd CISA 2025 President

Dear colleagues and participants,

It is with great pleasure that I welcome you to the **2nd International congress on food sciences CISA 2025**. This year, The **Institute of Nutrition, Food and Agri-food Technologies** – INATAA, **Constantine 1 University Frères Mentouri** is organizing the second edition **CISA 2025** under the theme "**Durability, Innovation and Health**". This edition follows the series of seminars organized since 2014 on food sciences and reflecting the evolution of national research in this strategic field.

The **2nd CISA 2025** highlights the essential interrelation between food, nutrition and health at a time when issues of prevention, quality and food safety are more than even at the forefront of societal priorities of our Country. This edition aims to emphasize scientific advances that improve our understanding of the impact of diet on well-being, prevention of metabolic diseases and the promotion of sustainable health.

Special attention is given to functional foods, true drivers of innovation and public health. Rich in bioactive compounds and developed to meet specific physiological needs, these products offer a strategic response to current nutritional challenges by contributing to preventive, personalized and evidence based nutrition.

Furthermore, **CISA 2025** will emphasize research on bioactive and smart packaging, a rapidly expanding area aimed at improving food preservation, extending shelf life, enhancing safety and reducing environmental impact. These innovative packaging systems, enriched with natural antimicrobial and antioxidant compounds, represent a key component of sustainable and functional food solutions.

The 2025 edition also highlights the growing integration of artificial intelligence (AI) into food sciences. AI technologies now make it possible to optimize food formulation, enhance processing methods, strengthen traceability and sanitary safety and model complex interactions between food components, the microbiota and human health. AI is thus becoming an essential tool for accelerating innovation and supporting the transition toward smarter and more sustainable food systems.

This congress will bring together Keynote speakers from various countries (Algeria, Belgium, Italy, Spain, Poland, Tunisia and Burkina Faso), more than 350 researchers representing universities, research centers from the national territory, public institutions and socioeconomic partners.

I would also like to express my sincere gratitude to all our sponsors. Their commitment and support have been essential to the success of this congress.

Finally, **CISA 2025** offers a unique opportunity to share knowledge, collaborations and promote innovative solutions for healthy, functional and sustainable food.

Welcome to Constantine

Prof. Halima Boughellout
President of 2nd CISA 2025
Director of INATAA

Conferences

Santé 4.0: l'IA au cœur de la médecine de précision

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Abstract

La Santé 4.0 représente une révolution dans le domaine de la santé, où l'intelligence artificielle joue un rôle fondamental pour la création d'un écosystème de santé intelligent, préventif, prédictif et personnalisé.
L'IA, en cette médecine de précision, intègre dans des algorithmes d'apprentissage automatique (Machine Learning) et d'apprentissage profond (Deep Learning), des données multi-omiques (génomiques, protéomiques, métabolomiques), cliniques, biométriques en temps réel provenant de capteurs portables et informations sur le mode de vie des patients. On peut ainsi, grâce à l'IA, stratifier le risque des patients avec une plus grande précision, prédire la susceptibilité aux maladies et diagnostiquer des affections à des stades encore plus précoces.
Le volet thérapeutique est aussi révolutionné par l'IA avec la possibilité de personnalisation des traitements. Elle contribue à identifier les cibles thérapeutiques optimales, à proposer des schémas thérapeutiques personnalisés et à prédire la réponse individuelle des patients à des médicaments spécifiques, améliorant ainsi l'efficacité et minimisant les effets indésirables. L'analyse par l'IA des données issues des objets connectés permet également des ajustements en temps réel des traitements et une surveillance à distance des patients, à l'origine de modèle de soins continu et participatif.
Toutefois, la mise en place de la médecine de précision pilotée par l'IA rencontre des défis majeurs, en rapport particulièrement avec la confidentialité et sécurité des données, le risque de biais algorithmique, le cadre réglementaire et la formation des cliniciens. Ces derniers ne seront pas détrônés par l'IA mais celle-ci devrait les rendre meilleurs.

Anti-fraud controls and Agri-food quality: ICQRF-MASAF

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Abstract

Food safety and fraud prevention are of great importance in maintaining public health, safeguarding consumer trust, and ensuring the integrity of the import/export fluxes. The increasing complexity and globalization of the food industry have made it increasingly challenging to detect and fight against food fraud effectively. The ICQRF, with its daily action for the protection of "Made in Italy" products gives a significant contribution to consolidate the reputation of the quality of Italian products. Controls in the Agro-food sector are more and more an active marketing factor, which can position Italian food as a high-end product. Fighting frauds and the 'Italian Sounding' phenomenon is therefore a priority. This work shows the activity carried out by the ICQRF against frauds, usurpations, and counterfeiting phenomenon, which harms Italian quality products, and consumers as well. The operational results confirm the quality of the Italian control system, where the ICQRF stands among the main enforcement Authorities worldwide. With six laboratories and about 100 laboratory technicians, ICQRF has an independent capacity for analytical verification of agri-food productions, a peculiarity that has few international comparisons. All laboratories operate in compliance with the UNI CEI EN ISO/IEC 17025:2018 standard "General criteria on the competence of testing and calibration laboratories", carrying out checks based on analytical determinations accredited by the national accreditation body ACCREDIA, the accreditation concerns a total of 240 tests, of which 13 managed in a "flexible field". ICQRF has also tasting panels, responsible for the evaluation and official control of the organoleptic characteristics of virgin and extra virgin olive oils, using the method defined at EU level. The tasting committees admitted pursuant to the Ministerial Decree of 18 June 2014, have obtained international recognition from the IOC. (International Olive Council). All ICQRF Laboratories participate in proficiency tests, i.e. ring tests organized by Providers, preferably accredited based on the UNI CEI EN ISO/IEC 17043 standard, to evaluate their analytical performance, also for the purpose of maintenance of accreditation. The harmonization of the ICQRF Quality System, a priority objective for the uniform application of the specific sector standard and to guarantee the validity of the analytical data produced by the individual laboratories, is managed by the TERR II Office with the active collaboration of a working group which involves all the Quality Assurance Managers of the Laboratories distributed throughout Italy. The ICQRF laboratories, as an institutional task, also carry out research activities with National and International Research Institutions and Universities, coordinated by the TERR II Office. The various lines of research are in fact an essential tool for improving the action to combat fraud in the agri-food sector, as well as for enhancing the quality characteristics of foods. ICQRF develops new methods of analysis on agri-food matrices capable of highlighting any use of fraudulent production practices or identifying new parameters for the qualitative characterization of foods. ICQRF appointed representatives actively also participate as expert members inside the DG AGRI EU Committee for several matrices (i.e. Oil, wine, etc.)

Allaitement maternel

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Abstract

L'allaitement maternel exclusif jusqu'à l'âge de 6 mois reste l'étalon or en matière de nutrition pour le nouveau-né et pour le nourrisson.
A travers cette conférence, l'auteure détaille la physiologie de la lactation, les bienfaits de l'allaitement maternel, comment mettre en route un bon AM, les difficultés rencontrées au cours de l'AM (pour les 2 concernés mère et enfant), les situations particulières que doit gérer le clinicien, les CI réelles de l'AM et elle termine par une conclusion sur les avantages de l'AM.

AI-based approaches for nutritional risk assessment

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Abstract

Nutritional risk assessment is essential for preventing and managing clinical issues related to malnutrition, obesity, and dietary imbalances. Traditional tools often depend on static clinical scoring systems that may lack sensitivity to the complex, multifaceted nature of individual nutritional status. Artificial intelligence (AI), especially machine learning and neural network models, offers promising ways to improve the accuracy, responsiveness, and personalization of nutritional risk assessment. This conference reviews current AI-based methods for identifying nutritional risk, both in clinical and community environments. It will highlight models that combine multimodal data, such as biological metrics, clinical signs, dietary intake, and data from wearable sensors, to enable personalized risk classification and real-time tracking. Case studies from oncology, geriatrics, and critical care will demonstrate AI's added value in recognizing high-risk profiles and supporting early nutritional intervention. The performance of AI-driven techniques versus traditional screening tools will be critically analyzed. Lastly, ethical, methodological, and regulatory issues will be addressed, with a focus on transparency and clinical validation of algorithms.

Oxidative stress, dietary antioxidants and their role in human health.

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Abstract

The role of oxidative stress (or redox status) in human health in general, but also in the development of various diseases such as cardiovascular and neurodegenerative diseases and cancers, has become a scientific reality. However, it is important to understand that there are three types: physiological, pathological and adaptive, the mechanisms of action of which we will examine in detail. To counteract the harmful effects of pathological oxidative stress, our body has two main types of antioxidants: enzymes and small antioxidants, the latter found exclusively in our diet and, in particular, in the age-old Mediterranean diet. We will focus on the dietary sources of polyphenols, which are still relatively unknown, as well as their roles and modes of action in human health. However, we will also discuss the potential toxicity of antioxidant dietary supplements taken in excessive doses. Finally, we will briefly discuss the different blood markers that can be used to accurately assess oxidative stress and how to interpret the data.

All this information can be found in the book:
Oxidative Stress and Antioxidants. New Concepts. J. Pincemail, Testez Edition, 2014.

Plaidoyer pour un plan national Nutrition, pourquoi et comment ?

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Abstract

L'obésité est d'une maladie chronique, multifactorielle, influencée par la génétique, le microbiote, les habitudes alimentaires, des facteurs socio-economiques et les modes de vie. L'obésité représente un défi majeur de santé publique : son coût dépasse largement les dépenses de prévention. En Algérie, comme dans de nombreux pays, sa prévalence augmente de manière préoccupante et touche toutes les tranches d'âge. Les données issues de l'enquête STEPwise OMS montrent une progression constante du surpoids et de l'obésité (surpoids : Femmes : 63,3%, Hommes : 48,3%. Obésité : femmes 30 %, hommes 14 %. Aussi, les deux dernières enquêtes réalisées par l'INSP (2024 et 2025), en collaboration avec la SAOMM, ont mis en évidence une prévalence élevée de l'obésité chez les enfants scolarisés âgés de 5 à 11 ans, estimée à 13,4 % ainsi que chez les jeunes adultes universitaires (étudiants) âgés de 18 à 24 ans estimée a 11,3 %. Par ailleurs, plusieurs études ont montré une évolution des habitudes alimentaires vers des régimes plus denses en énergie, riches en sucres et en produits ultra-transformés. Cette transition nutritionnelle, associée à une forte sédentarité, contribue à l'augmentation de l'obésité et ses complications ; le diabète, l'hypertension, les maladies cardio-vasculaires, certains cancers et la MASH.

Face à cette situation, il est urgent de dépasser les approches individuelles pour construire une réponse nationale cohérente. Un Plan National de Nutrition, fondé sur des bases scientifiques solides, est indispensable. En effet, aucun département ministériel ne peut, à lui seul, résoudre la crise de l'obésité : un véritable plan doit mobiliser la santé, l'agriculture, l'éducation, les finances, l'industrie alimentaire et les collectivités locales.

Un Plan National de Nutrition constitue une opportunité majeure pour améliorer la santé de la population, réduire les maladies chroniques et renforcer le système de santé algérien.

Ce plan devra s'appuyer sur plusieurs piliers essentiels : l'éducation nutritionnelle à tous les âges ; l'accès à une alimentation saine et abordable ; la régulation de l'industrie agroalimentaire ; l'aménagement du territoire favorisant l'activité physique ; une prise en charge médicale adaptée ; la lutte contre les inégalités sociales. L'Algérie dispose du savoir scientifique, de données locales fiables et d'exemples internationaux éprouvés. Il est temps de transformer ces acquis en un plan national ; une action collective ambitieuse et durable.

Variabilité pondérale et son impact sur la santé

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Abstract

La variabilité pondérale, définie comme l'ensemble des fluctuations du poids corporel au cours du temps, constitue un phénomène fréquent mais encore sous-estimé dans l'évaluation du risque cardiométabolique. De nombreuses données montrent que les cycles répétés de perte et reprise de poids, souvent appelés « weight cycling » ou « effet yo-yo », sont associés à une augmentation de la morbidité, indépendamment de l'indice de masse corporelle (IMC) initial.
Comprendre les mécanismes physiopathologiques impliqués dans cette variabilité, notamment les modifications hormonales, métaboliques et inflammatoires, ainsi que leurs répercussions sur le risque cardiovasculaire, le diabète de type 2 et certaines pathologies chroniques permet une meilleure maîtrise de la perte pondérale. L'objectif est de souligner l'importance d'une approche centrée non seulement sur la perte de poids, mais aussi sur sa durabilité, afin d'améliorer les résultats de santé globale.

Facteurs influençant la malnutrition aiguë chez les enfants de moins de cinq (05) ans au Burkina Faso

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Abstract

Le Burkina Faso, à l'instar des pays en développement est structurellement confronté à une situation nutritionnelle préoccupante. Dans le but de renforcer la surveillance nutritionnelle, le Gouvernement et ses partenaires ont mis en place depuis 2009 un mécanisme de collecte de données basée sur la méthodologie SMART. Les enfants âgés de 0 à 59 mois étaient concernés pour les mesures anthropométriques et la morbidité et ceux de 0 à 23 mois pour les pratiques d'alimentation du nourrisson et du jeune enfant (ANJE). Les analyses ont porté sur toutes les 45 provinces du pays. Au total, il a été estimé que 699 000 enfants âgés de 6 à 59 mois ont souffert de malnutrition aiguë, ce qui représentent environ 10% de cas en plus en comparaison à la période d'octobre 2020 à juillet 2021 avec une augmentation des cas de MAS de plus de 18 %. Sur la période courante, seule une (01) province était en situation Acceptable ; 21 provinces étaient en situation d'Alerte; 18 provinces en situation Sérieuse et 5 provinces en situation Critique. Les facteurs contributifs à la malnutrition aigüe variaient d'une unité d'analyse à une autre, cependant, il peut être retenu pour les provinces classées en phase sérieuse et plus : un apport alimentaire inadéquat, les prévalences élevées des morbidités infantiles (fièvre, paludisme diarrhée...), les mauvaises conditions d'hygiène (inaccessibilité à des installations d'assainissement) et la faible couverture d'accès à l'eau potable. Des interventions urgentes et précoces étaient nécessaires pour inverser ou contenir une éventuelle dégradation de l'état nutritionnel des personnes vulnérables (enfants de moins de 5 ans) et les tendances de la malnutrition aiguë. Parmi ces interventions, il était question d'assurer la surveillance et l'analyse de la sécurité alimentaire et nutritionnelle dans les zones identifiées comme critiques et/ou à risque de dégradation, avec des analyses à un niveau désagrégé, prenant en compte les facteurs capables d'influencer les dynamiques de la prévalence. C'est dans cette optique que cette étude a été initiée. Elle visait à fournir non seulement des données actualisées sur la situation nutritionnelle et sur la morbidité chez les enfants de 6 à 59 mois, mais aussi sur les pratiques d'alimentation chez le nourrisson et le jeune enfant (ANJE).
Méthodologie : La première étude visait à évaluer les « facteurs influençant la malnutrition aiguë chez les enfants de moins de 5 ans à l'Hôpital Saint Camille de Ouagadougou (HOSCO) » afin de disposer de données actualisées pour une meilleure planification des interventions en matière de nutrition et des pratiques d'alimentation chez le nourrisson et le jeune enfant (ANJE). La méthodologie utilisée s'est appuyée sur une étude prospective à visée descriptive. La population d'étude était constituée de 201 enfants de moins de 5 ans reçus en consultation pédiatrique ou pour la pesée du mois à l'HOSCO. Les données ont été collectées à travers une fiche d'enquête élaborée autour des éléments suivants : les données sociodémographiques de l'enfant, les données sociodémographiques des parents, les caractéristiques alimentaires de l'enfant, les examens cliniques et les autres causes associées à la malnutrition (causes immédiates, fondamentales et sous-jacentes). Ces données ont été saisies grâce au tableur Excel 2016 et analysées grâce au logiciel IBM SPSS version 2020.

Une autre étude en cours de rédaction vise à établir les éléments clés permettant de comprendre le rôle potentiel de l'allaitement maternel exclusif sur le développement de l'immunité et l'expression génique chez les enfants exclusivement allaités. Ceci est essentiel pour concevoir de manière optimale des outils d'intervention utilisables dans les programmes d'élimination de la malnutrition. Nous analyserons les mécanismes épigénétiques ainsi que les profils de transcription et les relierons aux différentes réponses immunologiques. Une comparaison sera effectuée entre les enfants exclusivement allaités et ceux qui ne le sont pas, après un suivi d'un an et demi.
Résultats : L'âge moyen des enfants de cette première étude était de 12,36 mois ± 7,4 avec un sex ratio (M/F) de 1,21. La tranche d'âge de 7 à 13 mois était la plus représentée (59,2%). Les premiers enfants de la fratrie étaient majoritairement touchés (38,30%). Le test de Chi-carré a montré que le statut professionnel (p = 0,025), matrimonial (p = 0,000) et le niveau d'instruction (p =0,025) de la mère et l'état général de l'enfant (p = 0,000) étaient des facteurs significativement associés à l'état nutritionnel des enfants. Nous avons également observé un lien statistiquement significatif entre le niveau d'instruction du père (p = 0,011) et les autres causes associées à la malnutrition telle que la pauvreté qui influençaient la survenue de la malnutrition aiguë. L'approche utilisée dans la deuxième étude génèrera des données plus fines incluant les données moléculaires épigénétiques et immunologiques dans le cadre d'un programme de surveillance visant à évaluer la protection relative contre les infections chez les enfants exclusivement allaités. Dans notre contexte, peu de données existent sur le sujet à ce jour. Cette étude ambitionne d'établir l'existence d'une telle corrélation et d'optimiser la conception d'interventions efficaces ciblant le réservoir asymptomatique du parasite, du virus ou de la bactérie. Dans le cadre de ce projet, nous mettrons en commun de multiples compétences existantes au Burkina Faso et une expertise unique.
Conclusion : Les résultats de la première étude ont montré que les retards dans l'introduction des aliments complémentaires, le statut professionnel et matrimonial des mères, le niveau d'instruction des parents, l'état général des enfants, ainsi que la pauvreté ont des influences notables sur le statut nutritionnel de l'enfant. L'approche qui sera utilisée dans la deuxième étude pourrait être employée en complément des résultats déjà obtenus dans le cadre d'un programme de surveillance intégré de la malnutrition chez les enfants de 0 à 5 ans. Elle constituera donc une preuve de concept afin d'optimiser la conception d'interventions efficaces ciblant les enfants de moins de 5 ans.

Application and perspectives of natural deep eutectic solvents

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Abstract

Natural deep eutectic solvents (NADES) are emerging as green, tunable media formed by hydrogen-bond donors and acceptors that turn liquid near room temperature. Compared to traditional volatile organic solvents, NADES provide low toxicity, minimal vapor pressure, and adjustable viscosity, supporting green chemistry principles for safer and more sustainable processing. In food and health uses, their main benefits include (i) efficient extraction of valuable bioactives from plant and food by-products, (ii) stabilization and delivery of sensitive compounds, and (iii) process intensification with less environmental impact.

This contribution synthesizes recent laboratory findings on NADES composed of biocompatible components. Using agri-food waste and plant materials such as chokeberry pomace, spent coffee grounds, hop cones, and various fruits/flowers as matrices, NADES enabled efficient recovery of anthocyanins, carotenoids, betalains, and polyphenols. Response surface methodology highlighted how temperature, time, and solvent-to-material ratio, together with strategic water addition, modulate viscosity and mass transfer to maximize yield and antioxidant activity.

Looking ahead, NADES open possibilities for ready-to-use, food-grade extracts, smart/active packaging ideas, and cryopreservation of foods and biological materials. Major challenges for scaling up include solvent recycling, obtaining regulatory approval, conducting thorough toxicological assessments, and integrating with existing processes. Overall, NADES serve as a flexible platform to valorize side streams, develop functional foods, and reduce the environmental impact of extraction and stabilization steps throughout the food supply chain.

Anti-listeria bacteriophage-based packaging to enhance the safety of traditional Canestrato cheese

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Abstract

The project "Anti-Listeria Bacteriophage-Based Packaging to Enhance the Safety of Traditional Canestrato Cheese (Pa4Ca)" aims to promote food safety, sustainability, and circular innovation within the agri-food chain through the development of natural antimicrobial packaging solutions. In this framework, two novel anti-Listeria edible biopackaging systems—based on whey protein (WPS) and tapioca starch (TSS) and activated with the bacteriophage Listex™ P100—were developed and tested to enhance the microbial safety of traditional Canestrato Siciliano cheese.

Both formulations ensured phage viability and microbiological stability for 60 days under refrigeration, achieving a ≈2 log CFU/g reduction of Listeria monocytogenes after 3 days of storage in inoculated cheese. Sensory analyses (CATA, QDA, and triangular tests) revealed that the innovative phage-based coating preserved the typical visual and olfactory traits of Canestrato while enhancing aroma intensity and freshness perception. Notably, 70% of assessors preferred the cheese with bioactive packaging, indicating positive consumer acceptance.

Complementary neuromarketing studies showed that bio-packaged products, especially when supported by clear informational priming, elicited higher cognitive engagement, emotional activation, and perceived product innovativeness, safety, and sustainability. These factors were associated with increased purchase intention and willingness to pay.

Overall, results demonstrate that bacteriophage-activated edible coatings can ensure microbial protection without compromising sensory identity, aligning with Pa4Ca's mission of integrating biotechnology, tradition, and consumer perception.

Towards active and sustainable packaging: natural deep eutectic solvents-modified chitosan films

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Abstract

Deep eutectic solvents (DES), and more specifically their natural variants (NADES), have emerged in recent years as a promising class of green solvents with potential applications across food, pharmaceutical, and polymer science. These eutectic mixtures, composed of hydrogen bond donors and acceptors, are typically biodegradable, non-toxic, and accessible from natural compounds such as organic acids, sugars, amino acids, or quaternary ammonium salts. Due to their unique physicochemical properties – including low volatility, high solvating power, and tunable polarity – NADES are gaining increasing attention as functional alternatives to conventional organic solvents. In the context of food science, their utility extends beyond the extraction and stabilization of bioactives. They can be employed as plasticizers, carriers for active substances, or even as edible components in the formulation of food-contact materials. The role of NADES in modifying the structure and functionality of biopolymeric films is particularly relevant to the development of sustainable food packaging. Their ability to alter molecular interactions within polymer matrices opens new avenues for improving mechanical properties, enhancing bioactive retention, and controlling release kinetics. Among natural polymers used in food packaging, chitosan stands out due to its film-forming ability, biodegradability, biocompatibility, and intrinsic antimicrobial activity. Recognized as Generally Recognized As Safe (GRAS), chitosan is frequently applied to produce edible coatings and films that act as a protective barrier against oxygen, moisture, and microbial contamination. These coatings can also serve as delivery systems for functional additives, enhancing shelf life and food safety.
Ongoing research, including studies conducted by the author, has focused on exploring the potential of NADES in developing chitosan-based films for food packaging applications. These studies investigate how NADES can influence chitosan films' mechanical properties, antioxidant activity, and migration behavior, aiming to enhance their functionality and sustainability in food packaging systems.

Le statistiquement significatif, le vraisemblable et la recherche scientifique

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Abstract

A travers des exemples récents et problématiques concernant l'usage ou l'intervention de la statistique dans la connaissance et la communication scientifique en général (en Biologie en particulier), nous allons essayer d'aborder les questions épineuses que rencontre aujourd'hui un chercheur face à des données et face aux nombreuses théories qui se bousculent donnant souvent d'ailleurs l'impression de se contredire. Nous essayerons à ce sujet d'aborder la différence entre la crédence d'une théorie et la vraisemblance des données. Allant par exemple de la notion de mal nutrition en se basant des seuils dits statistiques universels, en passant par des indicateurs notoires tels que les taux de TSH statiquement "significatifs" pour poser un ou des diagnostics, il nous parait aujourd'hui impératif de rétablir le rôle prépondérant de l'expert – appellation statisticienne pour désigner un domaine de compétence – et démêler un tant soit peu des notions répandues parmi nous et qui ne sont pas sans décrédibiliser la science et les scientifiques. Quel sens donner à une valeur statistiquement "normale" vs une valeur optimale ?
Car contrairement aux autres branches de la Mathématique à propos desquelles la communication se fait en intra muros, la statistique est convoquée presque comme une caution de "véracité"; et d'efficacité à chaque fois qu'un scientifique dont les travaux abondent des pourcentages souhaite communiquer le fruit de ses recherches. Entre l'impossibilité de maitriser l'arsenal théorique de la Statistique et le danger de réduire cette dernière à une panoplie de recettes, nous attendent de véritables défis.

Smart and sustainable process manufacturing for agri-food formulated products: engineering the products of tomorrow

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Abstract

The global agri-food system faces an unprecedented challenge, providing safe, nutritious, and appealing food to a growing population while drastically reducing its environmental footprint. This paradigm shift requires a transformation in the manufacturing methods of formulated food products. This study focuses on the innovation in technologies and strategies that will define the future of food production. It highlights the challenges of smart manufacturing for formulated products, which are typically multi-component, structured, and multi-phase. These challenges, prevalent in the agri-food industry, are linked to rapidly evolving customer demands and, in some cases, a strict regulatory framework. This study examines advances in smart manufacturing, including digitalization and the use of large datasets with predictive models and solution-finding algorithms in these industries. While progress has been made, it is imperative to develop demonstrations of model-based tools on realistic problems to demonstrate their benefits and highlight systemic weaknesses.

Application of nuclear and isotopic techniques to enhance contaminant detection in food safety systems in Algeria

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Abstract

Food safety in Algeria faces increasing challenges due to expanding agricultural activities and food processing industries. Conventional analytical techniques, while essential, show limitations in sensitivity and speed when addressing complex chemical and biological contaminants. Nuclear and isotopic methods have demonstrated superior capability for trace-level contaminant detection, contributing to more accurate risk assessments and regulatory compliance.

This study evaluates the application of nuclear analytical techniques including gamma spectrometry, DXRF, isotopes and radio receptor assay in Algerian food safety laboratories. These methods were applied to representative samples from agricultural products and processed foods to detect pesticide residues, heavy metals (e.g., lead, cadmium), mycotoxins, and antibiotics. Analytical protocols were benchmarked against international standards, including Codex Alimentarius guidelines, and ISO/IEC 17025 standards to ensure method validity and reproducibility.

The integration of nuclear and isotopic methods significantly improved detection limits, reaching contaminant concentrations as low as parts per billion (ppb). Combined, these techniques enhanced traceability and provided reliable datasets for contamination mapping across the food supply chain. Implementation of these methods strengthened national monitoring programs and improved alignment with international food safety requirements. This communication summarizes analytical findings.

Nuclear and isotopic analytical techniques offer powerful tools to overcome limitations ofconventional methods in Algeria's food safety framework. Their adoption enhances laboratory capacity, supports early-warning systems, and bolsters quality assurance practices crucial for public health protection and sustainable agriculture. Algeria in 2025 made a Strategic investment in these technologies, in capacity building, and interdisciplinary collaboration that are essential for advancing food safety governance.

Sustainable microbial production of PHAs for next-generation biodegradable food Packaging

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Abstract

Growing awareness of environmental pollution from petroleum-based plastics has driven the search for sustainable alternatives in food packaging. Polyhydroxyalkanoates (PHAs) are a family of biodegradable polyesters synthesized by various microorganisms as intracellular carbon and energy storage materials. They are fully biobased, biocompatible, and compostable, making them promising candidates for replacing traditional plastics. This study focuses on optimizing the microbial production of PHAs using cost-effective renewable feedstocks and evaluating their performance as biodegradable food packaging materials.

PHA was synthesized through bacterial fermentation under nutrient-limited conditions using glucose or agro-industrial waste as the primary carbon source to reduce process costs.

Following fermentation, polymers were recovered using solvent and non-solvent extraction techniques, then purified and characterized. Fourier-transform infrared spectroscopy (FTIR), differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), and scanning electron microscopy (SEM) were employed to investigate the chemical structure, crystallinity, morphology, and thermal stability of the resulting materials. PHA films were prepared by solvent casting and tested for tensile strength, elongation at break, oxygen and water vapor transmission rates, and biodegradation behavior under simulated composting conditions.

The developed films exhibited desirable flexibility, mechanical integrity, and barrier performance suitable for short-term food preservation applications. Additionally, the materials showed complete biodegradability within weeks to months, eliminating post-use plastic residue and lowering environmental impact.

The use of agricultural residues such as molasses and corn steep liquor further improved the economic viability and sustainability of the PHA production process. This research demonstrates the potential of integrating biotechnological polymer synthesis with environmentally responsible food packaging design. Future work will focus on improving polymer properties through copolymerization and blending strategies to expand the applicability of PHAs in various packaging formats.

Oral communications

Thematic 1 – Food and Public Health

Abstract #: **T1-O-01**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Health risk assessment of level of acidity and sweeteners through beverages marketed in Algeria

Presenting author **Hesna Malainine**[1,2]

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Abstract

The aim of our study is to determine a physico-chemical quality of beverages (pH, titratable acidity, Sugar content (Brix) and level of sweeteners) mar-keted in Algeria. 66 analyzed samples are divided into five categories: 33 soft drinks, 23 fruit drinks, 4 energy drinks, 3 light beverages, 3 juices and nectar. pH analysis is performed by pH-meter, titratable acidity by increment of 0.1N NaOH were titrated un-til neutrality reached. The 1st part is to use an Abbe refractometer to measure the sugar content (Brix). The 2nd part, using high performance liquid to ana-lyze aspartame saccharin and acesulfame k. The physicochemical results of all the analyzed samples show mean value of pH was between 2.42 to 3.94. With mean titratable acidity of 0.38±0.233g/100mL. The brix rate is showed an average value of 10.76±3.112%. On average, beverages contained of 22.11 ± 46.062mg/L of Aspartame, 16.15 ± 21.424mg/L of saccharin and 47.47 ± 53.32mg/L of acesulfame k. All results of chemical quality present a significant difference between mean (p-value <0.005).

Keywords

Algeria, beverages, HPLC, physico-chemical, quality

Thematic 1 – Food and Public Health

Abstract #: **T1-O-02**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Relation entre l'apport alimentaire en vitamine K et la stabilité de l'effet anticoagulant chez les patients sous Sintrom a courte terme

Presenting author **Zenati Naziha**[1]

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Abstract

Sintrom est un anticoagulant oral couramment prescrit pour la prévention et le traitement des troubles thromboemboliques. En raison de sa marge thérapeutique étroite, son efficacité nécessite une surveillance stricte du dosage afin d'éviter les complications hémorragiques tout en maintenant un effet anticoagulant optimal. Plusieurs facteurs influencent la variabilité intra- et interindividuelle de la dose requise, notamment l'état nutritionnel, la fonction hépatique, la malabsorption intestinale, les facteurs génétiques, l'origine ethnique et particulièrement l'apport alimentaire en vitamine K. Bien que certaines études aient évoqué l'impact de la vitamine K sur la stabilité de l'INR, la plupart se sont limitées à des observations de court terme. Cette étude vise à examiner l'effet d'un régime restreint en vitamine K sur l'équilibre diététique de patients sous traitement par anti-vitamine K (Sintrom) et à proposer un schéma alimentaire adapté. Elle a été menée au sein du service de chirurgie cardiaque de l'EHU d'Oran, sur une période de six mois (septembre 2023 – février 2024). Des données cliniques, nutritionnelles et biologiques ont été recueillies via un questionnaire comportant un examen clinique et une enquête alimentaire. Les bilans sanguins ont été extraits des dossiers médicaux, et les analyses ont été effectuées à l'aide de GraphPad Prism et Nutrisurvey. L'étude a inclus des patients âgés de 19 à 60 ans. Les résultats montrent que les patients respectant un apport réduit en vitamine K maintiennent un INR stable entre 2 et 3, correspondant à la plage thérapeutique recommandée. En revanche, les patients consommant régulièrement des aliments riches en vitamine K présentent un INR inférieur à 2, réduisant l'efficacité anticoagulante. Ainsi, un apport stable et modéré en vitamine K, plutôt qu'une restriction stricte, est essentiel pour garantir la stabilité de l'INR.

Keywords

Vitamine K, Sintrom, AVK, INR, Anticoagulant, Régime alimentaire, Variabilité thérapeutique

Thematic 1 – Food and Public Health

Abstract #: **T1-O-03**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Estimation of theoretical maximum daily intake (TMDI) of the azoicfooddde INS 102 among the general population

Presenting author **Sabrina Zazoun**

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Abstract

With the rising use of chemicals of synthetic origin in food industries, food control and exposure monitoring remain critical concerns for ensuring food safety. The present study aimed at evaluating the exposure of the general population to INS 102 through diet by adopting a tiered approach as established by EFSA. To this end, Theoretical Maximum Daily Intake (TMDI) was derived from the Maximum Permitted Level (MPL) of 100 $\mu g.mL^{-1}$ and the Daily Exposure (DE) of INS 102 was calculated from the actual usage levels measured using LC-MS/MS method in one food category. The first results showed that the TMDI oscillated between 0.11 and 1.31 mg/Kg bw/day per capita. The more refined tier showcased that the DE of INS102 ranged from 0.03 to 0.35 mg/Kg bw/day per capita. Our findings estimated that the exposure to INS 102 did not exceed the TDI via consumption of solely one food category. Within the regulation frameworks, further food categories containing INS 102 must be included to derive a global estimate of consumption and a periodic monitoring is advised for promoting public health.

Keywords

Food safety, TMDI, INS 102, LC-MS/MS, Daily exposure

Thematic 1 – Food and Public Health

Abstract #: **T1-O-04**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Anthropometric measurements, muscle mass assessment, skeletal muscle mass index (SMI), older adults, type 2 diabetes

Presenting author **Khadidja Bessaid**

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Abstract

Assessing muscle mass in older adults with diabetes is essential for detecting frailty, preventing functional decline, and reducing metabolic complications. Simple anthropometric measurements such as mid-upper arm circumference and calf circumference are frequently used as surrogate markers of muscle mass, yet their diagnostic accuracy remains uncertain. To evaluate the relationship between anthropometric parameters (mid-upper arm circumference, calf circumference, waistcircumference) and appendiculars keletal muscle mass (ASM) and skeletal muscle mass index (SMI) in older adults with diabetes. A cross-sectional study was conducted in 252 diabetic patients aged ≥60 years. ASM was measure dusing DEXA, and SMI was calculated as ASM/height². Anthropometric measures were compared between individuals withlow vs normal muscle mass. Correlations were assessedusing Pearson and Spearman coefficients. ROC curves were generated to evaluate the discriminatory performance of each measurement. Meanmid-upper arm circumference was 28.0 ± 3.1 cm, and mean calf circumference was 34.4 ± 3.1 cm. Mean ASM was 16.99 ± 3.80 kg, significantly higher in men (20.3 ± 2.8 kg) than in women (14.5 ± 2.3 kg; p<0.001). Low ASM was present in 56.3% of participants, and low SMI in 60.7%, with higher prevalence among women (p<0.001).
Calf circumferences howed moderate correlations with SMI (r = 0.535, p<0.001) and ASM (r = 0.521, p<0.001). Waistcircumference (r = 0.304, p<0.001) and mid-upper arm circumference (r = 0.275, p<0,001) demonstrated weaker correlations with ASM. ROC analysisrevealedpoordiscriminatoryability for both mid-upper arm circumference (AUC = 0.251) and calf circumference (AUC = 0.19) in identifying low muscle mass. In olderdiabeticadults, low muscle mass is highly prevalent, especially among women. Although anthropometric measurements correlate with ASM, their diagnostic performance is limited. More specific techniques such as DEXA remain essential for accurate assessment of muscle mass in this population.

Keywords

Anthropometric measurements, Muscle mass assessment, SMI, Older adults, Type 2 diabetes

Thematic 1 – Food and Public Health

Abstract #: **T1-O-05**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Regional variations in mediterranean diet adherence: a sociodemographic and lifestyle analysis across mediterranean and non mediterranean regions within the MEDIET4ALL project

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Abstract

L'huile brute de soja, est une huile végétale qui nécessite impérativement un raffinage avant consommation, en raison de la présence d'impuretés susceptibles de nuire à la santé humaine. L'étude réalisée au sein de l'entreprise SPA Mahroussa s'est appuyée sur le suivi de plusieurs paramètres physico-chimiques (acidité, humidité, indice de peroxyde, traces de savon, phosphore, indice d'iode, indice de saponification, couleur) à chaque étape du raffinage, ainsi que sur une analyse sensorielle de l'huile raffinée. Les résultats montrent que le raffinage chimique permet une amélioration significative de la qualité de l'huile : diminution marquée de l'acidité, élimination des impuretés, stabilité de la couleur et réduction de l'indice de peroxyde à des niveaux conformes aux normes. L'huile raffinée obtenue présente systématiquement un aspect limpide, une couleur jaune clair, et une absence d'odeur ou de goût, répondant ainsi pleinement aux attentes des consommateurs et aux exigences du marché.

Keywords

Analyse sensorielle, huile de soja, paramètres physico-chimiques, raffinage chimique

Thematic 1 – Food and Public Health

Abstract #: **T1-O-06**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Experimental evaluation of plant extract: a natural hypolipidemic approach for cardiovascular health

Presenting author **Madi Aicha**[1]

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Abstract

Cardiovascular diseases and lipid metabolism disorders remain a major public health problem. According to the WHO (2010), these pathologies accounted for 30% of global mortality. Hyperlipidemia is a disorder of lipid metabolism characterized by elevated plasma concentrations of different lipid and lipoprotein fractions (Saga et al., 2011). Hypercholesterolemia is a major risk factor for cardiovascular diseases and also induces oxidative stress, leading to increased lipid peroxidation in several organs (Cai et al., 2014).

The present study evaluated the effect of the hydroalcoholic extract of the aerial parts of Natten (Cleome arabica L.) on biochemical parameters (cholesterol, triglycerides, HDL, LDL) in Wistar albino rats. Four groups were prepared: Group 1 served as the negative control, Group 2 received thermoxidized vegetable oil (positive control), while Groups 3 and 4 received thermoxidized oil along with Cleome arabica extract at doses of 100 mg/kg and 500 mg/kg for 22 days. The results showed significant changes in biochemical parameters following the administration of thermoxidized vegetable oil, inducing hypercholesterolemia (increased plasma cholesterol, triglycerides, and LDL levels, with a decrease in HDL). However, rats treated with Cleome arabica extract showed a reduction in cholesterol, triglycerides, and LDL, accompanied by an increase in HDL. In conclusion, this study demonstrates that the hydroalcoholic extract of Cleome arabica L. exhibits a hypolipidemic effect, helping to reduce the risk of cardiovascular diseases induced by hypercholesterolemia. These results support the idea that traditional medicinal plants can contribute to innovative health solutions and offer sustainable alternatives for managing metabolic disorders. The use of Cleome arabica aligns promoting the development of natural, accessible, and eco-friendly bioactive products that support public health and reduce reliance on synthetic drugs.

Keywords

Hypercholesterolemia, Cleome arabica, Hypolipidemic effect, Lipid metabolism

Thematic 1 – Food and Public Health

Abstract #: **T1-O-07**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Ultra-processed foods and childhood allergies: signals from a 45-case study in Constantine

Presenting author **Rabiâa Karoune**[1,2]

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Abstract

The primary objective of this study was to investigate the potential association between the consumption of Ultra-Processed Foods (UPFs) and the onset of allergic symptoms among children and adolescents. Given the increasing global concern regarding the health implications of UPF exposure, particularly in pediatric populations, this exploratory work aimed to generate preliminary evidence within the Algerian context, where data remains carce. A descriptive cross-sectional survey was conducted among 45 children presenting clinically identified allergic manifestations. The data collection tool consisted of a structured questionnaire specifically designed for this study, addressing dietary behaviours, frequency of UPF intake, and maternal perceptions regarding food-induced allergic reactions. The questionnaire was administered through direct, face-to-face interviews during routine consultations in various medical centres across the city of Constantine. UPF categorization adhered strictly to the NOVA classification, which is widely used in contemporary epidemiological and nutritional research for defining levels of food processing. The analysis revealed that the majority of participants consumed UPFs on a daily basis, with several products being ingested multiple times per day. More than 38% of mothers admitted to consume UPFs daily during their pregnancy. Over 42% of the children consumed UPFs daily during their first year of life. Among the most frequently consumed items were instant sugary preparations, chocolate-flavoured drinks, industrial sliced bread, packaged buns and bakery products, all of which represent highly accessible and widely marketed UPFs in Algeria. Moreover, foods identified by mothers as potential triggers of allergic symptoms were pre dominantly UPFs. Confectionery, industrial dairy products, chocolate, and savoury snack foods—particularly crisps—were the most frequently incriminated categories. These findings highlight a possible link between regular UPF consumption and the emergence or exacerbation of allergic manifestations in children and adolescents. Although the present study provides valuable preliminary insight, its limited sample size underscores the need for larger, analytically powered investigations to confirm these associations. Future research should integrate detailed dietary assess ment tools, objective biomarkers of allergic response, and broader population samples to better elucidate causal pathways and to evaluate the implications of UPF exposure on pediatric immune health in Algeria.

Keywords

Ultra-Processed Foods, NOVA classification, pediatric allergy, Algeria

Thematic 1 – Food and Public Health

Abstract #: **T1-O-08**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Influence of the sodium/potassium ratio on left ventricular mass index in hypertensive patients

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Abstract

Arterial hypertension is a major factor in left ventricular remodeling, manifested notably by an increase in left ventricular mass index (LVMi) and alterations in diastolic function. While hemodynamic factors play a decisive role, dietary intake has received growing attention due to its potential contribution to structural cardiac changes. This study aimed to examine the associations between various dietary intakes and echocardiographic parameters in hypertensive patients. Sociodemographic and anthropometric data were collected using a standardized questionnaire. Dietary intake was assessed via a 24-hour dietary recall. Echocardiographic parameters were measured according to international guidelines. The study included 152 hypertensive patients (mean age: 64.71 ± 9.21 years; BMI: 29.23 ± 4.61 kg/m²). High sodium intake was positively associated with an increased atrial filling fraction ($p = 0.034$), indicating impaired diastolic filling. Moreover, a high sodium/potassium ratio was significantly correlated with an increase in LVMi ($p = 0.046$). Analysis also showed that LVMi increases with higher sodium intake. In hypertensive patients, dietary intake significantly influences left ventricular structure and function. Excessive sodium intake is associated with increased LVMi and impaired diastolic filling. These findings emphasize the importance of optimized dietary strategies in preventing left ventricular remodeling in hypertensive individuals.

Keywords

Hypertension, Sodium/potassium ratio, Sodium, LVMI, Nutrition

Thematic 1 – Food and Public Health

Abstract #: **T1-O-09**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Preference scores for salty foods and blood pressure

Presenting author **Esma Boudjouada**

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Abstract

Consumption is largely guided by food preferences, which are shaped by biological factors, cultural influences, and environmental availability. To determine whether there is a relationship between blood pressure levels and salty food preferences. A total of 215 subjects aged from 18 to 55 years, 110 normotensive and 105 hypertensive subjects were recruited. Preferences for salty foods were assessed by scores ranging from 0 "never tastes" to 5 "likes a lot," and thresholds of sensitivity to salty taste were assessed by the three alternatives forced choice test (3-FCA) with increasing concentrations. Statistical analyses were performed using StatView version 5 software. The significance level was 0.05. Our results indicate that the SBP in the whole sample was positively correlated with the PSF (r = 0,28 ; P = < 0,0001), the PSFF (r = 0,20 ; P = 0,0027), and the PTSF (r = 0,20 ; P = 0,003).). A negative correlation was observed between the DBP and the PSFF (r = ‗ 0,27 ; P = 0,0049), and the PTSF (*r* = ‗ 0,25 ; *P* = 0.0075) in normotensive individuals. Preferences score for salty foods (PSF) was 3,74 ± 0,5 and 2,82 ± 1,03 ; preferences score for salty fatty foods (PSFF) was 4,06 ± 0,5 and 3,60 ± 0,6, and preferences score for the total salty foods (PTSF) was 3,74 ± 0,5 and 3,44 ± 0,5 for hypertensive and for normotensive subjects respectively. An association between blood pressure levels and salty food preference scores was observed; there were significant differences between hypertensive and normotensive subjects.

Keywords

Salt, blood pressure, food preferences, comparison, scores

Thematic 1 – Food and Public Health

Abstract #: **T1-O-10**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Prevalence of ESBL- and carbapenemase-producing gram-negative bacteria isolated from diabetic foot infections

Presenting author **Fatima Zohra Moualkia**

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Abstract

Diabetic foot infections (DFIs) represent a major clinical and economic burden for diabetic patients. They are among the most serious metabolic complications of diabetes and may rapidly progress to irreversible septic gangrene requiring limb amputation. Optimizing antibiotic therapy for DFIs relies on understanding the antibiotic susceptibility patterns of the involved bacterial pathogens. This study aimed to evaluate the prevalence of extended-spectrum β-lactamase (ESBL) and carbapenemase production among Gram-negative bacteria isolated from DFIs. Sterile swabs were used to collect samples from foot ulcers. Bacterial identification, antimicrobial susceptibility testing, and phenotypic detection of ESBL and carbapenemase production were performed using the VITEK 2 Compact system. Among 80 tested isolates, 53.9% (43/80) were phenotypically ESBL producers. The highest ESBL frequencies were observed in *Klebsiella spp.* 75% (6/11), *Pseudomonas aeruginosa* 64.3% (16/26), *Escherichia coli* 57.8% (10/18), and *Proteus mirabilis* (25%, 4/16). Additionally, 27.9% (22/80) of isolates were carbapenemase producers, mainly *Klebsiella spp* 62.5% (7/11), *P. aeruginosa* 23.5% (6/26), and *E. coli* 15.8% (3/18). These findings highlight the importance of microbiological testing and antimicrobial susceptibility profiling in the management of diabetic foot infections, especially given the high prevalence of multidrug-resistant ESBL- and carbapenemase-producing microorganisms.

Keywords

Diabetic foot infections, ESBL, Carbapenemase, Antibiotic resistance

Thematic 1 – Food and Public Health

Abstract #: **T1-O-11**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Health status of the marine ecosystem by monitoring the bioaccumulation of certain trace metals in *Merluccius merluccius*: public health risk assessment and ecotoxicology

Presenting author **Ourida Alik**[1,2]

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Abstract

The Algerian coastline is facing increasing anthropogenic pressure, which primarily affects marine biodiversity and, more specifically, human health. This study examines the level of trace metal contamination (Zn, Fe, Cu, Ni, Pb and Cd) and their bioaccumulation in the liver (storage organ) and muscle (the part most consumed by humans) of M. merluccius, a key bio indicator of commercial importance. It thus allows for the assessment of the level of contamination in the marine ecosystem and the risk to human health. Specimens of M. merluccius were collected from various sites along the Algerian coast (Gulf of Béjaïa, Bay of Jijel, and Gulf of Annaba). The concentrations of Zn, Fe, Cu, and Ni (essential trace elements, but whose over accumulation can be toxic), as well as Pb and Cd (non-essential and toxic metals), were measured by inductively coupled plasma atomic emission spectrometry (ICP-AES). The results of this study reveal significant heterogeneity in values, both in terms of target organs and areas studied. The most significant contamination concerns essential trace elements (Zn, Fe), followed by essential trace elements at low doses (Cu, Ni), and finally, purely toxic trace elements (Pb, Cd). Based on the limit values for average concentration in fish muscle, the order of contamination by metallic elements is as follows: Zn>Fe>Cu>Ni>Pb> Cd. Hake from the Gulf of Béjaïa accumulates more essential trace elements (Zn, Fe) than hake from the Bay of Jijel and the Gulf of Annaba, while essential trace elements (Cu, Ni) accumulate more in hake from the Gulf of Annaba. However, Cd and Pb are the predominant elements in the muscle of hake from the Gulf of Béjaïa and the Bay of Jijel, respectively. Depending on the target organ, Zn and Fe accumulate more in the liver, while Cu, Ni, Pb, and Cd accumulate more in muscle than in the liver. The results confirm a state of environmental stress for marine populations and reveal a direct toxicological risk to human health linked to fish consumption. The study calls for an urgent regulatory response to protect the marine environment and public health.

Keywords

Bioaccumulation, Heavy metals, *Merluccius merluccius*, Toxicity, Algeria

Thematic 2 – Functional Foods and Health

Abstract #: **T2-O-01**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Impact of varying freezing temperatures on *Sardinia pilcarudus* as blue fish's nutritional composition and microbiological quality

Presenting author **Nabila Berrighi**[1]

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Abstract

Large amounts of industrial byproducts are discarded annually due to the way the industry handles them. However, because they include significant amounts of bioactive substances, such as polyphenols, these wastes offer a significant potential energy source for animal feed. This research assesses and investigates the effects of replacing ONAB feed with a mixture of tomato dregs and molasses on the broiler bodyweight gain and meat quality. A mixture of tomato dregs and molasses was given as a supplement to the first group, while an ONAB diet was given to the second. Meat samples were removed from each carcass at the conclusion of the studies, and the animals'; weight gain was noted. High-performance liquid chromatography and other analytical methods were used to evaluate the industrial byproduct in order to measure factors such as antioxidant activity. When compared to the control group, the results showed varying degrees of improvement in the polyphenols in the Group 1.

According to the data, broilers fed a diet of industrial byproducts (Group 1) gained noticeably more weight than those fed an ONAB diet (Group 2). The amounts of polyunsaturated fatty acids (PUFAs) and omega-3 fatty acids, especially alpha-linolenic acid (ALA), was one of the latter group notable increases was higher in meat from animals fed on the mixture molasses- tomato dregs compared to that from broiler meat fed only on ONAB ingredient. This can be attributed to the richness of industrial byproducts in bioactive compounds and unsaturated fatty acids. The special benefits of using industrial byproducts for outdoor broiler breeding, which yields nutritious meat and may increase its marketability, must be emphasized.

Keywords

Bioactive substances, broiler, fatty acids, meat quality, industrial byproducts

Thematic 2 – Functional Foods and Health

Abstract #: **T2-O-02**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Production and genomic characterization of exopolysaccharides from *Lactiplantibacillus plantarum* Jb21-11 in an ice cream mix

Presenting author **Mohamed Amine Gomri**[1]

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Abstract

Lactiplantibacillus plantarum Jb21-11, an autochthonous lactic acid bacterium isolated from traditional Algerian Jben cheese, was previously characterized as a safe and potent probiotic candidate through in vitro and in silico investigations, demonstrating high acid and bile tolerance, adhesion to intestinal cells, absence of virulence or transferable resistance genes, and anti-inflammatory activity. Building upon this foundation, the present work focuses on the production kinetics and structural elucidation of its exopolysaccharides (EPS) synthesized on De Man, Rogosa, and Sharpe (MRS) broth and within a functional low-fat ice cream matrix. EPS production on MRS medium reached 674 mgL-1, yielding a ropy, high-molecularweight (MW) heteropolysaccharide (~1.08 × 10^5 Da) composed of mannose, galactose, and glucose (5.42:1.00:4.52). When cultivated in the ice cream mix, Jb21-11 produced up to 2082.78 ± 37.03 µg L-1 of similar EPS (MW ~ 1.05 × 105Da, composed primarily ofglucose, galactose and mannose with ratio ≈ 2:1.5:1) after 1 h of fermentation, followed by a gradual decline to ≈1500 µg L-1 at 4 h, consistent with partial acid hydrolysis during pH decrease from 6.23 to 5.6. The strain maintained high viability (> 12 log CFU mL-1), confirming its metabolic activity and resilience under processing conditions. Physicochemical analyses indicated that the high-molecular-weight EPS enhanced viscosity and structural stability of the ice cream, acting as a natural bio-thickener without synthetic stabilizers. Genomic exploration revealed two near-complete EPS gene clusters (cps3 and cps4) and partial cps2 genes, encoding multiple glycosyltransferases, flippases, and polymerases involved in heteropolysaccharide synthesis via the Wzx/Wzy-dependent pathway. The presence of 179 CAZyme-encoding genes and numerous extracellular glycosyltransferases underlines the strain's strong carbohydrate metabolism and EPS biosynthetic capacity. These findings demonstrate a consistent genotype-phenotype correlation for EPS production both in MRS and in dairy matrices. Altogether, *Lp. plantarum* Jb21-11 combines probiotic safety, technological robustness, and EPS-driven textural enhancement, supporting its application as a functional adjunct culture in fermented and frozen dairy products. Future work will address biological validation of the health-promoting activities of its EPS in vivo.

Keywords

Lactiplantibacillus plantarum, exopolysaccharides, ice cream, genomic analysis

Thematic 2 – Functional Foods and Health

Abstract #: **T2-O-04**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Valorisation du marc de café comme ingrédient fonctionnel dans l'alimentation des poulets de chair : impact sur les performances zootechniques et le rendement à l'abattage

Presenting author **Teniou Fatima El Batoul[1]**

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Abstract

Le marc de café, sous-produit agroalimentaire abondant, représente à la fois un défi environnemental et une ressource potentielle riche en composés bioactifs (polyphénols, fibres). Cette étude s'inscrit dans une démarche d'économie circulaire visant à valoriser ce déchet en tant qu'ingrédient dans l'alimentation des volailles. L'objectif principal était d'évaluer l'impact de l'incorporation de marc de café dans la ration de poulets de chair sur leurs performances de croissance, leur santé et la qualité de leur carcasse. Un essai d'élevage de 48 jours a été mené sur 100 poulets de chair Cobb 500, répartis en deux groupes expérimentaux (n=50) : un groupe témoin (T) recevant une ration standard et un groupe supplémenté en marc de café (MC). Le suivi a inclus l'enregistrement quotidien de la mortalité et de l'état de santé, ainsi que la mesure hebdomadaire des paramètres zootechniques. À l'abattage, le rendement carcasse a été évalué. L'analyse statistique a montré que l'incorporation du marc de café n'a eu aucun effet significatif sur le taux de mortalité ($P>0,05$) et l'état de santé général des poulets, restant comparable au groupe témoin. Cependant, la croissance a été légèrement ralentie dans le groupe (MC), affichant un poids vif de 1756,4g contre 2228,5g pour le groupe (T) ($p<0,01$). Malgré cette différence de poids, le groupe (MC) a présenté un rendement carcasse significativement amélioré, 85,36% contre 80,85% pour (T) ($p<0,001$), ainsi que des rendements plus élevés pour les abats et le bréchet. De plus, une réduction significative des dépôts de gras abdominal ($p<0,001$) a été observée chez les animaux recevant le marc de café à faibles niveaux. Cette étude confirme le potentiel du marc de café en tant que ressource valorisable dans la filière avicole. Son incorporation ouvre des pistes pour la réduction des coûts d'alimentation et contribue à une gestion durable des sous-produits. Bien qu'une légère diminution de la croissance ait été notée, l'amélioration du rendement carcasse et la réduction du gras abdominal sont des avantages significatifs. Des travaux futurs sont envisagés pour évaluer la qualité de la viande.

Keywords

Sous-produit agroalimentaire, économie circulaire, marc de café, poulets de chair, rendement d'abattage

Thematic 2 – Functional Foods and Health

Abstract #: **T2-O-05**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Evaluation of the nutritional quality of a beverage made from whey and beet peels

Presenting author **Ouldali Ouardia**[1]

Co-authors **Kamir Bouchera**[2], **Hazouti Ahlem**[2]

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Abstract

The objective of this study is to create an innovative, nutritious and sustainable product by preparing a drink based on whey and beet peels, meeting consumer needs while contributing to the reduction of food waste and the promotion of more sustainable consumption patterns and the circular economy. A characterization of the physico-chemical quality was carried out for the whey and beet peels as well as for the prepared drinks. Thus, it was recorded that whey is characterized by a pH=5.9; an acidity of 15°D, a dry matter content of 6.4%, with an interesting mineral apport (8.68%) in addition to a lactose content of 3.80%, and a protein content of 8.17%. On the other hand, beet peels demonstrate an interesting reserve of bioactive substances, including total polyphenols (250.1±9.03 mg/g), total flavonoids (181.9±9.03 mg/g), and specifically total betalains (446.21±10.55 mg/L).

The prepared beverages are evaluated during a storage period subsequently confirmed by sensory analysis (14 days). The results of the microbiological analysis confirmed the acceptable quality and stability of all the prepared products. Ultimately, the beverages were well received by the tasters, indicating promising potential for future commercialization.

Keywords

Whey, Beetroot peels, Beverage, Nutritional quality, Microbiological quality

Thematic 2 – Functional Foods and Health

Abstract #: **T2-O-06**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Beyond the folklore: *Thymus algeriensis* exhibits effective antioxidant and anti-inflammatory activity (in vitro)

Presenting author **Bourek Baya Farah**[1]

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Abstract

Thymus is a large plant genus comprising up to 400 species of aromatic and medicinal herbs. One of the most common species of thyme found in North Africa is *Thymus algeriensis* (Boiss. &Reut.) (Lamiaceae). In traditional Algerian medicine, *T. algeriensis* is used as an astringent, expectorant and healing agent, as well as a circulation stimulant. Infusions of the leaves and flowers are used to treat abdominal pain, wound infections and food poisoning, as well as colds, thanks to their anti-inflammatory properties. In culinary traditions, *T. algerensis* is used to flavour coffee, buttermilk, and tea. The aim of this study is to evaluate the antioxidant and anti-inflammatory activity of *T. algeriensis* from the Batna region of Algeria. Following botanical identification, the bioactive compounds were extracted by hydro-ethanolic maceration (80/20% ethanol/distilled water) for 24 hours. The polyphenol and flavonoid content were measured to evaluate the content of bioactive molecules. On the one hand, antioxidant activity was determined in vitro using the DPPH and phosphomolybdenum tests. Anti-inflammatory activity, meanwhile, was determined using the anti-hemolytic test. The results showed that the crude extract is rich in polyphenols 51.36 ± 0.002 µg AGE/mg extract and flavonoids with a content of 35.659 ± 0.001 µg QE/mg extract. The results demonstrated notable and interesting antioxidant activity (IC_{50}=33,50 µg /mL), though seven times lower than that of the standard (IC_{50}=4,80µg /mL) ($p < 0.001$). The findings of the phosphomolybdenum assay indicated that the extract has significant antioxidant capacity (1000 mg GAE/g). Anti-inflammatory activity testing revealed that *T. algeriensis* extract exhibits substantial in vitro anti-inflammatory activity, with a protection rate of 68,322% for the extract and 88,959% for the standard (diclofenac). The study showed that *T. algeriensis* is a plant with health-promoting properties, making foods containing it functional. It is therefore recommended that this plant be encouraged for culinary use and that traditional foods prepared from it be consumed.

Keywords

Thymus algeriensis, antioxidantactivity, anti-inflammatory activity, bioactive compounds

Thematic 2 – Functional Foods and Health

Abstract #: **T2-O-07**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Valorization of whey proteins by enzymatic hydrolysis using plant extract: enhancement of functional and antioxidant activities

Presenting author **Khangui Ahlem**

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Abstract

Whey protein, a byproduct of cheese manufacturing, is rich in essential proteins and lactose. Because of its high BOD, if released into the environment without adequate treatment, it can inflict serious ecological damage. In this study, we aim to add value to whey proteins by enzymatically hydrolyzing them using a plant extract-based enzyme and compared its performance with commercial porcine pepsin. Whey protein concentrate, with 80% protein content, was hydrolyzed by plant extract and pepsin at two E/S ratios 0.1% and 0.05%. The hydrolysates were stored at -20°C to evaluate their techno-functional properties and antioxidant activities via DPPH and ABTS radical scavenging assays at different hydrolysis times (0, 30, 360, and 1440 minutes). Our results highlighted that hydrolysates produced from plant extract showed higher solubility and emulsifying capacity than those treated with pepsin. Antioxidant activity generally increased with time for all samples, plant extract hydrolysates showed a higher radical scavenging efficiency than pepsin hydrolysates after 1440 minutes, which was the longest time interval measured by DPPH, with the highest value of plant extract at 0.1% being 45.92% and that of pepsin at 0.1% being 38.90%. ABTS inhibition was constantly superior, with plant extract at 0.1% giving the highest inhibition of 86.75% and pepsin at 0.1% next with 83.12%. Thus, the results confirm that plant extract hydrolysates have better antioxidant ability than those treated with pepsin. Enzymatic hydrolysis of whey proteins by plant extract improves both functional and antioxidant properties. This concludes that plant extract is a good and sustainable biotechnological tool to the conversion of dairy byproducts into valuable ingredients for the food and nutraceutical industries.

Keywords

Whey, plant, hydrolysis, antioxidant, valorization

Thematic 2 – Functional Foods and Health

Abstract #: **T2-O-08**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Evaluation of the antioxidant activity of *Curcuma longa* dry extract: toward safer natural preservatives

Presenting author **Naima Hadjadj**

Co-authors **Zakia Abdellaoui, Fateh Bougherra, Meriem Retimi, Rifka Mesdour, Mouhamadou I. Idrissa**

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Abstract

The growing use of chemical preservatives in the food industry raises concerns due to their toxic, carcinogenic, and allergenic effects. In this context, *Curcuma longa* appears as a promising natural source of antioxidant bioactive compounds. This work aims to evaluate the antioxidant activity of *Curcuma longa* crude non-volatile extract to propose it as a safer natural alternative. The non-volatile extract was obtained by solid–liquid extraction using ethanol. Total polyphenol content was determined using the Folin–Ciocalteu method, while flavonoid content was measured using the aluminium chloride ($AlCl_3$) method. Antioxidant activity was assessed through DPPH• and ABTS•+ radical-scavenging assays over a concentration range from 10 to 600 mg/L. Ethanolic extraction yielded 5.93% of non-volatile extract. Antioxidant activities were dose-dependent. For DPPH•, the scavenging capacity ranged from 16.99% at 10 mg/L to 69.63% at 600 mg/L. For ABTS•+, activity increased from 29.51% at 12.25 mg/L to 94.66% at 600 mg/L. At this highest concentration, ABTS•+ activity exceeded that of the reference antioxidant BHT (86.35%), although BHT remained more potent at most other concentrations. These performances are attributed to the extract's richness in total polyphenols and flavonoids (192,6 GAE/g extract and 159,8 QE/g extract, respectively). The non-volatile extract of *Curcuma longa* shows noteworthy antioxidant potential, particularly at high concentrations, making it a promising natural alternative to chemical preservatives in both food and pharmaceutical applications.

Keywords

Curcuma longa, antioxidant activity, DPPH, ABTS, polyphenols

Thematic 2 – Functional Foods and Health

Abstract #: **T2-O-09**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Impact of rye incorporation rate on functional and nutritional quality

Presenting author **Abdellaoui Z.**[1,2]

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Abstract

The aim of this study is to highlight the technological potential of a local whole rye flour incorporated at different levels (10%, 20%, 30%, 40%, and 50%). Physico-chemical analyses of the whole rye flour were carried out, along with rheological and physico-chemical analyses of the bread-making flour before and after incorporation. The results showed an increase in ash content and swelling index in the flours, as well as a decrease in wet gluten (from 24.25% to 11%) and dry gluten (from 8.8% to 4.5%) as the proportion of whole rye flour increased. The findings also indicated that adding whole rye flour leads to a reduction in baking strength (W) from 182 to 86×10^{-4}, a decrease in swelling (from 13 to 7.8) and an increase in the configuration ratio (tenacity/extensibility) from 3.59 to 12.42. Baking trials were conducted for all incorporation levels using two protocols with two fermentation types: instant yeast and accelerated sourdough. The results showed that high-quality bread (texture, softness, external appearance, increased loaf volume, and good crumb alveolation), comparable to the 100% soft wheat control bread, can be obtained with 20% whole rye flour using yeast fermentation, and with 10% whole rye flour using accelerated sourdough. The corresponding baking values were 245/300 and 256/300, respectively.

Keywords

whole rye flour, rheological properties, yeast, accelerated sourdough, baking value

Thematic 2 – Functional Foods and Health

Abstract #: **T2-O-10**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Potentiel thérapeutique des protéines des co-produits des mollusques méditerranéennes : modulation de l'inflammation liée à l'obésité

Presenting author **Hichem Benhamou**

Co-authors **Sabrine Louala, Walid Otsamane, Myriem Lamri Senhadji**

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Abstract

L'obésité est associée à un état inflammatoire chronique de bas grade impliqué dans le développement de complications métaboliques. Les coproduits de moules méditerranéennes (*Mytilus galloprovincialis*), actuellement sous-valorisés, constituent une source riche en protéines bioactives aux propriétés potentiellement bénéfiques. Cette étude vise à évaluer l'effet des protéines extraites des coproduits de moules sur les marqueurs inflammatoires chez des rats rendus obèses par un régime hyper lipidique. Des rats Wistar mâles (n=24) ont été répartis en trois groupes : témoin (régime standard), obèse (régime hyper lipidique), et obèse traité (régime hyper lipidique enrichi en protéines de coproduits de moule). Les protéines ont été extraites par la méthode de Guillaume (1999), Les paramètres anthropométriques, les marqueurs inflammatoires sériques (TNF-α, CRP) et la vitesse de sédimentation. Les résultats montrent que les protéines de coproduits de moules a significativement réduit les niveaux de marqueurs pro-inflammatoires : TNF-α, CRP et la vitesse de sédimentation par rapport au groupe obèse non traité ainsi que les paramètres anthropométriques ($p<0,05$). Les protéines extraites des coproduits de moules méditerranéennes exercent un effet anti-inflammatoire significatif chez le rat obèse, réduisant les marqueurs inflammatoires. Ces résultats valorisent ces déchets comme source potentielle d'ingrédients bioactifs pour le développement d'aliments fonctionnels destinés à la prévention et la gestion de l'obésité et ses complications métaboliques.

Keywords

Mollusques méditerranéennes, Coproduits, Protéines marines, Inflammation, Obésité

Thematic 2 – Functional Foods and Health

Abstract #: **T2-O-11**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Développement d'une formulation nutritionnelle diététique destinée aux enfants autistes ciblant axe intestin-cerveau

Presenting author **Sabrine Louala**
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Abstract

Les troubles du spectre autistique (TSA) touchent plus d'1 enfant sur 100 et sont associés à des dysfonctionnements du microbiote intestinal, une inflammation chronique et un stress oxydatif. Cette étude vise à développer et caractériser une formulation nutritionnelle innovante ciblant l'axe intestin-cerveau chez les enfants avec TSA. Une enquête a été menée auprès de parents d'enfants TSA pour identifier les besoins nutritionnels. Une formulation combinant polyphénols, oméga-3, probiotiques, prébiotiques et anti-inflammatoires naturels a été développée. Des analyses nutritionnelles et physico-chimiques in vitro et l'évaluation des activités biologiques (activité antioxydante et anti-inflammatoire) de la formulation ont été réalisées. Une étude d'acceptabilité sensorielle a évalué l'apparence, la texture, le goût, l'arôme et la tolérance du produit. L'enquête révèle que 70% des enfants TSA présentent des difficultés de déglutition et 90% des troubles digestifs. Les analyses nutritionnelles de la formulation confirment sa richesse en composés bioactifs. Les activités biologiques testées démontrent les propriétés antioxydantes et anti-inflammatoires du produit. L'évaluation sensorielle montre 90% d'acceptabilité pour l'apparence et la couleur, 80% pour la texture, et 90% pour le goût avec préférence pour le sucré (70%). La tolérance physique est excellente (90% sans inconfort). L'intention de consommation régulière atteint 90% d'adhésion avec 100% de satisfaction globale. La formulation développée présente un profil nutritionnel et biologique optimal ciblant l'axe intestin-cerveau. Les propriétés antioxydantes et anti-inflammatoires confirmées in vitro, associées à l'excellente acceptabilité sensorielle, en font une innovation prometteuse pour la prise en charge nutritionnelle des TSA en Algérie. Des études cliniques sont nécessaires pour valider l'efficacité *in vivo*.

Keywords

formulation nutritionnelle, diététique, enfants autistes, axe intestin-cerveau

Thematic 2 – Functional Foods and Health

Abstract #: **T2-O-12**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Development of an enzymatic-polyphenolic strategy to mitigate the allergenic properties of peanut proteins

Presenting author **Hanène Djeghim**[1]

Co-authors **Ouided Benslama**[2], **Bechar Hiba**[3], **Bendjedid Sirine**[3], **Abdellah Zikiou**[4]

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Abstract

Peanut allergy is a major public health concern, requiring effective strategies to reduce protein allergenicity. This study evaluated the effects of enzymatic digestion with trypsin and aspartic protease, alone or combined, and gallic acid conjugation on peanut proteins. Biochemical assays and a Balb/c mouse model confirmed reduced allergenicity across all treatments, with the combined enzymatic and gallic acid treatment yielding the most significant decrease in IgE levels and allergic symptoms. In silico analysis of major allergens Ara h 1, Ara h 2, Ara h 3, and Ara h 6 showed that Ara h 2 and Ara h 6 were highly resistant to enzymatic degradation, especially within IgE-binding regions. Covalent docking simulations revealed that gallic acid quinone formed stable interactions with serine and threonine residues near key epitopes. These results suggest that sequential enzymatic hydrolysis and gallic acid conjugation is a promising strategy to lower peanut protein allergenicity and improve food safety for allergic individuals.

Keywords

Peanut allergy, Enzymatic digestion, Gallic acid conjugation, Covalent docking, Hypoallergenic products

Thematic 3 – Innovative Products and Health

Abstract #: **T3-O-01**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Computational analysis of thymol binding to SarA and CrtM virulence factors in MRSA

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Abstract

Aromatic plant species of genus Thymus are important medicinal plants, highly recommended due to a range of therapeutic properties of their essential oils, commonly known as thyme oil: antirheumatic, antiseptic, antispasmodic, antimicrobial, cardiac, carminative, diuretic and expectorant. The aim of study was undertaken to investigate the antimicrobial of an endemic Thyme, *Thymu svulgaris*, against a large number of pathogens as well as its phytochemical composition, antioxidant properties. The extraction of essential oils of leaves of *Thymus vulgaris* is obtained by hydrodistillation and analyzed by gas chromatography coupled with mass spectrometry (GC/MS) for determining their chemical composition. Their antimicrobial activity was studied in vitro on bacterial strains: *Bacillus subtilis*, *Bacillus cereus*, *Staphylococcus aureus*, *Pseudomonas murabilis*, *Escherichia coli*, *klebsiella pneumoniae*. The antibiofilm activity were tested against MRSA The antioxidant activity assessed by Diphenylpicrylhydrazyl (DPPH), ferric reducing antioxidant power (FRAP) and ABTS assay. Ferther more the samples of Thymus provided a yieldof1,50%. Chromatographic analyzes (CG-SM) have shown that Thymus essential oil is rich in 34 chemical constituents totaling 99.99%, thymol is the most abundant compound representing more than 70% of the total composition. The bacterial strains tested were found to be sensitive to essential oil to the studied, showing significant inhibition zones, with sizes ranging from 24.25 to 49.27 mm. and exhibiting a very effective bactericidal activity with minimum inhibitory concentrations (MIC) rangingfrom0,06 to 0,31µg/mL. The lowest MIC is found with the *S. aureus* strain. The effect of T. vulgaris essential oil on various bacterial strains, including MRSA , showed a 80% reduction in biofilm at the lowest concentration (0.01% v/v) and a 60% reduction .The evaluation of DPPH radical scavenging activity and ferric reducing antioxidant t power and The ABTS•+ radical cation scavenging activity showed that EO Thyme exhibited excellent antioxidant activity at IC50 = 8.81±0.02 µg/mL and EC50=340±4.3µg/mL and IC50=2.93±0.08 µg/ml, respectively compared to essential oil of other species of thyme in the literature. The results of docking molecular revealed that all compounds exhibited varying binding energies with values ranging from -4.0 to -6.7 Kcal/mol. Investigately, these results represent an inexpensive source of natural antibacterial, antioxidants substances and in silico study that exhibited potential for use in pathogenic systems.

Keywords
Essential oil, Gc/Ms, Antimicrobial, Antioydant, Dpph, Frap, *Thymus vulgaris*

Thematic 3 – Innovative Products and Health

Abstract #: **T3-O-02**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Effect of date powder on the physicochemical, microbiological and sensory properties of processed cheese

Presenting author **Ouardia Ouldali**[1,3]

Co-authors **Rym Nouria Benamara**[1,2], **Ouardia Ouldali**[1,3], **Ahlem Yagoubi**[1], **Khansaa Mazari**[1], **Kada Ibri**[1], **Khaled Smail**[4], **Nasria Benamara**[5]

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Abstract

The enrichment of processed cheese through the addition of date powder represents a relevant strategy, as this natural ingredient is particularly rich in nutrients. This study aims to evaluate the effect of incorporating date powder on the physicochemical, microbiological, and organoleptic properties of processed cheese. The investigation first examined the impact of different proportions of date powder added to the cheese by assessing parameters such as moisture, texture, and color. Microbiological analyses were then performed to determine the product's stability and safety during storage. Finally, a sensory panel conducted an organoleptic evaluation to assess the acceptability of the date powder enriched processed cheese. The results indicate that the addition of date powder enhances both the nutritional value and the sensory attributes of processed cheese, while maintaining its microbiological safety. In conclusion, this work contributes to innovation in the dairy sector by proposing a new approach for enriching processed cheeses with natural ingredients without compromising product quality).

Keywords

Processed cheese, date powder, enrichment, physicochemical quality, microbiological quality

Thematic 3 – Innovative Products and Health

Abstract #: **T3-O-03**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Nixtamalization of bitter lupine seeds

Presenting author **Hizia Berrou**[1]

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Abstract

Lupine is a cheaper legume that can grow in a variety of environmental conditions. Human consumption of lupine is only around 4% of total production due to its content of anti-nutritional factors, "alkaloids," which restrict its direct use in food applications. Nixtamalization is a chemical modification usually performed on grains by cooking in an alkaline solution to improve the final product characteristics and reduce the anti-nutritional compounds. White bitter lupine (*Lupinus albus*) seeds were nixtamalized at various concentration of calcium hydroxide in the range of 0.16–3.33% at 50, 70, and 90°C for 35 min and steeped for 0, 8, 16, and 24 hand the moisture uptake was determined to model seed hydration kinetics this process was applied on bitter lupine seeds in which kinetic hydration was studied for all samples, alkaloids, and farinograph tests were conducted on selected samples. White bitter lupine seeds used in this study were characterized for each 100g (d.b) by a moisture content of 6.47±0.13, 41.69±0.54 of proteins, 14.23±1.09 fat, 3.34±0.2 ash, and a negligible starch percentage. Moisture uptake increased with increasing nixtamalization temperature regardless of calcium hydroxide concentration. The Page and Weibull models adequately describe white bitter lupine kinetics hydration during nixtamalization. This method changes the kinetic hydration from the sigmoid behavior cited in previous studies to a downward concave shape. The findings may contribute to improving industrial nixtamalization processes for lupine seeds and expanding their utilization as a high-value food ingredient. The alkaloid content of raw lupine flour was 1.08 g/100 g, and it gradually decreased as a result of nixtamalization in increasingly concentrated calcium hydroxide solutions and higher temperatures. The addition of 10% raw lupine flour to wheat flour increases dough stability, water absorption, peak time, and degree of softening. Nixtamalized flour increases water absorption and prolongs dough stability time and development time in farinograph parameters.

Keywords

Nixtamalization, lupine, models, alkaloids, farinograph

Thematic 3 – Innovative Products and Health

Abstract #: **T3-O-04**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Valorisation des grignons d'olives via la conversion de l'hémicellulose extraite en biomolécules à haute valeur ajoutée

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Abstract

Les grignons d'olives, sous-produits majeurs de l'industrie oléicole méditerranéenne, représentent une biomasse lignocellulosique abondante et sous-exploitée. Cette biomasse, riche en hémicellulose, cellulose et lignine offre un potentiel considérable pour la valorisation de ces coproduits par extraction ciblée des hémicelluloses et ouvre la voie à une nouvelle filière innovante alliant développement durable et produits à valeur ajoutée, notamment dans le domaine de l'emballages alimentaires. Dans ce cadre, notre recherche s'est focalisée sur la récupération des hémicelluloses, des biopolymères naturellement présents dans la biomasse végétale. Trois types de grignons ont été étudiés, issus respectivement des procédés d'extraction traditionnels, biphasés et triphasés. Deux techniques d'extraction ont été mises en œuvre afin d'évaluer leur efficacité en fonction de la nature des résidus. Les extraits obtenus ont ensuite été soumis à des analyses physico-chimiques afin de déterminer leur composition. Les résultats ont révélé que l'extraction alcaline est la plus performante pour l'obtention des hémicelluloses, et que les grignons issus du procédé triphasé présentent les rendements les plus élevés. Ainsi, cette approche innovante de valorisation des grignons d'olives concilie exploitation rationnelle des ressources naturelles, amélioration des performances des produits et contribution à la promotion de la santé, inscrivant ces déchets agro-industriels dans une dynamique de progrès technologique et environnemental.

Keywords

Grignons d'olives, valorisation, hémicellulose, extraction, biomasse lignocellulosique

Thematic 3 – Innovative Products and Health

Abstract #: **T3-O-05**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Effect of medicinal plant extracts on enriched food product quality

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Abstract

The incorporation of medicinal plants into food systems is a promising approach to improve food security and public health, particularly due to their content of bioactive compounds with nutritional and functional potential. This study investigated the formulation of biscuits enriched with CytisusvillosusPourr. leaf extracts and compared them with control formulations prepared either without additives or with a synthetic additive. The physicochemical properties of the biscuits, including moisture, pH, acidity, and °Brix, were evaluated. In addition, total polyphenol and flavonoid contents, as well as antioxidant activity (DPPH and FRAP assays), were assessed. All parameters were measured on the first day and after 15, 30, and 90 days of storage. The results showed that the addition of CytisusvillosusPourr. extracts improved the physicochemical quality and antioxidant properties of the biscuits. Moisture, pH, acidity, and °Brix values remained consistent with biscuit preparation standards, although slight variations occurred during storage. In particular, biscuits enriched with plant extract exhibited higher levels of polyphenols and flavonoids and stronger antioxidant activity than the other formulations. During storage, a decrease in polyphenol, flavonoid, and antioxidant activity was observed; however, this decline was less pronounced in biscuits enriched with plant extract, highlighting the protective effect of the bioactive compounds. Thus, CytisusvillosusPourr. leaf extracts represent a promising natural additive for the development of functional cereal products, offering improved nutritional and antioxidant properties while supporting the sustainable valorization of medicinal plants.

Keywords

Cytisus villosus Pourr, Biscuit, Enrichment, Antioxydants, Storage

Thematic 3 – Innovative Products and Health

Abstract #: **T3-O-06**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Development of an enzymatic-polyphenolic strategy to mitigate the allergenic properties of peanut proteins

Presenting author **Hanène Djeghim**[1]

Co-authors **Ouided Benslama**[2], **Bechar Hiba**[3], **Bendjedid Sirine**[3], **Abdellah Zikioud**[4]

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Abstract

Peanut allergy is a major public health concern, requiring effective strategies to reduce protein allergenicity. This study evaluated the effects of enzymatic digestion with trypsin and aspartic protease, alone or combined, and gallic acid conjugation on peanut proteins. Biochemical assays and a Balb/c mouse model confirmed reduced allergenicity across all treatments, with the combined enzymatic and gallic acid treatment yielding the most significant decrease in IgE levels and allergic symptoms. In silico analysis of major allergens Ara h 1, Ara h 2, Ara h 3, and Ara h 6 showed that Ara h 2 and Ara h 6 were highly resistant to enzymatic degradation, especially within IgE-binding regions. Covalent docking simulations revealed that gallic acid quinone formed stable interactions with serine and threonine residues near key epitopes. These results suggest that sequential enzymatic hydrolysis and gallic acid conjugation is a promising strategy to lower peanut protein allergenicity and improve food safety for allergic individuals.

Keywords

Peanut allergy, Enzymatic digestion, Gallic acid conjugation, Covalent docking, Hypoallergenic products

Thematic 3 – Innovative Products and Health

Abstract #: **T3-O-07**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Optimization of drying methods (by oven) and kinetic analysis of Jameed cheese

Presenting author **Bensaad Dhiya Eddine**[1]

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Abstract

This study investigates the effect of controlled oven drying on the physicochemical quality and drying kinetics of Jameed cheese produced from goat milk using traditional and modern techniques. Drying experiments were conducted at five temperatures (50, 60, 70, 80, and 90 °C), and the drying behavior was modeled using an exponential kinetic model. The results showed excellent model performance, with coefficients of determination ranging from R^2 = 0.92 to 0.99, confirming the suitability of first-order kinetics in describing moisture loss. Physicochemical analyses revealed that Jameed exhibited an acidity level within the typical range for dried fermented cheese (pH 5.22–5.25), a high protein content of 32.63%, low fat content of 2.5%, and a strong water hold capacity (WAC = 122.22%), indicating excellent rehydration properties. Color measurements using the CIELAB system demonstrated that drying at moderate temperatures maintained the natural lightness and yellowness of Jameed, while higher temperatures (80–90 °C) produced intensified redness due to Maillard reactions. Among the tested conditions, 50 °C provided the best balance between drying efficiency, color preservation, and retention of nutritional attributes, producing a stable and high-quality final product. Overall, the findings highlight the importance of kinetic modeling and controlled thermal processing in optimizing the production of high-quality, shelf-stable Jameed cheese.

Keywords

Jameed, oven drying, drying kinetics, physicochemical properties, water hold capacity, thermal processing

Thematic 3 – Innovative Products and Health

Abstract #: **T3-O-08**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Effect of wheat flour type and fermentation agent on some quality characteristics of bread

Presenting author **Bouasla Abdallah**[1]

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Abstract

The objective of this work is to study the effect of flour type and fermentation agent type on some quality characteristics of bread. Four types of breads were made, two samples based on T55 wheat flour (one with yeast and the other with sourdough) and two samples based on T150 wheat flour (one with yeast and the other with sourdough). A technological characterization of the obtained breads was carried out by determining the specific volume (Vsp), the loss of weight during baking, the color of the crust and the crumb, the alveolar characteristics of the crumb, sensory attributes. The results showed that the use of T150 flour in yeast bread-making significantly reduced Vsp (3.48 cm3/g vs 2.81 cm3/g) and alveoli circularity, while increasing their number (432 vs 535.5), and improving the crust color score (7.7), promoting better overall sensory acceptability (7.4). For sourdough bread-making, T150 flour decreased alveoli circularity and solidity, but increased their number (371 vs 425), which was accompanied by better sensory appreciation of color (7.1) and high overall sensory acceptability (7). Furthermore, the use of sourdough in bread-making based on T55 flour resulted in a decrease in Vsp (3.48 cm3/g vs 2.68 cm3/g), number of alveoli (425 vs 371) and overall sensory acceptability (6.03), as well as a lower sensory appreciation of color (6.33), despite an increase in the size and circularity of the alveoli. Finally, breads made from T150 flour, regardless of the fermentation agent, presented the best characteristics, particularly in terms of Vsp, alveolar structure and overall sensory acceptability.

Keywords

bread-making, T55 wheat flour, T150 wheat flour, yeast, sourdough

Thematic 3 – Innovative Products and Health

Abstract #: **T3-O-09**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Impact of carbon source and ethanol stress on lipid production and fatty acid profile of *Yarrowia lipolytica* L2

Presenting author **Doria Naila Bouchedja**[1]

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Abstract

Yarrowia lipolytica est une levure microbienne prometteuse pour la production de lipides à partir de résidus agro-industriels. Cette étude évalue l'effet du substrat et du stress éthanolique sur la lipogenèse et la composition en acides gras de la souche L2. Les cultures ont été réalisées dans deux milieux : margine (OMW) et huile de friture usée (WFO), supplémentés avec 0 %, 3 %, 5 % et 7 % d'éthanol (v/v). La composition en acides gras des lipides cellulaires a été déterminée après 96 h d'incubation. Les résultats montrent que le profil lipidique est fortement modulé par le type de substrat et la concentration en éthanol. Dans le milieu OMW, l'acide oléique (C18:1) est prédominant (40–49 %), tandis que les acides palmitique (C16:0) et palmitoléique (C16:1) diminuent avec l'éthanol, indiquant une adaptation membranaire. La proportion totale de SFA diminue progressivement, tandis que les MUFA augmentent, suggérant un mécanisme pour maintenir la fluidité lipidique. Dans le milieu WFO, C18:1 et C18:2 augmentent avec l'éthanol, tandis que certains acides gras rares disparaissent à ≥5 % d'éthanol. L'adaptation lipidique observée reflète des ajustements métaboliques spécifiques à chaque substrat. Ces observations indiquent que la margine constitue un substrat plus favorable pour la production de lipides à composition riche en acides gras insaturés. L'exposition à des concentrations modérées d'éthanol favorise la réorganisation des lipides, tandis que des concentrations élevées (7 %) entraînent une inhibition de la lipogenèse. Cette étude met en évidence le potentiel de *Y. lipolytica* pour la valorisation de résidus agro-industriels et la production de lipides microbiennes de qualité sous conditions de stress contrôlé.

Keywords

Yarrowia lipolytica, lipides microbiennes, stress éthanolique, huile de friture usée, margine

Thematic 3 – Innovative Products and Health

Abstract #: **T3-O-10**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Valorization of dairy whey through the development of functional high-protein gummies

Presenting author **Bencharif-Betina Soumeya**[1,2]

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Abstract

This project aims to valorize dairy whey—both in its liquid and freeze-dried forms—through the development of innovative 2-g functional gummies enriched with natural pigments. Sterilized liquid whey and lyophilized whey were incorporated into two optimized formulations, using beetroot extract to provide a natural red color and curcumin to achieve a yellow hue. These clean-label colorants were selected to enhance consumer appeal while maintaining a health-oriented formulation. Nutritional profiling, based on experimental assays and standardized compositional tables, indicates that the gummies provide 18–22% proteins, 60–65% carbohydrates, and less than 2% lipids, depending on the proportion and physical state of the whey used. This composition confirms the potential of whey as an accessible, nutrient-dense ingredient suitable for functional confectionery products. A hedonic sensory evaluation was conducted with consumer panelists to assess appearance, texture, flavor, and overall acceptability. The results revealed a marked preference for gummies made with liquid sterilized whey, achieving 86% acceptance, compared to only 15% for the freeze-dried whey version. Panelists attributed the lower acceptance of the lyophilized formulation to its stronger milky taste and more pronounced dairy odor, which were perceived as undesirable in a sweet gummy matrix. The findings highlight the technical and sensory advantages of using liquid whey over its freeze-dried counterpart. This work demonstrates a viable, sustainable, and innovative pathway to valorize dairy by-products while generating added-value functional foods aligned with circular economy principles and current trends in healthy confectionery.

Keywords

Whey valorization, Functional gummies, Protein enrichment, Natural colorants Food innovation

Thematic 3 – Innovative Products and Health

Abstract #: **T3-O-11**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

A natural strategy for food safety: controlling aflatoxigenic fungi from poultry feed using *Cymbopogon schoenanthus* essential oil

Presenting author **Amani Semmari**[1]

Co-authors **Azzedine Abdi**[1], **Karima Bouti**[1], **Faiza Baali**[2], **Nadjette Djemouai**[1,2], **Atika Meklat**[1], **Salim Mokrane**[1]

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Abstract

Aflatoxigenic fungi, particularly *Aspergillus flavus* and *A. parasiticus*, contaminate poultry feed and produce highly toxic aflatoxins, posing serious risks to animal health and food safety. Conventional fungicides are often limited by low efficacy and potential toxicity, creating a need for natural alternatives. Essential oils are eco-friendly agents with strong antifungal properties. This study explores the effectiveness of *Cymbopogon schoenanthus* (L.) Spreng essential oil (EO) against aflatoxigenic fungi isolated from Algerian poultry feed. The EO was extracted from the aerial parts of the plant by hydrodistillation and subsequently characterized by gas chromatography–mass spectrometry (GC–MS) to identify its bioactive constituents. Fungal strains were isolated from poultry feed and identified based on morphological and biochemical characteristics. The antifungal activity of *C. schoenanthus* (L.) Spreng EO against 30 selected aflatoxigenic isolates of *Aspergillus* section Flavi was assessed using the disc diffusion and broth macrodilution assays, while the broth microdilution method was employed to determine the minimum inhibitory concentrations (MICs). Results showed that *C. schoenanthus* (L.) Spreng EO exhibited significant antifungal effects, with inhibition zones ranging from 15.33 ± 0.57 mm to 27.33 ± 0.57 mm among aflatoxigenic fungal isolates and inhibition percentages varying between 46.82% and 89.94%. MICs values of the EO against the aflatoxigenic isolates were determined using the broth microdilution method with resazurin as an indicator. The essential oil inhibited all tested isolates, with MICs values ranging from 3.12 ± 0.00 to 12.5 ± 0.00 mg/mL, depending on the strain. The GC-MS analysis revealed the presence of major bioactive compounds being β-eudesmol (11.35%) and α-elemol (10.84%) with well-known antifungal properties. In conclusion, *Cymbopogon schoenanthus* (L.) Spreng essential oil exhibited strong in vitro antifungal activity against aflatoxigenic fungi isolated from poultry feed, highlighting its potential as a natural, eco-friendly alternative to synthetic fungicides for controlling mycotoxin contamination and enhancing feed safety.

Keywords

Aflatoxigenic fungi, poultry feed, antifungal, essential oils

Thematic 3 – Innovative Products and Health

Abstract #: **T3-O-12**

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Formulation of a Lentisk oil-based spread margarine added with Argan oil as an antioxidant

Presenting author **Anis Chikhoune[1,2]**

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Abstract

In response to the growing demand for more natural food products, the agri-food industries are exploring new plant-based sources with interesting nutritional and functional properties. Lentisk (*Pistacia lentiscus*) oil, rich in bioactive compounds, represents a promising alternative. This study focused on the formulation of two spreadable margarines made from crude and refined lentisk oil, enriched with argan oil used as a natural antioxidant. The results showed that the margarine formulated with crude oil exhibited a high peroxide value (1.7 meq O_2/kg) compared to the reference margarine (0.27 meq O_2/kg) and the one made with refined oil (0 meq O_2/kg). The Rancimat test revealed good oxidative stability, especially for the margarine made with refined oil (23.10 h), followed by the reference (19.31 h) and the crude oil-based margarine (14.72 h). The melting point also varied, with the highest value observed in the crude oil margarine (39.03 °C). Other parameters such as moisture, pH, acidity, and salt content complied with the internal regulatory standards.

Keywords

margarine, lentisk oil, argan oil, refining, extraction, oxidative stability

Thematic 4 – Artificial Intelligence in Food Sciences

Abstract #: T4-O-01

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Advancing Food Science Through Artificial Intelligence

Presenting author **Nousseiba Guidoum**

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Abstract

Artificial Intelligence (AI) has emerged as a transformative technology in food sciences, offering new analytical and predictive capabilities that surpass conventional approaches in quality control, safety assessment, and process optimization. Despite rapid developments, current research remains fragmented across domains, and there is limited integration of AI methodologies with the specific biological, chemical, and environmental constraints of food systems. To address this gap, this review synthesizes recent advances in machine learning, deep learning, and computer vision as applied across the food value chain and identifies priority challenges and opportunities for future research. In primary production, AI-driven predictive models support precision agriculture by integrating multisource data, such as satellite imagery, sensor outputs, and climatic indicators, to estimate yields, diagnose plant diseases, and optimize irrigation and nutrient management. These tools enhance resource efficiency and contribute to climate-resilient food systems. In food processing, AI enables real-time monitoring of physicochemical parameters, detection of contaminants, and automated control of critical operations. Computer vision and hyperspectral imaging are increasingly deployed for defect identification, grading, and authenticity verification, strengthening quality assurance and reducing losses. AI also plays a central role in food safety and risk assessment. Machine learning models support predictive microbiology by improving forecasts of microbial growth, shelf life, and hazard occurrence under dynamic conditions. These models assist industry and regulatory agencies in designing more responsive, evidence-based food safety management systems. In nutrition and consumer sciences, AI supports personalized dietary recommendations, automated dietary assessment, and pattern recognition in large-scale nutritional and omics datasets. The integration of AI with metabolomics, microbiomics, and other omics technologies provides new insights into diet–microbiota–health interactions and supports the development of functional and health-oriented foods. Despite these advances, the adoption of AI in food sciences faces persistent challenges, including limited availability of high-quality and standardized datasets, model interpretability issues, algorithmic bias, cybersecurity concerns, and the absence of harmonized regulatory frameworks. Addressing these limitations requires interdisciplinary collaboration and the application of FAIR data principles, explainable AI, and robust governance mechanisms. Overall, AI holds significant potential to advance food science research and practice, and its responsible integration will be essential for building sustainable, safe, and consumer-centric food systems.

Keywords

AI, precision agriculture, food processing, food safety and quality, predictive microbiology

Thematic 4 – Artificial Intelligence in Food Sciences

Abstract #: T4-O-02

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Application of machine learning for early detection of pathogens in processed cheese: a case study from Numidia dairy unit

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Abstract

Safety in processed cheese remains a challenge in the dairy industry due to the potential survival of pathogens like Salmonella spp., Escherichia coli, and Listeria monocytogenes, which led to reported illness in about 1,400 people in Europe between 2016 and 2021. This study proposes machine learning models to estimate the level of pathogen presence in processed cheese based on physicochemical properties (pH, fat content, and moisture content), as well as microbiologic properties from Algeria's Numidia Dairy Unit and a large survey in Canada. In 2025, during an internship, real-time analysis of samples using standard plating methods revealed potential contaminations and helped build a comprehensive database for model construction. Four methods - Random Forest (RF), Support Vector Machine (SVM), Logistic Regression (LR), and Gradient Boosting (GB) - were tested for model performance after hyperparameter adjustment and 10-fold cross-validation. The highest accuracy (97.2%) and precision (96.8%) were achieved by RF, followed by higher values for sensitivity (97.5%) and F1-score (97.1%) compared to the other models, due to its superior efficiency in handling nonlinear relationships between different microbes. Results were supported and confirmed by Recursive Feature Importance between pH and storage temperature for RF. The confusion matrices and receiver operating characteristic curves showed stronger discriminatory power for RF (AUC: 0.99), enabling early warnings despite changes over time. The findings suggest that artificial intelligence can be applied in the quality control of dairy products, as it can analyze and evaluate them faster and more accurately than the current culture-based approach. The proposed system can be integrated into devices like Raspberry Pi and used to address shortcomings in industrial data that affect the quality of processed cheese products within the supply chain. Improvements can be made in sensor fusion and alert systems.

Keywords

Machine Learning, Pathogen Detection, Processed Cheese, Random Forest, Dairy Safety

Thematic 4 – Artificial Intelligence in Food Sciences

Abstract #: T4-O-03

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Comparison of ANN and ANFIS models for predicting the drying kinetics of fruit slices in a microwave oven and characterization of dried products

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Abstract

In this study, the fruit layers were dried in a microwave oven at a variable microwave power of 200 to 800 W in order to analyze the drying behavior and adjust mathematical models, artificial neural networks (ANNs), and adaptive neuro-fuzzy systems (ANFIS) to predict the drying kinetics of the fruit layers. In addition, the products obtained were analyzed to determine their color properties, total sugar content, polyphenols, flavonoids, and antioxidant activity. The results showed that the ANN model with an R2 of 0.9991 provides a more accurate prediction of the drying kinetics of fruit layers dried in a microwave oven compared to mathematical modeling and ANN. Radiation drying had a significant effect ($p < 0.05$) on the L*, a*, b*, and saturation values of the dried layers. Increasing the microwave drying power from 200 to 800 W resulted in a decrease in the total sugar content of the dried fruit layers compared to the fresh fruit. It should be noted that antioxidant activity decreased with increasing microwave power, while polyphenols and flavonoids increased.

Keywords

Artificial neural networks, adaptive neuro-fuzzy systems, drying kinetics, antioxidant activity

Thematic 4 – Artificial Intelligence in Food Sciences

Abstract #: T4-O-04

Sunday, December 14 – 15:00 – 15:10 – Lecture Hall 1

Food Quality 4.0: Advancing a new era through innovative technologies

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Abstract

The food sector is among the industries that have undergone considerable transformation and development with the advent of the Fourth Industrial Revolution (Industry 4.0). The evolution of food processing and control technologies is therefore a key factor in improving food quality and safety. This review presents Food Quality 4.0 and the main technologies that make it possible. It explains the role of artificial intelligence, the Internet of Things, robotics, and other technologies in improving food processing. The integration of intelligent quality control, new analytical techniques, and traceability provides essential data on the manufacturing process, thus preventing fraud and anticipating non-compliant products. These new technologies and the transparency of the production process strengthen consumer safety and trust in food products. The implementation of Food Quality 4.0 therefore offers the opportunity to eliminate the risks inherent in traditional industries. It represents a successful transition from traditional to new concepts. Despite the challenges and prerequisites for its implementation, this transition is a real asset and contributes sustainably to the industrial, economic, social and environmental development of the sector.

Keywords

Food Quality 4.0, Safety, Smart Control, Artificial Intelligence, Novel Technologies

Poster communications

Thematics

Thematic 1 – Food and Public Health

T1-P-01

Influence of modern eating habits on the rising prevalence of metabolic diseases among Algerian youth

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Abstract

Over the past two decades, Algeria has experienced a rapid and profound nutrition transition driven by urbanization, changing lifestyles, and the growing accessibility of industrialized food products. These changes have led to a significant shift in eating behaviors among adolescents and young adults. Diets that once centered on traditional Mediterranean staples such as legumes, whole grains, fruits, and vegetables are increasingly being replaced by fast foods, sugar-sweetened beverages, and calorie-dense snacks. As a consequence, metabolic diseases particularly obesity, type 2 diabetes, and metabolic syndrome are rising at an alarming rate in the young population.

This review synthesizes recent research examining how modern dietary patterns influence metabolic health among Algerian youth.The findings indicate that unhealthy eating habits are shaped not only by increased access to processed foods but also by sedentary lifestyles, peer and social influences, and the pervasive marketing of unhealthy products. These factors collectively contribute to rising rates of poor dietary choices and metabolic disturbances in adolescents and young adults.

Overall, this review highlights the urgent need for comprehensive and culturally tailored public health strategies to address the rising burden of metabolic diseases among Algeria's younger generations. Effective action will require coordinated efforts to promote healthier dietary behaviors, improve food environments, and implement early preventive interventions that are sensitive to the social and cultural context in which adolescents live.

Keywords

Nutrition transition, Algerian population, metabolic diseases, Adolescents and young adults and Eating habits

T1-P-02

Sweet and fatty food preferences in diabetic adults

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Abstract

The global prevalence of diabetes has risen rapidly over recent decades and is expected to increase by more than 50% by 2045. Strong preferences for sweet and fatty tastes are associated with the consumption of calorie-dense foods. An excessive sugar intake can lead to poor glycemic control in individuals with diabetes. It is often assumed that people with diabetes show a strong preference for sweet tastes, yet limited data are available regarding this association. The aim of the present study was to investigate the potential relationship between diabetes, its duration, and food preferences among adults with diabetes. A cross-sectional study was conducted among 224 adults with type 1 or type 2 diabetes, aged between 18 and 55 years. Diabetes duration was defined as the number of years elapsed between diagnosis and the day of the survey. Food preferences were assessed using a questionnaire evaluating the level of attraction to 36 fatty and sweet foods, categorized as pure fatty, salty-fatty, sweet-fatty, and sweet foods. Total fat preference scores (pure fat, salty-fatty, and sweet-fatty) and total sugar preference scores (sweet-fatty and sweet) were calculated. Statistical analysis was performed using StatView 5th version. Differences were considered statistically significant when $p < 0.05$. In the overall sample,

64.73% were classified as having long-standing diabetes, while 35.27% had recent-onset diabetes. No significant differences were observed in fat or sugar preference scores between males and females ($p > 0.05$). Diabetes duration was negatively correlated with preference scores for sweet-fatty foods, total fat, pure sugar, and total sugar ($p < 0.05$). Diabetes duration seems to have an impact on food preferences. Individuals with long-standing diabetes showed lower preference scores for sweet and sweet-fatty foods. These findings may assist healthcare professionals in optimizing nutritional counseling for patients with diabetes, thereby contributing to improved glycemic control.

Keywords
Diabetes, food preferences, diabetes duration, sweet-fatty foods.

T1-P-03

Contamination of marine biodiversity in the Gulf of Béjaïa by heavy metals: Ecotoxicological risks to human health and the ecosystem

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Abstract
This study examines the bioaccumulation and distribution of several trace metals (Cd, Pb, Zn, Fe, Ni, and Cu) in marine organisms (algae, red mullet, hake, etc.) from the Gulf of Béjaïa to assess the ecotoxicological and health risks. Samples were analyzed by Inductively Coupled Plasma Enhanced Electron Spectrometry (ICP-AES), with statistical analysis performed using ANOVA.
The results confirm widespread bioaccumulation of trace metals along the food web. Concentrations are particularly high for Fe and Zn, with detectable levels of Ni and Cu. The most critical observation is the exceedance of permissible levels for lead (Pb) and cadmium (Cd maximum), as set by current Algerian standards. Unexpectedly, no significant difference ($p > 0.05$) was recorded in accumulation between species or between organs (muscle/liver).This research reveals significant metal contamination of the marine biodiversity of the Gulf of Béjaïa. Exceeding regulatory thresholds for Pb and Cd in the flesh of consumed species underscores a direct toxicological risk to human health. Urgent action is needed to identify the sources of this contamination and implement enhanced environmental and health monitoring.

Keywords
Biodiversity, Ecotoxicology, Heavy metals, Gulf of Béjaïa, Algeria.

T1-P-04

Etude de l'effet de l'âge et de l'état pondéral sur la connaissance des mesures hygiéno-diététiques adaptés aux patients diabétiques à Constantine

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Abstract
Une bonne gestion de diabète est conditionnée par une connaissance solide des mesures hygieno diététiques (MHD) recommandées pour les patients diabétiques. Ce travail vise à évaluer l'effet de l'âge et du statut pondéral sur la connaissance de ces mesures chez une population de diabétiques à Constantine. La population comporte 234 diabétiques adultes (de type 1 et 2) suivis dans le CHU-Constantine. L'âge (par ans) et la durée de diabète (mois) ont été investigués. Le poids (kg), la taille (cm) et le tour de taille (cm) ont été mesurés. L'indice de masse corporelle (IMC) a été calculé. Le niveau de connaissance des MHD est évalué par un questionnaire adapté à la population et qui s'inspire des questionnaires validés (KLIEMANN et coll., 2016 ; HELOU et coll., 2023 ; POST et coll., 2010). Un score de connaissance est calculé. Une connaissance faible (score ≤ 40) et une connaissance moyenne (> 40). L'analyse statistique est réalisée avec le logiciel SPSS25.

L'âge moyen de notre population est 50,96 ± 15,08 ans. L'IMC moyen est de 30,62 ± 5,90 kg/m2 et le tour de taille moyen est de 102,52 ± 14,27 cm. Le taux de surpoids représente 84,8 % de la population dont 52,10% d'obésité. selon le statut pondéral, Le score moyen de connaissance des MHD est de 40,91 ± 11,74 points avec un score maximal de 63 points. 39,8 % de sujets ont un faible niveau de connaissance des MHD. Le score total de connaissance des MHD diminue avec l'augmentation de l'âge (p = 0,0001), de la durée de maladie (p = 0,05) et de l'IMC (p = 0,02). Les diabétiques ayant plus de 70 ans ont le score de connaissance des MHD le plus faible (23,76±13,91 points). Aucune différence significative n'a été trouvée entre les groupes de corpulence et ceux des connaissances des MHD. Le niveau de connaissance des MHD conseillées aux diabétiques de notre population est impacté par l'âge et partiellement par la corpulence. Une éducation nutritionnelle adaptée aux personnes âgées est nécessaire afin qu'ils puissent mieux gérer leurs maladies.

Keywords
Diabète, Age, Etat Pondéral, Mesures Hygiéno-Diététiques.

T1-P-05

Adolescent overweight and obesity: public health implications and modern prevention strategies

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Abstract
Overweight and obesity among adolescents represent growing public health challenges, particularly in regions experiencing rapid lifestyle shifts. This cross-sectional descriptive study assessed the nutritional status of secondary-school adolescents in the district of Touggourt and examined lifestyle-related factors associated with excess weight. Conducted during the 2018/2019 academic year, the study included 744 adolescents aged 14–18 years (53% girls; mean age 17.21 ± 1.06 years). Data collection involved a structured questionnaire addressing dietary habits, physical activity, sedentary behaviors, and sleep duration, alongside both self-reported and measured anthropometric parameters. Nutritional status was evaluated using the International Obesity Task Force (IOTF) and WHO 2007 reference standards. Findings revealed that adolescents tended to overestimate their height and underestimate their weight, leading to a consistent underestimation of body mass index (BMI). Thus, only measured anthropometric values were considered reliable. According to IOTF criteria, the prevalence of overweight and obesity was 8.26% and 3.32%, respectively, whereas WHO 2007 standards showed higher rates of 18.14% and 5.64%. Across both classification systems, girls were significantly more affected (p = 0.001). Skipping breakfast and frequent snacking were identified as major behaviors likely contributing to excess weight. The study underscores the importance of implementing innovative and evidence-based public health strategies to address adolescent overweight and obesity in Touggourt. Modern approaches may include integrating digital health tools and mobile-based nutrition education, employing advanced body composition assessment technologies such as bioelectrical impedance analysis, and utilizing artificial intelligence and big-data-driven models to enhance risk prediction and guide targeted interventions. Strengthening school-based nutritional programs, promoting physical activity, and establishing local public health policies remain essential to reducing the burden of adolescent obesity and fostering long-term health.

Keywords
Adolescents; Overweight & Obesity; Bioelectrical Impedance Analysis; Artificial Intelligence; Touggourt.

T1-P-06

Technological and nutritional potential of carob in fermented dairy matrices

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Abstract
Carob (*Ceratonia siliqua L.*), a typical Mediterranean species, is well known for its pods rich in sugars, dietary fibers, and phenolic compounds. Due to its nutritional and functional value, it represents a natural ingredient of growing interest in the food industry. The aim of this study was to evaluate the incorporation of carob powder and carob syrup (concentrated to **70 °Brix**) into an experimental yogurt and to investigate their impact on its

physicochemical characteristics.A preliminary **physicochemical and phytochemical analysis** showed that carob powder has moderate moisture, high fiber content, and significant levels of phenolic compounds, confirming its potential as a source of bioactive substances. The syrup, on the other hand, was characterized by its high concentration of soluble sugars, giving it strong sweetening power and suitable density for dairy formulations.Three yogurt formulations were prepared: a control without incorporation, E1 (3% powder, 9% syrup), and E2 (1% powder, 15% syrup). The results revealed that the control had an acidity of **73 ± 1**, a °Brix of **18.0 ± 0.1**, and a viscosity of **3500 ± 100 mPa·s**. In comparison, formulation E1 showed an acidity of **103.5 ± 1.5**, a °Brix of **28.1 ± 0.1**, and a high viscosity (**18,800 ± 100 mPa·s**), reflecting the combined effect of powder and syrup on texture and density. Formulation E2 presented intermediate values with an acidity of **98 ± 1**, a °Brix of **21.5 ± 0.5**, and a viscosity of **16,720 ± 120 mPa·s**.These findings demonstrate that carob incorporation significantly improves yogurt characteristics by increasing its nutritional value, sugar density, and textural stability. The powder/syrup combination thus appears as a promising approach for the development of innovative dairy products that are both healthy and aligned with consumer expectations.

Keywords
Carob powder (*Ceratonia siliqua*), Carob syrup, Yogurt, Physicochemical analysis, Phytochemical analysis.

T1-P-07

Assessment of the nutritional status of patients undergoing cardiac surgery in Constantine

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Abstract
This study was conducted at the EHS Djeghri Mokhtar in Constantine with the aim of assessing the nutritional status of patients undergoing cardiac surgery, both before and after the intervention, and identifying associated risk factors. To achieve this, several tools were used: 24-hour dietary recall, questionnaire, NRI (for patients under 65 years), GNRI and MNA (for patients aged 65 and over), as well as serum albumin and CRP measurements. The results revealed a deterioration in nutritional status postoperatively, characterized by a significant decrease in caloric and protein intake, along with a reduction in serum albumin levels. The MNA score showed that 68% of patients aged 65 and over were already at risk of malnutrition before surgery. Although frequently used, serum albumin is not a specific marker of malnutrition in surgical settings, but rather an indicator of morbidity and mortality, whose relevance is enhanced when combined with indices such as GNRI or NRI. The main factors associated with this nutritional decline were: advanced age, female sex, comorbidities (hypertension, diabetes), low educational level, and certain types of surgical procedures. This study highlights the need for prolonged nutritional follow-up, particularly in at-risk patients, using more sensitive markers such as prealbumin and regular monitoring of nutritional intake.

Keywords
Cardiac surgery, nutritional status, malnutrition markers, risk factors

T1-P-08

Bioindication of heavy metal contamination in mediterranean fish: implications for seafood safety

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Abstract
Fish serve as critical bioindicators for monitoring heavy metal contamination in aquatic ecosystems. This study quantified lead (Pb) and cadmium (Cd) levels in three Mediterranean species, the salema (*Sarpa salpa*), gilt-head

seabream (*Sparus aurata*), and mullet (Mugilidae) to assess seafood safety risks. Specimens were collected via net fishing, transported live in oxygenated polyethylene containers, euthanized, and biometrically analyzed (weight, length, sex). Target organs (liver, gills and skeletal muscle) were dissected, with metal extraction and quantification via atomic absorption spectroscopy (AAS). Results revealed concerning Pb contamination exceeding the 0.3 ppm regulatory threshold: salema showed 0.74 ppm (muscle), 0.68 ppm (liver), and 0.98 ppm (gills); seabream exhibited 0.65 ppm (muscle/liver) and 0.63 ppm (gills); mullet displayed 0.46 ppm (muscle) and 0.53 ppm (liver), though its gills were compliant (0.21 ppm). Conversely, all Cd concentrations remained below the 0.05 ppm standard: salema (muscle: 0.048 ppm; liver: 0.043 ppm; gills: 0.037 ppm), seabream (muscle: 0.0079 ppm; liver: 0.0007 ppm; gills: 0.002 ppm), and mullet (muscle: 0.01 ppm; liver: 0.02 ppm; gills: 0.019 ppm). These findings highlight significant Pb bioaccumulation in key fisheries species, underscoring urgent needs for enhanced environmental monitoring and targeted pollution mitigation in coastal ecosystems

Keywords
Fish, Bioindicators, Food Safety, Lead, Cadmium

T1-P-09

Histoire alimentaire et état de santé des enfants de 3-5 ans à Skikda (2023- 2024)

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Abstract
Décrire l'histoire alimentaire et état de santé d'enfants âgés de 3 à 5 ans à Skikda.Une enquête transversale a été réalisée dans une crèche à l'Ouest de la commune de Skikda (Algérie) entre 2023et 2024 selon un questionnaire standard de l'OMS *(2004)* adapté. La collecte de données a été faite auprès des mères par interview et a concerné l'allaitement, l'âge d'introduction des aliments et des questions sur l'état de santé des enfants. Notre étude a porté sur 104 des enfants (54 garçons) âgés de 3à 5 ans. A la naissance, 4,8% sont nés prématurés, 2,8% avaient un poids normal et 92,3% avaient un faible poids de naissance. Durant les trois premiers mois de naissance,19,2% ont eu un allaitement exclusif, 16,3% un allaitement artificiel ou prédominant et 48,0% un allaitement mixte. L'âge d'introduction des aliments était de 4 mois chez 29,8% des enfants, 5 mois chez 34,6%des enfants, et 6 mois chez 31,7% des enfants. Concernant l'état de santé, 30% des enfants sont atteint de certaines maladies telles que : anémies, allergies respiratoires, asthme, problèmes orthophoniques (prononciations et retard de parler), surpoids et obésité. La consommation de compléments alimentaires (fer, zinc et vitamine C) est observée chez 11,5% enfants. La connaissance de l'histoire alimentaire des enfants depuis la naissance est importante pour se protéger contre certaines maladies pouvant apparaître dans des âges plus avancées de la croissance des enfants.

Keywords
Histoire Alimentaire, Enfants (3-5 Ans), Alimentation, Santé, Skikda

T1-P-10

Influence of desert pastures on the microbiological quality of camel milk (Region of Ouargla, Algeria)

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Abstract
Camel milk possesses an inherently strong protective system, particularly against halotolerant microorganisms, a property largely attributed to the natural desert grazing typical of extensive farming systems. However, in efforts to enhance milk yield, many producers have shifted toward semi-intensive or intensive husbandry practices. This study assesses the dynamics of halotolerant flora in camel milk obtained from three distinct farming systems (extensive, semi-intensive, and intensive) in the region of Ouargla (Algeria) and evaluates their evolution during storage at room temperature (30 °C) and under refrigeration (4 °C).At collection (D0) and up

to two days post-sampling, halotolerant flora remained undetectable in milk from the extensive system. Conversely, in the intensive system, halotolerant microorganisms appeared as early as D0+1, reaching 32,5 × 10^4 CFU/ml at 30 °C and 10,66 × 10^4 CFU/ml at 4 °C, followed by a decline the following day. The semi-intensive system exhibited relatively stable microbial levels throughout storage. Antagonism assays revealed that milk from the extensive system displayed the strongest inhibitory activity against *Staphylococcus aureus* (ATCC 25923). These findings indicate that transitioning from extensive to semi-intensive or intensive systems compromises the natural antimicrobial properties of camel milk, ultimately affecting its microbiological quality and potentially its value to consumers.

Keywords
Milk, *Camelus dromedarius,* Farming system, Antimicrobial activity, *Staphylococcus aureus.*

T1-P-11

Obésité et réactivité alimentaire : aperçu comportemental grâce au Power of food scale (Pfs)

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Abstract
La réactivité alimentaire, mesurée par le Power Food Scale (PFS), constitue un déterminant important du comportement alimentaire. Elle désigne la sensibilité psychologique et physiologique aux signaux alimentaires de l'environnement, favorisant la surconsommation et la prise de poids. L'objectif de cette étude est d'évaluer l'association entre la réactivité alimentaire et les comportements alimentaires chez des adultes obèses. Il s'agit d'une étude transversale intégrée dans un suivi longitudinal. L'enquête a été menée auprès de 45 femmes adultes ayant un IMC≥30 kg/m². La réactivité alimentaire est évaluée par le score du Power of food scale (PFS). Le comportement alimentaire est évalué via des questions sur la fréquence et les horaires des repas, le grignotage et les déclencheurs de la prise alimentaire. Un enregistrement alimentaire a été demandé pour estimer les apports nutritionnels et la consommation d'aliments appétissants. Le poids, la taille et l'IMC représentent les paramètres anthropométriques. L'analyse statistique est réalisée avec le logiciel IBM SPSS 20.Le poids moyen de la population était 97,63 ± 9,71 kg et l'IMC moyen 32,63 ± 2,01 kg/m². L'apport calorique moyen était de 2192,24± 561,93 (Kcal/j). Le score moyen du PFS était de 2,87 ± 0,80, révélant une réactivité modérée aux stimuli alimentaires appétissants au sein de l'échantillon. Les moyennes obtenues pour les trois sous-dimensions du PFS était : 2,61 ± 1,09 pour la nourriture disponible, 2,98 ± 0,13 pour la nourriture palatable et 3,71 ± 0,68 pour la nourriture présente. La réactivité alimentaire était significativement corrélée à la fréquence du grignotage (p=0,008), à la faim émotionnelle (p=0,013) et à l'apport calorique total (p=0,01). Aucune association significative n'a été observée entre le score du PFS et l'IMC (p>0,05).Une réactivité alimentaire élevée constitue un facteur clé des comportements alimentaires défavorables chez les adultes obèses. Ces résultats soulignent la pertinence d'intégrer une approche psychologique ciblant la réactivité alimentaire dans les programmes de prise en charge de l'obésité.

Keywords
Obésité, Réactivité alimentaire, Comportement alimentaire, Power of Food Scale, Palatabilité.

T1-P-12

Pratiques anti-gaspillage du pain au sein des ménages

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Abstract
Le pain est un aliment de base apprécié et consommé quotidiennement dans de nombreux pays. En Algérie, plus de 900 baguettes de pain sont jetées chaque année. Cependant, le pain gaspillé peut être récupéré et réutilisé dans d'autres recettes. L'objectif de cette étude est de connaître le comportement vis à vis des restes de pain au niveau des ménages. Nous avons réalisé une enquête transversale à visée descriptive auprès de 200 ménages dans la région de Ichemoul (Batna). Un questionnaire sur les habitudes de consommation du pain, les

quantités restantes et leur devenir était utilisé pour interviewer les ménagères. Les données ont été traitées à l'aide du logiciel Epi info. Les résultats montrent que 94% de cette population consomment du pain, avec une fréquence de 3 à 4 jours par semaine pour 34% des ménages et quotidiennement. Pour 18% d'entre eux.Selon les déclarations des ménagères, plus de 60% des enquêtées achètent entre 2 et 4 baguettes de pain par jour, 64% enregistrent des restes de pain après les repas quotidiennement et 34% occasionnellement, avec des quantités différentes (30% ont des restes d'une demi-baguette). Plus de 88% d'entre elles ne jettent pas ces restes de pain. Les utilisations possibles sont : conservation et présentation pour les repas suivants (56%), chapelure (43%) et pain grillé (3,1%) ainsi qu'un nombre de préparations tel que : mini pizza (2,7%), *Khobz el bey* (3,2%), *Sfiria* (3,7%), pain perdu (4,7%). Le pain restant peut aussi être destiné à l'alimentation des animaux dans 34,5% des cas.

Il a aussi été noté que 27% de cette population ne consomment pas la mie de pain et que seulement 8% la jettent et les autres l'orientent vers l'alimentation animale. Cette étude met en évidence une adoption d'un grand nombre de pratiques anti-gaspillage du pain au sein des ménages aux quelles des actions de sensibilisation doivent être associées afin de minimiser le plus possible ce phénomène.

Keywords
Pain, gaspillage alimentaire, comportement alimentaire, pratiques anti-gaspillage

T1-P-13

Impact of tomato by-product incorporation on selected properties of extruded gluten free pasta

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Abstract
Tomato by-product (TBP) is a nutrient rich by-product that could enhance nutritional value of gluten free pasta, and support sustainable waste reduction. This study investigated selected quality properties of gluten free rice pasta fortified with different amount of TBP (0, 7.5 and 10 %). Gluten-free pasta was made using a single screw extruder EXP-45-32 (Zamak Mercator, Skawina, Poland). Cooking quality (cooking loss and water absorption capacity), textural properties (hardness and firmness) and specific mechanical energy were evaluated. The results showed that the increase of incorporation level increased significantly ($p<0.05$) cooking loss (8.35 – 14.47 %), WAC (116.12 – 131.52%), and specific mechanical energy (0.11 - 0.72 kWh/kg), and decreased both hardness (5.68 – 13.07 N) and firmness (318.5 - 401.25 N). TBP can successfully be used (less than 7.5%) in nutritionally valuable pasta formulations. The processing parameters optimisation may allow the application of TBP in the production of gluten free pasta fortification.

Keywords
Extrusion-cooking, tomato by-product, gluten free pasta, textural properties, cooking quality.

T1-P-14

Combined effects of dietary intake and obesity on left ventricular remodeling

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Abstract
Left ventricular remodeling is a common complication of arterial hypertension and is influenced not only by hemodynamic factors but also by nutritional determinants. Dietary intake and nutritional status, particularly obesity, may contribute to structural alterations of the left ventricle.This study aims to assess the combined effects of dietary intake and body mass index (BMI) on echocardiographic parameters in hypertensive patients. A cross-sectional study was conducted among 152 adult hypertensive patients (mean age: 64.71 ± 9.21 years; mean BMI: 29.23 ± 4.61 kg/m²). Dietary intake was assessed using a 24-hour dietary recall. Echocardiographic

measurements, including left ventricular mass index (LVMi) and diastolic filling parameters, were performed according to international guidelines.Higher sodium intake, total caloric intake, and saturated fat intake were significantly associated with an increased LVMi, indicating adverse concentric ventricular remodeling. Patients with higher LVMi also exhibited significantly higher BMI values. Conversely, greater fiber intake was observed among individuals with lower LVMi.Dietary factors and excess body weight appear to be major determinants of left ventricular remodeling in hypertensive patients. These findings highlight the importance of integrating targeted nutritional strategies in the management of left ventricular hypertrophy.

Keywords
Hypertension, Fiber, Energy, LVMI, Nutrition

T1-P-15

Étude du potentiel immunothérapeutique du lait de chamelle dans le traitement du cancer : approche épidémiologique

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Abstract
Le cancer demeure une cause majeure de mortalité mondiale malgré les progrès thérapeutiques (chirurgie, chimiothérapie, radiothérapie, immunothérapie) qui présentent encore des limites liées à leurs effets secondaires et à leur manque de spécificité. Dans cette optique, l'intérêt pour les substances naturelles, notamment le lait de chamelle, ne cesse de croître en raison de ses propriétés immunomodulatrices et antioxydantes. Cette étude, menée au Centre Anti-Cancer de Batna, a porté sur 149 patients atteints de divers cancers (sein, foie, côlon, poumon, etc.). Les données, recueillies par questionnaire, ont exploré les habitudes de consommation du lait de chamelle, ses effets perçus sur la santé et les éventuels effets indésirables. La population était composée majoritairement de femmes (69,8 %) et de patients âgés de 19 à 50 ans (52 %). Les cancers les plus fréquents étaient ceux du sein (37,5 %), du foie (17 %) et du côlon (13 %). Environ 37 % des patients consommaient régulièrement du lait de chamelle, souvent cru (58 %), à raison d'un verre par jour, parfois associé à du miel ou du curcuma. Les principales motivations étaient le renforcement de l'immunité (72 %), la réduction de la fatigue (63 %) et l'amélioration du moral (55 %). Parmi eux, 61 % ont noté une amélioration générale de leur santé et une meilleure tolérance aux traitements.
Ces résultats soutiennent les propriétés bénéfiques du lait de chamelle, riche en lactoferrine, immunoglobulines et antioxydants, suggérant qu'il pourrait constituer un adjuvant naturel prometteur dans la prise en charge du cancer. Cependant, des études cliniques approfondies restent nécessaires pour confirmer ces effets et encadrer son usage thérapeutique.

Keywords
Lait de chamelle, Cancer, Immunothérapie, Lactoferrine, Étude épidémiologique.

T1-P-16

Nutritional status and quality of life in Algerian hemodialysis patients: a cross-sectional study

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Abstract
Malnutrition is a prevalent and multifactorial condition among chronic hemodialysis patients and is closely linked to inflammation, morbidity, and reduced quality of life (QOL). In Algeria, data on nutritional status and its association with QOL remain scarce. This study aimed to assess nutritional status, dietary intake, inflammation, and their relationship with QOL in chronic hemodialysis patients. A multicenter cross-sectional study was conducted among 164 chronic hemodialysis patients recruited from four Algerian dialysis units. Collected data included anthropometry, 24-hour dietary recall, biological markers (albumin, CRP), and the Nutritional Risk Index (NRI). QOL was evaluated using the validated KDQOL-SF™ questionnaire. Associations

between nutritional indicators, inflammation, dialysis adequacy (Kt/V), and QOL domains were analyzed. More than 70% of patients showed body weight instability over the preceding three months. Underweight affected 16% of participants, while a double nutritional burden (underweight and overweight) was particularly evident among women. Malnutrition prevalence, based on the NRI, reached 25%. Dietary intake was inadequate in most patients: 87.8% consumed <1.2 g/kg/day of protein and 89% <35 kcal/kg/day. Mean serum albumin was normal, though severe hypoalbuminemia (<30 g/L) occurred. Elevated CRP levels (mean 18 mg/L) suggested chronic inflammation. The NRI correlated positively with dietary intake, body weight, and BMI. QOL impairment was reported in 64% of patients, especially women, who exhibited higher pain, emotional limitations, and psychosocial distress. QOL scores were positively associated with Kt/V, serum albumin, and creatinine, whereas age, comorbidities, and inflammation were significant negative determinants. Malnutrition, inflammation, and reduced QOL are highly prevalent among Algerian hemodialysis patients. These findings underscore the need for individualized, multidisciplinary nutritional management and longitudinal studies to evaluate targeted interventions.

Keywords
Hemodialysis, Nutritional status, malnutrition, Inflammation, Quality of Life.

T1-P-17

Impact of varying freezing temperatures on *Sardinia pilcarudus* as blue fish's nutritional composition and microbiological quality

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Abstract
The aim of this study was to investigate the effect of different freezing temperatures on maintaining nutritional quality and monitoring microbiological aspects during a 15-day storage period of sardines. Three types of samples stored at -18°C, -40°C, and -60°C were compared. Statistical analysis revealed a significant relationship (p<0.05) between the total fat content, crude protein content, and peroxidation index of fish flesh and the degree of freezing applied to raw sardines from the control batch. Sardine samples stored at -40°C had the highest levels of antioxidant activity and key nutrients, indicating that this is the appropriate temperature for maintaining the nutritional quality of meat. No pathogenic germs were detected in the samples studied, according to the microbiological analysis, which indicates that hygiene standards were strictly respected during cutting, followed by good control of the cold chain throughout the experimental period. Freezing is a valuable technique for increasing the shelf life of highly perishable meat such as fish. The extent of each of these effects depends on the size and distribution of ice crystals that form in the meat during freezing. Mitigating the negative effects of freezing on sardine meat quality is challenging because the size and distribution of ice crystals depend on many factors, such as freezing rate and temperature, as well as storage time. Therefore, researchers have explored different combinations of freezing temperatures, rates, and durations to optimize the freezing method for better preservation of meat quality.

Keywords
Freezing, Ice Crystals, Peroxidation, Preservation, Quality, Sardines

T1-P-18

Performance of body mass index in assessing nutritional status compared with fat mass index in non-obese older adults with diabetes

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Abstract
Body Mass Index (BMI) is widely used to assess nutritional status, yet it has important limitations in older adults, particularly regarding body composition changes. Fat Mass Index (FMI), defined as fat mass measured by dual-energy X-ray absorptiometry (DEXA) divided by height², may offer a more accurate assessment of adiposity in this population.To evaluate the diagnostic performance of BMI compared with FMI (reference method) in

classifying the nutritional status of non-obese older adults with diabetes. A cross-sectional study was conducted among 252 diabetic patients aged ≥ 60 years. Nutritional status was categorized into four groups (undernutrition, normal weight, overweight, obesity) according to BMI and FMI. BMI performance metrics were assessed using FMI as the gold standard: sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV). BMI detected no cases of obesity (0 %), while FMI identified 13.9 %. Normal weight was overestimated by BMI (37.3 % vs 21.4 % with FMI). Overweight classifications were similar (60.7 % vs 61.1 %). For undernutrition, BMI identified 1.19 % compared with 1.6 % by FMI. BMI showed high sensitivity for overweight detection (99.35 %) but moderate specificity (62.8 %). The PPV was 81.4 % and the NPV 98.3 %. In non-obese older adults with diabetes, BMI efficiently screens for overweight but markedly underestimates obesity and overestimates normal weight. FMI provides a more accurate evaluation of nutritional status, supporting its use in this vulnerable population.

Keywords
Nutritional status. Body Mass Index (BMI). Fat Mass Index (FMI). Dual-energy X ray absorptiometry (DEXA). Type 2 diabetes.

T1-P-19

Validity of the mini nutritional assessment screening tool for detecting malnutrition in older adults with diabetes

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Abstract
As life expectancy increases, type 2 diabetes is increasingly associated with age-related complications, among which nutritional disorders hold a central position. Early detection of malnutrition in older adults with diabetes is a public health priority, yet available evidence remains limited. The Mini Nutritional Assessment (MNA) is a validated tool including a rapid screening form and a full version, the latter being considered the diagnostic reference.To evaluate the validity of the MNA screening tool in assessing the nutritional status of older adults with diabetes, compared with the full MNA.A cross-sectional study included 252 diabetic patients aged ≥60 years. Nutritional status was assessed using both the MNA screening tool and the full MNA. Participants were classified into three categories: normal nutritional status, risk of malnutrition, and confirmed malnutrition. The validity of the MNA screening tool was analysed in terms of sensitivity, specificity, and predictive values, using the full MNA as the gold standard.According to the MNA screening tool, 53.2% of patients had normal nutritional status, 40.9% were at risk of malnutrition, and 6% had confirmed malnutrition. Based on the full MNA, the proportions were 59.9%, 34.9%, and 5.2%, respectively. A statistically significant difference was found between the two classifications ($p < 0.001$). The MNA screening tool demonstrated a sensitivity of 86.1%, a specificity of 79.5%, a positive predictive value of 73.7%, and a negative predictive value of 89.6% for detecting malnutrition or risk of malnutrition. Nutritional disorders are common among older adults with diabetes, with more than 40% being malnourished or at risk. The MNA screening tool shows good validity compared with the full MNA and represents a simple, rapid, and relevant instrument for malnutrition screening in clinical practice.

Keywords
Mini Nutritional Assessment, Malnutrition screening, Older adults, Type 2 diabetes, Nutritional assessment.

T1-P-20

Allergy to peanut proteins

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Abstract
Peanut allergy is a common and potentially life-threatening food allergy that affects millions of people worldwide. It is an immunoglobulin E (IgE)-mediated hypersensitivity reaction caused by the immune system's abnormal response to specific peanut proteins, primarily Ara h 1, Ara h 2, Ara h 3, and Ara h 6. These proteins are highly stable and resistant to heat and digestion, making them potent allergens capable of triggering severe allergic reactions even in small amounts. During sensitization, exposure to peanut proteins induces the

production of specific IgE antibodies that bind to mast cells and basophils. Upon re-exposure, these antibodies cross-link, leading to the release of histamine and other mediators responsible for allergic symptoms, ranging from mild urticaria and gastrointestinal distress to severe anaphylaxis. Genetic predisposition, environmental influences, and early dietary exposure are key factors in the development of peanut allergy. Diagnosis involves clinical evaluation, skin prick testing, measurement of peanut-specific IgE, and, when required, oral food challenges. Management primarily focuses on strict avoidance of peanuts and prompt administration of epinephrine in case of accidental exposure. Recent advances in oral, sublingual, and epicutaneous immunotherapy offer promising strategies to induce desensitization and improve quality of life. Continued research on peanut protein structure and immune mechanisms is essential for developing effective prevention and treatment options.

Keywords
Allergy, Food, Peanut proteins, Sensitization, Immunotherapy.

T1-P-21

Multivariate analysis of the milk quality prediction dataset

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Abstract
Guaranteeing an adequate level of milk quality is crucial, especially for populations with higher nutritional vulnerability such as children and elderly individuals. These groups require milk that meets strict safety and quality standards to minimize risks associated with contamination or compositional defects. In this context, this study investigates the multivariate structure of the Milk Quality Prediction dataset through the application of Principal Component Analysis (PCA), with the objective of identifying the key physicochemical and sensory attributes that drive milk quality differentiation. The dataset comprises eight variables: pH, temperature, taste, odor, fat content, turbidity, color, and grade. Prior to analysis, all variables were centered and scaled to ensure comparability. The projection of the observations onto the factorial plane reveals well-defined clusters corresponding to distinct grade levels, demonstrating the discriminative capacity of both physicochemical and sensory variables. Overall, the findings highlight the relevance of PCA as a robust exploratory technique for dimensionality reduction, pattern recognition, and the identification of dominant factors influencing milk quality within dairy datasets.

Keywords
Principal Component Analysis (PCA), Multivariate analysis; Milk quality; Physicochemical properties, Quality classification.

T1-P-22

Dietary diversity score is positively associated with height-for-age in 24-months-old Algerian children

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Abstract
A diverse diet from early life is essential to ensure adequate intake of required nutrients and several studies had linked it to better health outcomes. The complexity of measuring the quality of children's diets and evaluating its relationship to child's growth has been reduced by the use of simple indicators. The aim of this study is to assess the dietary diversity score (DDS) and to examine its association with nutritional status of children aged 24 months in eastern Algeria. a cross-sectional survey was carried out between January and December 2022, among 140 mother-child pairs attending vaccination centers of the Municipality of El-Khroub, eastern Algeria. A structured questionnaire was used to collect data on sociodemographic characteristics and anthropometric measurements of the child. Dietary diversity was assessed through a single 24-hour recall. Statistical analysis was performed using IBM SPSS version 26. The association between child anthropometric indices (LAZ, WHZ

and WAZ) and DDS were examined through binary logistic regression and multiple linear regression models. Significance was fixed at $p<0.05$. The mean DDS of the sample was 3,99±1,11 and 70,71% child did not achieve the minimum dietary diversity. The prevalence of stunting, wasting and overweight were 4,29%, 2,14% and 5,71% successively. A significant association was found between DDS an HAZ (p=0,02; r=0,168), but there was no significant association neither between DDS and WHZ (p=0,46), nor for DDS and WAZ (p=0,43). Awareness program on dietary diversity should be implemented to educate parents of its importance for their children's health.

Keywords
Dietary Diversity, Score, Nutritional Status, Children, Algeria.

T1-P-23

Phenotypic characterization and identification of *Salmonella spp.* strains isolated from chicken in the Adrar region

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Abstract
Salmonella infections constitute a major public health concern and are considered among the principal pathogenic agents responsible for human gastroenteritis, causing millions of foodborne illness cases each year. They also represent one of the leading causes of contamination in the food industry, associated with high morbidity and mortality rates. In developing countries, where hygiene and food preservation conditions may be inadequate, the prevalence of salmonellosis is even more pronounced. Moreover, *Salmonella* is among the main causes of microbiological non-compliance in the agri-food industry, resulting in significant economic losses and notable public health risks. This study aims to phenotypically characterize and identify *Salmonella spp.* strains isolated from raw chicken samples collected from various retail points in the Adrar region, southern Algeria. A total of 30 chicken samples were collected and analyzed in accordance with the recommendations of ISO 6579-1:2017, which outlines the procedures for the detection of *Salmonella spp.*, including pre-enrichment, selective enrichment, isolation, and identification of the recovered strains. Bacterial isolation was carried out using two selective media. Typical *Salmonella spp.* colonies appeared on Xylose Lysine Deoxycholate (XLD) agar as pink colonies with a black center, while on Hektoen Enteric Agar (HEA) they appeared greenish-blue to green with a black center. These suspected colonies were subcultured on nutrient agar, where they formed round, smooth, convex, light beige colonies with regular edges. The confirmation of isolates was performed using standard biochemical tests (oxidase, catalase, TSI, mannitol motility and citrate), supplemented by the API 20E system for more precise identification. Among the 30 samples analyzed, 14 isolates were identified and confirmed as *Salmonella spp.*, yielding a positivity rate of 46.7%. In conclusion, *Salmonella spp.* were prevalent in local chicken meat, highlighting their role in foodborne infections and public health risks. These findings underscore the need to strengthen hygiene and microbiological controls in poultry production. The phenotypic approach provides a critical preliminary step before applying molecular methods for detailed strain typing and understanding genetic diversity.

Keywords
Salmonella spp.; poultry; phenotypic characterization; food safety; Adrar

T1-P-24

Hospital malnutrition among patients with non-communicable diseases in Algeria: Assessment, prevalence, risk factors, screening tools, and quality of hospital meals

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Abstract
Non-communicable diseases (NCDs) are a major cause of hospitalization and are often worsened by malnutrition, leading to increased morbidity, mortality, and healthcare costs.This study aimed to determine the prevalence and risk factors of hospital malnutrition in Algeria, to analyze meals served and consumed, and to identify the most appropriate nutritional screening tool. A cross-sectional study was conducted on 105 adult patients hospitalized for NCDs in Skikda between 15 November and 10 December 2020. Data were collected through face-to-face interviews, including nutritional assessment using MST, MUST, BBT, and SNAQ, compared to the reference tool (SGA). Dietary intake was estimated using Ciqual food composition tables, and hospital meals were analyzed. Data processing was performed with Excel, Epi-Info, and SPSS. The mean age of patients was 58.21 ± 13.69 years. The prevalence of malnutrition according to SGA was 44.76%, with an average hospital stay of 4.14 ± 7.69 days. The prevalence of malnutrition risk varied across screening tools: MUST 52.38%, MST 22.86%, with MUST showing the highest sensitivity. Most of the food consumed came from patients themselves (78.09%), while only 3.81% was provided by the hospital nutrition service. Only 24.76% of patients met 100% of their energy requirements, and 13.33% met ≥ 75% of their protein needs, with severe deficiencies in vitamins and minerals. Hospital meals provided on average 9759 ± 1111.6 kJ/day, 106 ± 9.2 g of protein, 65 ± 20.5 g of fat, and 326 ± 39.3 g of carbohydrates, indicating macronutrient imbalance and insufficient healthy fats and micronutrients due to the absence or inadequacy of certain food groups. Hospital malnutrition is common in Algeria. Improving nutritional intake and using appropriate screening tools are essential for optimizing the care of hospitalized patients.

Keywords
Ncds, Hospitalization, Hospital Meal, Malnutrition, SGA

T1-P-25

Study of the release kinetics and the digestibility of encapsulated and non-encapsulated carotenoids from seaweeds

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Abstract
Carotenoids from marine algae are widely recognized for their strong antioxidant and anti-inflammatory properties, yet their stability and bioavailability are often limited during digestion. Encapsulation has emerged as an effective strategy to protect these sensitive compounds and improve their delivery to the intestinal tract, where their absorption and biological activities are most relevant. This study evaluated the encapsulated and non-encapsulated carotenoids of brown seaweed (Fucus vesiculosus) extracts, as well as their antioxidant and anti-inflammatory activities during in vitro gastrointestinal digestion. Carotenoid content was quantified, and the antioxidant (DPPH radical scavenging), reducing (ferric reducing power), and anti-inflammatory activities were assessed before and during the different phases of digestion. The release kinetics of encapsulated carotenoids were also examined. The results show that before digestion, non-encapsulated extracts had a higher carotenoid content (4.52 mg/100 g) compared to encapsulated ones (3.20 mg/100 g). However, during the intestinal phase, bioaccessibility was higher for the encapsulated extracts (3.8 mg/100 g), due to a targeted release of compounds facilitated by the alkaline pH. The release kinetics displayed a progressive pattern according to pH, peaking at 5.2 mg/100 g at pH 7. Encapsulated extracts retained significant antioxidant and anti-inflammatory activities, particularly during the salivary and intestinal phases. In the gastric environment, the low release observed indicated good carotenoid stability, protecting them from degradation. Correlation analysis revealed strong relationships between carotenoid content and biological activities, especially for encapsulated extracts in the intestinal phase. These results confirm the relevance of alginate-based encapsulation in protecting carotenoids, enhancing their intestinal release, and boosting their bioactive effects. Overall, these findings highlight the nutritional relevance of encapsulated carotenoids from Fucus vesiculosus, demonstrating that encapsulation enhances their stability, intestinal bioaccessibility, and functional health benefits, thereby increasing their potential as valuable marine-derived nutritional compounds.

Keywords

Seaweed, Carotenoids, Digestibly, Biological Activity, Release Kinetics.

T1-P-26

Dietary fibers and type 2 diabetes management: A study in a population of diabetic women

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Abstract
The main objective of this study is to assess the impact of dietary fiber intake on glycemic control in 250 adult women with T2DM attending the Belle Vue diabetes center - Constantine. Using a detailed questionnaire, we evaluated participant's sociodemographic profiles, eating habits, fiber knowledge, and lifestyle, alongside their blood glucose, HbA1c, and lipid profiles.Findings revealed that most participants were obese (BMI = 30.1 ± 4.8), had poor glycemic control (HbA1c = 7.7 ± 1.24%), and low fiber intake (11.55 ± 5.24 g/day), far below international recommendations. While dietary diversity was moderate, overall food quality was poor characterized by high intake of high-glycemic index foods and low consumption of fiber- rich foods. The majority of participants lacked knowledge of fiber's role in diabetes management and had never heard of the glycemic index or load. Although statistical differences between fiber intake and glycemic control were not significant, trends suggest that participants with better glycemic control consumed slightly more fiber and engaged more in physical activity.This study highlights the need for nutrition education and fiber-focused dietary interventions to improve glycemic outcomes among Algerian diabetic patients.

Keywords
Type 2 Diabetes Mellitus, Dietary Fiber, Glycemic Control, HbA1c, Glycemic Index, Nutritional Awareness.

T1-P-27

Sustainable enhancement of barley grain quality through rhizobacterial interventions

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Abstract
Barley (*Hordeum vulgare* L.) is a vital cereal crop known for its functional components, particularly β-glucan and phenolic compounds, which contribute to improved digestive health, glycemic control, and antioxidant protection. Enhancing these bioactive compounds through sustainable agricultural practices has become a priority for developing high-quality cereal-based products. Plant Growth-Promoting Rhizobacteria (PGPR) offer an eco-friendly approach to improve plant metabolism and boost grain nutritional quality. This study aimed to evaluate the effects of three *Pseudomonas* strains (BT1, BT2, and BT3) on β-glucan, total phenolic, and antioxidant content in barley grains under open-field conditions. A randomized complete block design with five replications was used, including a non-inoculated control. Seeds were inoculated with each *Pseudomonas* strain before sowing. β-glucan content was determined using an enzymatic assay. Total phenolic content was quantified using the Folin–Ciocalteu method, and antioxidant activity was assessed through the DPPH radical scavenging assay. Statistical differences among treatments were evaluated using ANOVA followed by mean separation tests. The results showed that BT1 treatment exhibited the highest antioxidant activity and also enhanced polyphenol content, followed by BT2. In contrast, BT3 treatment recorded the lowest levels among the *Pseudomonas* treatments, while the Control had the lowest β-glucan content (3.90) compared to BT1 (4.62), BT2 (4.54), and BT3 (4.04). Overall, these findings indicate that *Pseudomonas*, particularly strain BT1, can effectively enhance the biosynthesis of health-promoting secondary metabolites and improve dietary fiber content in barley grains. *Pseudomonas* spp. application, particularly strain BT1, effectively enhances key functional components in barley, including β-glucan, phenolic content, and antioxidant capacity. These results highlight the potential of Plant growth-promoting rhizobacteria-based strategies to sustainably improve barley grain quality and support the production of high-value cereal ingredients for nutrition-focused applications.

Keywords
Barley (*Hordeum vulgare* L.), β-glucan, Plant Growth-Promoting Rhizobacteria, Total Phenolic Content, Antioxidant Activity.

T1-P-28

From traditional remedy to evidence-based therapy: Lemon balm in diabetes care

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Abstract
Diabetes mellitus represents a significant global health challenge, affecting nearly 5% of the world's population. Type 2 diabetes constitutes the most prevalent form, accounting for over 90% of cases, and is characterized by persistent hyperglycemia resulting from disruptions in glucose metabolism and insulin secretion and function. Recent research in type 2 diabetes management has increasingly focused on exploring plant-derived compounds with demonstrated hypoglycemic and lipid-lowering properties. This has led to growing scientific interest in herbal extracts, particularly due to their antioxidant and hypolipidemic activities. Lemon balm (*Melissa officinalis* L) is a widely recognized medicinal plant utilized globally in perfumery, cosmetics, and food products. Traditional applications include its use as a mild sedative, antispasmodic, and antimicrobial agent. The leaves contain numerous bioactive compounds, notably polyphenols such as rosmarinic acid, trimeric compounds, and various flavonoids. *In vivo* investigations evaluated the hypoglycemic capacity of Melissa officinalis L. extracts in both normoglycemic and hyperglycemic rabbit models. A control group (n=3) received 1 ml/kg distilled water, while a reference group (n=3) was administered 500 mg/kg BW of Glucophage. Diabetes was induced through glucose overload 30 minutes post-administration of distilled water, plant extracts, and Glucophage. All substances were administered orally. The findings demonstrate that *M. officinalis* L. possesses significant anti-diabetic potential, substantiating its traditional use in diabetes management. The results provide scientific validation for its ethnobotanical application in glycemic control.

Keywords
Hypoglycemic Activity, Cultivated Plants, Hydroethanolic Extract, Anti-Diabetic Effect.

T1-P-29

Development of a novel gluten free cookie enriched with Prickly pear peel: physical, textural, sensory, and antioxidant characteristics

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Abstract
Prickly pear peel is rich in bioactive compounds and dietary fibre, making it a valuable biomass for nutraceutical and bakery applications. This study investigates the potential of substituting rice flour (RF) with prickly pear peel powder (PPP) at levels of 2.5–15 % to produce a gluten free nutritionally healthy cookies. The enriched gluten free cookies were characterized by physical, textural, antioxidant, chemical composition, sensory, and microbiological properties. The enrichment results indicated that 10 % prickly pear powder-enriched gluten free cookies have a hight spread ration (14.10) compared to control gluten free cookies. The textural properties indicated a higher value of the hardness of enriched gluten-free cookies compared to control cookie with rice flour. Chromatographic analysis (HPLC-ESI-MS/MS (high-performance liquid chromatography-electrospray ionization tandem mass spectrometry)) revealed a wide variety of phenolic acids. The total content of free phenolic acids and the sum of polyphenols increased with increasing content of the functional additive. Moreover, in most cases, the content of individual acids increased with the addition of prickly pear powder. Besides, the antioxidant activity was positively correlated with the addition of prickly pear powder, the content of free phenolic acids, and total polyphenols. Similarly, the addition of prickly pear powder reveals an improvement in insoluble fiber contents. The values range from 2.17 g/100g for the control gluten-free cookies made with only rice to 11.87 g/100g for the cookies with 15% prickly pear powder. Sensory analysis revealed greater appreciation for the cookies enriched with prickly pear powder compared to their gluten-free rice-based control. Cookies produced with peels recorded the highest values of taste, color, texture and overall acceptability. Storage studies demonstrated that prickly pear powder extended the cookies shelf life to 9 days,

acted as a natural preservative compared to the 5-day shelf life for the control. Our research has shown that our innovative cookies with the addition of prickly pear peel can become a source bioactive compounds indispensable for human health.

Keywords
Gluten-Free Cookies, Pricky Pear, Functional Food, Textural Properties, Antioxidant Activity.

T1-P-30

Assessment of dietary diversity and body composition in young adults from Algiers

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Abstract
Dietary diversity is recognized as a major determinant of overall nutritional profile and can be assessed using the Dietary Diversity Score (DDS). However, its relationship with body composition remains poorly explored in North African populations. The aim of this study was to assess dietary diversity in young Algerian adults and to explore its association with body composition.This is a descriptive cross-sectional study conducted in 142 young adults. Collected data included anthropometric measurements, body composition assessed by bioelectrical impedance analysis (InBody S10), and a dietary survey allowing the calculation of a Dietary Diversity Score (DDS). Sex-related differences and associations between variables were analyzed using appropriate statistical tests. The mean age of participants was 22.46 ± 2.68 years. Mean body weight was 70.93 ± 16.50 kg and was significantly higher in men (78.13 ± 17.17 kg) than in women (65.19 ± 12.89 kg) ($p < 0.05$). A notable prevalence of overweight and obesity was observed, affecting 17.9% of men and 18.6% of women. Mean fat mass was 19.04 ± 11.10 kg and was significantly higher in women ($p < 0.001$). The mean Dietary Diversity Score (DDS) was 2.73 ± 1.29, with no significant difference between sexes ($p = 0.62$). Among participants, 45.4% had a low DDS, 48.2% a moderate DDS, and only 6.4% a high DDS. Participants with a low DDS had higher fat mass ($p = 0.024$), suggesting that low dietary diversity may be associated with a less favorable adiposity profile. In contrast, no significant association was observed between DDS and muscle mass ($p = 0.127$). These results indicate that a low DDS was associated with higher fat mass, suggesting a less favorable adiposity profile in the context of poorly diversified diets. This underscores, from early adulthood, the importance of promoting a varied and higher-quality diet.

Keywords
Dietary Survey, Dietary Diversity Score, Body Composition, Fat Mass, Adiposity Profile.

T1-P-31

Assessment of eating patterns and body composition in young Algerian adults: A cross-sectional study

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Abstract
Diet quality and body composition in early adulthood are key determinants of subsequent cardiometabolic risk. However, data simultaneously integrating dietary profile and detailed body composition remain limited in North African populations. The aim of this study was to describe dietary habits and body composition in young adults and to explore the associations between these two dimensions. A descriptive cross-sectional study was conducted in 117 adults aged 18–36 years. Collected data included anthropometric measurements, body composition assessed by bioelectrical impedance analysis (InBody S10), and a dietary survey based on a food frequency questionnaire.

The mean age of participants was 22.36 ± 2.50 years. Mean body weight was 70.93 ± 16.50 kg and was significantly higher in men ($p < 0.05$). Mean fat mass (FM) was 19.04 ± 11.10 kg and mean visceral fat area 80.52 ± 52.74 cm², both being significantly higher in women ($p < 0.001$ and $p = 0.012$, respectively). Conversely, for a mean muscle mass (MM) of 29.15 ± 7.57 kg, men showed higher values ($p < 0.001$. A high proportion of participants reported frequent consumption of vegetables (70.3%), dairy products (64.8%), fresh fruit (44.8%) and protein-rich foods (65%). In contrast, more than half reported a low intake of whole grains (55.2%), while processed foods and legumes were moderately consumed (44.8% and 52.4%, respectively). High consumption of processed foods was associated with higher FM and visceral fat ($p < 0.001$ and $p = 0.022$, respectively), with no significant association with MM ($p = 0.57$). Participants reporting three daily portions of protein-rich foods had lower FM ($p = 0.019$). In parallel, visceral fat tended to decrease with increasing protein intake, although this trend did not reach statistical significance ($p = 0.077$).
These findings highlight the need to promote better diet quality in young adults, by limiting processed food intake while ensuring adequate protein consumption. They also support the implementation of longitudinal studies to confirm these observations and clarify their long-term cardiometabolic implications.

Keywords
Eating patterns, Body composition, visceral fat, processed foods, protein intake.

T1-P-32

Biotechnological approches to combat antimicrobial resistance in the food chain: A one health perspective

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Abstract
Antimicrobial resistance (AMR) is a growing global threat to food safety and public health. The excessive use of antibiotics in agriculture and food processing promotes the spread of resistant microorganisms throughout the food chain. This work highlights innovative biotechnological approaches designed to control AMR within the One Health framework. Promising solutions include the use of probiotics, bacteriophages, antimicrobial peptides, and biosensors for rapid detection and targeted control of resistant strains. These strategies provide sustainable and eco-friendly alternatives to conventional antimicrobials and contribute to building a safer and more resilient food system.

Keywords
Antimicrobial resistance, Biotechnology, Food chain, One Health, Food safety.

T1-P-33

The Impact of breakfast habits on academic performance: A case study with high school seniors in Batna, Algeria

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Abstract
Numerous studies highlight the close link between dietary habits and essential brain functions such as cognition, memory, attention, and emotional regulation. The main source of energy after the overnight fast, breakfast provides glucose as well as the macro- and micronutrients necessary for optimal mental performance throughout the school day.In this case study, we conducted an analytical survey among high school seniors in Batna, Algeria, to assess their breakfast habits and their perception of their academic performance. A structured questionnaire allowed us to assess the composition of their breakfast, their lifestyle-related behaviors, and their daily cognitive indicators such. The results revealed that a significant percentage of

students regularly skip breakfast, while many consume nutritionally inadequate morning meals. A significant number of participants also reported early morning fatigue, suggesting a direct link between skipping breakfast/poor nutrition and decreased morning alertness.These factors can limit the availability of glucose for the brain, disrupt neurotransmitter synthesis, and contribute to stress, mood swings, reduced attention span,and decreased school engagement, particularly during morning classes.
Based on these results, this research offers practical recommendations aimed at improving the quality of students' breakfasts, as a general health strategy that can promote cognitive development, emotional stability, and academic success.

Keywords
Food, mental health, scholar performance, Dietary quality

T1-P-34

Impact of curcumin supplementation on anthropometric parameters, glucose homeostasis and atherogenic indices (Cri-I and Aip) in rats fed a cafeteria diet

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Abstract
Obesity induced by modern "cafeteria" diets is characterized by visceral adiposity and severe metabolic disruptions. Finding nutritional strategies targeting both central adiposity and cardiovascular risk is a priority. This study evaluates the effect of curcumin supplementation on anthropometric parameters, glycemic regulation, and atherogenic risk indices in obese rats.Rats were subjected to a hypercaloric cafeteria diet to induce obesity (4 mounths) , then treated with curcumin for 6 weeks. Nutritional evaluation included Body Mass Index (BMI) and abdominal circumference. Carbohydrate metabolism was explored via fasting glycemia, glucose tolerance (GTT), and insulin sensitivity (ITT) tests. Cardiovascular risk was specifically estimated by the Castelli Risk Index I (CRI-I) and the Atherogenic Index of Plasma (AIP).The cafeteria diet induced a significant increase in BMI and abdominal circumference, indicating central obesity, associated with hyperglycemia and insulin resistance. Curcumin supplementation resulted in: (1) a significant reduction in adiposity, marked by decreased BMI and waist circumference; (2) improved glucose homeostasis, with normalized glycemia, enhanced glucose tolerance, and restored insulin sensitivity; and (3) a correction of the lipid profile translated by a significant decrease ($p < 0.05$) in atherogenic indices CRI-I and AIP. Curcumin exhibits pleiotropic benefits against cafeteria diet-induced alterations. By simultaneously reducing abdominal obesity, improving metabolic flexibility, and lowering atherogenic risk indices (CRI-I, AIP), these results support its potential as a nutraceutical agent in the management of metabolic syndrome.

Keywords
Cafeteria diet, Curcumin, Abdominal obesity, Insulin resistance, Atherogenic indices.

T1-P-35

Elevated oxidative stress and hepatic dysfunction characterize the clinical profile of celiac disease

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Abstract
Celiac disease is a chronic autoimmune disorder triggered by the ingestion of gluten in genetically predisposed individuals. By promoting cellular injury, oxidative stress may be a factor in the onset of celiac disease and may affect its long-term outcomes. The understanding that oxidative stress is a key modifier of celiac disease opens up potential avenues for adjunct therapies.This study aimed to characterize the epidemiological, biochemical, and oxidative stress profiles in celiac disease patients. In a 45-day prospective study, we enrolled 27 biopsy-

confirmed celiac patients from Mostaganem. Data collection included a questionnaire and analysis of biochemical parameters. Oxidative stress was assessed by measuring lipid peroxidation via the TBARS assay. Results indicated a female predominance, alongside anemia, hyperbilirubinemia, elevated liver transaminases, and a marked inflammatory state. Critically, patients exhibited a significant increase in oxidative stress, as measured by elevated malondialdehyde (MDA). Celiac disease is associated with a distinct profile including hepatic abnormalities and a significant increase in systemic oxidative stress.

Keywords
Celiac Disease, Oxidative Stress, Lipid Peroxidation, Liver Transaminases.

T1-P-36

Bacteriological water quality in livestock farming: a critical link between public health and food safety

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Abstract
Globally, the exponential increase in birth rates, particularly in emerging countries, is generating increased demand for animal products. To meet this demand, broiler chicken farming is an essential source of accessible protein, and projections indicate that by 2050, this meat will become the most consumed meat product in the world. However, maintaining high production levels in this sector depends on intensifying farming systems, which would bring with it major challenges in terms of hygiene, particularly in relation to the quality of the water used, thereby jeopardizing food safety and public health. This study is part of this general context and aims to assess the bacteriological quality of drinking water and its potential impacts on public health and food safety. The experiment was conducted on a broiler chicken farm in Algeria. Drinking water samples were taken four times, at weekly intervals, throughout the supply chain, from the collection point to the drinking troughs. Bacteriological analyses revealed the presence of total coliforms (142.10±7.85/100ml) and fecal coliforms (22.13±3.08/100ml), as well as detectable levels of *Escherichia coli* (13.44±2.01/100ml) and fecal streptococci (5.71±0.78/100ml). The presence of fecal coliforms and *Escherichia coli* would increase the risk of introducing enteropathogenic agents such as Salmonella, noroviruses, and other pathogenic bacteria that can cause gastroenteritis in humans. In addition, fecal streptococci could be associated with increased risks of infection. Furthermore, the deterioration in water quality had an impact on the main production indicators and resulted in a decrease in the average weight of the birds (2231.55±354.29g/s) and an increase in mortality (7.00%). The results indicate the necessity for consistent monitoring of drinking water quality, the the adoption of proper hygiene and biosecurity measures, and the implementation of sustainable management strategies to mitigate microbial load. Such measures are essential to enhance food safety and prevent the spread of antibiotic-resistant pathogens, a major global public health issue.

Keywords
Water, Bacteriological Quality, Livestock Farming, Public Health, Food Safety.

T1-P-37

Safe cultivation methods for nutritional spirulina: healthy production strategies and quality assurance

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Abstract
Spirulina microalgae are considered a rich source of essential nutrients such as high-quality proteins, vitamins, minerals, and antioxidants, making them a promising candidate for the production of healthy nutritional supplements. Safe cultivation of spirulina depends on creating optimal conditions, including clean water tanks rich in nitrogen, phosphorus, and potassium, while monitoring pH and temperature and providing sufficient lighting to optimize growth and product quality. It is crucial to apply low-temperature harvesting and drying techniques to retain nutritional value and prevent contamination by microbes or heavy metals. Recent studies

show that spirulina plays an effective role in supporting public health, combating malnutrition and anemia, boosting immunity, and reducing cholesterol and blood sugar levels. Producing spirulina supplements according to stringent quality standards contributes to the provision of safe and sustainable dietary sources supporting local and global food security, especially given the growing need for plant protein and eco-friendly food alternatives for the future.

Keywords
Spirulina Microalgae, Nutritional supplement, Food security, Sustainable agriculture, Antioxidants

T1-P-38

Stéatose hépatique et consommation des sucres

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Abstract
La stéatose hépatique non alcoolique, également connue sous le nom de « maladie du foie gras », représente aujourd'hui une préoccupation majeure de santé publique, en raison de son ampleur et de la gravité potentielle de ses complications. En Algérie, une augmentation notable de cette pathologie a été observée, en lien direct avec la transition nutritionnelle des dernières décennies. Évaluer les facteurs associés à la survenue de la stéatose hépatique non alcoolique chez une population adulte résidant dans la wilaya de Constantine. Une enquête alimentaire et des mesures anthropométriques ont été réalisées auprès d'un échantillon de 101 patients adultes présentant une stéatose hépatique non alcoolique dans la wilaya de Constantine. L'âge moyen des patients est de 47,27 ± 12,02 ans, avec une majorité d'individus âgés de 40 à 59 ans. La population étudiée est principalement féminine et issue d'un niveau socio-économique moyen. Plus de la moitié des patients sont en surpoids (55,45%), et près de 20% souffrent d'une obésité modérée à sévère. La plupart des cas présentent une forme légère de stéatose. Sur le plan nutritionnel, la consommation de sucres est fréquente, tandis que celle des fruits est modérée. L'activité physique est insuffisante chez près de 80% des patients, et environ la moitié déclarent grignoter entre les repas. Ces résultats soulignent la nécessité d'interventions ciblées sur la modification des habitudes alimentaires et l'augmentation de l'activité physique. Une prise en charge globale et multidisciplinaire s'avère essentielle pour prévenir la progression vers des formes plus sévères de la maladie.

Keywords
Stéatose hépatique non alcoolique, enquête, alimentation, facteurs, Adulte.

T1-P-39

Analyse physicochimique et microbiologique de l'altération de deux types de crèmes laitières

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Abstract
Chaque aliment a une durée de conservation qui peut aller de quelques jours à plusieurs mois selon la nature du produit alimentaire. De même, pour les produits laitiers qui sont connus par leur altération rapide, vu leur richesse en nutriments, qui les rend une source facile de contamination par les microorganismes. Dans ce contexte, nous nous sommes intéressés à l'étude de l'altération de deux types de crèmes laitières différentes par leur composition, afin de suivre l'évolution de leur altération, après leur première ouverture, en respectant les conditions de conservation au réfrigérateur. Pour mener à bien cette étude, nous avons réalisé une étude physicochimique et microbiologique de ces deux crèmes, en suivant l'évolution et la modification de leur paramètres physicochimiques et microbiologiques, au long d'une période de 15 jours. Cette étude nous a permet d'indiquer la durée de consommation de chaque crème laitière après sa première ouverture. Nos résultats ont montré qu'après l'ouverture des boites de crème, les deux crèmes deviennent de plus en plus acide au long de la période d'analyse, avec une diminution du taux de matière grasse (MG). Cette acidité et cette

diminution de la MG sont dues aux activités des micro-organismes qui altèrent différemment les deux crèmes. Nous avons observé un développement de plusieurs flores microbiennes au cours de cette durée, mais d'une façon différentielle entre les deux crèmes laitières.

Keywords
Crème Laitière, Conservation, Altération, Physicochimie, Microorganismes

T1-P-40

Efficacité et implications toxicologiques des décontaminants appliqués aux carcasses bovines : une méta-analyse mondiale

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Abstract
This meta-analysis aims to evaluate the effectiveness of the main chemical and physical decontamination methods applied to carcasses (lactic acid, peracetic acid, hot water, chlorine), and to examine their toxicological implications for food safety and public health.A systematic search of PubMed, Scopus, and Web of Science (1990–2025) was conducted. Random-effects models (DerSimonian–Laird) were applied. The analysis includes in-plant intervention studies and regulatory evaluations. Across all included studies, the observed weighted reductions were generally higher for hot water and peracetic acid. Chlorine showed lower efficiency and raised concerns regarding disinfection by-products (DBPs) Considerable heterogeneity was observed among chemical-based studies. Decontamination interventions significantly reduce microbial loads on carcasses. However, the choice of decontaminant should balance antimicrobial performance with its toxicological profile for the consumer.

Keywords
Carcasses, Decontamination, Lactic Acid, Food Toxicology, Food Safety.

T1-P-41

Antibiotic residues in milk: a review of current data and health implications

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Abstract
Antibiotic residues in food of animal origin represent a major public health concern in Algeria due to their potential to induce bacterial resistance and allergic reactions.
This work is based on a literature synthesis of African studies published between 2011 and 2025, aiming to compare the occurrence, prevalence, and concentration levels of antibiotic residues detected in milk according to antibiotic classes and analytical techniques used. The results were summarized using a meta-analytical approach. In milk, the positivity rates range from **10% to over 90%**, with frequent exceedances of **maximum residue limits (MRLs)**, particularly for **β-lactams, tetracyclines, and sulfonamides**. Studies conducted in **Algeria (Meklati, Boultif, Zeghilet, Samari)** revealed that up to **92.5% of analyzed samples** contained antibiotic residues, with a significant proportion exceeding regulatory thresholds. Similar findings have been reported in **Egypt, Kenya, Nigeria, and South Africa.** These results demonstrate that the issue remains persistent despite repeated health and regulatory alerts, highlighting the urgent need to strengthen **veterinary control systems**, address the **overuse of antibiotics in livestock**, and enhance both **farmer training** and **consumer awareness**.

Keywords
Antibiotic Residues; Milk; B-Lactams; Food Safety

T1-P-42

Microbiological quality assessment of charlotte cakes marketed in Djelfa (Algeria)

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Abstract

Charlotte cakes are among the most widely consumed cream-based pastries in Algeria. Their high moisture content, nutrient-rich composition, and frequent manual handling make them particularly vulnerable to microbial contamination. Inadequate hygiene during preparation, storage, or distribution can facilitate bacterial proliferation and increase the risk of foodborne illnesses. Evaluating their microbiological quality is therefore essential to identify potential contamination hazards and ensure consumer safety. This study aims to assess the microbiological quality of Charlotte cakes marketed in the commune of Djelfa (Algeria) and to determine their compliance with Algerian microbiological standards for cream-based pastries. It also seeks to identify hygiene-related factors contributing to contamination.Twelve Charlotte cake samples representing four varieties (chocolate, lemon, strawberry, and caramel; three samples each) were collected from local pastry shops. Microbiological analyses targeted three indicator groups: total aerobic mesophilic count (TAMC), thermotolerant coliforms, and coagulase-positive *Staphylococcus* spp. (mainly *Staphylococcus aureus*). All microbiological procedures, including sample homogenization, serial dilutions, selective plating, incubation conditions, and enumeration, were performed according to ISO standard methods. Results were expressed as $\log_{10}$ CFU/g and compared with established microbiological criteria for cream-based pastries.Most samples exhibited microbial loads exceeding acceptable limits for all tested indicators. Total aerobic mesophilic count (TAMC) values ranged from 5.4 to 6.0 $\log_{10}$ CFU/g, reflecting substantial environmental contamination. Thermotolerant coliform levels (4.5–5.2 $\log_{10}$ CFU/g) suggested inadequate sanitation or possible fecal contamination. Coagulase-positive *Staphylococcus* spp. ranged from 3.7 to 4.9 $\log_{10}$ CFU/g, indicating poor personal hygiene and improper handling practices. Altogether, the results highlighted major shortcomings in hygiene, temperature control, and overall food handling conditions. Charlotte cakes commercialized in Djelfa showed a concerning level of microbiological contamination, with most samples failing to meet acceptable safety thresholds. Strengthening Good Manufacturing Practices (GMP), implementing Hazard Analysis and Critical Control Point (HACCP) systems, ensuring strict temperature control, and improving hygiene training for pastry workers are essential measures to enhance the safety of Charlotte cakes and reduce the risks of foodborne illness.

Keywords

Charlotte Cakes, Microbiological Quality, Indicator Groups, Hygiene, Djelfa.

T1-P-43

Prevalence, virulence profiles and antibiotic resistance of avian and human *Salmonella* isolates: Implications for food safety and public health

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Abstract

Salmonella ranks among the main agents responsible for foodborne illnesses and represents a major threat to both human and animal health. Contamination of poultry products constitutes an important route of transmission, often facilitated by inadequate hygiene practices along the food production chain. The emergence of multidrug-resistant (MDR) strains further increases this risk by limiting therapeutic options and enhancing the likelihood of large-scale dissemination. In this study, 25 *Salmonella* strains of human and avian origin (isolated from chicken offal and wings sold in markets) were collected and characterized in the regions of Annaba and Constantine. Their identification was performed using microbiological and biochemical approaches. The investigation allowed the identification of several serotypes, as well as specific virulence genes detected by PCR. In parallel, the susceptibility of these isolates to 15 antibiotics was assessed, revealing a notable prevalence of multidrug resistance. These findings highlight the importance of continuous microbiological and molecular surveillance of *Salmonella* circulating in both human and avian sectors. They also emphasize the need to strengthen biosecurity measures, good manufacturing practices, and strict

implementation of HACCP to limit the spread of resistant strains. Integrating microbiological, toxicological, and epidemiological data is essential to improving food safety and protecting public health.

Keywords
Salmonella Spp.; Food Safety; Antimicrobial Resistance; Virulence Genes; Public Health.

T1-P-44

Physicochemical, nutritional, and in vitro anti-diabetic properties of yoghurt enriched with polysaccharides from jute mallow (Mloukhiya)

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Abstract
Diabetes mellitus is a metabolic disease characterised by chronic hyperglycaemia, which is often the result of the excessive digestion and absorption of carbohydrates. The enzyme α-amylase plays a central role in this process, as it catalyses the hydrolysis of α-1,4-glucosidic bonds in starch and glycogen. Its inhibition therefore represents an effective strategy to reduce glucose absorption and help regulate blood glucose levels. In this context, the incorporation of bioactive, plant-derived compounds into dairy products offers a promising approach to the development of functional foods with anti-diabetic properties.This study aims to evaluate the physicochemical, nutritional, and anti-diabetic properties of yoghurt enriched with polysaccharides extracted from the leaves of *Corchorus olitorius* L. (jute mallow), which is known for its high content of phenolic compounds and bioactive fibres. Specifically, the study will investigate the relationship between the concentration of added polysaccharides and the inhibitory effectiveness against the α-amylase enzyme, which serves as a key indicator of the product's anti-diabetic potential. The results revealed a direct correlation between polysaccharide concentration and α-amylase inhibitory activity. During the 21-day storage period, a gradual decrease in enzymatic inhibition was observed for all samples: from 25% to 15% for the control yoghurt, 27% to 14% for the yoghurt enriched with 1% polysaccharides, and from 56% to 31% for the yoghurt enriched with 4%. The yoghurt containing 4% polysaccharides exhibited the greatest initial inhibition (56%), suggesting a dose-dependent effect. This inhibition could be attributed to the presence of phenolic compounds derived from *C. olitorius*. In conclusion, enriching yoghurt with polysaccharides from Mloukhiya cress significantly enhances its anti-diabetic properties through α-amylase inhibition, while maintaining its favourable physicochemical properties during storage. These results demonstrate the value of *C. olitorius* as a natural, functional ingredient in dairy products intended for the prevention and management of diabetes.

Keywords
Anti-diabetic activity, Polysaccharides, Yoghurt, Enrichment.

T1-P-45

Biosurfactant-producing extremophilic bacteria from oil fields: a new frontier for natural food bio-emulsifiers

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Abstract
The global food industry faces increasing demand for natural, sustainable, and safe emulsifying agents to replace synthetic surfactants. This study investigates extremophilic bacteria isolated from petroleum reservoirs as novel sources of biosurfactants suitable for food applications. To isolate, characterize, and evaluate the emulsification capacity of extremophilic bacterial strains and assess their potential as natural bio-emulsifiers for the food industry. Extremophilic bacteria were isolated from deep petroleum reservoir samples under selective

enrichment conditions. Bacterial isolates were screened for biosurfactant production using the Emulsification Index (E24) assay, measuring their ability to form and stabilize crude oil-water emulsions over 24 hours. Emulsifying efficiency was compared against chemical standards (10% SDS and 10% Triton X-100). Bacterial strains were identified using Matrix-assisted laser desorption ionization time-of-flight mass spectrometry (MALDI-TOF MS) VITEK.Results : Among 22 bacterial isolates screened, two extremophilic strains, designated N1 and N7, demonstrated exceptional emulsification indices of approximately 45% and 25%, respectively, exceeding the chemical controls (SDS: 25%, Triton X: 40%). Molecular identification via MALDI-TOF- MS VITEK revealed N1 and N7 as previously uncharacterized extremophilic species, while other productive isolates included Pseudomonas stutzeri strains (S16, S20, S31) and Enterobacter kobei (FB220), each displaying distinct emulsifying profiles ranging from 6% to 15% E24. The superior emulsification capacity of strains N1 and N7 suggests that extremophilic bacteria from petroleum environments produce biosurfactants with remarkable functional properties. These compounds exhibit remarkable stability under extreme conditions such as temperature and salinity, to which the strains are naturally adapted. They also show efficiency comparable to, or even surpassing, that of conventional industrial surfactants, while providing key advantages such as biodegradability, lower toxicity, and compliance with clean-label standards in the food industry. This research establishes extremophilic bacteria from oil fields as promising biofactories for producing natural bio-emulsifiers for food applications. Future studies will focus on optimisation of production.

Keywords
Extremophile Bacteria, Biosurfactants, Bio-Emulsifiers, Emulsification Index, Petroleum Reservoirs

T1-P-46

Safety of iftar meals: microbiological assessment in two collective catering establishments in Constantine

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Abstract
Ensuring the microbiological safety of food served in collective catering environments is a critical public health priority, particularly during periods of intensified meal production such as the month of Ramadan. Iftar meals, traditionally prepared and distributed in large quantities within a limited time frame, are highly susceptible to microbial contamination due to increased handling, prolonged exposure to ambient temperatures, and frequent lapses in hygienic practices.This study investigates the microbiological quality of traditional Iftar dishes served in two collective catering establishments in the city of Constantine. Six representative food samples were analyzed according to Algerian regulatory standards (JORA No. 39, 2017). The assessment targeted total mesophilic aerobic flora, total coliforms, Escherichia coli, coagulase-positive staphylococci, sulfite-reducing anaerobes, and Salmonella spp. The results reveal substantial microbial contamination in several samples, with bacterial loads exceeding regulatory thresholds. Elevated counts of total aerobic mesophilic bacteria and coliforms indicate inadequate hygiene and insufficient control of handling practices. The detection of *Staphylococcus aureus* at concentrations up to 3.0 × 10^4 CFU/g in cooked dishes points to post-cooking contamination, likely due to improper food handling. In contrast, *Salmonella* spp. and *E. coli* were not detected. Antibiotic susceptibility testing further showed penicillin resistance in *S. aureus*, whereas *Klebsiella* spp. remained sensitive to all tested antibiotics. Collectively, these findings underscore the need for strengthened hygiene protocols, improved temperature control, and enhanced staff training in collective catering settings during Ramadan. Reinforcing these measures is essential to reducing the risk of foodborne infections and safeguarding public health.

Keywords
Food Safety, Ramadan, Collective Catering, Food Microbiology, Microbial Contamination

T1-P-47

From farm welfare to consumer health: influence of dairy cow well-being on milk quality parameters

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Abstract

Animal welfare is a fundamental component of sustainable dairy production and strongly influences milk quality, safety, and nutritional value. Stress factors such as inadequate housing, poor hygiene, overcrowding, and improper handling can induce physiological disturbances in dairy cows, negatively affecting milk composition and increasing the risk of microbial contamination. Establishing the relationship between cow well-being and milk quality is therefore essential for enhancing food safety and protecting public health. This study aimed to evaluate the impact of dairy cow welfare on the physicochemical and bacteriological characteristics of raw milk and to highlight the implications of welfare practices on consumer health and sustainable dairy systems. The study was conducted on selected dairy farms where cow welfare was assessed using standardized indicators, including body condition score, locomotion, cleanliness, housing quality, and behavioral observations. Raw milk samples were aseptically collected from clinically healthy cows. Physicochemical analyses included measurements of pH, fat content, protein concentration, lactose level, total solids, and somatic cell count (SCC). Bacteriological quality was determined through total viable count, coliform enumeration, and detection of potentially pathogenic microorganisms using standard microbiological techniques. Statistical analyses, including correlation and regression models, were applied to evaluate the associations between welfare scores and milk quality parameters. A strong association was observed between animal welfare status and milk quality. Farms with low welfare scores showed increased somatic cell counts and higher bacterial loads, indicating a greater risk of subclinical mastitis and reduced hygienic conditions. These farms also presented changes in physicochemical parameters, such as decreased fat and protein content and abnormal pH values, reflecting the detrimental effects of stress on milk synthesis. In contrast, farms implementing better welfare practices demonstrated improved milk composition, lower microbial contamination levels, and overall enhanced hygienic quality. The results confirm that dairy cow welfare is a key determinant of raw milk quality and safety. Improved welfare conditions support the production of nutritionally richer milk with reduced microbial contamination, thereby lowering potential health risks for consumers. Integrating welfare assessment into dairy quality-control programs is crucial for promoting sustainable livestock production, reinforcing food safety strategies, and safeguarding public health.

Keywords

Milk Quality, Physicochemical Properties, Bacteriological Analysis, Food Safety, Sustainable Production.

T1-P-48

Anti-diabetic activity of Algerian *Bunium incrassatum* extracts mediated by digestive α-amylase inhibition

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Abstract

Bunium incrassatum has traditionally been used in food and conventional medicine, particularly for treating infections, inflammation, bronchitis, and thyroid disorders. The objective of this study is to evaluate the chemical composition of methanolic extracts derived from the roots (MERO), seeds (MESE), and stems (MEST) of *B. incrassatum*. The analysis was conducted using high-performance liquid chromatography with ultraviolet detection (HPLC/UV). In addition, the extracts were assessed for their *in vitro* alpha-amylase inhibitory activity and tested using the agar disc diffusion method. HPLC/UV analysis identified 25 phenolic compounds in the methanolic extract of seeds (MESE), 24 in roots (MERO), and 21 in stems (MEST). Among all tested extracts, MESE exhibited the highest α-amylase inhibitory activity at a concentration of 1 mg/mL, with an IC_{50} of 0.76

mg/mL and an inhibition rate of 80.24%. It also reduced starch hydrolysis by 15.83%, with a comparable inhibition rate of 84.17%. These findings point to a strong anti-amylase potential attributed to the phenolic compounds of *B. incrassatum*. As such, this plant stands out as a promising natural source of bioactive compounds for pharmaceutical and therapeutic development.

Keywords
HPLC/UV, Phenolic Compounds, Inhibition Rate, Alpha-Amylase, Starch Hydrolysis.

T1-P-49

Gluten-related disorders: intestinal epithelium, microbiota, gluten digestion, and innovative therapies. Scientific advances 2023–2025

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Abstract
Recent advances have profoundly renewed our understanding of gluten-related disorders, including celiac disease, non-celiac gluten sensitivity, and certain cases of functional dyspepsia. The traditional approach, which considered gluten to be the sole trigger, has now been replaced by a more integrated view in which the intestinal epithelium and microbiota play a central role in the pathophysiology. Recent research highlights: The role of the intestinal epithelium.The key role of the microbiota. The importance of microbial digestive enzymes.The emergence of new therapeutic approaches. Recent advances have profoundly changed our understanding of gluten-related disorders, revealing the crucial role played by the intestinal epithelium and microbiota. Under the influence of inflammation and IFN-γ, epithelial cells can express HLA-DQ2.5 and act as antigen-presenting cells that directly activate CD4+ T cells. This mechanism contributes to the amplification of intestinal lesions typical of celiac disease. At the same time, the gut microbiota shows characteristic alterations in gluten-related disorders. Decreases in *Lactobacillus* and *Bifidobacterium*, increases in *Neisseria*, and variations in *Streptococcus* were frequently observed, but without a "typical microbial profile." However, certain enzymatic functions are impaired, including aminopeptidase, proline-iminopeptidase, and Xaa-Pro dipeptidase, thereby affecting gluten digestion. This digestion becomes incomplete, generating highly immunogenic proline-rich peptides, which enhance CD4+ T cell activation and duodenal inflammation. These discoveries have led to new therapeutic approaches: oral gluten-degrading enzymes (AN-PEP, TAK-062), targeted probiotics (*Lactobacillus* and *Bifidobacterium*), and personalized strategies based on the patient's microbial profile. Monitoring tools now include Gluten Immunogenic Peptides (GIP), which can detect actual exposure to gluten, supplemented by serology and duodenal biopsy.
Advances show that:The function of the microbiota is more decisive than its composition; Microbial gluten-degrading enzymes play a central role in the pathophysiology; Targeted enzyme and probiotic therapies pave the way for personalized treatment

Keywords
Gluten-related disorders, microbiota, intestinal epithelium, gluten-degrading enzymes, innovative therapies.

T1-P-50

Therapeutic effect of the aqueous extract of moringa oleifera on cardiac tissue damage and oxidative status in rats subjected to glucolipotoxicity

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Abstract

Glucolipotoxicity, resulting from chronic exposure to an excess of sugars and lipids, is a major determinant in the development of metabolic and cardiovascular disorders. This nutritional imbalance induces oxidative stress and tissue alterations, particularly affecting the myocardium.
The objective of this study is to evaluate the effects of a hyperglucidolipidique diet on the oxidative status and cardiac histological modifications in Rattus norvegicus, as well as to analyze the therapeutic potential of the aqueous extract of Moringa oleifera (MO) in preventing or mitigating these alterations. Glucolipotoxicity was induced in rats by administering a hyperglucidolipidique diet with specified percentages of sugar and lipids for 9 months. An oral treatment with the aqueous extract of Moringa oleifera (200 mg/kg/day) was administered during the last 30 days of the experiment. Analyses focused on the evaluation of biochemical parameters (glycemia, triglycerides), oxidative stress markers (TBARs and catalase), and the histological study of cardiac tissue. The hyperglucidolipidic diet induced hyperglycemia associated with hypertriglyceridemia and oxidative imbalance, characterized by an increase in TBARs and a decrease in catalase activity. Histologically, severe myocardial lesions were recorded, such as fibrosis, inflammatory infiltration, and accumulation of connective tissue. Moringa oleifera led to a significant improvement in metabolic parameters and restoration of redox status. Histologically, a notable reduction in cardiac lesions was observed, reflecting a cardioprotective effect. Moringa oleifera shows promising natural therapeutic potential against glucolipotoxicity. Through its antioxidant, metabolic, and histoprotective actions, it may contribute to the prevention of cardiovascular complications associated with chronic nutritional disorders.

Keywords
Moringa oleifera, hyperglycemia, Glucolipotoxicity, ROS.

T1-P-51

Biogenic amines in traditional and industrial foods of animal origin: toxicological impact and preventive approaches

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Abstract
Biogenic amines (BAs), including histamine, tyramine, putrescine and cadaverine, are nitrogenous compounds produced mainly through the microbial decarboxylation of amino acids. They are naturally present in a wide variety of traditional and industrial foods of animal origin, particularly in fermented, aged or protein-rich products such as ripened cheeses, fermented meat products, fish and fermented milk. Although low concentrations of BAs are physiologically tolerated, elevated levels constitute an emerging chemical hazard capable of triggering adverse toxicological effects. Histamine is well known for causing scombroid poisoning, typically associated with inadequate refrigeration of fish, while tyramine may induce hypertensive crises, migraine and various neurological disturbances. Putrescine and cadaverine potentiate histamine toxicity and contribute to spoilage, off-odours and the overall deterioration of food quality.The accumulation of BAs in food results from multiple factors, including the quality and freshness of raw materials, hygiene during processing, storage temperature, fermentation conditions, and the presence of decarboxylase-positive microorganisms. Technological parameters such as pH, salt concentration, oxygen availability and aging duration further influence BA production. The development of advanced analytical technologies, particularly HPLC and LC-MS/MS, has enhanced the detection, quantification and surveillance of BAs in complex food matrices, supporting improved risk assessment and regulatory monitoring. Preventive strategies rely on an integrated food safety approach encompassing strict temperature control, rapid chilling of fishery products, the adoption of good hygienic practices, and the use of starter cultures lacking decarboxylase activity in fermented foods. Additional measures include raw material selection, hurdle technology, improved packaging systems, and the implementation of rapid or continuous monitoring methods to detect early BA formation. Establishing regulatory limits and harmonized surveillance systems remains essential to reduce consumer exposure.Overall, biogenic amines constitute a significant yet preventable toxicological risk in animal-origin foodstuffs. Strengthening monitoring frameworks and applying targeted microbiological and technological interventions at critical points of the food chain can substantially limit BA accumulation, thereby enhancing food safety, extending shelf life, and ensuring better protection of public health.

Keywords
Biogenic amines, Animal-origin foods, Toxicological risk, Food and public health, Preventive strategies

T1-P-52

The moderating effect of health attitudes on how convenience and social enjoyment influence fast-food purchase intention

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Abstract
The aim of this study is to determine if health-related attitudes alter consumers' intention to purchase fast food when convenience or social enjoyment are present. To address this, a conceptual model was developed and tested using a quantitative methodology. Data were collected via an online questionnaire from a sample of 446 consumers and analyzed using Structural Equation Modeling (SEM). The results revealed that both convenience and social enjoyment demonstrated a significant and positive direct effect on fast-food purchase intention, reaffirming their critical role as primary motivators. Contrary to expectations, neither health concerns nor perceived unhealthiness significantly moderated these relationships. This indicates that the strength of the relationship between convenience/social enjoyment and purchase intention does not meaningfully change based on a consumer's level of health consciousness or their belief that fast food is unhealthy. The study contributes on consumption trade-offs, by highlighting the limited role of health concerns in hedonic or utilitarian consumption contexts and calls for integration of situational factors into health-behavior frameworks. Practically, for policymakers and health promoters, traditional health messages may be insufficient. Interventions should therefore couple information with structural changes such as improving availability of convenient and healthier options to meaningfully shift choices.

Keywords
Health Attitudes, Social Enjoyment, Convenience, Purchase Intention

T1-P-53

Water contamination and the quality of table eggs: Microbiological challenges for public health

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Abstract
Currently, demand for animal protein is being driven by an increase in the birth rate and associated with an improvement in people's incomes, particularly in emerging countries. In order to meet this demand, intensive poultry farming, with its two segments, meat and egg production, plays a major role in meeting these needs. To this end, eggs are an essential nutritional resource, rich in high-quality protein and accessible to large segments of the population, thus contributing directly to food security and the fight against malnutrition. However, this "intensive" model, where large numbers of animals are concentrated in small areas, is beginning to be criticized, particularly in terms of animal welfare and public health. Concentrating large numbers of animals in closed buildings creates a certain promiscuity where food and water can become mixed with droppings, thereby weakening the solubility of treatments and their therapeutic effectiveness, inactivating vaccines, or even becoming vectors of diseases that directly affect public health. In addition, under these harmful conditions, production performance is impaired, directly threatening food safety. In view of all these considerations, the study focused on monitoring the quality of drinking water for laying hens in Algeria. Water samples were taken throughout the feed chain and bacteriological analyses were carried out. The results revealed the presence of total coliforms (100.66±3.28/100ml) and fecal coliforms (10.79±1.69/100ml), as well as Escherichia coli (6.64±0.28/100ml) and fecal streptococci (2.20±0.69/100ml). In terms of production indicators, egg weight was severely impacted (56.66±3.69g), as was the vitality of the flock (7.79%). The results of this research draw attention to the danger to public health posed by the presence of these pathogens, which can become vectors of disease. In addition, the decline in performance destabilizes the entire production sector,

thereby jeopardizing food security. Finally, measures should be taken in terms of hygiene, biosecurity, and disinfection to guarantee the health of the population while ensuring the sustainability of the activity.

Keywords
Water, Eggs, Bacteriological Quality, Public Health, Food Safety.

T1-P-54

In vitro evaluation of the antioxidant and anti-inflammatory activities of the hydroethanolic extracts of taraxacum officinale and Rhamnus alaternus: a study of synergy in combined formulations

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Abstract
Medicinal plants represent an important source of bioactive compounds with diverse therapeutic properties. This study evaluates the antioxidant and anti-inflammatory activities of the hydroethanolic extract of two plant species, namely *Rhamnus alaternus* and *Taraxacum officinale*, as well as the synergistic potential of the *R. alaternus* / *T. officinale* combination for therapeutic valorization. The total polyphenol content was determined using the Folin–Ciocalteu method, and flavonoid content using the aluminum trichloride method. Antioxidant activity was assessed through four in vitro assays: DPPH, ABTS, reducing power, and phenanthroline.The results show that *R. alaternus* exhibits the highest levels of polyphenols (300 µg GAE/mL) and flavonoids (658.75 µg QE/mL), followed by *T. officinale* (170 µg GAE/mL and 165.41 µg QE/mL). Regarding antioxidant capacity, the extract of *R. alaternus* demonstrates the strongest activity in most of the antioxidant tests.Concerning anti-inflammatory activity, *R. alaternus* (IC_{50} = 1.61 ± 0.25 µg/mL) and *T. officinale* (IC_{50} = 1.37 ± 0.13 µg/mL) show high efficacy. Synergy analysis (Compusyn software) reveals that the 3:1 ratio (*R. alaternus* / *T. officinale*) exhibits the best synergistic effect, optimizing dose and antioxidant activity. These results confirm the potential of this combination as a promising natural source of therapeutic agents with enhanced antioxidant and anti-inflammatory properties.

Keywords
Taraxacum officinale, *Rhamnus alaternus*, Polyphenols, Combined Formulation, Antioxidant Activity

T1-P-55

From farm to fork: Conceptual modeling of contamination pathways and the role of livestock building hygiene in food safety

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Abstract
The quality and safety of animal-derived foods result from a set of complex interactions that begin well before processing stages. Among these determinants, livestock building hygiene plays a central role, influencing animal health, microbial contamination of products, and ultimately the safety of foods intended for consumption. This work proposes the development of an integrative conceptual model "from farm to fork," linking the farming environment to the quality of animal-derived products. The model describes the main contamination pathways and provides a systematic framework for identifying critical points along the food chain to ensure product safety. A conceptual modeling approach was applied based on scientific articles, epidemiological reports, and national and international surveillance data. Environmental sources, transfer mechanisms, and critical points were systematically identified from published studies. Risk factors related to housing conditions, the rearing environment, and management practices were considered. Data on bacterial prevalence at different stages of the food chain were integrated to strengthen the model. This approach allowed for a comprehensive understanding of potential contamination pathways and the control of critical

points. Five major contamination sources representing critical points to be monitored were identified: bedding, manure, water, air/dust, and animal surfaces. Data reported in the literature show that poor hygiene in livestock buildings increases bacterial loads in products. Proper bedding management, ventilation, equipment disinfection, udder preparation, strict cold-chain control, and staff training can significantly reduce contamination risks. This conceptual model highlights the central role of livestock building hygiene in contamination dynamics throughout the food chain and offers a systemic view of the relationships between farming practices and food safety. It constitutes a relevant tool for reducing microbiological risks and protecting public health.

Keywords
Food safety, Microbial contamination, Livestock hygiene, Conceptual model.

T1-P-56

Contribution to the study of the impact of olive variety on the physicochemical quality of olive oils from Eastern Algeria

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Abstract
The quality of olive oil depends on various factors, including the olive variety, fat content, and extraction process. This study aims to evaluate the impact of these factors on key quality parameters of olive oil, such as extraction yield, acidity index, and peroxide value.Four olive varieties (Schemlal, Sigoise, Rougette, and Oleaster) were subjected to extraction across eight (08) sampling sites. The main effects, interactions, and relationships among the variables were assessed using statistical analyses.The fat content of the Schemlal, Rougette, and Sigoise varieties was relatively high (40%–45%), whereas that of the Oleaster variety exhibited lower values (25–28%).The acidity index varied considerably among varieties: Oleaster showed the highest values (7.5–8.5), followed by Sigoise (2.5–3.0), whereas Schemlal and Rougette presented lower values (0.8–1.7). Regarding the peroxide value, Oleaster showed the highest levels (15–18). These results highlight the importance of adjusting the extraction process for each variety to optimize the quality and yield of olive oil, especially for the first cluster. Conversely, the Oleaster variety, with its unique chemical characteristics, requires particular attention due to its lower yield. Moreover, the Schemlal variety offers a good balance between extraction yield and fat content, making it an attractive option for producers seeking a compromise. Overall, this study provides valuable information to guide producers in selecting olive varieties and extraction methods according to their production and quality goals. The impact of these factors on the organoleptic properties and long-term stability of olive oil could be explored in future research.

Keywords
Olive Variety, Olive Oil, Quality, Extraction.

T1-P-57

Investigation of the antioxidant and anti-inflammatory activities of walnut (*Juglans regia*) extracts from eastern Algeria for potential nutraceutical applications targeting neurological health

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Abstract
Juglans regia, commonly known as walnut, is a species of the *Juglandaceae* family, a group that includes several taxa of notable ecological and medicinal importance. This plant was selected for our study as part of an on going initiative to enhance the valorization of Algeria's rich botanical heritage. particularly with regard to its potential applications in the nutraceutical and biomedical sectors, including targeted nutritional strategies for specific population groups such as individuals with neurological disorders.The aim of this work was to examine the chemical constituents and biologically active molecules of walnut in order to gain deeper insight into its

therapeutic potential and biological effectiveness.The plant material was extracted using a hydroethanolic mixture (70:30, v/v). The resulting extract underwent qualitative screening and quantitative determination of total polyphenols, flavonoids, and tannins. Antioxidant capacity was assessed through ABTS and CUPRAC assays, while anti-inflammatory activity was evaluated using a complementary bioassay.The hydroethanolic extract exhibited the following levels of phenolic compounds: 75.45 mg GAE/g DM for total polyphenols, 4.17 mg QE/g DM for flavonoids, and 5.52 mg CE/g DM for condensed tannins. Antioxidant evaluation showed an IC_{50} of 17,03 mg/mL using the ABTS method and a value of 20,95±0,38 mg/mL in the CUPRAC assay. Additionally, the extract displayed a marked anti-inflammatory activity over 1,68±0,02 µg/ml. Overall, the findings indicate that Juglans regia represents a valuable natural source of phenolic compounds with significant antioxidant and anti-inflammatory effects. These properties support its potential use in the development of natural therapeutic agents aimed at mitigating oxidative stress and inflammation-related conditions.

Keywords
Juglans regia, Antioxidant Activity, Medicinal Plants , Phytochemistry,Valorization of Bioactive Compounds.

T1-P-58

Prevalence of celiac disease and the study of adherence to the gluten-free diet among schoolchildren in Constantine

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Abstract
The study aims to estimate celiac disease prevalence in schoolchildren in Constantine municipality, describe their clinical and nutritional profiles, and assess adherence to a gluten-free diet, including difficulties and food preferences. A cross-sectional study was conducted involving a sample of 4053 pupil aged from 5 to 11 years, recruited from several primary schools. A structured questionnaire was used to collect clinical, nutritional, demographic, and familial data. Statistical analyses were conducted using EPINFO. The observed prevalence was 0.98% (40 confirmed cases). The mean age of the children was 8.11 ± 1.48 years (SD). The gender distribution was balanced (21 girls, 19 boys), showing no significant difference. The dominant clinical presentation was abdominal pain (70%, n=28); anorexia (67.5%, n=27); followed by tiredness (62,5% n=25); and transit disorders (50% n=20). The adherence to the gluten-free diet after diagnosis showed notable variability. The main reported difficulties were: the high cost of gluten-free products (77,14%), limited availability in stores (48,57%), and a lack of dietary diversity (51,43%). Despite this, the majority of children reported rapid improvement in symptoms after a few weeks on the diet. Preference analysis confirmed the predominance of gluten-free cereal substitutes (bread, pasta) as essential for maintaining basic eating habits. Indulgent foods like chocolate, cakes, and pastries followed gluten-free cereal substitutes. Significant variability in individual choices regarding taste and texture shows that organoleptic acceptability limits long-term adherence to the gluten-free diet.

Keywords
Prevalence, Celiac Disease, Gluten-Free Diet, Schoolchildren, Adherence.

T1-P-59

Microbiological quality and public health risk assessment of raw milk sold in informal markets in Constantine, Algeria

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Abstract
The consumption of unpasteurized raw milk poses a significant health risk due to the potential presence of pathogenic microorganisms. This study was conducted to assess the microbiological quality and safety of raw milk sold in local markets in the province of Constantine, Algeria. A total of 20 samples of raw cow's milk were

collected and analyzed. Standard microbiological methods were used. The results showed that 53% of the samples exceeded the acceptable limits for aerobic mesophilic flora (more than 10^5 CFU/mL), indicating poor milking and storage hygiene. Escherichia coli was detected in 42% of the samples, while Staphylococcus aureus and Listeria monocytogenes were isolated in 18% and 7% of cases, respectively. These results highlight the high level of microbial contamination in raw milk, which can lead to foodborne infections in consumers. Strict hygiene measures are essential during milking, refrigeration, and marketing of raw milk. To improve milk safety and protect public health, it is also necessary to raise awareness among producers and implement regular veterinary controls.

Keywords
Raw Milk, Constantine, Food Safety, *E. Coli*, One Health

T1-P-60

Risques sanitaires des additifs alimentaires utilisés dans la fabrication des yaourts et laits ferments

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Abstract
Les yaourts et laits fermentés sont devenus des aliments essentiels pour les différentes catégories de la population : enfants, adultes, personnes âgées et individus avec des besoins spécifiques. Ils apportent à la fois des protéines, du calcium et des bactéries lactiques bénéfiques dont les probiotiques, améliorent la digestion du lactose, renforcent le microbiote intestinal et contribuent à la santé osseuse et immunitaire. Cependant, la fabrication industrielle de ces produits fait appel à l'utilisation d'une multitude d'additifs alimentaires. Le présent travail vise une investigation sur le marché local des différents types de produits laitiers de type yaourt afin de recenser les catégories d'additifs alimentaires mentionnés sur l'étiquetage et d'évaluer leur impact sanitaire sur les consommateurs. Vingt et un produits de différentes marques ont été recensés, dont seulement 9,5 % sont désignés en tant que yaourt ; le reste correspond à des laits fermentés aromatisés. Les additifs alimentaires présents incluent sept catégories, dont principalement les arômes (81 % des produits), les épaississants (76,2 %) et les gélifiants (47,62 %). La catégorie des colorants est mentionnée dans 47,62 % des produits, suivie par les régulateurs d'acidité (33,3 %) et les stabilisants (14,3 %). Sur le plan toxicologique, les colorants suscitent une importance particulière. Sept colorants sont utilisés : SIN 124, 122, 129, 141, 150,160, et SIN 202. En effet, les colorants azoïques (SIN 124, 122, 129) sont souvent associés à des troubles comportementaux chez les enfants (hyperactivité), à des allergies, et leur potentiel cancérogène reste imprécis. D'autre part, les épaississants les plus utilisés sont : SIN 1442, 1440, 1422, 1423, 1412 et SIN 1447. Ils peuvent modifier la composition du microbiote intestinal, augmenter la perméabilité digestive et favoriser une inflammation de faible intensité, surtout à fortes doses ou chez les personnes prédisposées. L'analyse d'une partie des produits commercialisés laits ferments et yaourt révèle une prédominance de produits industriels aromatisés, dont la composition repose largement sur l'utilisation d'additifs alimentaires. Cette formulation industrielle soulève des préoccupations toxicologiques, notamment en ce qui concerne les colorants azoïques et les épaississants modifiés, dont les effets potentiels sur la santé intestinale.

Keywords
Laits fermentés, Yaourt, Additifs alimentaires, toxicité, santé

T1-P-61

Assessment of bread consumption patterns among adults and children in Guelma city

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Abstract

A questionnaire was designed to investigate bread consumption behaviors among adults and children. The instrument included classification, multiple-choice, and open-ended questions. Using a descriptive and quantitative approach, the survey targeted consumers of all age groups and children aged 3–13 years, through their parents. The questionnaire was distributed in paper format across neighborhoods and schools, and digitally via Google Forms. In total, 792 responses were collected: 380 related to children and 412 from other consumers. Statistical analysis was conducted using SPSS version 27, applying descriptive and inferential methods. The level of significance was set at $p \leq 0.05$. Among the 412 adults surveyed, 27% reported dissatisfaction with bread quality. The results show that bread consumption is a staple habit among respondents, with most consuming bread frequently throughout the week. Specifically, 53.1% reported eating bread 4–6 times per week. Traditional bread was the most consumed type (51.3%), and bread was predominantly consumed at dinner (64.4%). Frequent consumers (4–6 times per week) tended to prefer fresh bread. Most respondents rated bread quality as moderate (score 3, 49.0%). The Chi-square test ($\chi^2 = 15.282$, df = 9, $p = 0.083$) showed no significant relationship between bread consumption frequency and daily intake. Similarly, no significant relationship was found between consumption frequency and preference for bread freshness ($\chi^2 = 6.289$, df = 6, $p = 0.392$). However, reactions to price changes varied significantly according to consumption frequency ($p = 0.003$). Regarding the 380 mothers surveyed, a minority reported an increase in food allergies among their children, particularly gluten intolerance (celiac disease). The data indicated no significant association ($p = 0.484$) between gender and the average number of baguettes consumed per day by children. In contrast, a significant association was found between age and the average number of baguettes consumed per day ($p < 0.001$). Overall, the data provide a solid foundation for analyzing bread consumption patterns and consumer preferences.

Keywords
Bread consumption, Dietary habits, Adult eating behavior, Child dietary patterns, Food quality perception.

T1-P-62

Assessment of nutritional status of patients with multiple sclerosis

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Abstract
Multiple sclerosis (MS) is a chronic, inflammatory neurological disease that primarily affects young adults, with a female predominance. The objective of this study was to assess the nutritional status of patients with MS. A descriptive, cross-sectional study was conducted among 136 MS patients followed in the Constantine region. Data were collected using a structured questionnaire covering sociodemographic characteristics, nutritional status (anthropometric measurements), eating habits (meal frequency, snacking, water consumption, cooking methods), and lifestyle (physical activity, sleep, smoking). Nutritional intakes were assessed using food composition tables and compared to the ANCs. Statistics were performed using Statview™ and SPSS software. The significance threshold was set at 0.05.The relapsing-remitting form was the most common (81.6%) form, followed by the secondary progressive form (14.7%) and the primary progressive form (3.7%). The average BMI was 25.0 ± 5.2 kg/m², with 44.0% of patients overweight or obese. Energy intake was insufficient (1538.4 ± 714.3 kcal/day). Fiber, calcium, magnesium, vitamins D and E were below recommended intakes. 41.9% of patients frequently skipped meals and snacking was common (89.7%), mostly on sugary foods. Water consumption was low for 71.0% of patients and 59.6% did not practice any physical activity. The average sleep duration was 6.6 ± 1.7 h/d. Sleep quality was considered good in only 37.5% of patients. A percentage of 8.8% of patients consumed tobacco and 33.1% of them lived with a male smoker. This study highlights a widespread dietary imbalance, poor lifestyle habits, and a lack of nutritional support among MS patients. An individualized nutritional approach, integrated into multidisciplinary care, is essential to improve quality of life, prevent comorbidities and slow disease progression.

Keywords
Multiple Sclerosis, Nutritional Status, Eating Habits, Nutritional Intake, Lifestyle.

T1-P-63

Phytochemistry and pharmacological activities of the ethanolic extract of *Malva sp* from Algeria

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Abstract

The genus Malva (Mallow) belongs to the Malvaceae family and is commonly known as cheeseweed. Malva leaves are used to treat various ailments. Rich in bioactive molecules, its leaves exhibit multiple physiological activities. The current research aimed to verify the phytochemistry and *in vitro* pharmacological activities of the ethanolic extract of *Malva sp*. Antioxidant properties of this plant were assessed using different methods: 2,2-diphenyl-1-picrylhydrazyl (DPPH), 2,2′-casino-bis (3-ethylbenzothiazoline)-6-sulfonate (ABTS), O-phenanthroline and FRAP assays. Total bioactive contents were determined with a spectrophotometric method. Additionally, *in vitro* and *in vivo* anti-inflammatory and antidiabetic activities. Dermatoprotective effect was estimated by sun protection factor (SPF) assays. The plant extract showed high total phenolic (509.20±8.59µg GAE/mg fraction), flavonoid, and flavonol contents (392.13±9.13 and 86.13±1.57 QE/mg fraction, respectively), aiming to highlight the recent advances in current knowledge on *Malva sp* as a source of bioactive flavonoids. Furthermore, the results indicate that this extract was so effective in scavenging ability on DPPH and ABTS (IC_{50}=94.25±2.25.07 and 2.30±0.04µg/mL, respectively). The reducing activity by the phenanthroline method: the absorbance A0.5 obtained is 1.85 ± 0.55 µg/mL, while in the FRAP test, it reaches 52.04 ± 0.19 µg/mL. Compared to BHA and BHT and ascorbic acid, which showed very high reducing activity, with $A_{0.5}$ values of 0.90±0.04, 2.18±0.06 and 3.08±0.02 µg/mL, respectively with respect to O-phenanthroline, and $A_{0.5}$ values of 8.41±0.21, 92.17±0.89 and 9.03±0.4 µg/mL, respectively with respect to FRAP. The results reveal that the ethanolic extract exhibits superior α-amylase inhibitory activity compared to acarbose. Furthermore, *Malva sp* demonstrated strong dermatoprotective activity and a significant anti-inflammatory effect, with a maximum inhibition rate of 76.81% at a concentration of 500 µg/mL during protein denaturation. In the *in vivo* study, oral administration of *Malva sp* at doses of 200 and 400 mg/kg resulted in a decrease in blood glucose levels, with reductions of 65% and 72% respectively after 6 hours of edema induction. Acute toxicity assessments at doses of 5, 50, 300, and 2000 mg/kg of this plant were negative. As a result, the findings of our work justify their application in traditional phytotherapy.

Keywords

Malva sp, Bioactive Contents, Antioxidant, Dermatoprotective, Anti-Diabetic, Anti-Inflammatory.

T1-P-64

Relation entre l'apport alimentaire en vitamine k et la stabilité de l'effet anticoagulant chez les patients sous Sintrom

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Abstract

Le Sintrom est un anticoagulant oral largement prescrit pour la prévention et le traitement des troubles thromboemboliques. Étant donné sa marge thérapeutique étroite, une surveillance rigoureuse de l'INR est nécessaire pour éviter les complications hémorragiques tout en assurant une efficacité optimale. Parmi les facteurs influençant la variabilité de la réponse au traitement figurent l'état nutritionnel et notamment l'apport alimentaire en vitamine K. Cette étude vise à évaluer l'impact d'un régime restreint en vitamine K sur l'équilibre diététique et la stabilité de l'effet anticoagulant chez des patients traités par anti-vitamine K (Sintrom), et à

proposer un modèle alimentaire adapté. L'étude a été réalisée au service de chirurgie cardiaque de l'EHU d'Oran sur une période de six mois (Septembre 2023 – Février 2024) sur des 123 patients. Les données cliniques et nutritionnelles ont été recueillies à l'aide d'un questionnaire comprenant un examen clinique et une enquête diététique. Les bilans biologiques (INR) ont été extraits des dossiers médicaux. L'analyse statistique a été effectuée à l'aide des logiciels GraphPad Prism et Nutrisurvey. Les patients inclus étaient âgés de 19 à 60 ans. Chez les patients sous traitement AVK, les valeurs de l'INR se situaient majoritairement entre 2 et 3, plage thérapeutique recommandée. Deux tendances principales ont été observées : les patients suivant un régime restreint en vitamine K présentaient un INR stable (2–3), les patients consommant régulièrement des aliments riches en vitamine K avaient un INR plus faible (<2), traduisant une diminution de l'effet anticoagulant. Un apport régulier et modéré en vitamine K contribue à la stabilité de l'INR et à une meilleure maîtrise de l'effet anticoagulant du Sintrom. IL n'est donc pas nécessaire d'exclure totalement la vitamine K, mais plutôt de maintenir un équilibre alimentaire constant pour éviter les fluctuations de l'efficacité thérapeutique.

Keywords

Thematic 2 – Functional Foods and Health

T2-P-01

A barley-based yoghurt-like product

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Abstract
Currently, barley is attracting more and more attention from the agri-food industry, particularly in the development of functional products rich in β-glucans. The aim of the present work is to contribute to the diversification of barley consumption patterns by studying the feasibility of elaborating new food preparations from this cereal ; barley-based yoghurt-like product. To elaborate the product, a 10% solution of barley flour in water heated to 80°C is clarified by filtration. A quantity of whole milk powder (4%, w/v) is added to this solution. The preparation is inoculated with thermophilic lactic ferments 0.08% (v/w) and fermented for 6h (40-45°). A physicochemical and sensory characterization of the product is carried out. Physicochemical analyses indicate that barley flour is a significant source of dietary fiber, with a content of 10.15%, including 4.3% β-glucan. The prepared barley extract is characterized by a significant β-glucan content (2.9%), a pH of 6.87, and a viscosity of 3.8 mPa, with protein and carbohydrate contents of 0.81% and 5%, respectively. The pH and acidity of the yoghurt-like fermented product elaborated from barley are 4.3, and 86.61, respectively. The pH values are comparable to that of the yoghurt control, but the acidity is lower. Significant differences were noted, for the majority of sensory criteria between barley-based yoghurt-like product and control ; specifically consistency and flavor. For better product acceptance, optimization of organoleptic quality through purification of barley extract and the addition of natural additives to the product should be considered.

Keywords
Barley, β-glucans, yoghurt-like product , Characterization

T2-P-02

Regional variability in algerian honey: Insights into its functional and health-beneficial attributes

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Abstract
Honey is increasingly recognized as a functional food due to its rich bioactive composition and associated health-promoting properties. These functional attributes, particularly antioxidant capacity, are influenced by factors such as botanical origin, bee species, and geographical conditions. This study investigates the functional quality of two Algerian honey samples from Guelma and Bejaia by assessing key physicochemical indicators (moisture, pH, electrical conductivity, protein, proline, and hydroxymethylfurfural), as well as total phenolic and flavonoid contents. Antioxidant activities were evaluated using DPPH and ABTS assays to determine their potential contribution to health protection. By comparing the bioactive and nutritional profiles of the two regional honeys, this work provides insight into their value as functional foods and supports their potential use in promoting human health and wellness.

Keywords
Algerian honey; Functional foods; Physicochemical properties; Phenolic compounds; Antioxidant activity

T2-P-03

Antioxidant and nutritional potential of Algerian bee pollen as a functional food

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Abstract

Bee pollen is widely regarded as a functional food thanks to its rich nutrient profile and bioactive compounds. This study examines the physicochemical, phytochemical, and nutritional properties of Algerian bee pollen collected from different regions, with a focus on its antioxidant potential and relevance to human health. Moisture, pH, and ash content were analyzed to assess quality and stability, while nutritional analysis confirmed high levels of proteins, carbohydrates, and lipids. Total phenolic content ranged approximately from 17.10 ± 0.30 mg GAE/g to 24.60 ± 0.10 mg GAE/g, and flavonoid content from 5.80 ± 0.70 mg QE/g to 12.60 ± 0.95 mg QE/g. These bioactive compounds contribute to notable antioxidant activity, with IC50 values ranging between 0.20 mg/mL and 0.37 mg/mL. The findings support the potential of Algerian bee pollen as a health-promoting ingredient in functional foods, highlighting the value of regional and botanical diversity.

Keywords

Bee pollen; Functional foods; Antioxidant activity; Phenolic compounds; Nutritional quality

T2-P-04

Etude de l'activité anticholinestérase d'une espèce du genre *Centaurea*

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Abstract

Il existe deux types de cholinestérases : l'acétylcholinestérase (AChE) et la butyrylcholinestérase (BChE). Bien que toutes les deux soient présentes dans le cerveau, l'acétylcholinestérase prédominante au niveau central est la principale responsable du métabolisme de l'acétylcholine dans le cerveau, alors que la butyrylcholinestérase a principalement une action périphérique et peut aussi être à l'origine d'effets périphériques indésirables. Les recherches pharmacologiques réalisées sur le traitement de la Maladie d'Alzheimer ont trouvé une relation entre le déficit des neurotransmissions cholinergiques et les différents symptômes de cette maladie. Les anticholinestérasiques diminuent l'activité de l'acétylcholinestérase. Leur action favorise donc l'élévation de la concentration d'acétylcholine dans le cerveau. L'investigation phytochimique des plantes médicinales représente actuellement un potentiel inestimable pour la découverte de nouvelles substances chimiques bioactives. Dans ce contexte, notre étude s'est portée sur l'investigation de l'activité anti-cholinestérase d'une espèce du genre *Centaurea*. Le protocole d'extraction a débuté par une macération dans un système hydro-méthanolique (MeOH/H2O; 80:20; v/v) suivi par des extractions liquide-liquide par des solvants de polarité croissante : chloroforme, acétate d'éthyle et n-butanol. La séparation de la phase chloroformique sur colonne chromatographique nous a permis d'obtenir un mélange de deux stérols, un majoritaire c'est le β-sitostérol et le second minoritaire est le stigmastérol avec les proportions 62,4% et 37,6%, respectivement. L'extrait chloroformique (CI_{50} = 146,75±0,68 µg /mL) a présenté une activité modérée contre la BChE par rapport à la galantamine (CI_{50} = 34,75±1,99 µg/mL). Cependant, les deux extraits acétate d'éthyle et n-butanol étaient inactifs pour les différentes concentrations. L'effet modéré de l'extrait chloroformique est lié à la présence du β-sitostérol et stigmastérol, qui possède une forte inhibition de la BChE.

Keywords

extraction, Alzheimer,*Centaurea*, l'acétylcholinestérase, butyrylcholinestérase

T2-P-05

Impact of non-enzymatic deamidation on *in vitro* gastrointestinal digestion and anti-inflammatory potential of camel whey proteins: implications for the development of nutritional supplements

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Abstract
Camel whey proteins are emerging as promising ingredients for dietary supplements due to their ability to release anti-inflammatory peptides during digestion. Non-enzymatic deamidation of *Camelus dromedarius* α-lactalbumin (α-La), a modification that may occur during food processing or storage, can alter protein structure and potentially affect the nutritional and functional value of whey-derived products. This study investigated how spontaneous deamidation influences the gastrointestinal digestion of dromedary whey proteins and the anti-inflammatory activity of their hydrolysates.
Native camel whey proteins (nCWP) were obtained after casein precipitation, then incubated in 150 mM phosphate buffer (pH 8.4, 72 h) to induce spontaneous deamidation, producing deamidated proteins (dCWP) as confirmed by Native-PAGE. Both forms underwent a two-step *in vitro* gastrointestinal digestion simulating gastric (pepsin, pH 2) and intestinal phases (pancreatin with or without bile extract, pH 7). At the end of the gastric hydrolysis (nGH and dGH) and intestinal hydrolysis without (nIH and dIH) or with cholic acids (nIHca and dIHca), samples were collected and adjusted to 1% (w/v) and pH 7. Hydrolysis efficiency was quantified using TCA-soluble fractions, and anti-inflammatory activity was assessed by inhibition of heat-induced BSA denaturation, with salicylic acid as a positive control. Native α-La (A_1) disappeared and two new isoforms (A_2 and A_3) appeared, confirming spontaneous deamidation. This reaction markedly reduced digestibility at all stages, the degree of hydrolysis decreased from 23.1% (nGH) to 11.7% (dGH) during gastric digestion, from 70.9% (nIH) to 38.8% (dIH) during intestinal digestion, and from 77.7% (nIHca) to 58.5% (dIHca) in the presence of cholic acids. Digestion significantly increased anti-inflammatory activity, with nIHca showing the highest inhibition (94.71%), followed by dIHca (73.11%), values close to salicylic acid (93.33%). Overall, gastrointestinal digestion enhanced the release of anti-inflammatory peptides from camel whey proteins, supporting their use as functional ingredients in dietary supplements However, spontaneous deamidation reduced both peptide release and bioactivity, highlighting the importance of controlling proteins modifications during processing to maintain supplement quality and functional efficacy.

Keywords
Camel whey proteins, non-enzymatic deamidation, gastrointestinal digestion, bioactive peptides, anti-inflammatory potential.

T2-P-06

The effect of gastrointestinal digestion on the radical scavenging and albumin protection properties of isolated camel milk αS-casein: in vitro investigation

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Abstract
Camel milk is a vital ingredient for food innovation and advanced nutrition, with its αs-caseins holding significant potential as a source of bioactive compounds. This study aimed to isolate these proteins and evaluate the antioxidant activity of peptides released during a simulated gastrointestinal digestion. Using a simplified ion exchange chromatography method, αs-casein were purified on a batch-wise DEAE-Cellulose and then evaluated in Sodium Dodecyl Sulfate - Polyacrylamid Gel Electropgoresis (SDS- PAGE), the isolated αs-casein subjected to a two-stage in vitro enzymatic digestion model with pepsin (gastric) and pancreatin (intestinal), the degree of hydrolysis was measured for each stage. The radical scaveging capacity and albumin protection of the resulting hydrolysates were subsequently measured using 2,2-diphenyl-1-picrylhydrazyl (DPPH) and heat-induced

Ovalbumin denaturation assays. The intestinal digestion phase with pancreatin achieved the highest degree of hydrolysis (78,39 ± 1.25%), indicating extensive protein breakdown (P < 0.05). Critically, these enzymatic hydrolysis byproducts correspondingly showed the highest activities across all assays (P < 0.05), demonstrating an increase in DPPH scavenging activity, from 18.96 % in native αs-casein to 22.61 ± 0.57% and 29.69 ± 1.99% in gastric and intestinal hydrolysates, respectively. As well as a dramatic increase of Ovalbumin protection activity from 14.03 ± 0.45% to 71.45 ± 0.35% and 71.17 ± 0.71%. This research confirms that camel milk αs-caseins are a rich precursor to potential antioxidant and anti-inflammatory peptides that are efficiently liberated during the intestinal phase of digestion. This highlights their high bioavailability and provides a robust scientific basis for their incorporation into next-generation functional foods and nutraceuticals, positioning them as high-value ingredients for the modern food industry.

T2-P-07

Metabolic regulatory effects of *Lepidium sativum* in hyperglycemia and dyslipidemia: A review of preclinical rodent studies

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Abstract

Metabolic syndrome, characterized by hyperglycemia, insulin resistance, and dyslipidemia, represents a major global health challenge due to its rising prevalence and strong association with cardiovascular diseases. Amid growing interest in complementary therapeutic strategies, garden cress (Lepidium sativum) has emerged as a promising medicinal plant. Its seeds, rich in polyphenols, flavonoids, and antioxidant compounds, are increasingly studied for their potential metabolic benefits. This review was developed through a systematic search of PubMed, Web of Science, and Google Scholar, focusing on studies published between 2010 and the present. Search terms included "Lepidium sativum", "metabolic syndrome", "hyperglycemia", "dyslipidemia", and "polyphenols". Only preclinical studies—mainly in rodent models—investigating metabolic and lipid-modulating effects were selected. Across approximately ten relevant studies, supplementation with L. sativum seeds consistently resulted in significant improvements in glucose homeostasis. Reported effects include reduced fasting blood glucose, improved glucose tolerance, and enhanced insulin sensitivity. These outcomes are commonly linked to the plant's antioxidant capacity, modulation of oxidative stress, stimulation of peripheral glucose uptake, and regulation of hepatic glucose production. Regarding lipid metabolism, available animal studies highlight consistent reductions in total cholesterol, triglycerides, and LDL, along with increases in HDL levels following cress seed administration. These improvements suggest a potential protective effect against dyslipidemia and atherogenic progression. The polyphenolic content of L. sativum is believed to contribute significantly to these effects by limiting lipid peroxidation and modulating key metabolic enzymes. Overall, current preclinical evidence supports the promising role of Lepidium sativum in managing hyperglycemia and dyslipidemia. However, further research is required to determine optimal dosing, isolate active compounds, clarify mechanisms of action, and validate these effects in human clinical trials. Continued experimental work will be essential to advance its therapeutic development.

Keywords

Lepidium sativum, Metabolic syndrome, **Hyperglycemia**, **Dyslipidemia,Preclinical Research**

T2-P-08

Mentha aquatica as a functional food: chemical composition and antioxidant properties

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Abstract

Mentha aquatica is a species of mint belonging to the Lamiaceae family, known for its perennial herbaceous growth and presence in the Mediterranean region. This family is one of the most important families in Algerian flora and one of the most widely used by traditional therapists. Species in this family are known to be effective against various diseases due to the bioactive compounds they contain. *Mentha aquatica*is one of the 38 species and hybrids within the *Mentha* genus, which is characterized by high essential oil variation and diverse culinary uses. This work is part of a larger effort to promote Algerian medicinal herbs, focusing on their therapeutic and pharmacological qualities. It is based on a phytochemical and biological assessment of the plant *Mentha aquatica*. Antioxidant activity evaluation showed that the extracts studied had variable and significant antioxidant properties: the DPPH test revealed that the ethyl acetate extract was the most active with an IC_{50} value of 0.031 mg MS/mL, while the ABTS test showed that the butanolic extract was the best with an IC 50 value of 0.0257, and the FRAP assay favoured the n-butanol extract. In light of these results, the bioactive compounds in our plant extracts should be isolated and tested. Further *in vivo* studies are encouraged, particularly those aimed at the food, pharmaceutical and cosmetic industries.

Keywords
Mentha aquatica, Lamiaceae, antioxidant activity, medicinal herbs.

T2-P-09

Low-sugar pumpkin-based jam: physicochemical, microbiological, and sensory qualities during refrigerated storage

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Abstract
Because of the increasing consumer awareness of health-related issues, there is a growing demand for noncariogenic, low-energy food products. This study was carried out to develop formulations for natural reduced-sugar and sugar-free, pumpkin-based jam products. The first and the most important goal is to formulate a low-sugar dietary jam for diabetic consumers based on pumpkin (*Cucurbita pepo* L.). This jam is fortified with carob syrup as a natural sweetener and flax seeds as a natural thickener. The second goal is to evaluate how refrigerated storage for 21 days affects the physicochemical, microbiological, and sensory properties of the jam compared to a control jam. The results showed a slight decrease in pH, stable Brix levels, and satisfying microbial stability. On the sensory level, enriched samples, particularly those with 75% carob syrup as a sugar substitute, received higher overall evaluations. This jam offers a natural, healthful, and stable alternative to standard jams.

T2-P-10

Effect of natural sourdough fermentation on bread's nutritional profile

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Abstract
Natural sourdough, a veritable microbial ecosystem of cereals, can generate bioactive compounds that are beneficial to human health, thereby improving the nutritional quality and digestibility of bread. The purpose of this study is to compare the nutritional quality of bread made with natural sourdough to that of bread fermented with baker's yeast. The sourdough was prepared using water and T80 flour, refreshed daily for a week until it reached maturity. The mature sourdough was then incorporated into the bread-making process at a rate of 30%. A control bread was also made from the same flour, using baker's yeast at a rate of 2%. The

analyses of total protein, lipids, and sugars were performed using the Kjeldahl, Soxhlet, and Dubois methods, respectively. The corresponding levels in the sourdough bread (6.13, 1.45, and 0.63%, respectively) were slightly lower than those in the control bread (6.46, 2.73, and 1.03%, respectively). This decrease can be explained by various biochemical mechanisms linked to the microbial activity of sourdough, particularly that of lactic acid bacteria. These bacteria produce enzymes such as lipases and proteases, which are responsible for the partial hydrolysis of proteins, thereby improving their digestibility. On the other hand, naturally occurring sugars are consumed as energy substrates during fermentation, leading to the formation of short-chain fatty acids and postbiotic compounds, which are known for their beneficial effects on intestinal health.

Keywords
Sourdough, bread, lactic acid bacteria, enzyme, nutritional quality.

T2-P-11

Exploring the antioxidant capacity of *Centaurea sp.* ethanolic extract: a multi-method in vitro investigation

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Abstract
Oxidative stress plays a major role in the development of several chronic diseases, encouraging the search for natural antioxidant sources such as medicinal plant extracts. This study aimed to investigate the in vitro antioxidant capacity of an ethanolic extract of *Centaurea sp.*, obtained by maceration. Antioxidant activity was evaluated using five different assays: DPPH, ABTS, CUPRAC, GOR, and the o-Phenanthroline assay. Results were expressed as IC_{50} values (µg/mL) and reported as mean ± SD. The extract demonstrated notable antioxidant potential in most tests, with IC_{50} values of 121.29 ± 18.21 µg/mL (DPPH), 641.17 ± 10.58 µg/mL (ABTS), 78.08 ± 4.54 µg/mL (CUPRAC), and 211.83 ± 82.57 µg/mL (Phenanthroline). No significant antioxidant activity was detected with the GOR assay. The coefficient of variation ranged from low to moderate, indicating acceptable reproducibility. These results highlight the antioxidant capacity of the ethanolic extract of *Centaurea sp.*, particularly its strong activity in the CUPRAC and DPPH assays. This suggests its potential use as a natural antioxidant source in functional food or nutraceutical applications. Further phytochemical investigation is recommended to identify the active compounds responsible for these effects.

Keywords
Centaurea sp., antioxidant activity, ethanolic extract.

T2-P-12

Produits fonctionnels innovants : Potentiel technologique et nutritionnel de la courge (*Cucurbita maxima)*

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Abstract
La courge (*Cucurbita maxima*) constitue une ressource alimentaire stratégique grâce à sa richesse en fibres alimentaires, minéraux, composés phénoliques et caroténoïdes ayant des activités biologiques importantes et largement reconnus pour leurs effets protecteurs sur la santé humaine. Ce travail vise la transformation complète de la courge « Guelii », variété locale encore peu étudiée mais présentant un potentiel bioactif important sous forme de purée concentrée prête à consommer. Les résultats obtenus ont permis de démontrer la faisabilité de la concentration thermique de la purée de courge, aboutissant à un produit final stable d'un point de vue physico-chimique, sensoriel et technologique. La purée concentrée, avec ou sans supplément d'huile d'olive épicée, présentait une humidité de 76,17 ± 0,10 %, un pH de 5,44 ± 0,08, une acidité titrable de

0,06 ± 0,01 % (exprimée en acide citrique) et une viscosité de 444,07 ± 3,91 mPa.s, indiquant une bonne texture pour un usage immédiat ou en tant que base culinaire. Sur le plan sensoriel, le produit final a été apprécié pour sa couleur vive, sa texture homogène et sa saveur douce, tandis que la formule enrichie en huile épicée a apporté une dimension aromatique supplémentaire.
Les résultats obtenus démontrent la faisabilité technologique et l'intérêt nutritionnel d'une valorisation intégrale de la courge « Guelii ». Les produits développés présentent un potentiel d'intégration dans l'alimentation quotidienne, l'industrie agroalimentaire et les formulations fonctionnelles. Ces formules à base de courge présentent un grand intérêt nutritionnel grâce à leur richesse en provitamine A, vitamines C et E, ainsi qu'en minéraux essentiels comme le potassium et le magnésium. Elles apportent des fibres favorisant la digestion et la satiété, tout en restant faibles en calories et à index glycémique modéré, ce qui les rend adaptées aux régimes pour diabétiques ou au contrôle du poids. Leur teneur élevée en antioxydants contribue à renforcer l'immunité et à réduire le stress oxydatif.

Keywords
Courge, *Cucurbita maxima*, Aliment fonctionnel, fibres, Purée de courge

T2-P-13

Caractérisation partielle des grains de kéfir de lait commercialisés en Algérie

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Abstract
Les grains de kéfir sont des agrégats gélatineux formés par des bactéries et des levures symbiotiques, considérés comme une source inépuisable de probiotiques bénéfiques pour la santé humaine. Ce produit naturel a fait son entrée sur le marché algérien grâce aux réseaux sociaux, suscitant un engouement auprès d'une population de plus en plus consciente de sa santé. Toutefois, des réserves sont à émettre quant à sa qualité hygiénique et sa composition microbienne, car sa commercialisation suit des circuits informels. Dans cette optique, notre étude s'est fixée comme objectif de caractériser des grains de kefir acquis auprès de vendeurs en ligne de la région d'Alger, sur le plan macroscopique, physico-chimique et microbiologique. Les grains se présentent sous la forme de granules blancs jaunâtres de texture irrégulière et de consistance ferme et visqueuse. L'analyse de leur composition a révélé des taux exprimés par 100 g de : lipides de 0,36 g, glucides 1,08 g, protéines de 0,71 g, matière sèche de 16,59 g, minéraux de 1,4 g, soit un apport calorifique de 10,4 Kcal d'énergie avec un taux d'humidité de 84,81 %. La croissance moyenne de la biomasse des grains en 24 h est d'environ 9,26 % à 20 °C. Sur le plan microbiologique, l'analyse microbiologique des grains a montré une flore totale très importante, de l'ordre de $1,17.10^9$ UFC/g ; elle est essentiellement composée de bactéries lactiques réparties entre coques ($2,64.10^8$ UFC/g) et lactobacilles ($1,3.10^8$ UFC/g), de levures ($1,06.10^7$ UFC/g), de bactéries acétiques ($5,4.10^6$ UFC/g). Aucune présence de germes indicateurs de contamination fécale ou pathogènes n'a été détectée. En dépit des résultats d'analyses obtenus, il est important d'imposer le contrôle de la qualité sanitaire des produits alimentaires qui échappent aux circuits conventionnels notamment ceux vendus en ligne.

Keywords
Grains de kéfir, caractérisation partielle, composition, qualité, flore microbiologique.

T2-P-14

Analysis of the fiber composition of three agro-industrial by-products (tomato peels, orange peels, and olive pomace) for their potential use in food packaging

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Abstract

This study examined the fiber composition of three agri-food by-products (tomato peel, orange peel, and olive pomace) in view of their potential use in bio-based food packaging. The functional properties of such materials depend largely on the relative proportions of cellulose, hemicellulose, and lignin, which govern mechanical strength, rigidity, flexibility, film-forming capacity, and biodegradability. Crude fiber contents were determined using the Weende method, involving sequential acid (H_2SO_4, 1.25%) and alkali (NaOH, 1.25%) digestion, followed by filtration, drying at 105 °C, and ashing at 550 °C, in accordance with AOAC Method 978.10. NDF and ADF fractions were quantified following the detergent-fiber procedures of Van Soest *et al.* (1991). Prior to analysis, samples were dried at 60 °C, ground to 1 mm, and stored in airtight containers. The results reveal marked differences among the three by-products. Tomato peel contained moderate fiber levels (13.32% crude fiber; 34.16% NDF; 25.07% ADF), indicative of a cell wall enriched in cellulose and pectin. Olive pomace exhibited the highest lignocellulosic content (24.12% crude fiber; 51.71% NDF; 42.13% ADF), confirming its rigid and highly lignified structure. In contrast, orange peel showed comparatively low fiber values (11.08% crude fiber; 21.42% NDF; 16.12% ADF). Overall, the moderate cellulose content and higher soluble fiber proportions of tomato and orange peels make them suitable candidates for film- and bioplastic-forming applications, whereas the high lignin and cellulose content of olive pomace favors its use in rigid bio-composite materials.

Keywords
by-products, crude fiber, cellulose, hemicellulose, lignin

T2-P-15

Probiotic therapy for Parkinson's disease

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Abstract
This project aims to create a natural way of providing dopamine continually to help reduce the symptoms and slow the progression of Parkinson's disease. The idea is to use an engineered spore-forming microorganism probiotic (Bacillus licheniformis) that can produce L-DOPA (the precursor of dopamine) right inside the human's intestine. For this, we preferred to combine a genetically modified bacterium with a prebiotic that helps it grow, survive, and stay active within the gut microbiota.The bacterium used, is already known for its safety and resilience. Because it is commonly used in commercial probiotic products, it offers a strong biological foundation. The strain was improved by introducing an inducible plasmid "pMA5-hpaBC" carrying the genes needed to convert tyrosine into L-DOPA. The expression of these genes is regulated by a promoter activated by L-rhamnose rhaPBAD, allowing the control of production levels. L-DOPA production is further supported by a prebiotic medium containing lactose, sucrose, some essential minerals, and tetracycline for maintaining the plasmid selection. Results observed from the reviews, the optimized fermentation conditions are 37 °C, pH [6.3-6.5], 180 rpm, 3% inoculum, and around 120 hours of incubation to obtain the main solution, the strain produces measurable quantities of L-DOPA, confirmed by HPLC analysis. Other experiments also reached high levels of tyrosine, up to 1500 mg/L. However, this result shows that further optimization is still useful. After fermentation, the biomass is harvested, stabilized, and formulated with the prebiotic to promote better intestinal colonization. The next step is to refine how the product will be administered (either as a single combined capsule or starting by colonizing the intestine, then add the prebiotic as treatment). This strategy opens a promising path toward a gut-based therapeutic option for Parkinson's disease.

T2-P-16

Effect of the addition of local dates on the properties of a fermented yogurt

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Abstract

In a context of growing demand for healthy and naturally sourced dairy products, this studyfocused on the development of a fermented yogurt enriched with three local varieties of Algerian dates: Degla Baïda, Hmira and Tinacer (Gurbai). These dates were chosen for their richness in natural sugars, dietary fiber, antioxidant and mineral compounds, and their functional potential. The aim of this study is to evaluate the impact of the addition of dates (at different concentrations) on the physicochemical (pH, acidity, dry matter, ash, sugar, proteins, lipids), microbiological (total mesophilic aerobic flora, total coliforms, Escherichia coli, Salmonella spp., Staphylococcus aureus, yeasts and molds) and sensory (taste, texture, flavor, odor, smoothness) characteristics of set yogurt, in comparison to a control without dates. The results showed that date enrichment improved the overall nutritional value and technological properties of yogurt. The addition of dates promoted the growth of lactic acid bacteria, contributing to better fermentation. The enriched yogurts also exhibited a firmer texture and better sensory acceptability, particularly due to the natural sweetness and fruity aromas characteristic of the varieties used. This study highlights the importance of leveraging local and underutilized resources in the formulation of innovative products, while meeting nutritional, sensory, and sustainability requirements. It paves the way for a new generation of yogurts tailored to the preferences of Algerian consumers and the expectations of the modern agri-food market.

Keywords
Yogurt, Algerian dates, Degla Baïda, Hmira, Tinacer, sensoryquality, lactic fermentation

T2-P-17

The role of green tea polyphenols in reducing cardiovascular risk and improving metabolic function

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Abstract
Green tea is widely recognized as a functional food due to its high content of polyphenols, particularly catechins such as epigallocatechin gallate (EGCG). These bioactive compounds exhibit strong antioxidant properties that help reduce oxidative stress, a key mechanism involved in the development of chronic diseases. Numerous studies indicate that regular consumption of green tea may contribute to cardiovascular protection by improving endothelial function, reducing LDL oxidation, and supporting blood pressure regulation. In addition, green tea polyphenols appear to play a beneficial role in metabolic health by enhancing insulin sensitivity, regulating glucose and lipid metabolism, and increasing energy expenditure. These combined effects suggest that green tea could support the prevention of metabolic disorders such as obesity and type 2 diabetes. Overall, green tea represents a natural functional food with promising potential for promoting cardiovascular and metabolic health. This study aims to optimize the extraction conditions of polyphenols and to evaluate the antibacterial activity of aqueous and methanolic extracts of *Camellia sinensis*. The influence of several parameters (temperature, soaking time, plant-to-solvent ratio, and solvent concentration) was examined. Optimal extraction conditions were achieved with 6% plant material at 80 °C for 50 minutes for the aqueous extract (97.457 g GAE/L), and with 6% plant material in 50% methanol at 35 °C for 40 minutes (91.171 g GAE/L). Water proved to be more effective than methanol for extracting polyphenols. Antibacterial tests conducted on *E. coli*, *P. aeruginosa*, and *S. aureus* showed strong activity of the aqueous extract against *P. aeruginosa* (20 mm inhibition), and notable activity of the methanolic extract against *P. aeruginosa* (15 mm) and *S. aureus* (18 mm). MIC results confirmed the antibacterial potential of both extracts.

Keywords
Polyphenols extraction, Antibacterial activity, *Pseudomonas aeruginosa*, *Staphylococcus aureus*

T2-P-18

Isolation and MALDI-TOF characterization of lactic acid bacteria from Algerian fermented foods: towards functional probiotics

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Abstract
Traditional Algerian foods represent a rich and diverse microbial reservoir, still largely unexplored, with strong potential as functional foods. In this study, several natural and fermented matrices were systematically investigated to isolate lactic acid bacteria with biotechnological and probiotic properties. Isolation was performed from a variety of sources, followed by morphological characterization using microscopy and identification by MALDI-TOF mass spectrometry, revealing a diversity of genera and strains recognized for their functional and potential probiotic properties. The generated protein spectra were used as biological fingerprints, allowing, through multivariate analyses (clustering, PCA, discriminant peak identification), the comparison of proteomic diversity among isolates and the identification of clusters associated with their food origin. This approach provides a local bioinformatic framework for the rational selection of strains with high probiotic potential. This initial proteomic screening provides a strategic biological resource for research focused on the intestinal microbiota and human health, enabling the prioritization of isolates for subsequent genomic analyses and evaluation of their capacity to beneficially modulate the gut microbiota. These results highlight the potential of traditional Algerian foods as a source of probiotics and functional foods aimed at promoting intestinal health.

T2-P-19

Antioxidant and antimicrobial potential of *Thymus vulgaris* from the Aures Region (Algeria) revealed by HPLC-DAD and GC-MS analyses: a promising source of functional bioactive Compounds

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Abstract
The present study aimed to investigate the phytochemical composition and biological potential of Thymus vulgaris collected from the Aures region of Algeria. Chemical profiling was carried out using HPLC-DAD and GC-MS analyses to identify phenolic and volatile compounds, respectively. The methanolic extract (TVME), which yielded 6.5%, revealed 18 phenolic constituents by HPLC-DAD analysis, with luteolin-7-O-glucoside (2.11 mg/g), apigenin-7-O-glucoside (1.84 mg/g), and tyrosol (1.03 mg/g) as the major compounds. Meanwhile, GC-MS analysis of the essential oil (TVEO), which yielded 0.5%, identified 76 volatile constituents, mainly (+)-2-bornanone (11.14%), eucalyptol (8.14%), and α-pinene (6.43%). The TVME contained notable amounts of polyphenols and flavonoids (77.6 ± 0.9 µg GAE/mg and 107.36 ± 27.56 µg QE/mg, respectively), exhibiting moderate antioxidant (IC_{50} = 2.94 ± 0.04 mg/mL; 34.03 ± 0.13%) and antimicrobial activities (inhibition zone = 9.08 ± 1.66 mm).These findings demonstrate the promising biological potential of this species. Overall, Thymus vulgaris from the Algerian Aures region represents a valuable natural source of functional bioactive compounds with potential applications in health-promoting products. Notably, (+)-2-bornanone, α-gurjunene, ledol, luteolin-7-O-glucoside, and tyrosol were determined for the first time in this species at high levels.

Keywords
HPLC-DAD, GC-MS, antioxidant activity, antimicrobial activity

T2-P-20

L'intérêt des propriétés techno-fonctionnelles de beta-glucane de l'orge d'Algérie, dans son intégration aux molécules bioactives

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Abstract

L'intérêt porté aux aliments fonctionnels ne cesse de croître en raison de leurs effets positifs sur la santé. L'orge, riche en composés bioactifs, représente une ressource prometteuse à valoriser. La présente étude se consacre à l'évaluation des propriétés techno-fonctionnelles d'un extrait de β-glucane obtenu à partir de l'orge algérienne. Les propriétés fonctionnelles de β-glucane (BG) obtenu par macération d'une farine d'orge locale ont été étudiées. L'étude consiste à déterminer la capacité de rétention d'eau et la concentration de gélification minimale de BG, ainsi que son pouvoir stabilisant des solutions. Ceci passe par une résolubilisation des β-glucanes dans l'eau. Un rendement d'extraction de 3 g de BG/100 g d'orge a été obtenu d'une variété d'orge algérienne contenant 6 % de BG. L'extrait de BG résultant ayant une humidité résiduelle de 9±2,8 %, présentait une capacité de rétention d'eau de 13,8±0,2 % et un pouvoir moussant de 60±10 %, en plus de son pouvoir gélifiant qui est de 10%. Les tests de stabilisation des solutions additionnées de BG ont donné une mousse stable à 63±3,7 % et une capacité émulsifiante de BG égale à 2,0 %.

Keywords

Orge, beta-glucane, molécules bioactives, propriétés techno-fonctionnelles, aliments fonctionnels.

T2-P-21

Antioxidant characteristics of the seed oil from two pumpkin species: *Cucurbita pepo* and *Cucurbita maxima*

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Abstract

Pumpkin seeds are produced in large quantities and are considered co-products that can be valorized due to their high oil content. This oil is mainly used for therapeutic purposes. Its richness in bioactive compounds gives it several properties that make it beneficial for prostate health. The aim of our study was to determine the content of bioactive compounds in the seed oil of two *Cucurbita* species cultivated in Algeria (*Cucurbita pepo* and *Cucurbita maxima*). The antioxidant activity of these compounds present in the oils was also evaluated by spectrophotometry using the DPPH• and ABTS•+ free radical scavenging methods. As a result, the oil analysis revealed that the phenolic compound contents were 67.36 ± 4.44 mg GAE/100 g and 71.80 ± 5.17 mg GAE/100 g for *Cucurbita pepo* and *Cucurbita maxima* respectively. The oil extracted from *Cucurbita maxima* showed a significantly higher flavonoid content (25.58 ± 0.64 mg QE/100 g) compared to the oil extracted from *Cucurbita pepo* (22,76 ± 0,58 mg EQ/100g). The carotenoid content ranged from 1.52 ± 0.009 mg/100 g in the oil extracted from *Cucurbita pepo* to 1,71 ± 0,01 mg/100g in *Cucurbita maxima*. The antioxidant activity of the oils against the DPPH• radical showed inhibition percentages of 24.85% for *Cucurbita pepo* and 25.17% for *Cucurbita maxima*. Meanwhile, the methanolic extract of *Cucurbita maxima* seed oil exhibited the highest inhibition percentage (94.49%) against the ABTS•+ radical compared to *Cucurbita pepo*. We recorded a positive correlation between the total polyphenol content of the oils and their Antioxidant activity. Overall, this study indicates that the seed oil of the examined *Cucurbita* species possesses significant nutritional and bioactive potential that deserves to be further.

Keywords

Pumpkin seed oil, antioxidant activity, *Cucurbita pepo*, *Cucurbita maxima*, phenolic compounds.

T2-P-22

Comparative nutritional, phytochemical, and sensory evaluation of traditional artisanal couscous varieties from Blida, Algeria

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Abstract
This study aims to determine the nutritional value, culinary qualities, and sensory characteristics of seven types of artisanal couscous known in the Blida region: whole *Triticum durum* couscous, *Hordeum vulgare* couscous, *Zea mays* couscous, *Quercus* spp. couscous (acorn), *Ceratonia siliqua* couscous (carob), *Origanum vulgare* couscous (oregano), and *Lavandula angustifolia* couscous (lavender). These traditional couscous varieties were compared to *Triticum durum* wheat (the control sample). To this end, a nutritional analysis of moisture, ash, proteins, lipids, fibres and total carbohydrates was conducted in accordance with AFNOR standards (1991). Additionally, the total phenol content, antioxidant activity, colour indices, cooking characteristics and sensory properties were studied. Physico-chemical analysis of the couscous samples showed a significant difference in all analysed parameters ($P < 0.05$). There was significant variation in protein content, which ranged from 9.8% ± 0.6 to 14.5% ± 0.8. Carob couscous (*Ceratonia siliqua*) showed the highest protein level, meeting the Algerian national standard of 11–15%. The swelling index, which indicates water absorption capacity and culinary quality, varied significantly from 175% ± 10 to 214% ± 25.Phytochemical analyses revealed significant variations in total phenolic content ($P < 0.001$), with carob couscous (*Ceratonia siliqua*) demonstrating the highest content at 68 ± 4.5 mg GAE/g. Flavonoid content ranged from 15 ± 3 to 45 ± 5 mg QE/g ($P < 0.001$), with carob again exhibiting the highest levels. Antioxidant activity, as measured by the DPPH assay, varied significantly ($P < 0.001$), with carob couscous demonstrating the highest activity (IC_{50} = 15 ± 1.2 µg/mL). Wheat (*Triticum Durum*) and Zea mays couscous showed the most intense yellow colouring.This study highlights the nutritional and sensory diversity of artisanal couscous varieties from the Blida region. These findings affirm the cultural and nutritional significance of traditional couscous, reinforcing its importance in Algerian and North African heritage.

T2-P-23

Antioxidant properties of gluten-free pasta enriched with by-products of tomatoes and linseed cakes

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Abstract
The aim of this research was the valorization of by-products of tomatoes and linseed cakes at 10% and 15% in the formulation and manufacturing of gluten-free pasta based on rice and fava bean. On the other hand to study the effect of the introduction of these vegetableby-products on their antioxidants proprieties. The traits analysed were, tocols, carotenoids and phenolics (by HPLC) and the antioxidant activity. The results showed that the addition of tomato by products and linseeds meal improved tocol concentration but had no effect on carotenoid content. The increase in free soluble polyphenols was similar for both by-products and proportional to the percentage enrichment, while bound insoluble polyphenols were higher in flaxseed-enriched pasta. Antioxidant activity was significantly higher for pasta enriched with linseed cakes ($p < 0.05$). In conclusion, the addition of tomato and linseed by-products significantly increases the presence of bioactive compounds (particularly polyphenols) and antioxidant activity too.

Keywords
Pasta, tomato by-products, linseed meal

T2-P-24

Effects of sodium chloride substitution with magnesium chloride on fermentation, bioactive compounds, and antioxidant activity in pickled vegetables

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Abstract

This study investigates the effects of completely replacing NaCl with $MgCl_2$ on salt retention, lactate production, lactic acid bacteria viability, bioactive compounds, and antioxidant activity in fresh and pickled vegetables over a 28-day fermentation period. The addition of $MgCl_2$ enhanced the quality of pickled vegetables compared to NaCl. Vegetables fermented with $MgCl_2$ exhibited higher levels of flavonoids and polyphenols than those fermented with NaCl. Salinity influenced both the viable lactic acid bacteria count and lactic acid production. The highest lactate concentration (1533.25±0.14mg/100g)was observed in the $MgCl_2$-fermented sample on day 21. Correspondingly, lactic acid bacteria count peaked at 5.73 log CFU/g for $MgCl_2$-fermented samples (P-Mg) and 4.06 log CFU/g for NaCl-fermented samples(P-Na) on the same day.Antioxidant activity increased throughout fermentation across all saline treatments, reaching 60.86 ± 0.03 mmol TE/g DW (ABTS assay) in $MgCl_2$-fermented vegetable safter 28 days.These findings suggest that substituting NaCl with $MgCl_2$ induces on lyminor changes invegetable characteristics and represents promising strategy for reducing dietary sodiumintake.

Keywords
Pickling, lactic acid bacteria, bioactive compounds, antioxidant activity, lactic acid content

T2-P-25

Sweet potato flour: a nutritional, gluten-free ingredient for health promotion and food security

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Abstract
In a global context where food security and public health are priorities, the search for healthy, nutritious, and gluten-free food sources is essential. The sweet potato (Ipomoea batatas L.), an economical, available, and resilient crop, represents a sustainable and health-beneficial alternative. The objective of this study was to develop sweet potato flour and evaluate its nutritional, physicochemical, functional, and antioxidant properties in order to explore its potential in the formulation of safe and functional foods. The analyses were conducted in accordance with standardized analytical methods. The protein content was quantified using the Bradford method, while the lipid content was determined by Soxhlet extraction. The moisture and carbohydrate levels, as well as the functional properties and total phenolic compound content, were evaluated using standard analytical protocols. The results showed a moisture content of 6.06 ± 0.63% and a fat content of 0.44 ± 0.12%, a moderate protein content (5.29 ± 0.12%), and a high proportion of carbohydrates (82.99%), and the crude fiber content of sweet potato flour was 3.36 ± 0.50%. The flour exhibited a water absorption capacity of 400.05 ± 0.8%, an oil absorption of 90.67 ± 0.90%, and a swelling index of 7.36 (g/g). Flour showed a higher gelatinization temperature (Tp = 79.32°C) and the total phenolic content was (10.35 mg GAE/g), indicating a strong antioxidant potential. These results confirm that sweet potato flour, naturally gluten-free, is a promising ingredient for the development of healthy, nutritious, and sustainable food products, thereby contributing to the prevention of malnutrition and metabolic disorders.

Keywords
Sweet potato flour, Gluten-free, Nutrition, Functional properties, Antioxidant

T2-P-26

Cassava and sweet potato peels: a source of antioxidants for functional foods

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Abstract
The present study is a contribution to the valorization of the peels of traditional local foods commonly consumed in many societies around the world. It is a promising avenue for sustainable agriculture, waste reduction, and economic development, as well as their use in various food applications. The objective of this work is to evaluate the phytochemical composition and antioxidant activity of total phenolic extracts from the bark of two species of cassava and sweet potato, which are starchy roots belonging to the tuber family. The

extracts were obtained by cold maceration for 12 hours, using methanol/water (80%) as a solvent. The content of phenolic compounds, flavonoids, and tannins was measured using the Folin-Ciocalteu reagent, aluminum trichloride, and vanillin tests, respectively. Antioxidant efficacy was examined using two methods: the 2,2'-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging method and ABTS activity. The results of the phenolic compounds revealed that *Ipomoea batatas L.* contained high levels at 14.978 ± 0.034 mg GAE/g DW, while *Manihot esculenta* contained 12.065 ± 0.070 mg GAE/g DW. Significant differences were also observed between the peels of the two plants regarding flavonoid and tannin ratios. The analysis of variance (ANOVA 1) and the t-test indicated that $P < 0.05$. The in vitro evaluation of antioxidant power using the DPPH free radical scavenging and ABTS methods allows us to conclude that there is a significant difference in the antioxidant activity performed by the total extracts from the two species ($P < 0.05$). The present results suggest the promising antioxidant properties of cassava and sweet potato peels, which can be used in the fabrication of functional bioactive ingredients for different purposes.

Keywords
Starchy roots, Phenolic Compounds, Antioxidants, Functional bioactive

T2-P-27

Development and characterization of traditional durum wheat *Waha* couscous enriched with carob (*Ceratonia siliqua* L.)

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Abstract
Today, consumers are increasingly health-conscious and are looking for food alternatives that are both healthy and tasty. Among Algerian culinary traditions, couscous occupies a central place, with varieties such as Mesfouff, a sweet dish that is particularly popular during Ramadan. Traditionally prepared with white sugar and raisins, we now offer an innovative version of this classic: a revisited Mesfouff, where refined sugar is replaced by a natural alternative, enriched with carob powder using a durum wheat semolina of a known variety, Waha. The aim is to promote the carob fruit, an under-exploited local resource rich in fibre, antioxidants, and minerals, by incorporating it into an everyday consumer product, and to assess the impact of its incorporation on the technological and nutraceutical quality of couscous, while promoting the use of local products.
The evaluation focused on several analyses comparing to an artisanal control couscous, including physicochemical parameters (water content, ash content, water and oil absorption capacity, etc.), and technological parameters (rolling efficiency, density, flow properties, degree of disintegration, etc.). Phytochemical analyses were also conducted, including total polyphenol, flavonoid, and tannin contents, as well as antioxidant activity.
The characterization of carob-enriched couscous showed a water content that compliant with standards (8.32±0.01), as well as a significant increase in water absorption capacity compared with the control (3.37±0.92; 2.33±0.87). Both bulk and tapped densities showed intermediate values. The degree of disintegration met the standards (4.22±0.14), and the optimal cooking time was slightly higher than that of the control (3.24±0.20 vs. 2.77±0.33). The antioxidant activity of the enriched couscous was approximately three times higher than that of the non-enriched sample, as determined by the DPPH and ABTS assays. Imaging revealed well-defined agglomeration and a regular grain structure.
This study shows that carob pulp powder could be used as a natural, functional ingredient for couscous enrichment. These results are promising and highlight the potential for developing an innovative product, enriched with nutrients, while retaining the appreciated characteristics of traditional couscous.

Keywords
Couscous, Enrichment, Carob Powder, *Ceratonia siliqua* L., antioxidant activity.

T2-P-28

Biological activities of Algerian propolis: a promising natural approach against resistant urinary tract pathogens

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Abstract

The increasing prevalence of multidrug-resistant bacterial strains, particularly those associated with urinary tract infections (UTIs), underscores the urgent need for novel therapeutic alternatives. This study evaluated the biological potential of Algerian propolis, a bee-derived natural product renowned for its richness in bioactive compounds. Three ethanolic propolis extracts collected from Eastern Algeria were investigated, among which the Djaâfra extract (EPDB) exhibited the highest extraction yield (57.20%). Phytochemical analysis revealed a chemically diverse profile, with high contents of polyphenols (258.8 ± 2.73 µg GAE/mg) and flavonoids (262.07 ± 3.12 µg QE/mg). These constituents were associated with strong antioxidant activity, with DPPH radical scavenging reaching 87.83 ± 1.70%. Antimicrobial evaluation showed that the extracts exerted pronounced inhibitory effects against Gram-positive bacteria, particularly *Staphylococcus aureus* (up to 20.67 ± 0.94 mm) and *Bacillus* spp. (21.33 ± 1.89 mm). Gram-negative bacteria were less susceptible; nevertheless, the EPDB extract exhibited notable antibacterial activity against key uropathogens, with inhibition zones of 22.33 ± 2.05 mm for *Escherichia coli* and 15.00 mm for *Klebsiella* spp., confirming its efficacy despite their high intrinsic resistance. These findings highlight the promising therapeutic potential of Algerian propolis, particularly the EPDB extract, as a natural source of antioxidant and antibacterial agents for the management of multidrug-resistant urinary tract infections.

Keywords

Propolis, urinary tract infections, ethanolic extract, antioxidant activity, antibacterial activity

T2-P-29

Phytochemical study and in vitro evaluation of the anti-inflammatory activity of the phenolic leaf extract of *Cupressus lusitanica* from Cameroon

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Abstract

Cupressus lusitanica, a medicinal plant from Cameroon, is rich in phenolic compounds with antioxidant and anti-inflammatory properties, including flavonoids and tannins found in its leaves. These bioactive molecules present promising potential for the development of functional foods and dietary supplements; however, their in vitro anti-inflammatory activity remains poorly documented. In this study, we characterized the phytochemical composition of the phenolic extract of the leaves and evaluated its effect on bovine serum albumin protein denaturation, using diclofenac as a reference drug. The leaves were extracted by hydroalcoholic maceration, and total polyphenols, flavonoids, and tannins were quantified using the Folin–Ciocalteu, aluminum chloride, and vanillin methods, respectively. The extract exhibited a high content of polyphenols and flavonoids, along with a moderate level of tannins, and significantly inhibited protein denaturation with an effect comparable to that of diclofenac. These findings confirm that the phenolic extract of *Cupressus lusitanica* represents a promising source of bioactive compounds that could be incorporated into functional food formulations or supplements intended to modulate inflammation. This work highlights the potential of this plant as a functional ingredient for health and nutrition, while also emphasizing the need for further investigations, particularly in vivo studies and the precise identification of the compounds responsible for the anti-inflammatory activity.

Keywords

Cupressus lusitanica, Anti-inflammatory activity, Phenolic compounds, Functional food

T2-P-30

Characterization of a probiotic ice cream produced with probiotic candidate *Lactiplantibacillus plantarum* Jb21-11

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Abstract

Algeria's rich food heritage includes a diversity of traditional fermented foods, which are valuable sources of novel microorganisms. This study aimed to characterize the probiotic candidate strain *Lactiplantibacillus plantarum* Jb21-11, isolated from *Jben* cheese, and to evaluate its application into a functional low-fat ice cream matrix. The strain was subjected to technological characterization, including assessments of acidification kinetics, proteolytic and lipolytic activities, exopolysaccharide (EPS) production, osmotic and thermal stress tolerance, and survival under cold and frozen storage. To evaluate the impact of this strain on a frozen dessert matrix, three distinct ice cream formulations were produced: a control formula (F1), a probiotic non-fermented formula (F2), and a probiotic fermented formula (F3). Analytical work included pH, titratable acidity, dry matter, EPS quantification, viscosity, specific gravity, overrun, melting rate, colour, hedonic sensory tests and microbiological counts during storage at -20 °C. Phenotypic characterization of the strain revealed that Jb21-11 produces exopolysaccharides (EPS), organic acids and exhibits facultative heterofermentative metabolism. The strain demonstrated high osmotic tolerance and a high survival rate under freezing conditions. Incorporation of Jb21-11 significantly affected the ice cream's physicochemical properties, lowering pH, increasing acidity and viscosity, and decreasing overrun and melting rate. The probiotic maintained high viability (≥ 10^8 CFU/g) over 48 days of storage at -20°C, confirming the strain efficacy as a probiotic candidate. Microbiological analysis confirmed the final product's excellent hygienic quality, and the sensory evaluation indicated that the non-fermented probiotic formula (F2) was significantly more appreciated by consumers than the control and the fermented one. This study demonstrates that *Lp. plantarum* Jb21-11 is a promising candidate for low-fat ice-cream: it improves rheological stability and maintains high viability during frozen storage. Further techno-functional and safety profiling, optimisation for pilot/industrial scale and in vitro/in vivo assessment of health effects, are required to confirm its functional potential.

Keywords

Probiotic, Lactic acid bacteria, Ice cream, Functional food, Functional frozen desert.

T2-P-31

The molecular mechanisms of *Prunus avium* and *Prunus cerasus*: A systematic review of bioactive compounds and their role in modulating oxidative stress and inflammation

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Abstract

Consuming sweet and sour cherries is associated with a wide range of health-promoting effects. While their nutritional value remains stable, the molecular mechanisms responsible for their therapeutic effects, particularly in reducing oxidative stress and inflammation, remain unclear. This comprehensive review aims to analyse and synthesise evidence from in vitro, in vivo, and clinical studies concerning the bioactive components of *P. avium* and *P. cerasus*, focusing on their mechanistic roles in regulating oxidative stress and inflammatory pathways. We conducted a systematic search, in accordance with PRISMA guidelines, in major scientific databases (PubMed, Scopus, and Web of Science) from 2009 to 2025. Studies that assessed the effects of cherry-derived bioactive compounds on molecular or cellular mechanisms associated with oxidative stress or inflammation were included. The results indicate that cherries contain a wide range of bioactive compounds,

particularly anthocyanins (such as cyanidin-3-rutinoside), phenolic acids (such as chlorogenic acid), and flavonoids. Tart cherries are an exceptional natural source of melatonin. Key molecular mechanisms identified include the direct scavenging of reactive oxygen species, which enhances systemic antioxidant capacity; activation of endogenous antioxidant defences via the Nrf2-ARE pathway; and inhibition of NF-κB signalling, leading to reduced expression of pro-inflammatory cytokines (such as TNF-α and IL-6) and enzymes (such as COX-2 and iNOS). Cherry consumption has also been shown to modulate the gut microbiome, through which polyphenol metabolites contribute to systemic anti-inflammatory effects. The beneficial effects of *Prunus avium* and *Prunus cerasus* stem from the interaction of their active compounds, which simultaneously target oxidative stress and inflammatory pathways in the body. These results underscore their value as promising functional foods for supporting general health and preventing chronic inflammation-related diseases, with the need for further clinical studies to develop practical recommendations for their use.

Keywords
Prunus spp, phytochemicals, anthocyanins, oxidative stress, anti-inflammatory agents

T2-P-32

Improving yogurt's nutritional and sensory profile with some plant extracts

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Abstract
Fruits and medicinal plants are increasingly being used to enhance dairy products, attracting considerable attention for their health benefits. The present study aims to develop a functional yogurt by incorporating aqueous extracts of Laurus nobilis (bay leaves) to improve its physicochemical and functional qualities. The extract was added at concentrations of 8%, 10%, and 12%, and its effects were evaluated on bacterial growth, pH, titratable acidity, antioxidant activity, and sensory properties during refrigerated storage. The results showed that the inclusion of Laurus nobilis extract improved yogurt stability. At 10% concentration, the yogurt exhibited a stable pH of 4.42. Titratable acidity was highest with 8% (100°D) after 14 days, but more stable at 10% (98°D). Lactic acid bacteria count remained high and stable with both 8% and 10% concentrations. The DPPH antioxidant test showed the highest activity at 12% (68.70%) compared to plain yogurt (18%) after 14 days, although the 10% concentration demonstrated more stable antioxidant levels during storage. A similar trend was observed in the FIC antioxidant assay. Sensory analysis revealed that yogurt with 10% Laurus nobilis extract received the highest score (9), compared to 12% (7.5) and the plain yogurt (6). These findings suggest that a 10% bay leaf extract can be a promising natural additive for the development of value-added, health-promoting dairy products.

Keywords
Antioxidant activity, Functional yogurt, Laurus nobilis, Sensory evaluation, Storage

T2-P-33

Exploring antimicrobial properties of lactic acid bacteria from Algerian dairy products

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Abstract

In Algeria, a wide variety of fermented dairy products are traditionally prepared, these products are part of the Algerian heritage and represents a cultural, medicinal and economic importance. These products contain lactic acid bacteria (LABs), known for their ability to produce antimicrobial compounds and organic acids, which play a crucial role in the development of various strategies to control other bacterial populations. This study aimed to characterize the antimicrobial susceptibility profile and evaluate the inhibition potential against *Staphylococcus aureus* (ATCC 2856), *Listeria monocytogenes* (ATCC 19115), *Escherichia coli* (ATCC 7839), *Bacillus subtilis* (ATCC 6633) and *Pseudomonas aeruginosa* (ATCC 10145); as well as to assess their tolerance to extreme conditions. The study was carried out with 22 LABs previously isolated from Algerian dairy milk products (milk, rayeb, butter, *dhan*). Results showed that all LAB strains were sensitive to Ampicillin and tetracycline. In contrast, all strains were resistant to vancomycin except *Latilactibacillus curvatus* was only strain sensible to this ATB. The analysis of antimicrobial activity confirmed the ability of lactic acid bacteria (LAB) to produce antimicrobial compounds effective against major foodborne pathogens. The most significant reduction in pH could be observed from 24 h to 48 h, ranging from 6.7 (0 h) to 4.07 (48 h) for *Lentilactobacillus parabuchneri*, *Lacticaseibacillus rhamnosus*, *Lactococcus lactis*, *Leuconostoc mesenteroides*. Antibacterial activity tests showed that *L. rhamnosus*, *Lactiplantibacillus plantarum* had strong inhibitory effects against tested pathogens. Results showed also that the most strains were mesophilic (they grow best at 30 °C) and could tolerate acidic (pH 3.5–4.5) and alkaline (up to pH 9.5) conditions. One strain, *L. curvatus*, could grow even at pH 2, and another, *Lactococcus garvieae*, could grow at low temperature (2 °C). This study contributes to the search for alternative approaches to the treatment of bacterial infections by reducing antibiotic use, which has become increasingly problematic due to rising bacterial resistance.

Keywords
Dairy products, Lactic acid bacteria, Antibiotic resistance, Antibacterial Actuvity, extreme conditions.

T2-P-34

Comparative analysis of secondary metabolites in saffron from West Algeria

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Abstract
Saffron (*Crocus sativus* L.) is cultivated across the Mediterranean area and South-West Asia to produce the the highly prized spice that, represented by stigmas. Historically, saffron was also grown in Algeria, and in 2006, its cultivation was reintroduced in Constantine and later spreading to several regions of the country. The quality of saffron is critically assessed according to ISO 3632 standards, as it largely depends on its secondary metabolites mainly crocins, picrocrocins and safranal;which determine its color,taste and special aroma. Other constituents, including flavonoids and phenolic compounds, contribute to its antioxidant and therapeutic properties. Saffron was collected from three regions of west Algeria. Optimzed extraction and chromatographic analysis was performed to identify saffron composition and evaluate Algerian saffron quality. The obtained results revealed a high concentration of crocins and safranal, besides of identification of 13 phenolic compounds and 7 flavonoids in the plant samples. Algerian Saffron demonstrates quality and characteristics that can match internationally recorgnized saffron, and can be used for their medicinal , aromatic, and coloring properties.

Keywords
Saffron, west Algeria, Crocins, Safranal, Secondary methabolites

T2-P-35

Antioxidant activity and inhibition of key enzymes linked to type-2 diabetes by *Mentha pulegium*-fortified yogurt

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Abstract
Mentha pulegium is widely used in traditional medicine for the treatment of diabetes. In this study*M. pulegium*-yogurt was prepared and refrigerated up to 21 days. The effect of the addition of *M. pulegium* extract on the properties of physicochemical properties, phenolic content, antioxidant activity, and enzyme inhibitory capacity was assessed throughout the storage period. The fortified yogurt exhibited a consistently lower pH and higher total titratable acidity compared to plain yogurt throughout the storage period. Both the total phenolic content and antioxidant activity (measured by DPPH radical scavenging and ferric reducing antioxidant power assays) increased over time, reaching peak values on day 14. On this day, *M. pulegium*-fortified yogurt showed significantly higher TPC, DPPH radical scavenging activity, and ferric reducing antioxidant power than the control. Furthermore, the addition of the plant extract significantly enhanced the inhibition of α-amylase and α-glucosidase enzymes, key enzymes involved in carbohydrate digestion, with the most pronounced effect also observed on day 14, followed by a slight decline by day 21. These findings suggest that *M. pulegium*-fortified yogurt possesses greater antioxidant potential and enzyme inhibitory activity than plain yogurt. Therefore, it may serve as a promising functional food with potential anti-diabetic properties.

Keywords
Mentha pulegium, Polyphenols, Antioxidant, Cytotoxicy, MTT

T2-P-36

Optimizing polyphenol bioaccessibility: The impact of freeze-drying on chlorogenic acid stability in vitelotte potatoes

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Abstract
Chlorogenic acids (CGAs) are widely recognized for their antioxidant and metabolic-modulating properties; however, their stability during digestion largely depends on the food matrix and processing conditions. In this study, a freeze-dried matrix of *Solanum tuberosum* L. cv. Vitelotte was utilized to assess the impact of lyophilization on CGA retention and controlled release. A standardized in vitro digestion model was combined with multi-analytical techniques (HPLC-UV-DAD, UHPLC-HRMS, UV-Vis spectroscopy) to evaluate the fate of CGAs during gastrointestinal transit. The results demonstrate that lyophilization significantly enhances CGA stability by minimizing oxidative degradation and modulating their bioaccessibility through interactions with potato starch. Compared to fresh matrices, freeze-drying preserved the structural integrity of three major caffeoylquinic acid isomers, which remained chemically stable up to the intestinal phase. The protective effect of starch–polyphenol interactions likely contributed to a more controlled bioaccessibility, preventing abrupt losses in phenolic content. Unlike CGAs, anthocyanins exhibited lower bioaccessibility, confirming their pH-dependent instability. These findings underscore the importance of sample preparation methods in polyphenol bioaccessibility studies and highlight the potential of lyophilization as a strategy to optimize the nutritional value of CGA-rich functional foods.

Keywords
Chlorogenic acids, UHPLC-HRMS, metabolic-modulating,polyphenos

T2-P-37

Evaluation of probiotic properties of lactic acid bacteria isolated from naturally fermented green olives for potential use as functional starters

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Abstract
The present study aimed to evaluate the probiotic potential of lactic acid bacteria (LAB) isolated from naturally fermented green olives and to identify promising candidates for use as probiotic starters in improving traditional olive fermentation and developing value-added functional foods. Thirty (30) LAB strains belonging to the genera *Lactobacillus*, *Enterococcus*, and *Pediococcus* were screened for their tolerance to gastrointestinal conditions and functional properties. The isolates were tested *in vitro* for their ability to survive at low pH (pH 3.0), resistance to bile salts (3.0%), surface hydrophobicity, auto-aggregation capacity, antimicrobial activity against foodborne pathogens (*Escherichia coli*, *Salmonella*, *Staphylococcus*, and *Bacillus*), antibiotic susceptibility, and hemolytic activity. Approximately 33% of the isolates (10 strains) exhibited excellent survival after 3 h at pH 3.0, maintaining viability above 70%, except for strain LB8 (*Enterococcus* sp.) which showed 40% survival. Most strains also tolerated 3.0% bile salts for 4 h. Among the selected strains, high surface hydrophobicity (up to 68%) and auto-aggregation ability (up to 57%) were observed, particularly for strain LB10 (*Lactobacillus* sp.). All LAB isolates inhibited the growth of pathogenic bacteria, showed variable antibiotic resistance patterns, and none exhibited β-hemolytic activity. These results highlight several LAB strains, notably *Lactobacillus* sp. LB10, as promising probiotic candidates for further *in vivo* evaluation and technological application as functional starters in olive fermentation processes.
Keywords
Probiotic, Lactic acid bacteria, fermented olives, functional foods, antimicrobial activity.

T2-P-38

Le levain de blé complet algérien : potentiel technologique et richesse microbienne comme alternative aux levures commerciales.

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Abstract
La fermentation au levain naturel occupe une place centrale dans les traditions alimentaires algériennes, où elle est utilisée depuis des générations pour la préparation de pains artisanaux à base de farines locales, notamment de blé complet. Ce savoir-faire repose sur des pratiques empiriques transmises au sein des familles, caractérisées par l'utilisation de farines complètes non raffinées, avec des méthodes de rafraîchissement spécifiques au contexte local.
Cette étude vise le développement d'un levain naturel à partir de farine de blé complet algérien, Les analyses physico-chimiques effectuées sur le blé complet ont permis d'évaluer les conditions du milieu et leur influence sur le développement microbien. Les résultats montrent des valeurs conformes aux normes de qualité alimentaire : humidité (9,21 %), cendres totales (2,49 %), acidité titrable (0,033 %), protéines (13,75 %) et fibres totales (2,03 %). Ces paramètres traduisent une bonne stabilité du levain et confirment son aptitude à assurer une fermentation efficace. Le levain a été élaboré par fermentation spontanée d'un mélange farine/eau, puis soumis à des analyses microbiologiques, les résultats révèlent une diversité de micro-organismes, notamment les genres *Lactobacillus* et *Leuconostoc* parmi les bactéries lactiques, et *Pichia* chez les levures. Cette flore illustre la complexité des interactions microbiennes et leur rôle dans la production d'acides organiques et de composés aromatiques. Les résultats montrent que ce levain naturel présente une richesse microbienne significative et une forte valeur technologique, constituant une alternative durable et performante aux levures commerciales pour la panification.
Keywords
Levain Naturel, bactéries lactiques, levures, blé entier, fermentation spontanée

T2-P-39

Innovative bioactive formulation from artemisia campestris: a natural multi-functional product for antioxidant, anti-inflammatory, and metabolic health applications

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Abstract

The development of innovative, plant-based bioactive products is gaining increasing attention in biomedical research due to their safety, affordability, and therapeutic potential. This study introduces an innovative natural formulation derived from *Artemisia campestris L.*, a medicinal plant traditionally used in North Africa, and evaluates its *in vitro* biological activities relevant to human health. The aqueous extract and essential oil demonstrated exceptional antioxidant power, with IC_{50} values as low as 4.34 µg/mL (DPPH•) and 6.19 µg/mL (FRAP), confirming strong free-radical neutralizing capacity. Both extracts exhibited significant anti-inflammatory activity in the albumin-denaturation model, comparable to standard pharmaceutical drugs. Additionally, the aqueous extract strongly inhibited α-amylase (IC_{50} = 2.41 µg/mL), indicating potential benefits for metabolic health and glycemic regulation. Advanced chemical profiling (UPLC and GC-MS) revealed a rich composition of bioactive molecules, including β-sitosterol, scopoletin, artemisinin, and linalyl acetate, supporting the plant's multi-target therapeutic potential. Collectively, these findings position *Artemisia campestris* as a promising source for developing innovative natural health products targeting oxidative stress, inflammation, and metabolic imbalance. This research contributes to the growing field of eco-friendly, plant-based solutions for improved human health and preventive medicine.

Keywords

Innovative natural products, *Artemisia campestris*, antioxidant activity, anti-inflammatory activity, metabolic health, α-amylase inhibition, GC-MS, UPLC.

T2-P-40

Technological formulation of propolis capsules: integrating carob and pine resin for enhanced properties

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Abstract

Natural bioactive ingredients such as propolis, carob, and pine resin offer diverse health benefits and are increasingly used in dietary supplements. This study applies a functional-profile approach to guide the rational selection of capsule formulations tailored to specific health outcomes. Three formulations were developed: propolis alone (control), propolis–carob (F1), and propolis–pine resin (F2). Microbiological quality and pharmacotechnical properties were evaluated according to the European Pharmacopoeia (9th edition), while antioxidant and antibacterial activities were assessed using the DPPH assay and disc diffusion method, respectively. All formulations met pharmacopoeial standards. F1 exhibited the highest antioxidant activity, suggesting potential for oxidative stress management, whereas F2 showed the strongest antibacterial efficacy, highlighting its relevance for microbial control and immune support. These findings demonstrate that functional profiling can guide the selection of natural supplement formulations according to targeted health benefits, allowing the choice between antioxidant or antibacterial effects based on the intended application.

Keywords

Propolis formulations, Bioactive natural ingredients, Antioxidant capacity, Antibacterial properties, Functional food supplements

T2-P-41

Ensuring excellence in olive oil: physicochemical and microbiological profiling based on international standards

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Abstract

Olive oil, an emblematic product of the Mediterranean region, is widely recognized for its nutritional qualities and health-promoting properties. This study addresses the issue of olive oil quality control through the analysis of physicochemical, microbiological, and organoleptic parameters to ensure a safe, stable product that complies with international standards. An initial survey was conducted to identify the most commonly consumed brands in the Sig (Mascara) region, from which three samples were selected. Physicochemical analyses (moisture and volatile matter content, density, refractive index, free acidity, maximum acid index, peroxide value) and microbiological analyses (coliforms, *E. coli*, yeasts, *Salmonella*, *Staphylococcus aureus*) were subsequently performed. The second, more application-oriented part of the study presents the results obtained from these samples, highlighting the impact of modern extraction and storage techniques (centrifugation and controlled-atmosphere storage) on the final quality of the oil. The results show that all three samples were free of pathogenic bacterial contamination. Moreover, the measured physicochemical parameters made it possible to classify the oils according to the standards of the International Olive Council and the Codex Alimentarius, revealing characteristics consistent with virgin to extra-virgin olive oils. These findings reinforce the importance of rigorous microbiological monitoring to prevent potential contamination and to preserve the organoleptic qualities of the product. Finally, adherence to international standards emerges as essential for ensuring the safety, conformity, and competitiveness of olive oil in global markets.

Keywords

Olive oil quality, Codex Alimentarius, IOC standards, microbiological safety, Physicochemical analyses.

T2-P-42

Assessment of antimicrobial, antioxidant properties, and acute toxicity of essential oil extracted from *Salvia chudaei*: an endemic species of the Central Sahara

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Abstract

Plant extracts rich in natural antioxidants are increasingly investigated as safer substitutes for synthetic antioxidants, whose potential adverse health effects have become a growing concern. These bioactive compounds efficiently counteract oxidative processes and support the development of cleaner and health-oriented food products. Within this context, the present work focuses on the valorization of Algerian Saharan flora, particularly the endemic species *Salvia chudaei Batt. & Trab,* byassessing the biological properties of its essential oil, notably their antioxidant and antimicrobial activity.The aerial parts of the plant were subjected to extraction by hydrodistillation using a Clevenger-type apparatus. Analysis of the essential oil by GC/MS revealed the presence of 26 compounds, among which bornyl acetate (34.09%) and alpha-pinene (24.22%) were identified as major constituents. The antimicrobial activity was assessed against a wide range of microorganisms (12 bacterial strains, two yeasts, and two phytopathogenic fungal strains). *Salvia chudaei*'s essential oil exhibited stronger activity against Gram-positive bacteria compared to Gram-negative, with marked sensitivity observed in the *Sarcinea lutea* strain (Ø = 38.25 ± 1.52 mm). The antioxidant potential was evaluated using three different

methods: the Diphenyl-picrylhydrazyl (DPPH) radical scavenging assay, β-carotene bleaching assay, and Ferric Reducing Antioxidant Power (FRAP) assay. The essential oil demonstrated remarkable ability to neutralize various types of free radicals but with varying degrees. Oral administration of the essential oil at different concentrations to mice did not induce any signs of toxicity, behavior changement or mortality. The LD_{50} values exceeding 5g/kg.

Key words
Salvia chudaei, Essential oil, CG/MS, Antimicrobial, Antioxydant

T2-P-43

Le potentiel inhibiteur de l'acéthylcholinestérase d'une huile essentielle

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Abstract
La valorisation des résidus agro-industriels, en particulier ceux issus des agrumes, constitue une stratégie essentielle pour promouvoir le développement durable et l'économie circulaire dans le secteur alimentaire. Les écorces d'orange, générées en grande quantité lors de la transformation des jus, représentent une source riche en composés bioactifs, notamment en huile essentielle caractérisée par une forte teneur en monoterpènes tels que le limonène, le linalol et le β-myrcène. Ces molécules présentent diverses propriétés biologiques, dont des activités antioxydantes, anti-inflammatoires et neuroprotectrices, suggérant leur intérêt potentiel dans la prévention des maladies neurodégénératives. La maladie d'Alzheimer est un trouble neurodégénératif progressif marqué par une détérioration de la mémoire, un déclin cognitif et des altérations synaptiques. L'un des mécanismes thérapeutiques les plus ciblés dans sa prise en charge est l'inhibition de l'acétylcholinestérase (AChE), enzyme responsable de la dégradation de l'acétylcholine. Une activité excessive de cette enzyme réduit la transmission cholinergique, aggravant les troubles cognitifs. Dans ce contexte, les inhibiteurs naturels de l'AChE suscitent un intérêt croissant comme alternatives plus sûres aux inhibiteurs synthétiques. Dans cet intérêt, l'activité inhibitrice de l'AChE de l'huile essentielle d'orange a été évaluée. Le rendement d'extraction a varié entre 1,5 % et 3,2 % selon les conditions opératoires. L'huile essentielle a montré une inhibition dose dépendante de l'AChE, avec une CI_{50} comprise entre 80 et 150 µg/mL, conforme aux valeurs rapportées pour les monoterpènes d'agrumes. Selon la littérature le linalol, un de ses constituants majeurs, présente des CI_{50} plus faibles, généralement situées entre 50 et 70 µg/mL, suggérant un effet synergique renforçant l'activité globale de l'huile. Ces résultats démontrent que l'huile essentielle extraite des résidus d'orange peut être efficacement valorisé pour produire des aliments fonctionnels dotés d'un potentiel anti-Alzheimer prometteur.

Keywords
Valorisation, huile essentielle, AchE, Alzheimer

T2-P-44

Anti-inflammatory potential of *Arbutus unedo–L. rhamnosus* combination in experimental PCOS

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Abstract
Polycystic ovary syndrome (PCOS) is characterized by chronic low-grade inflammation that contributes to metabolic dysfunction, insulin resistance, and reproductive abnormalities. This study aimed to evaluate whether *Arbutus unedo* fruit (AU), combined with probiotic bacteria, can attenuate inflammation in a letrozole-induced PCOS in rat that mimics the principal endocrine and metabolic characteristics observed in women with the syndrome. To establish PCOS, female Wistar rats received oral letrozole at a dose of 1 mg/kg per day for 21 consecutive days. Following disease onset, the rats were administered *Arbutus unedo* as a functional marmalade (100 mg/kg/day, orally) in combination with *Lacticaseibacillus rhamnosus* SL42 at 10^7 CFU/day, p.o..The results indicate that AU marmalades increased the inflammatory cytokines TNF-α, IL-6, and the IL-1β/NFκB signaling pathway with SL42 treatment. Analysis of the results reveal that AU's anti-inflammatory

qualities in combination with our probiotic strain reduce inflammatory mediators, thereby attenuating ovarian damage and restoring hormonal balance. The **polyphenolic fraction of AU fruit** is primarily responsible for the anti-inflammatory activity of arbouse fruits. These compound act by suppressing pro-inflammatory cytokines (TNF-α, IL-6, IL-1β), inhibiting NF-κB signaling, reducing oxidative stress, which is tightly linked to inflammation. Clinical and preclinical studies show that specific Lactobacillus strains particularly L. rhamnosus, significantly reduce circulating levels of pro-inflammatory cytokines, including tumor necrosis factor-alpha (TNF-α), interleukin-6 (IL-6), and interleukin-1β (IL-1β). The stronger health effects of combining *Arbutus unedo* fruit, rich in phenolics and dietary fibers, with *Lactobacillus* probiotics represent a promising adjunct therapy for reducing inflammation-related metabolic dysfunction in PCOS.

Keywords
Arbutus unedo fruit (AU), *Lacticaseibacillus rhamnosus* SL42, Polycystic ovary syndrome (PCOS), inflammatory cytokines, NF-κB signaling

T2-P-45

Potentiel probiotique d'une souche *Lactococcus* isolée du fromage traditionnel Algérien "*Klila*"

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Abstract
Le fromage artisanal algérien *Klila* constituent une source importante de micro-organismes à potentiel probiotique, notamment les *Lactococcus*. L'étude d'une souche indigène vise à évaluer sa résistance aux conditions gastro-intestinales, son activité enzymatique et sa production de composés bioactifs. La présente étude a pour objectif d'étudier les caractéristiques probiotiques d'une souche de *Lactococcus* MS07 isolée de ce produit fermenté. L'analyse a porté sur l'identification microbiologique de la souche, sa tolérance à des conditions physiologiques difficiles notamment une acidité élevée (pH 2) et la présence de sels biliaires (0,3 %) ainsi que sur son activité antimicrobienne vis-à-vis de microorganismes pathogènes. L'absence d'activité hémolytique a également été vérifiée pour assurer son innocuité. Les résultats obtenus sont globalement encourageants et mettent en évidence plusieurs caractéristiques probiotiques prometteuses, confirmant le potentiel de cette souche comme candidat intéressant pour des applications industrielles et le développement d'aliments fonctionnels. En conclusion, cette étude souligne l'intérêt de la souche évaluée et ouvre des perspectives pour des recherches plus approfondies en vue de son exploitation dans des formulations alimentaires diverses.

Keywords
Probiotiques, *Lactococcus*, Activité antimicrobienne, Tolérance à l'acidité et aux sels biliaires, Applications agroalimentaires.

T2-P-46

Isolation and characterization of probiotic lactic acid bacteria from fermented goat milk as a functional food

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Abstract
Recent investigations have highlighted the essential role of the intestinal microbiota in numerous digestive, metabolic, immune, and neurological functions. Disruptions within this complex ecosystem are increasingly associated with a wide range of diseases, including inflammatory and neurodegenerative disorders, diabetes, obesity, certain cancers, and neurodevelopmental conditions such as autism and schizophrenia. Among the strategies aimed at restoring microbial balance, dietary modulation, particularly through the consumption of functional foods enriched with probiotics, has gained significant attention. Probiotics, defined as beneficial living microorganisms, contribute to the enhancement of gut health and overall well-being. The objective of the present study was to isolate and characterize lactic acid bacteria from three samples of fermented goat milk, a traditional product often considered a natural functional food due to its richness in bioactive microbial

communities and prebiotics. A preliminary screening was performed using Gram staining, the catalase test, and a series of morphological and biochemical assays. The in vitro assessment of the probiotic potential of the selected strains focused on their ability to withstand major gastrointestinal barriers (acidity and bile salts), their hydrophobicity, auto-aggregation and co-aggregation properties, and their antagonistic activity against several pathogenic microorganisms, including methicillin-resistant and methicillin-sensitive *Staphylococcus aureus, Pseudomonas aeruginosa, Escherichia coli, Enterococcus faecalis, and Candida albicans.* Particular attention was given to their antimicrobial activity, potentially mediated by the production of bacteriocins—natural antimicrobial peptides often linked to the functional and health-promoting properties of probiotic lactic acid bacteria. The screening results led to the identification of 16 strains with a promising probiotic profile, showing good thermotolerance, notable resistance to acidity and bile salts, high hydrophobicity, and strong auto-aggregation and co-aggregation capacities. Their antagonistic activity further suggests a high potential for bacteriocin production, reinforcing their relevance for probiotic formulation and for the development of new functional foods.

Keywords
Functional foods, Goat milk, Lactic acid bacteria, Probiotics, Bacteriocin

T2-P-47

Phytochemical profile and bioactive potential of milk thistle seeds for functional food applications

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Abstract
The main objective of this study is to assess how varietal differences influence the phytochemical profile, as well as the antioxidant and antibacterial activities, of extracts obtained from the seeds of two milk thistle (*Silybum marianum* L.) varieties (black and light brown). These seeds represent a promising natural source of bioactive polyphenols with potential applications in the development of functional foods aimed at improving food quality, safety, and shelf-life. Extraction yields differed markedly between varieties, with the black-seed extract (E1) presenting the highest yield (10.43%) and the light brown variety (E2) the lowest (6.84%). Phytochemical screening revealed the presence of several classes of health-promoting compounds, including catechu tannins, flavone aglycones, flavonoids, alkaloids, sterols, and triterpenes. Thin-layer chromatography also confirmed that both varieties are rich in secondary metabolites of high nutritional and functional value particularly terpenes known for their natural protective roles against microbial and environmental stressors. The extracts of *S. marianum* L. seeds demonstrated high levels of phenolic compounds and flavonoids, contributing to strong antioxidant capacity, which varied according to variety. The light brown seed extract (E2) exhibited greater inhibitory activity against *Escherichiacoli* and showed antimicrobial potential against *Pseudomonas aeruginosa*, whereas the black seed extract (E1) displayed more consistent antibacterial effects against *Staphylococcusaureus* and *Bacillus cereus*. These findings indicate that each variety offers distinct functional advantages depending on the target microorganism.
Overall, *S. marianum* L. seeds constitute a valuable natural source of antioxidants and bioactive molecules, highlighting their potential use as functional food ingredients capable of reducing oxidative stress and contributing to natural food preservation and health-promoting properties.

Keywords
Milk thistle, Phytochemicals, Antioxidant activity, Antimicrobial properties, Functional foods

T2-P-48

Development of functional gluten-free cookies enriched with nutrient rich alternative flours

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Abstract

Celiac disease is one of the most common gastrointestinal diseases, manifesting as malabsorption resulting from villous atrophy. Since a strict gluten-free diet remains the only effective treatment, developing high-quality gluten-free products is essential. The aim of this study was to investigate the effect of enriching gluten-free cookie(rice/corn/starches cookies) with nutrient rich alternative flours: soya, acorn, chestnut, chickpea, quinoa and millet, focusing on the technological and antioxidants properties. The base formulation consisted of a flour-starch combination (70% flour and 30% starch). An extreme vertices mixture design was employed to optimize the mix of starches added (X1: corn starch; X2: potato starch; X3: tapioca starch). The optimized cookies were then enriched with the different flours and their physical proprieties (expansion factor, spread ratio) and antioxidant proprieties were evaluated. The main results indicated that significant differences ($p < 0.05$) were observed between enriched cookies and the optimum for physical parameters, including expansion factor and spread ratio. The highest expansion factor was obtained with corn-enriched cookies, whereas soy-enriched cookies showed the lowest. Quinoa-enriched cookies exhibited a notably high spread ratio, followed by soy-enriched cookies. Replacing corn flour also enhanced the antioxidant profile of the cookies. Acorn-enriched cookies (2.83 mg GAE/g dw) and soy enriched cookies (2.49 mg GAE/g dw) showed the highest total phenolic contents, reflecting their richness in bioactive compounds. This increase in phenolics was accompanied by a marked improvement in antioxidant activities, as demonstrated by stronger DPPH and ABTS radical-scavenging capacities, as well as higher reducing power. These results indicate that incorporating acorn and soy flours not only improves the nutritional quality of gluten-free cookies but also contributes to their functional potential, making them promising ingredients for the development of value-added gluten-free products. These findings highlight the potential of alternative gluten-free flours to improve both the technological performance and the nutritional value of gluten-free cookies.

Keywords
Gluten-free cookies, formulation, antioxidants activities, physical proprieties

T2-P-49

Nutritional properties and sensorial aspects of gluten free Algerian pancakes prepared from teff and garden cress-based healthy formulation

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Abstract
Celiac disease is a gluten intolerance developed in genetically predisposed patients. It is characterized by lymphocytosis and atrophy of crypts and villi, leading to continuous intestinal irritation and chronic malabsorption. Meeting the nutritional, technological, and sensory expectations of this category of patients represents a major challenge for stakeholders in the cereal sector. The present work aims to study the sensory aspects and nutritional quality of a gluten-free formulation developed for the preparation of traditional Algerian pancakes. The formulation studied consists of a mixture of cereal/pseudo-cereals (teff/quinoa-millet, X1) supplemented with a legume (chickpea, X2) and a mixture of seeds (flaxseed and garden cress seed, X3). The choice of supplements is based on their organoleptic properties, technological qualities, and nutritional value. The therapeutic effect provided by garden cress seeds is also considered in the selection. A simplex-centroid mixture design was used to study the effect of each component and optimize their contribution. Nutritional quality was assessed by determining biochemical composition (protein, lipid, carbohydrate, ash, fiber contents, and caloric value) as well as antioxidant properties. The sensory characteristics typical of Algerian pancakes were evaluated using a hedonic test, where porosity, taste, aroma, texture, color, lightness, and overall acceptability constitute the attributes assessed. The optimized teff-based formulation showed significantly higher ($P<0.05$) levels of proteins, lipids, ash, and fibers compared to the durum wheat control. This formulation was rich in antioxidants, with a total polyphenol content exceeding 2 mg GAE/g dw, resulting in a significantly higher antioxidant activity than the durum wheat control (total antioxidant activity > 3 vs 2 .2 mg AAE/g dw for wheat). Pancakes prepared with the optimal formulation demonstrated overall acceptability close to those made with durum wheat (>5 vs 7), with porosity, texture, lightness, and color being the most highly rated sensory attributes. The developed formulation produces Algerian pancakes enriched with nutrients and antioxidants, designed to address the specific nutritional and sensory requirements of celiac patients

Keywords
Teff, garden cress seeds, sensorial aspects, nutritional quality, Algerian pancakes

T2-P-50

Functional vegetable oil obtained by ultrasound-assisted extraction of orange pomace antioxidants

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Abstract
In recent years, significant progress has been made in the recovery of bioactive molecules from agro-industrial by-products, particularly carotenoids. These bioactive compounds, known for their high nutritional potential, represent a natural source of antioxidants. They can be extracted from materials such as orange pomace and are highly valued in the food and medical industries for the development of functional ingredients and for their health-promoting properties. In this context, our work aims to optimize an extraction process to obtain a functional vegetable oil, intended either for direct consumption or for use in the formulation of high-value-added food products. We investigated the extraction of carotenoids using ultrasound-assisted extraction (UAE) with vegetable oil as a green solvent. A Central Composite Design (CCD) combined with Response Surface Methodology (RSM) was applied to identify the optimal operating conditions affecting carotenoid yield. The yield was measured by spectrophotometry and expressed as mg of β-carotene/100 g of dry matter. Our results demonstrated the practical feasibility of this approach, with a p-value < 0.05 and an R^2 close to 1. They highlight the potential of this strategy for producing a functional oil rich in natural antioxidants, offering a promising alternative for the agro-food industry.

Keywords
Carotenoids, natural antioxidants, by-products, ultrasound-assisted extraction, vegetable oil, response surface methodology

T2-P-51

Natural antimicrobials for safer foods: The potential of *Curcuma longa* essential oil

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Abstract
Antibiotic resistance is now one of the greatest public health challenges, and infections are becoming increasingly difficult to treat. In response to this urgent situation, natural molecules, particularly essential oils, are attracting growing interest. *Curcuma longa* is a medicinal plant valued for its bioactive compounds, including its essential oil (EO), which is increasingly investigated for antimicrobial applications. This study aimed to assess the antimicrobial activity of *Curcuma longa* essential oil, and explore its potential as natural alternative to conventional antibiotics. The essential oil was extracted from Curcuma longa rhizomes using hydrodistillation. Antimicrobial activity was evaluated against two Gram-positive bacteria (*Bacillus subtilis and Staphylococcus aureus*) and two Gram-negative bacteria (Escherichia coli and Pseudomonas aeruginosa). Both assays; qualitative, determined by aromatogram method and quantitative determined by Minimum Inhibitory Concentration (MIC) determinations were performed to assess the inhibitory effect of the EO. *Curcuma longa* essential oil yield1.78%. This EO demonstrated notable antimicrobial activity, particularly against Gram-positive bacteria, and this activity increased with EO concentration. *Bacillus subtilis and Staphylococcus aureus* were highly sensitive, while *Escherichia coli and Pseudomonas aeruginosa* showed resistance. MIC results indicated the following increasing order of sensitivity: Staphylococcus aureus < Bacillus subtilis. The essential oil of *Curcuma longa* exhibits promising antimicrobial potential, especially against Gram-positive strains. Its dose-dependent activity and confirmed MIC values suggest its potential use as a natural antimicrobial agent which can be used as alternative to antibiotics and synthetic antimicrobial agents.

Keywords
Curcuma longa, medicinal plants, essential oil, antimicrobial activity, MIC

T2-P-52

The functional properties and probiotic potential of lactic acid bacteria isolated from breast milk

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Abstract
Breast milk is a natural source of beneficial lactic acid bacteria that are likely to play an important role in developing an infant's intestinal microbiota. With this in mind, the present study aims to isolate and characterise these bacteria, assessing their probiotic potential. Samples were taken from 20 healthy nursing mothers under strict hygienic conditions. The samples were enriched and plated on MRS medium to isolate lactic acid bacteria. Eighteen isolates were selected based on Gram staining (Gram-positive) and the catalase test (negative), which are typical criteria for lactic acid bacteria. The isolated bacteria were then subjected to a series of functional tests, including hemolytic activity (to assess safety), antibiogram (sensitivity to different antibiotics), proteolytic activity, anti-inflammatory effect (erythrocyte membrane stabilization test), antibacterial activity against pathogens, α-amylase inhibitory power (potential anti-diabetic activity), as well as an assessment of antioxidant power using the DPPH radical scavenging test and the FRAP reducing power test. The results revealed that all strains were non-haemolytic and predominantly sensitive to the tested antibiotics. They also demonstrated interesting antibacterial activity against Gram-negative bacteria, with zones of inhibition ranging from 5 to 16 mm. The isolates also demonstrated enhanced anti-inflammatory activity, stabilising erythrocyte membranes by up to 79%. Two of the 18 LAB isolates tested exhibited notable DPPH radical scavenging rates exceeding 60%, as well as significant reducing power. In vitro analyses highlighted the potential health benefits associated with the isolates' anti-diabetic properties, particularly their ability to inhibit the α-amylase enzyme with a frequency of 70%. In conclusion, the lactic acid bacteria strains isolated from breast milk in this study exhibit a variety of beneficial functional properties, suggesting their potential as probiotics for future health and nutritional applications.

Keywords
Lactic acid bacteria, breast milk, probiotic

T2-P-53

From bark to acorn: Exploring the bioactive compounds of *Quercus suber* for innovative product development

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Abstract
Phenolic compounds, including polyphenols, flavonoids, and tannins, are potent bioactive molecules in medicinal plants due to their exceptional antioxidant properties and their ability to alleviate oxidative stress-related disorders. Acting as natural free radical scavengers and oxidation inhibitors, these compounds are valuable candidates for the development of functional and innovative products. Among Mediterranean flora, the cork oak (*Quercus suber* L.) is a prominent species in northern Algeria, traditionally prized for its astringent, antiseptic, and antimicrobial properties.This study investigated the phytochemical composition and antioxidant potential of bark, leaves, and acorns of *Quercus suber* collected from Mila Province. Plant materials were air-dried, finely powdered, and extracted via hydroethanolic maceration (ethanol/water, 70/30 v/v). Total phenolic, flavonoid, and tannin contents were quantified using spectrophotometric methods, and antioxidant activity was assessed through DPPH, ABTS, CUPRAC, and Phenantroline assays.All extracts exhibited notable antioxidant activity, with considerable variation between plant parts. The bark displayed the highest phenolic content (338 mg GAE/g) and potent DPPH radical scavenging activity (IC_{50} = 5.45 µg/mL), outperforming standard antioxidants BHA and BHT. **LC-MS analysis revealed significant differences in bioactive composition, with the bark particularly enriched in catechin and vanillin.** Leaves were rich in flavonoids (78 mg QE/g),

whereas acorns contained comparatively lower levels of phenolic and flavonoid compounds. These results highlight *Quercus suber* as a promising natural source of bioactive compounds suitable for incorporation into **functional foods, dietary supplements, and nutraceuticals**, which may also contribute to gut health and immune support.In conclusion, *Quercus suber* demonstrates considerable potential for valorization in nutraceutical, functional food, and cosmetic applications. Further studies focusing on the isolation, biological characterization, and mechanistic evaluation of individual compounds are recommended to optimize their integration into innovative formulations.

Keywords
Quercus suber, Bioactive compounds, Antioxidant activity, Functional foods

T2-P-54

Development of microencapsulated powder from plant extract to improve technological and pharmaceutical proprieties of bioactive compounds

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Abstract
Halimium halimifolium is a shrub up to 120 cm tall with tomentose leaves and large yellow flowers, growing in the Mediterranean regions.The phenolic profile was investigated by UHPLC-UV- (–)-HRMS. In the HRMS analysis, and the results showed that most of the detected compounds were identified as flavonol glycoconjugates, articularly, kaempferol, myricetin), and quercetin derivatives. The aim of this study is to upgrade the therapeutic effect, a microencapsulation process is proposed as a strategy to optimize stability, handling, and delivery of bioactive components, avoiding the degradation and loss of the biological efficacy after oral intake. Hh-loaded microparticles were designed using CAP as the enteric coating material and spray drying as a production process. The results showed a satisfactory process yield (67.9%), encapsulation efficiency (96.7%), and micrometric characteristics of microparticles (laser-scattering, fluorescent, and scanning electron microscopy). In vitro dissolution studies (USPII-pH change method) showed that Hh-loaded microparticles are able to prevent the release and degradation of the bioactive components in the gastric tract, releasing them into the intestinal environment.

Keywords
Halimium halimifolium, flavonol glycoconjugates, HRMS analysis, spray drying.

T2-P-55

Potentiel fonctionnel d'un cultivar de dattes algériennes : influence de la nature du solvant sur l'extraction des polyphénols et l'activité antioxydante

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Abstract
Les dattes algériennes constituent une ressource agroalimentaire précieuse, reconnue pour leur richesse en composés bioactifs d'intérêt nutritionnel. Dans cette étude, un cultivar a été évalué afin de mieux caractériser son potentiel antioxydant. Trois solvants ont été testés (eau pure, eau–éthanol 50:50, eau–acétone 50:50) pour l'extraction des polyphénols totaux (TPC) et l'évaluation de l'activité antioxydante par les tests DPPH et ABTS. Les résultats montrent qu'il n'existe pas de différence significative dans le rendement en TPC entre les solvants. En revanche, l'activité antioxydante mesurée par DPPH a été la plus élevée avec le mélange eau–éthanol (95,83 ± 1,41 mg AGE/g), tandis que les extraits obtenus avec l'eau pure et le mélange eau–acétone n'ont pas montré de différences significatives entre eux. Concernant l'ABTS, le mélange eau–acétone a présenté la meilleure activité (4,01 ± 0,10 mg TE/g), suivi par le mélange eau–éthanol (3,33 ± 0,14 mg TE/g) et l'eau pure

(0,92 ± 0,03 mg TE/g). Ces résultats mettent en évidence l'effet du choix du solvant sur l'activité antioxydante des extraits, et la divergence observée entre DPPH et ABTS révèle une composition différente des molécules phénoliques mobilisées. Sur le plan nutritionnel, ces résultats confirment le potentiel des dattes algériennes comme source d'antioxydants naturels, capables de contribuer à la prévention du stress oxydatif. Ces observations ouvrent des perspectives pour la formulation d'aliments fonctionnels, où l'adaptation du procédé d'extraction permet de cibler des profils bioactifs spécifiques et maximiser les bénéfices nutritionnels.

Keywords
Dattes algériennes, polyphénols, antioxydants, solvants, nutrition fonctionnelle.

T2-P-56

Bioactive potential of *Ruta graveolens* essential oil for functional foods and health

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Abstract
The valorization of medicinal plants as natural sources of bioactive compounds represents a promising avenue for the development of functional ingredients capable of enhancing food quality, safety, and health value. In this context, the present study focuses on Ruta graveolens L., a plant widely used in traditional medicine and known for its high content of secondary metabolites with antimicrobial, antioxidant, and anti-inflammatory properties. These natural compounds are increasingly explored for their potential application in functional food formulations and biopreservation strategies. The essential oil of Rut a graveolens was extracted through hydrodistillation, yielding 0.75 ± 0.057%, a productivity level that supports its potential industrial valorization. Physico-chemical analyses revealed a complex composition enriched in bioactive constituents capable of exerting protective effects against microbial spoilage. The acidic profile of the oil and the diversity of its secondary metabolites further highlight its relevance as a natural source of functional ingredients with potential health-promoting properties. Biological assays demonstrated a significant antifungal activity of the essential oil, notably through the inhibition of Fusarium sp., a fungus responsible for postharvest deterioration and nutritional degradation of food products. This inhibitory effect indicates that the volatile compounds of Ruta graveolens may serve as natural biopreservatives, contributing to the reduction of fungal contaminants and the extension of food shelf life. Such properties reinforce the interest in this plant as a sustainable alternative to synthetic preservatives. Overall, the findings underscore the potential of Ruta graveolens as a promising botanical resource for the development of bioactive ingredients intended for functional foods. Its essential oil may play a key role in enhancing food safety, limiting fungal risks, and supporting the advancement of natural, eco-friendly preservation solutions within the agri-food sector.

Keywords
Essential oil, Bioactive compounds, Functional foods, Antifungal activity / Food safety

T2-P-57

Rôle de *Corchorus olitorius* dans la prévention et le soulagement des gastrites

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Abstract
Corchorus olirorius est une plante médicinale d'origine africaine appartenant à la famille des Tiliaceae riche en composés bioactifs, prisée en médecine traditionnelle pour ses multiples usages. C'est une source précieuse de métabolites secondaires, reconnus pour leurs propriétés antioxydantes et anti-inflammatoires, contribuant ainsi à la lutte de diverses maladies. L'objectif de cette étude, vise à évaluer l'effet thérapeutique curatif de l'extrait phénolique de *Corchorus olitorius* contre les gastrites induites par l'éthanol absolu chez des rats wistars. Les rats ont été divisés en 5 groupes : deux groupes ont été traités par l'extrait phénolique de *Corchorus olitorius*

a deux concentration différentes, un groupe traité par Oméprazole comme référence, un groupe témoin et un groupe contrôle. Les résultats obtenus indiquent que l'extrait phénolique de *Corchorus olitorius* présente une efficacité thérapeutique significative et peut intervenir dans le traitement des gastriques. L'étude des effets thérapeutiques de *Corchorus olitorius* contre les gastrites illustre le rôle central des plantes médicinales dans une approche intégrée de la santé. Face aux enjeux actuels ces plantes offrent des solutions durables et innovantes. Cette contribution s'inscrit pleinement dans cette dynamique. Elle met en lumière le potentiel des bioproduits pour la santé globale.

Keywords
Plante médicinale, *Corchorus olitorius*, Polyphénols, santé, Gastrites.

T2-P-58

Valorization of *Stevia rebaudiana* glycosides as bioactive candidates for functional food and health-promoting applications

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Abstract
The search for bioactive molecules from plant sources has become an important strategy in functional foods development, especially when green extraction techniques are used to recover natural compounds while minimizing synthetic residues and environmental impact. Within this context, *Stevia rebaudiana* has emerged as a valuable ingredient for its naturally sweet steviol glycosides which have promising health-related properties. Beyond their well-known sweetening capacity, steviol glycosides have been associated with antioxidant, anti-inflammatory, and metabolic regulatory activities, supporting their potential role as multifunctional components in health-promoting formulations. This work aimed to obtain a steviol glycoside-enriched fraction and evaluate its chemical profile and antioxidant activity. A green extraction was performed, followed by purification through anti-solvent crystallization to selectively concentrate steviol glycosides and limit the co-extraction of undesired constituents. The enriched fraction was analyzed by Thin Layer Chromatography for identity confirmation and FTIR spectroscopy to characterize the functional groups of glycosylated diterpenes. Antioxidant activity was evaluated using the DPPH radical scavenging assay. TLC showed co-migration with reference standards, confirming the presence of major steviol glycosides such as rebaudioside A, while FTIR revealed characteristic absorption bands attributed to O–H stretching of glycosidic hydroxyl groups, C–H vibrations of carbohydrate moieties, and C=O stretching of the steviol aglycone backbone. The fraction showed strong radical scavenging activity, suggesting its potential incorporation into a variety of food formulations, which could provide additional health benefits to consumers and also enhance product stability and extend shelf-life. These findings reinforce the interest in steviol glycoside-rich extracts as natural functional compounds and support their integration into nutraceutical or health-oriented food products.

Keywords
Steviol glycosides, Stevia rebaudiana, Antioxidant activity, Green extraction, FTIR.

T2-P-59

Caractérisation physico-chimique et microbiologique des grignons d'olive de dix-huit huileries (traditionnel et moderne) de six régions Algériennes

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Abstract

Cette étude a été menée dans un premier temps pour évaluer la composition physico-chimique et microbiologique des grignons d'olive. Dix-huit échantillons de six régions ont été analysés au laboratoire (trois par région, issus de procédés d'extraction traditionnel 'presse', moderne ' biphasique et triphasique'). Les analyses physico-chimiques réalisées portaient sur le pH, la matière sèche, les cendres et la matière azotée totale. Alors que, les analyses microbiologiques ont concerné la numération des levures et des moisissures.
Les analyses physico-chimiques ont révélé des valeurs moyennes de 5.44, 67.22%, 3.4% et 3.47 % respectivement pour le pH, la matière sèche, les cendres et la matière azoté.Par ailleurs, l'analyse microbiologique a mis en évidence une charge élevée en levures et moisissures, avec une concentration moyenne de $2.5*10^7$ UFC/ml. En considération de la charge microbienne élevée des grignons et du potentiel biotechnologique de ces micro-organismes, particulièrement attribuable à leur activité enzymatique, l'étude a ensuite visé à identifier les souches de levures et moisissures exhibant une activité enzymatique bio-dégradante pertinente. Les résultats préliminaires révèlent que plusieurs micro-organismes manifestent une activité enzymatique notable, nécessitant une caractérisation approfondie dans des travaux ultérieurs. Cette démarche s'inscrit dans la perspective de valorisation des grignons d'olive en tant que source de micro-organismes producteurs de métabolites bioactifs, notamment des enzymes susceptibles d'être exploitées dans la formulation d'aliments fonctionnels. L'identification de souches d'intérêt pourrait ainsi contribuer au développement de nouveaux ingrédients améliorant la qualité nutritionnelle et les bénéfices santé des produits alimentaires.

Keywords
Grignons, microorganismes, enzymes, activité enzymatique

T2-P-60

Olive pomace as a functional feed ingredient: impact on growth performance, digestive efficiency, and metabolic health in Wistar rats

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Abstract
Olive pomace (OP), a by-product of olive oil extraction rich in bioactive compounds, represents a promising sustainable alternative for animal nutrition. This study evaluated the nutritional efficacy of OP as a functional feed ingredient in a rat model. Fourteen male Wistar rats were randomly allocated into two experimental groups (n = 7 per group): a standard control diet (S) or an OP-based diet for 28 days. The OP diet produced remarkable body weight gain of 95.86 ± 2.48 g (78.33% increase), achieving 92.6% of the standard group performance (103.5 ± 0.80 g; 80.73% increase) with significantly lower energy intake (1250.00 ± 7.40 kcal/rat vs. 1891.6 ± 7.14 kcal/rat), indicating superior feed conversion efficiency. Despite lower nitrogen balance and protein apparent digestibility coefficient in the OP group, significant intestinal morphological adaptations were observed, with villus height reaching 386.5 ± 15.2 µm and villus height-to-crypt depth ratio improving to 2.47 ± 0.11, compared to 1.92 ± 0.08 in the S group. These structural enhancements suggest improved absorptive capacity that may compensate for reduced digestibility. Biochemical profiling revealed no adverse effects on liver or kidney function. These results demonstrate that olive pomace possesses distinct functional properties, combining efficient growth promotion with beneficial gut health effects, supporting its valorization as a sustainable feed ingredient in animal nutrition systems.

Keywords
Olive pomace; functional feed; feed efficiency; intestinal morphology; gut health.

T2-P-61

In vitro antioxidant and antifungal activities of *Thymus* sp. acetate extract and its cytotoxic effect on hcc cells

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Abstract
Thymus species are aromatic medicinal plants widely recognized for their bioactive secondary metabolites, especially phenolic and flavonoid compounds, which are known for their antioxidant and antimicrobial potentials. Despite their traditional uses, limited data exist on their antifungal and cytotoxic effects on human cancer cells.
This study aimed to evaluate the in vitro antioxidant and antifungal activities of the acetate extract of *Thymus* sp., and to investigate its cytotoxic effect on human hepatocellular carcinoma (HCC)cells. The acetate extract of *Thymus* sp. was prepared by solvent extraction. Antioxidant activity was assessed using DPPH, FRAP, CUPRAC, ABTS and Phenanthroline assays, while antifungal potential was tested against selected pathogenic fungal strains. The cytotoxicity of the extract was evaluated on HCC cells using the MTT assay to determine cell viability. The *Thymus* acetate extract exhibited strong antioxidant capacity in both DPPH and FRAP assays, showing dose-dependent radical scavenging activity. It also demonstrated significant antifungal activity, particularly against Candida albicans. Furthermore, the MTT assay revealed a moderate cytotoxic effect on HCC cells, suggesting selective toxicity toward cancerous cells. The results indicate that the acetate extract of *Thymus* sp. possesses potent antioxidant and antifungal properties, along with a promising cytotoxic effect on HCC cells. These findings support the potential use of *Thymus* extracts as natural sources of bioactive compounds for pharmaceutical and therapeutic applications.

Keywords
Thymus, HCC , MTT, Antioxidant, Antifungal

T2-P-62

Dietary sardine (*Sardine Pilchardus*) protein attenuates hyprglycemia an hyperlipidemia

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Abstract
The objective of this investigation was to test the specific effect of sardine proteins compared with casein on insulin resistance and the emergence of risk factors associated to metabolic syndrome in a nutritional model of rats developing the metabolic syndrome with fructose. Diets containing sardine protein (SP) or casein (Cas) supplemented or not with fructose (64% F) have been administered to Wistar male rats for 2 months. The fasting blood glucose homeostasis (glycemia, insulinemia), glucose regulation on a dynamic situation (intraperitoneal glucose tolerance test), lipid and lipoprotein profiles, redox status as well as inflammatory status have been determined within 8 weeks of intervention. The results revealed that diets high in fructose promotes at short time the development of obesity through increased adiposity, insulin resistance through enhanced fasting glycemia and insulinemia and HOMA- IR and the deterioration of glucose tolerance, despite low food and energy intakes. Moreover, a decrease of plasma GLP-1, glycogen stores in liver, kidney and muscle are noted. The administration of sardine proteins results in decreased deposition of fat, glycemia and insulinemia, improved insulin sensitivity (low HOMA) and glucose tolerance as compared to casein. In addition, sardine proteins increase GLP-1 and hepatic glycogen. The addition of fructose to both protein diets increases circulating levels of free fatty acids (FFA), triglycerides (TG),total cholesterol (TC), phospholipids (PL), proteins and apo B-100 and decreases apo A-I. Hepatic steatosis is reported by increased TG, TC and PL. Analysis of the lipoprotein profile shows a significant increase in VLDL- and LDL-HDL1-C and decrease in HDL2- and HDL3-C. The TC/HDL's-C and LDL-HDL1-C/HDL's-C ratios are higher in rats treated with fructose as compared to untreated rats. The TC/LDL-HDL1-C ratio is lower in SP-F diet than in SP diet. In addition, an increase in VLDL and LDL-HDL1 mass and a decrease in HDL2 and HDL3 amount is recognized. VLDL and LDL-HDL1 apolipoproteins, TG, PL, UC and CE levels are much higher afterchronic consumption of fructose. Low PL, UC and CE of HDL2 and HDL3 and high TG-HDL3 are observed afterconsumption of fructose. in conclusion, consumption of sardine protein isolate

counteracts the deleterious effects of fructose in preventing the deterioration of insulin resistance and glucose tolerance. Moreover, the sardine protein isolate improves dyslipidemia.

T2-P-63

Functional and health-promoting potential of *Ceratonia siliqua* L. flour: a natural source of bioactive compounds for functional food development

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Abstract

The growing demand for natural and plant-based ingredients with functional and health-promoting properties has encouraged the exploration of underutilized Mediterranean resources such as *Ceratonia siliqua* (carob). This study investigated the nutritional composition, mineral profile, and phytochemical characteristics of carob flour to assess its potential as a sustainable ingredient for functional food development. Physicochemical parameters, mineral content and bioactive compounds were determined using standard analytical methods, while antioxidant capacity was evaluated through DPPH and ABTS radical scavenging assays. The results revealed that carob flour had a low moisture content (6.2 g/100 g d.m.) and moderate protein level (4.2 g/100 g d.m.), with high total dietary fiber (39.6 g/100 g d.m.) and carbohydrate content (46.4 g/100 g d.m.). Mineral analysis showed high levels of potassium (927 mg/100 g), calcium (319 mg/100 g), and magnesium (55 mg/100 g). Phytochemical profiling demonstrated elevated total phenolic (875.4 mg GAE/100 g) and flavonoid (230.2 mg QE/100 g) contents, associated with strong antioxidant activities (DPPH: 50.8 µmol TE/g; ABTS: 72.5 µmol TE/g). These findings highlight *C. siliqua* flour as a valuable natural source of nutrients and bioactive compounds that may contribute to oxidative stress reduction and improved health outcomes. Its incorporation into functional food formulations represents a promising strategy for promoting sustainable nutrition and enhancing the nutritional quality of plant-based foods in Mediterranean dietary models.

Keywords

Ceratonia siliqua; functional foods; bioactive compounds; antioxidant activity; sustainable nutrition

T2-P-64

Adhesion properties and biofilm formation of *Lactobacillus* strains isolated from *Bouhezza* cheese: evaluation on Caco-2/TC7 cells and confocal laser microscopy analysis

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Abstract

Adhesion to the intestinal epithelium is considered a key criterion in probiotic selection, as it contributes to gut colonization, antibacterial effects, and competitive exclusion of pathogens. This study investigated the adhesion ability and biofilm-forming properties of three *Lactobacillus* strains isolated from *Bouhezza*, a traditional Algerian cheese. The adhesion capacity of the strains was assessed using human intestinal epithelial Caco-2/TC7 cells. Cells were cultured in DMEM supplemented with heat-inactivated fetal bovine serum and Penicillin/Streptomycin, and grown under standard conditions (37°C, 5% CO_2). For adhesion assays, confluent monolayers were washed with PBS, and bacterial suspensions adjusted to 10^8 CFU/mL were incubated with the cells for 3 h. After washing to remove non-adherent bacteria, the cells were lysed using Triton X-100, and adhered bacteria were quantified by plate counting on MRS agar. Results demonstrate that the adhesion rates varied among strains: *Lactiplantibacillus plantarum* B2 showed the highest adhesion (20%), followed by *Lactiplantibacillus plantarum* (17.5%), whereas *Lacticaseibacillus paracasei* exhibited the lowest adhesion (9.09%). These results are in line with previous findings for *Lactobacillus* isolated from fermented foods. The strain-specific nature of adhesion may be attributed to surface molecules such as SLAPs, lipoteichoic acids, and mucin-binding proteins. Biofilm formation and adhesion on abiotic surfaces were further examined using confocal

laser scanning microscopy. After 24 h incubation in MRS, cells were fluorescently stained with Syto9 and visualized using a Zeiss LSM710 microscope. All strains formed central aggregates with variable biofilm thickness. Quantification using ImageJ showed low-density biofilms ranging from 5.2 µm to 13.1 µm. Consistent with Caco-2/TC7 results, strains B2 and R10 exhibited higher biofilm-forming capacity than FM11. Although adhesion to abiotic surfaces is not routinely assessed in probiotic evaluation, a positive correlation often exists between adherence to biotic and abiotic surfaces. The observed differences among strains may be associated with variations in surface proteins, polysaccharides, and cell wall architecture. Overall, strains B2 and R10 demonstrated the most promising adhesion and biofilm characteristics, supporting their potential as strong probiotic candidates.

Keywords
Lactobacillus strains; Caco-2/TC7 cells; Biofilm formation; Probiotic properties

T2-P-65

From fermentation to functionality: nutritional and beneficial insights (A review)

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Abstract
Approximately 30% of the global human diet comprises fermented foods, which are widely consumed across diverse cultures and lifestyles. In many societies, this kind of food holds cultural heritage significance and forms an essential part of traditional culinary practices. Their production is economically advantageous, relying on accessible, seasonal raw ingredients derived from local agriculture. Historically, fermentation has been adopted for its preservative qualities and enhancement of sensory properties. Other than the region-specific products, such as kimchi and kefir, the most well-known and available include yoghurt, cheeses and sourdough products. In Algeria, we have, for example, *Qadid/Acheluh* (fermented meat) and *Hamoum* (fermented couscous). Nowadays, their consumption is motivated by nutritional and health-related attributes. The Increasing evidence of the association of fermented foods with health has further increased their popularity in recent years. Fermented foods are a source of probiotics and various biomolecules, including vitamins, minerals, amino acids, and dietary fibre, providing high nutritional value. Fermented products are often regarded as superfoods, contributing to digestive health by supporting nutrient assimilation, balancing gut microbiota, and modulating the immune system.The intake of fermented foods can mitigate metabolic disorders; for example, they reduce intestinal glucose absorption, thereby offering protective effects against diabetes. Additionally, fermented products support weight management and cardiovascular health by significantly lowering total cholesterol, LDL cholesterol, and triglycerides. Their anti-inflammatory and immunoregulatory properties are largely attributed to their abundant antioxidants and lactic acid bacteria. These beneficial microbes help maintain a healthy gut microbiome and boost both local and systemic immunity, due to their capacity to interact with the gut mucosa, reinforce epithelial barrier integrity, and competitively inhibit the proliferation of pathogenic microorganisms. The adoption of fermentation technology is expanding rapidly, particularly in Western countries, where numerous start-ups are innovating to harness the health potentials of fermented foods, integrating traditional methods with modern food science. This trend underscores the global relevance of fermented foods as both cultural staples and functional dietary components.

Keywords
Fermented Foods, Functional Foods, Probiotics, Prebiotics, Health

T2-P-66

Energy bar enriched with microalgal proteins and whey: nutraceutical potential and application in preventive health

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Abstract

This study presents the formulation of a functional energy bar enriched with Spirulina protein and whey, using oats as the primary cereal base. The objective was to improve the nutritional profile of the product while maintaining acceptable sensory characteristics. The bar was developed by combining oat flakes, honey, and bioactive protein sources. Physicochemical analyses confirmed increased protein content and moisture control, contributing to better texture and shelf stability. The incorporation of Spirulina and whey proteins enhanced the nutritional value, particularly in terms of essential amino acids and antioxidant potential. Preliminary sensory observations indicated good consumer acceptability. This enriched bar demonstrates promising nutraceutical potential and aligns with current trends in preventive health and sustainable food innovation.

Keywords
Spirulina, Whey, Microalgal proteins, Energy bar, Preventive health

T2-P-67

Safe enterocin-producing enterococcus faecium from Algerian fig–olive preparation: Bioprotective cultures for functional food and health-oriented applications

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Abstract
Growing interest in functional foods has intensified the search for natural microbial cultures that can simultaneously support product safety and fit clean-label expectations. Algerian traditional dried figs marinated in olive oil represent a nutrient-rich, minimally processed food ecosystem that may harbor such beneficial microorganisms. In this work, Enterococcus faecium strains were recovered from this matrix and rigorously characterized to assess their bioprotective and safety attributes for potential use in health-oriented food systems. Twelve isolates were identified as E. faecium by MALDI-TOF MS and 16S rRNA gene sequencing. Genotyping by BOX-PCR, GTG-PCR and ERIC-PCR revealed marked intraspecies diversity, with BOX-PCR offering the highest discriminatory power. Functional screening showed a broad distribution of enterocin genes: entA was detected in all strains, while entB and entL50A/B were present in 60% and 20% of isolates, respectively. These genotypes were consistent with antimicrobial activity against Enterococcus faecium VCY, Micrococcus luteus GPE 3001, Staphylococcus aureus ATCC 25923, Pseudomonas aeruginosa ATCC 27853 and Acinetobacter lwoffii GPE 3002. Strain HFM7 emerged as the most active, displaying the largest inhibition halo (20.0 ± 1.0 mm) and carrying three enterocin genes (entA, entL50A and entL50B). Loss of activity after protease treatment confirmed the proteinaceous nature of the inhibitory compounds.
Crucially, none of the isolates harbored the tested virulence determinants (esp, gelE, hyl) or antibiotic resistance genes (vanA, vanB, ermA, ermB, aac(6')-Ie-aph(2'')), underscoring a favorable safety profile. Taken together, these findings position E. faecium strains from traditional fig–olive preparation as promising bioprotective cultures for functional foods aimed at enhancing microbial safety, extending shelf life and supporting consumer demand for natural, health-oriented preservation strategies.

Keywords
Functional foods, Enterococcus faecium, Enterocins, Biopreservation, Traditional Algerian foods.

T2-P-68

Probiotic potential of *Lactobacillus* strains isolated from camel milk

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Abstract
Chronic intestinal inflammation is a growing health burden, closely linked to inflammatory bowel disease and colorectal cancer. Probiotics are increasingly explored as therapeutic agents because of their ability to shape gut microbiota, strengthen barrier integrity, and modulate immune responses. This study aimed to isolate and characterise bacterial strains with probiotic potential for intestinal inflammation management. Isolates were obtained from camel milk collected in El Abiodh Sidi Cheikh, El Bayadh, and purified on MRS medium. After phenotypic screening (Gram staining and catalase testing), strains were subjected to functional assays relevant to probiotic selection. These included tolerance to acidic pH and bile salts, antipathogenic activity against *Staphylococcus aureus*, *Bacillus cereus*, *Salmonella Enteritidis*, and *Escherichia coli*, and evaluation of autoaggregation capacity as an indicator of adhesion potential. Safety was assessed through antibiotic susceptibility profiling in accordance with EFSA guidelines and hemolytic activity testing on sheep blood. Preliminary results identified the isolates as members of the genus Lactobacillus, displaying Gram-positive, rod-shaped, and catalase-negative characteristics. Functional screening showed strong resistance to gastrointestinal conditions and significant inhibitory effects against tested pathogens. The isolates also exhibited favourable antibiotic susceptibility and lacked hemolytic activity, confirming their safety. Strains with enhanced autoaggregation were considered promising candidates for intestinal colonisation. These findings highlight camel milk as a valuable source of novel probiotic strains. Their functional and safety attributes support further preclinical evaluation, including in vivo testing in models of intestinal inflammation. This work expands the repertoire of candidate probiotics and advances microbiota-based strategies for managing chronic intestinal inflammation.
Keywords
Camel milk, Inflammation, Lactobacillus, Probiotics, Screening

T2-P-69

Pistacia Lentiscus L.: Biological and therapeutic potential of a valuable natural resource

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Abstract
Pistacia lentiscus L., a major Mediterranean species of the Algerian flora, is the focus of the present work, which aims to present the biological activities, with the objective of promoting its utilization and highlighting its medicinal potential. *Pistacia lentiscus* L. is distinguished by its high content of bioactive compounds, including polyphenols, flavonoids, and terpenes. Long used in traditional medicine and now recognized in modern phytotherapy, mastic exhibits antioxidant, antimicrobial, anti-ulcer, anti-inflammatory, and wound-healing properties, as confirmed by numerous in vitro and in vivo studies. Its derivatives - resin, essential oil, and fixed oil - are employed in the treatment of respiratory, digestive, and inflammatory disorders, as well as in the management of atherosclerosis, arthritis, asthma, hypertension, gastroduodenal ulcers, and microbial and fungal infections. Owing to this diversity of biological activities, *Pistacia lentiscus* L. represents a strategic resource for the development of pharmaceutical, cosmetic, and nutraceutical products. Its sustainable valorization constitutes a major scientific and socio-economic opportunity, positioning this species as a key player in natural health innovation, both in Algeria and internationally.
Keywords
Pistacia lentiscus L., biological activity, therapeutic potential, essential oil, phytotherapy.

T2-P-70

Determination of vitamin c content and anti-oxydant activity of Guava (*Psidium Guajava*. L) cultivated in Algeria.

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Abstract
Vitamins are essential organic compounds fundamental to maintaining general health. They are nutrients mainly associated to fruit consumption. *Psidium guajava*, an exotic plant introduced in North Africa, contains high concentrations of bioactive compounds. It has been shown to be an excellent source of vitamin C. The present study aimed to analyze levels of vitamin C of white and red guava (*Psidium guajava*. L)and the leafs from the Northern Algeria. The vitamin C was quantified using the analytical method High Performance Liquid Chromatography (HPLC) using different fruit states (dry, frozen and freeze-dried). Moreover, it defines the chemical antioxidant activity by ABTS assay. Results revealed that vitamin C ranged from 4.64 mg/100 g to 33.74 mg/100 g. The antioxidant activity showed ethyl acetate fraction bearing the best results. These findings revealed that this exotic fruit can be consumed as a nutraceutical ingredient by the Algerian population and exploited as a natural source of vitamin C in the agri-food industry.

Keywords
ABTS, Algeria, HPLC, *Psidium guajava*, vitamin C

T2-P-71

Innovative healthy greek yogurt formulation using Persimmon (*Diospyros kaki*)

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Abstract
The objective of this study is to formulate a "Healthy" plain Greek yoghurt and a yoghurt with *Diospyros kaki* (plaquemine) coulis. Physicochemical characterization revealed that the addition of persimmon coulis increased pH from 4.37±0.01 to 4.48±0.00, reduced acidity from 95.46±0.00°D to 84.84±0.04°D and significantly increased total sugar content from 4.57±0.05% to 8.51±0.06%. The study of antioxidant activity showed an increase from 47.47±0.83% to 68.81±1.4% by the DPPH test and from 34.11±0.48% to 64.21±0.35% by the ABTS test. Evaluation of pH, acidity, syneresis and antioxidant activity during 21 days storage at 4°C indicates that the addition of persimmon coulis improved yogurt quality during storage. Microbiological quality evaluation conformed to regulations, with satisfied quality maintained during storage. Sensory analysis revealed an appreciation for both formulated products, but a marked preference for yogurt with persimmon coulis. These results demonstrate the positive impact of adding persimmon coulis on yogurt quality.

Keywords
Greek-style yogurt, Diospyros kaki, plaquemine, physicochemical compounds antioxidant activity

T2-P-72

Nutritional composition, cooking properties, viscoelasticity, and microstructure of a legume-based vegan burger optimized using a D-optimal mixture design

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Abstract
The growing request for plant-based meat substitutes reflects a global shift toward more sustainable, ethical, and health-promoting dietary practices. Legumes, due to their high protein and fiber content, are ideal for the formulation of such products. This study focused on the development of a plant-based burger made from lentils, peas, and black beans, with particular attention paid to optimizing ingredient proportions to achieve

balanced nutritional, technological, and sensory properties. With this in mind, a three-component D-optimal mixture design was implemented. The assessment of the nutritional properties of the legume-based plant burger, both before and after cooking, revealed high protein (8.15%) and crude fiber (6.33%) contents. After cooking, the protein amount remained relatively stable, indicating good thermal stability of the protein ma-trix, but a marked decrease in fiber content was noticed. The cooking properties of the legume-based plant burger demonstrated a technologically stable formulation, suitable for ready-to-eat consumption. The prod-uct exhibited moderate cooking loss (13.10 ± 0.69%), along with minimal reductions in diameter (1.94 ± 0.22%) and thickness (7.75 ± 0.80%), indicating good structural integrity during cooking and effec-tive shape retention. Lipid absorption remained controlled (19.62 ± 0.42%), while moisture retention (58.79 ± 1.08%) indicated a moderate water-holding capacity. These findings confirm the product's favora-ble thermal behavior. Rheological analysis showed that after cooking, the network of the burger became more elastic, which was confirmed by Scanning Electron Microscopy analysis (SEM), revealing a compact and homogeneous structure. To sum up, given its qualities and richness, especially in proteins, the elaborated vegetarian burger could constitute a substitute for the meat-based one.

Keywords
vegetable burger; lentil; pea; black bean; mixture design

T2-P-73

Antioxidant activity of camel milk β-casein peptides generated by pepsin and pancreatin hydrolysis

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Abstract
Camel milk is a valuable source of proteins, particularly β-casein, which was isolated and purified prior to analysis. The purity and integrity of the extracted β-casein were validated using SDS-PAGE and UREA-PAGE electrophoresis, which confirmed the presence of a single major band, indicating successful extraction. The purified β-casein was then subjected to enzymatic hydrolysis using pepsin(CNH-G) and pancreatin (CNH-B), enzymes that simulate gastric and intestinal digestion, with the objective of generating bioactive peptides and evaluating the impact of proteolysis on their antioxidant potential. The hydrolysis of camel β-casein by pepsin and pancreatin resulted in the formation of peptide fractions with significantly enhanced antioxidant properties. Antioxidant capacity was assessed using three complementary assays: DPPH and FRAP. The results revealed a remarkable increase in activity following hydrolysis. DPPH radical scavenging increased from 27.15 ± 0.17 % for native β-CN to 38.50 ± 0.09 % for CNH-G and reached 57.96 ± 0.17 % for CNH-B. Similarly, FRAP reducing activity also increased significantly from 46.03 ± 1.20 % in native β-CN to 53.79 ± 1.04 % and 73.36 ± 1.06 %, indicating stronger electron-donating ability after hydrolysis. These findings demonstrate that pepsin and pancreatin induced hydrolysis greatly enhances the antioxidant potential of camel milk β-casein, leading to the release of bioactive peptides capable of neutralizing free radicals and reducing oxidative stress. Due to their strong biological activity, these peptides represent promising natural ingredients for the development of functional foods and pharmaceutical applications

Keywords
native β-Casein, CNH-G, CNH-B, antioxidant activity, purification.

T2-P-74

Evaluation of the biochemical profile and biological activities of hydrolysates of common Carp (*Cyprinus Carpio*) waste

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Abstract
This study contributed to the evaluation of the biochemical profile of hydrolysates derived from common carp (*Cyprinus carpio*) byproducts, a freshwater species widely used in aquaculture. Two enzymatic methods were employed: autolysis (with endogenous enzymes) and heterolysis (with exogenous enzymes). The results

revealed a significant protein content, especially in heterolytic hydrolysates (54% compared to 14% in autolysates), with key amino acids identified such as valine, tyrosine, glutamic acid, and aspartic acid. Lipid content was 5.54% for autolysates and 5.6% for heterolysates, with omega-3 fatty acids (EPA and DHA) being predominant. Additionally, the sugar content was low (0.17 mg/ml for autolysates and 0.22 mg/ml for heterolysates). The analysis of biological activities showed higher antioxidant activity in autolysates (40%) compared to heterolysates (16%) and notable anti-inflammatory activity (76%). These findings highlight the potential of fish by-products as a source of bioactive compounds for use in the agri-food and nutraceutical sectors, within a sustainable and multidisciplinary approach.

Keywords
Fish waste, common carp, hydrolysates, biochemical profile, biological activities

T2-P-75

Study of the potential antioxidant and prebiotic effect of *Bituminaria Bituminosa* and *Ambrosia Maritima*

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Abstract
The imbalance of the gut microbiota, also known as dysbiosis, is implicated in numerous gastrointestinal disorders. In this context, the identification of natural agents capable of restoring microbial eubiosis represents a promising therapeutic alternative. This study implicates experimental approach to evaluate the prebiotic, antioxidant, and antibacterial potential of the phenolic extract of *Bituminaria bituminosa*, and *Ambrosia maritima* two medicinal plants rich in bioactive secondary metabolites including polyphenols. *In vitro* tests revealed moderate antioxidant activity (IC_{50} = 79.34 µg/mL in the ABTS assay) and notable antibacterial activity against *Staphylococcus aureus*, *Escherichia coli*, and *Bacillus subtilis*, with no effect observed against *Pseudomonas aeruginosa*. Evaluation of prebiotic activity showed differential stimulation of the probiotic strains *Lactobacillus gasseri* and *Lactobacillus acidophilus*, with a biphasic response observed in the latter, likely related to the presence of glycosylated flavonoids. These findings suggest that the studied plantssuggest a potential beneficial effect in regulating disrupted gut microbiota, particularly in oxidative stress mediated dysbiosis. The combined effect of its selective antimicrobial, antioxidant, and microbiota-modulating properties highlights its potential as a phytotherapeutic candidate. However, further in vitro and in vivo studies are necessary to confirm its clinical efficacy, elucidate its mechanisms of action, and to assess its safety profile.

Keywords
dysbiosis, *Bituminaria bituminosa*, *Ambrosia maritima*, microbiota, prebiotic, probiotic, polyphenols

T2-P-76

Quality, nutritional composition, and antioxidant potential of biscuits enriched with flaxseeds

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Abstract
Consumer's interest in healthy eating shifted towards the potential health benefits of specific foods and food ingredients. Flaxseed serves as a good source of protein , polyunsaturated fatty acids, dietary fibers, minerals and phenolic compounds. This study aimed to explore the potential use of flaxseed flour as a nutritious ingredient in biscuit production. flaxseed flour was blended with wheat flour to create biscuits with varying proportions: 15%, 30%, and 45% flaxseed flour. The analysis of the chemical composition of the biscuits revealed that increasing the proportion of flaxseed flour led to higher levels of protein, fiber, ash, polyphenols , flavonoids and a notable increase in antioxidant activity, thereby enhancing the health-promoting properties of the biscuit. Sensory evaluation showed that biscuits with 15% Flaxseed flour and 85% wheat flour had favorable characteristics in terms of color, flavor, crispness, and overall appeal. These findings indicate that incorporating Flaxseed flour into wheat flour can enhance the nutritional profile of biscuits, offering higher protein,Fiber, mineral , polyphenols and flavonoids content. The study suggests that a blend containing 15% Flaxseed flour is

optimal for producing biscuits with desirable sensory properties, making it a promising alternative ingredient for healthier biscuit formulations. Overall, this research highlights the potential of Flaxseed flour to improve the nutritional quality of biscuits without compromising their sensory qualities, paving the way for its use in health-consciousbaking practices.

Keywords
Wheat flour; biscuits; biscuits with Flaxseeds ,antioxidant activity ,sensory characteristics;

T2-P-77

Hydrolyse des caséines bovine par la ficine immobilisée

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Abstract
L'objectif de ce travail est l'utilisation de la ficine immobilisée dans la production de peptides bioactifs par hydrolyse des caséines bovine. La ficine a été immobilisée sur de glyoxyl-agarose puis étude de son potentiel protéolytique sur les caséines bovine et caractérisation des activités des hydrolysats obtenues de points de vue activité biologique spécialement antioxydante. Les résultats obtenus ont montré que l'extrait enzymatique s'immobilise rapidement sur l'agarose activé avec de glycidol. La ficine immobilisée garde 89% de son activité protéolytique. D'un autre coté les résultats ont montré que les hydrolysats obtenus avec la ficine immobilisé ont plus d'activité anti-oxydant que ceux avec la ficine libre. le pourcentage d'inhibition du DPPH est très important avec des valeurs estimées à 23.71%, 41.81%, 53.89%, 62,27% et 72,45% à 0.5, 1, 2, 4 et 5 heures d'hydrolyse respectivement. Concernant l'utilisation de la ficine libre les résultats on montés que le pourcentage d'inhibition du DPPH est important mais avec des valeures qui varies, les sont valeurs estimées à 43.57%, 61.43%, 73.05%, 42,19% et 37,39% à 0.5, 1, 2, 4 et 5 heures d'hydrolyse respectivement cette variation est due a l´hydrolyse intensive des caséines. Ces résultats reflètent la possibilité d'utiliser la ficine dans l'hydrolyse des caséines la production de peptides d'intérêt (antioxydant).

Keywords
Ficine, immobilisation ; caséines ; hydrolyse ; peptides antioxydants.

T2-P-78

Rhizospheric actinobacteria as innovative bio-resources for applications in functional foods and health

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Abstract
The growing interest in functional foods has increased the demand for natural bioactive compounds with antimicrobial and enzymatic properties that support both food preservation and consumer health. In this context, the present study explores the biotechnological potential of actinobacteria isolated from the rhizosphere of mastic tree, oak, and blueberry plants in the Jijel region of Algeria. Fourteen isolates were obtained from acidic, organic-matter-rich soils and characterized for physiological, biochemical, and antimicrobial traits relevant to functional food innovation. All isolates demonstrated halotolerance and notable hydrolytic capacities, including the production of amylases (42.86%), lipases and lipoproteinases (78.57%), proteases such as caseinase (57.14%) and gelatinase (100%). These enzyme profiles highlight their potential for use in food processing, nutrient modification, and enhancement of digestibility, key aspects of functional food development. Antimicrobial assays revealed that 57.14% of the isolates exhibited antifungal activity, while 35.71% displayed antibacterial effects against Gram-positive and Gram-negative foodborne pathogens. Notably, isolate L6 showed a broad inhibition spectrum, positioning it as a potential source of natural preservatives or functional ingredients with health-promoting properties. Together, the enzymatic and antimicrobial activities of these

rhizospheric actinobacteria underscore their promise as innovative biological resources for the design of safer, more nutritious, and health-enhancing food products. Their integration into functional foods could contribute to natural preservation strategies, reduction of synthetic additives, and improved gut health, aligning with global priorities for sustainable and health-oriented food systems. Further molecular and analytical characterization will support the development of these isolates into next-generation functional food bio-ingredients.

Keywords
Actinobacteria; bioactive compounds; antimicrobial activity; hydrolytic enzymes; functional foods.

T2-P-79

Sustainable valorization of olive (*Olea europaea* L.) stones via green extraction for functional ingredients and health-promoting food security

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Abstract
The present work aims to valorize olive stones from *Olea europaea* L. cv. *Limli* collected in Sidi Aich, Bejaia, Algeria. Samples were washed, dried, ground and subsequently subjected to green extraction using deep eutectic solvents (DES) under ultrasound-assisted extraction, in parallel with ethanolic and aqueous extractions. Extracts were screened for their total phenolic content (TPC), phenolic profile, antioxidant [2,2-diphenyl-1-picrylhydrazyl (DPPH) and 2,2′-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS•+) assays] and anti-inflammatory activities [inhibition of bovine serum albumin (BSA) protein denaturation].The DES-based extracts yielded the highest TPC (up to 56.8 ± 2.1 mg GAE/g DW) compared to ethanol (31.4 ± 1.7 mg GAE/g DW) and water (18.6 ± 1.2 mg GAE/g DW). LC-MS analysis identified hydroxytyrosol, (2.3–4.8 mg/g DW), tyrosol (1.7–3.2 mg/g DW), and lignan derivatives (0.9–2.6 mg/g DW) as dominant constituents, together with minor amounts of phenolic acids (caffeic acid, vanillic acid, ferulic acid) and flavonoids (apigenin, luteolin). Antioxidant assays confirmed the superior radical-scavenging potential of DES extracts, with DPPH IC_{50} = 48.5 ± 2.6 µg/mL and ABTS IC_{50} = 32.7 ± 1.9 µg/mL, significantly ($p<0.05$) more potent than conventional solvents. All samples exhibited potent anti-inflammatory potential, with BSA inhibition reached 72.3 ± 3.4% at 200 µg/mL for DES extract. A strong positive correlation (R^2 = 0.92) was observed between phenolic content and antioxidant capacity, confirming the pivotal role of polyphenols in bioactivity. These findings highlight the potential of eco-friendly DES extraction for the valorization of olive co-products and position olive stones as a promising source of nutraceuticals. Beyond waste reduction, this approach contributes to functional ingredient development, circular bio- and socio-economy advancement, health-promoting food security, and environmental preservation.

Keywords
Co-products valorization, Functional ingredients, Green extraction, Health, *Olea europaea* L. stones.

T2-P-80

Mixture design optimization of functional energy balls incorporated with prickly pear seed cake, sesame cake, and orange peel

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Abstract
As part of a sustainable development strategy and the valorization of agri-food by-products, this study investigates the formulation of functional energy balls using underutilized local ingredients. Three plant-based by-products were selected for their notable nutritional potential: prickly pear seed cake, sesame cake, and orange peels. The main objective was to optimize the formulation of energy balls enriched with these by-products and to assess their nutritional, functional, and sensory performance. The energy balls were prepared

using a base mixture of oat flakes, date molasses, peanut butter, sesame butter, and cocoa. An experimental mixture design generated using JMP Pro software was applied to test various combinations of the by-products, which were incorporated at levels not exceeding 20%. A control formulation without enrichment was also prepared for comparison. All formulations were analyzed through physico-chemical characterization (moisture, ash, fat, fiber, carbohydrates), biochemical evaluation (protein content), antioxidant activity assessment via the DPPH method, and sensory testing by an expert panel. Results revealed a significant increase in dietary fiber, notable antioxidant activity, and a satisfactory energy contribution. Enrichment with the selected by-products improved the overall nutritional value without compromising sensory acceptability, although slight variations in color and texture were noted. Overall, the developed energy balls constitute a functional and nutritious product that supports the valorization of local resources with high nutritional potential. They align well with consumer demand for healthy, convenient, and environmentally friendly food products.

Keywords
Energy balls, optimization, functional food, by-products, valorization

T2-P-81

Physicochemical, phytochemical, and sensory study of a fresh cheese enriched with spirulina algae

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Abstract
Functional foods enriched with bioactive compounds have gained increasing attention due to their potential health benefits. Among these, microalgae such as spirulina are recognized for their high content of proteins, vitamins, minerals, and antioxidants. Incorporating such bioactive ingredients into widely consumed foods like dairy products offers a promising approach to enhance their nutritional and functional properties. The objective of the present study was to investigate the enrichment of fresh cheese with spirulina, a microalga rich in bioactive compounds, to improve its nutritional and functional qualities. Spirulina was incorporated at different concentrations (0.1%, 0.2%, and 0.3%) into fresh cheese made from cow's milk. Physicochemical analyses (pH, moisture, acidity, Brix, and conductivity), phytochemical evaluations (total polyphenols, flavonoids, tannins, and carotenoids), antioxidant activity assays (DPPH, FRAP, and phosphomolybdate tests), and sensory analysis were performed to assess the effects of spirulina enrichment. The results showed that incorporating 0.3% spirulina significantly enhanced the functional properties of fresh cheese. The main physicochemical parameters were: pH 4.57 ± 0.03, titratable acidity 84.66 ± 2.31 D°, moisture 89 ± 3.54%, and electrical conductivity 2005 ± 1.44 µS/cm. Phytochemical analysis revealed high levels of bioactive compounds, including total phenolics (166.93 ± 7.85 mg GAE/100g), flavonoids (6.36 ± 0.27 mg QE/100g), tannins (127.42 ± 0.27 mg TE/100g), and carotenoids (5.74 ± 0.04 mg βC/100g). Antioxidant activity including DPPH, FRAP, and phosphomolybdate was also enhanced, with values of 45.46 ± 1.27%, 37.05 ± 0.63 mg QE/100g, and 4.73 ± 0.20 mg GAE/100g, respectively. Sensory evaluation showed improved color (8.47/10), stable texture (5.63–5.90/10), slightly reduced odor (3.23/10), and minor taste changes. Overall, the moderate addition of spirulina to fresh cheese appears to be a promising strategy for developing innovative functional dairy products.

Keywords
Fresh cheese; Spirulina; Bioactive compounds; Antioxidant activity; Sensory analysis

T2-P-82

Analyse mélisopalynologique, caractérisation physico-chimique, teneur en composés phénoliques et activités antioxydantes d'un miel Algérien

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Abstract

La relation entre l'abeille *Apis mellifera* et la pollinisation végétale produit des miels aux caractéristiques distinctes, fortement influencées par leur source botanique. Dans cette étude, un échantillon de miel algérien a été caractérisé par analyse mélissopalynologique (sans acétolyse), évaluation physicochimique (humidité, pH, teneur en cendres, 5-hydroxyméthylfurfural, proline) ainsi que par le dosage des composés phénoliques et la mesure de son activité antioxydante. Les capacités antioxydantes ont été évaluées via plusieurs méthodes : piégeage des radicaux DPPH et ABTS, méthode CUPRAC, test au phosphomolybdate, FRAP et chélation des ions fer. Les résultats révèlent un pollen dominant du genre *Ziziphus (Rhamnaceae*) à hauteur de 82%, attestant du caractère monofloral du miel. Les pollens secondaires appartiennent aux familles *Fabaceae*, *Asteraceae* et *Brassicaceae*, illustrant la diversité floristique locale. Les paramètres physicochimiques respectent pleinement les normes internationales, avec une humidité, un pH, une acidité libre, un taux de 5-HMF et une concentration en proline confirmant la haute qualité de ce miel. Par ailleurs, la richesse en composés phénoliques et le fort potentiel antioxydant observé confirment ses propriétés bioactives. Cette étude s'inscrit dans la continuité des travaux réalisés sur le miel algérien et fournit des résultats concordant avec les critères de qualité attendus.

Keywords
Miel, mélissopalynologie, Paramètres physicochimiques, Composés phénoliques

T2-P-83

From red juniper (*Juniperus phoenicea L.*) to the table: Valorization of the traditional know-how for transforming red juniper berries into *"El Robb"*, a syrup with functional and health-related uses

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Abstract
The red juniper (*Juniperus phoenicea* L.) is an emblematic plant of the Algerian high plateaus, widely recognized for its medicinal properties and traditional uses, attributed to its bioactive compounds and essential oils. This ethnobotanical study aimed to document local knowledge and the functional and health-related uses linked to the valorization of the red berries of *Juniperus phoenicea.* To ensure data relevance, the survey initially targeted families known for their active role in traditional activities, particularly in the Aïn Ghrab area of the commune of Djebel Messaâd, wilaya of M'sila. Based on these criteria, a simple random sample of 60 households from this area was then selected and surveyed using a questionnaire. Results show that the red berries are traditionally transformed into "*El Robb*" a syrup with both nutritional and therapeutic properties. This traditional syrup is obtained by hot maceration followed by prolonged cooking of mature berries, carefully selected for their characteristic reddish-brown color and quality. This artisanal process, strictly followed by local artisans, produces a viscous, dark brown syrup with a woody aroma and a sweet, slightly tangy taste accompanied by a bitter aftertaste. The transformation yield typically ranges from 10 to 30%, depending on berry quality and preparation techniques. "*El Robb*" is mainly stored in airtight glass jars, ensuring a shelf life of up to 24 months under optimal conditions. This stability is largely due to an acidic pH and a high concentration of bioactive compounds with antimicrobial and antioxidant properties, contributing to the product's microbiological safety. Traditional uses of "*El Robb*" are primarily medicinal, notably for relieving respiratory ailments such as asthma and cough, as well as digestive disorders, while also strengthening the body. Additionally, it is consumed as an energy-rich food, valued for its satiating effect, especially by local populations and in specific historical contexts. This study highlights the richness of local artisanal knowledge and the functional potential of "*El Robb*" underlining its importance for future scientific valorization and the preservation of intangible cultural heritage linked to traditional practices.

Keywords
Juniperus phoenicea, *El Robb*, survey, questionnaire, functional potential

Thematic 3 – Innovative Products and Health

T3-P-01

Natural bread sourdough with selected yeasts

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Abstract

Bread and flatbreads hold an important place in dietary habits in Algeria and accompany nearly all meals. Traditional dough fermentation relies largely on imported industrial yeasts, mainly Saccharomyces cerevisiae. While this yeast ensures rapid fermentation, it presents several limitations, including a standardized taste, a weak aromatic profile, reduced digestibility, and the absence of probiotic properties. In this context, the present study aims to develop an enriched natural sourdough combining wild yeasts with four indigenous lactic strains isolated from the traditional Bouhezza cheese, with the objective of improving the technological and nutritional quality of the fermented Algerian flatbread Matloue. Preliminary trials allowed the selection of the most suitable raw materials for sourdough cultivation. Two samples of wild sourdough were retained; the isolated yeasts were purified and subsequently combined with the selected lactic strains to formulate an experimental sourdough. This sourdough was characterized physicochemically (pH, total acidity) and incorporated into a standardized Matloue production process. The resulting products were evaluated based on several parameters, including leavening capacity, internal structure, moisture content, water loss, specific volume, texture, color, and sensory acceptability. The results show that the enriched sourdough leads to the production of Matloue with markedly improved organoleptic qualities. Physicochemical analyses confirm its stability and its higher fermentative activity compared to traditional sourdoughs. This work highlights the relevance of incorporating indigenous probiotic strains to enhance the quality of fermented products and underscores the potential for valorizing traditional know-how through modern scientific approaches, paving the way for high-value fermented foods that meet current health and sensory quality demands.

Keywords

Natural sourdough, Probiotic strains, Wild yeast, Lactic acid bacteria.

T3-P-02

Production of α-amylase by entomopathogenic fungi cultivated on a carrot waste-based medium

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Abstract

The production of industrially relevant enzymes using agro-industrial wastes represents a sustainable and cost-effective approach. In this study, entomopathogenic fungi isolated from *Ectomyelois ceratoniae* were evaluated for their ability to produce α-amylase using a culture medium formulated from carrot waste. Fourteen fungal isolates belonging to the genera *Aspergillus*, *Fusarium*, and *Cladosporium* were identified. The effect of pH (4, 7, and 10) on enzymatic activity was assessed after incubation at 28 °C for three days. The results showed that *Fusarium sp.* exhibited the highest amylolytic activity, reaching 284.64 U at pH 10. These findings highlight the potential of entomopathogenic fungi and plant-derived waste substrates for the sustainable production of industrial enzymes.

Keywords
Entomopathogenic fungi; *Fusarium*; α-amylase; carrot waste; *Ectomyelois ceratoniae*.

T3-P-03

Cookies based on the Algerian barley varieties « Fouara » and « Céleste »

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Abstract
Traditionally, barley is mainly used to prepare bread, and couscous. These products are not appreciated by the new generation. Currently, barley is attracting more and more attention from the agri-food industry, particularly in the development of functional products rich in β-glucans. Products such as cookies present common examples in the field of functional foods due to their convenience and ability to meet consumer expectations in terms of nutritional composition, shape and appearance (Martensson et al., 2018, Sun et al., 2022). Our work aims to contribute to the diversification of barley consumption patterns by studying the feasibility of developing biscuits based on two local varieties of barley; the variety "Fouara" characterized by a high β-glucan content and the variety "Celeste" characterized by bare grains without shells. These preparations were subjected to physico-chemical and sensory characterizations in order to evaluate their quality and acceptability by consumers. The cookies exhibited good shape stability, with specific volumes varying between 1.34 0.08 cm 3/g and 1.91 0.11 cm 3/g. The Fouara salted cookies, with a humidity of 4.00%, shows a value significantly lower than that of the Céleste variety (7.46%) and the wheat control (7.78%), which do not differ significantly between them. The sweet barley-based cookies (Fouara and Céleste) have a significantly lower moisture content than the wheat-based control. These results suggest that these cookies may offer better crispiness and storage stability. An accentuated dark hue is mainly associated with sweet Fouara biscuit, reflecting a higher non-enzymatic browning intensity. The sweet formulation tends to increase the dark color. Sensorially, the salty versions were particularly well-rated, reaching up to 4/5 according to the acceptability test.

Keywords
Barley, biscuits, physical properties, sensory acceptability.

T3-P-04

Application of a novel thermostable α-amylase for improved bread quality

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Abstract
In this study, a new thermostable α-amylase produced by Rhizopus oryzae FSIS4 was successfully purified for the first time, using an efficient three-phase partitioning (TPP) technique. This purification approach enabled the enzyme to be recovered in a single, rapid, and cost-effective step, demonstrating the practicality of TPP for fungal enzyme purification.
The purified α-amylase was then evaluated for its potential industrial applications, particularly in bread-making. For this purpose, the enzyme was incorporated into bread dough at a concentration of 1.936 U per kilogram of flour, and its performance was compared with that of a commercially available α-amylase commonly used in baking processes.
The experimental results revealed that the α-amylase recovered through TPP had a markedly positive impact on the quality of the bread produced. Improvements were observed in several technological parameters, such as dough handling, texture, loaf volume, and overall sensory characteristics. These findings strongly suggest that the enzyme possesses enhanced functional properties, likely linked to its thermostability.
Overall, the study clearly demonstrates that this newly purified thermostable α-amylase represents a promising and competitive candidate for use in the bread-making industry, where enzymes play a crucial role in improving product quality. Moreover, due to its stability and functional efficiency, this enzyme may also find valuable

applications in various other sectors of food biotechnology, supporting its potential for broader industrial exploitation.

Keywords
α-amylase, *Rhizopus oryzae* FSIS4, three phase partitioning, bread quality

T3-P-05

Valorization of whey powder in traditional madeleines: impact on texture, structure, and sensory quality

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Abstract
The aim of this study was to evaluate the feasibility of producing madeleines, a traditional Spanish cake, by partially or totally replacing eggs with whey powder, and to investigate the effect of this substitution on their physicochemical, techno-functional, and sensory properties. The raw materials were first analyzed to determine their particle size, moisture content, protein composition, and the techno-functional properties of the whey powder. Egg-based control madeleines were compared to formulations with different substitution levels: 25%, 50%, 75%, and 100%. The final products were then subjected to physicochemical analyses and sensory evaluation. The results showed that 25% and 50% substitutions reduced batter density (1.127 ± 0.001 g/cm³ and 1.118 ± 0.003 g/cm³, respectively), indicating better aeration. Rehydration and homogenization of the whey powder prior to incorporation improved the texture. Specific volume decreased with increasing substitution levels. Furthermore, incorporating whey increased the total number of alveoli in the 25%, 50%, and 100% samples, while their average size decreased, suggesting a finer internal structure. Sensory evaluation indicated that the 25% substituted madeleines closely resembled the control in appearance and received positive feedback. The 100% substitution was less favorably rated. No significant differences were observed among the 25%, 50%, and control samples regarding odor, taste, or crumb texture. Finally, the adhesiveness of all formulations was deemed acceptable.

Keywords
whey powder, valorization, egg, substitution, madeleine

T3-P-06

Multilevel in vitro and in silico exploration of antidiabetic phenolic compounds from date seeds: insights for public health and food security

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Abstract
Type 2 diabetes (T2D) is a major global health concern associated with chronic hyperglycemia due to impaired insulin secretion or resistance. In the context of food security and public health, the exploration of natural bioactive compounds as safer therapeutic alternatives has gained increasing attention.This study aimed to investigate the antidiabetic potential of *Phoenix dactylifera L.* (Mekwiya variety) date seed extract, an underutilized agro-industrial by-product. In vitro enzyme assays were performed to evaluate the inhibitory activity of the extract against α-amylase and α-glucosidase. Additionally, four phytochemicals identified by LC-MS were subjected to in silico molecular docking against 2 key proteins involved in glucose metabolism. ADME predictions were conducted to assess pharmacokinetic properties and drug-likeness. The extract showed significant inhibitory activity against α-amylase (IC_{50} = 14.62 ± 0.89 µg/mL) and α-glucosidase (IC_{50} = 213.47 ± 11.45 µg/mL), suggesting a strong potential to regulate postprandial hyperglycemia. Molecular docking revealed high binding affinities (−7.9 to −9.8 kcal/mol), with isoquercitrin, chrysoeriol, and resveratrol 3-glucoside displaying a multi-target profile. ADME predictions confirmed favorable pharmacokinetic characteristics. Mekwiya date

seeds represent a sustainable source of antidiabetic bioactive molecules with potential health-promoting effects.This work highlights the importance of valorizing agro-industrial by-products and supports further development of functional food ingredients or natural therapeutics for diabetes management.

Keywords
Diabetes, *Phoenix dactylifera*, α-glucosidase, ADME, Binding affinities

T3-P-07

Development and comprehensive characterization of innovative plant-based meat formulations

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Abstract
The principal objective of this work is to develop a hybrid plant-based meat product incorporating prickly pear seed cakes. The strategy implemented is based on the innovative valorization of these seed cakes, enabling the combination of the functional benefits of plant fibers with those of animal proteins. To support this approach, comprehensive physicochemical, nutritional, and microbiological characterizations of the seed cakes were performed to assess their suitability for integration into an appropriate food matrix. According to the results obtained, the by-products exhibited good antioxidant activity (18.5 ± 0.01 to 33.8 ± 0.01 mg EQ/g), low sugar content (0.072 ± 0.003 to 0.170 ± 0.10 per 100 g), high flavonoid levels (up to 88.39 mg GAE/100 g), and moderate fiber content (0.21 to 0.41 g). From a microbiological standpoint, the by-products showed good hygienic quality (absence of TAMF, coliforms, staphylococci, and sulfite-reducing anaerobes) and complied with safety standards, indicating that the products are safe and pose no health risk to consumers. The collected data confirm compliance with food safety standards, demonstrating their microbiological safety. Moreover, their valuable composition in dietary fibers, proteins, and phenolic compounds contributes to enhancing the nutritional quality of the hybrid meat product. This research was further strengthened by a sensory evaluation aimed at assessing consumer acceptability. The results show that the developed product exhibits a favorable sensory profile, paving the way for effective valorization of agro-industrial by-products. This innovative product can be adapted to various market segments, including athletes seeking balanced nutritional intake, individuals with chronic conditions (such as cardiovascular diseases or diabetes), and consumers aiming to transition toward a healthier and more sustainable plant-based diet. Choosing a hybrid plant-based meat offers multiple benefits, addressing both nutritional and environmental concerns while maintaining a taste and texture comparable to conventional meat.

Keywords
hybrid plant-based meat, prickly pear seed cakes, sustainable diet, valorization, agro-industrial by-products

T3-P-08

Formulation and characterization of nutrient-enhanced traditional flatbreads enriched with dietary fiber

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Abstract
Digestive disorders represent an increasingly common health issue across various populations, particularly among individuals with diabetes or celiac disease, whose digestive function is often compromised. In response to these challenges, the development of enhanced traditional foods emerges as a promising nutritional strategy. In this context, we developed a healthier formulation enriched with dietary fiber, proteins, phenolic compounds, and natural antioxidants: the "Reformulated Traditional Flatbread" (Kesra). The manufacturing process was optimized by adapting the preparation diagram and incorporating nutrient ingredients (corn semolina, seeds, fibers, healthy oils) along with by-products from the agro-food industry. This formulation not only improves the nutritional value of the product but also meets the needs of several health-sensitive population groups. By-products were characterized through the determination of their constituents (sugars,

lipids, fibers, flavonoids, etc.), as well as their technological, nutritional, and microbiological properties, in order to ensure both hygienic and sensory quality of the final products. The results showed that the by-products exhibited good antioxidant activity (18.5 ± 0.01 mg EQ/g), low sugar content (0.072 ± 0.003 g/100 g), high flavonoid levels (up to 88.39 mg GAE/100 g), and moderate fiber content (0.41 g). Microbiological analyses confirmed excellent hygienic quality, with the absence of FTAM, coliforms, staphylococci, and sulfite-reducing anaerobes, demonstrating compliance with standards and the safety of the product for consumers. Sensory evaluation results were satisfactory, and the new formulations were well appreciated by most panelists. This product aims to enhance digestive comfort while preserving the familiar and widely appreciated taste of traditional Kesra. The objective is to offer a functional alternative capable of supporting digestive health and meeting the nutritional needs of vulnerable populations: individuals with diabetes (reduced glycemic index), people with digestive disorders (high fiber content, improving digestibility), individuals following a healthy low-calorie diet, and athletes (protein and complex carbohydrate supply, improved performance). Owing to its enriched composition, this flatbread represents a healthy alternative to conventional bread.

Keywords
Functional foods; Fiber-enriched flatbread; *Kesra* formulation; Agro-food by-products; Nutritional enhancement

T3-P-09

Analysis of the fiber composition of three agro-industrial by-products (tomato peels, orange peels, and olive pomace) for their potential use in food packaging

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Abstract
This study examined the fiber composition of three agri-food by-products (tomato peel, orange peel, and olive pomace) in view of their potential use in bio-based food packaging. The functional properties of such materials depend largely on the relative proportions of cellulose, hemicellulose, and lignin, which govern mechanical strength, rigidity, flexibility, film-forming capacity, and biodegradability. Crude fiber contents were determined using the Weende method, involving sequential acid (H_2SO_4, 1.25%) and alkali (NaOH, 1.25%) digestion, followed by filtration, drying at 105 °C, and ashing at 550 °C, in accordance with AOAC Method 978.10. NDF and ADF fractions were quantified following the detergent-fiber procedures of Van Soest *et al.* (1991). Prior to analysis, samples were dried at 60 °C, ground to 1 mm, and stored in airtight containers. The results reveal marked differences among the three by-products. Tomato peel contained moderate fiber levels (13.32% crude fiber; 34.16% NDF; 25.07% ADF), indicative of a cell wall enriched in cellulose and pectin. Olive pomace exhibited the highest lignocellulosic content (24.12% crude fiber; 51.71% NDF; 42.13% ADF), confirming its rigid and highly lignified structure. In contrast, orange peel showed comparatively low fiber values (11.08% crude fiber; 21.42% NDF; 16.12% ADF). Overall, the moderate cellulose content and higher soluble fiber proportions of tomato and orange peels make them suitable candidates for film- and bioplastic-forming applications, whereas the high lignin and cellulose content of olive pomace favors its use in rigid bio-composite materials.

Keywords
By-products, crude fiber, cellulose, hemicellulose, lignin

T3-P-10

Evaluation of the biochemical and nutritional parameters of monoconcentgrated tomato paste according to the stages of the continuous technological process

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Abstract

In order to assess physicochemical parameters during technological processing of tomato paste, cultivars are grounded under biological conditions. Fresh tomatoes are preheated at 64.66°C for 20 min according to Hot-Break method. Obtained juice is concentrated at 88.23° C for 2 hours until 22% Brix point. Tomato paste is pasteurized at 91.7°C for 20 min and then heated at 95.1°C in 10 min. Physicochemical parameters are assessed following FAO and ISO standard methods. The linear correlation coefficients are calculated with MiniTab v.16 software. During preheating, Brix percentage, ascorbic acid, α-tocopherol, reducing sugars, β-carotene, lycopene, proteins rates, red/yellow color and brightness decrease. During different processing stages, we noticed an increase in these parameters values due to the concentration effect. In another hand, during pasteurization and sterilization, Brix, ascorbic acid, α-tocopherol and reducing sugars rates decrease while lycopene, β-carotene, red/yellow color, brightness and viscosity increased. The protein content remains stable. Throughout the technological process, the group consisting of Brix, ascorbic acid, α-tocopherol and reducing sugars and the one formed by the levels of lycopene and β-carotene, of the ratio of the red color on the yellow color and brightness vary comparably within the groups. During pasteurization and sterilization, viscosity changes in the same way of lycopene, β-carotene, red/yellow color and brightness. Protein content is correlated to Brix, ascorbic acid, α-tocopherol, reducing sugars, β-carotene and lycopene levels. Red/yellow color and brightness were also slightly correlated at the beginning of pasteurization phase. The existence of positive linear and non-linear relationships between specific physicochemical parameters is proven and explained biochemical changes occurred in the food matrix during heat treatments.

Keywords
Tomato paste, physicochemical parameters, heat treatments, lycopene.

T3-P-11

Development of a functional yogurt for diabetic populations using novel ingredient combinations: chia seeds, sweet potato, and pomegranate juice

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Abstract
The growing prevalence of diabetes worldwide necessitates the development of innovative functional foods with controlled glycemic impact. Yogurt, as a widely consumed fermented dairy product, represents an ideal matrix for nutritional enrichment aimed at managing metabolic disorders. This study aimed to develop a novel functional yogurt formulation based on goat's milk, enriched with chia seeds (*Salvia hispanica L.*), sweet potato (*Ipomoea batatas*), and pomegranate juice (*Punica granatum*), specifically designed for diabetic consumers, and to evaluate its microbiological, physicochemical, sensory properties, and glycemic impact. The raw materials and final product underwent comprehensive quality control analyses. Microbiological quality was assessed following standard methods. Physicochemical parameters including pH, titratable acidity, density, dry matter, and fat content were determined according to Algerian Official Journal and AFNOR standards. Sensory evaluation was conducted using descriptive analysis and hedonic testing with trained panelists, comparing the developed product with commercial alternatives. The glycemic response was evaluated in diabetic subjects through measurement of fasting and postprandial blood glucose levels. The results demonstrated excellent microbiological safety and physicochemical quality of both the goat's milk and the formulated yogurt, with all parameters complying with regulatory standards. Sensory analysis revealed superior organoleptic characteristics in the developed product compared to commercial counterparts, particularly in color, texture, taste, and aroma, resulting in its first ranking in preference tests. Clinical evaluation showed a minimal postprandial glycemic increase in diabetic subjects following consumption of the enriched yogurt. The innovative yogurt formulation developed in this study represents a significant advancement in functional food technology for diabetes management. The combination of goat's milk with chia seeds, sweet potato, and pomegranate juice resulted in a product with enhanced nutritional profile, superior sensory attributes, and favorable glycemic response, offering a promising dietary option for diabetic populations.

Keywords
Functional food, goat milk, diabetes management, sweet potato, pomegranate

T3-P-12

Effect of enrichment with fermented wheat, acorns, and sorghum on the culinary properties and microstructure of Couscous

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Abstract
Couscous, a staple food widely consumed in various African countries, is produced from processed cereal grains. In several Algerian localities, it is traditionally enriched with fermented materials. The objective of this study was to evaluate the culinary quality and microstructure of couscous enriched with three fermented plant materials: wheat, acorns, and sorghum. Four formulations were prepared using couscous made from durum wheat semolina: couscous 1 (4% sorghum, 4% wheat, and 8% acorns), couscous 2 (8% acorns), couscous 3 (0.8% sorghum and 6% acorns), and couscous 4 (4% wheat and 4% acorns).
A comparative analysis of the four couscous types revealed significant differences in their physicochemical and microstructural properties. Among the samples analyzed, formulations C3 and C4 exhibited the best functional performance. Regarding the swelling index measured at 25°C and 95°C, C3 reached 131.11% and 165.55%, respectively, while C4 reached 124.9% and 157.0%. In addition, cooking-loss analysis showed higher values for couscous 1 and 2. Microstructural observations of couscous 2 revealed the presence of native starch granules, open porosity, and partial gelatinization.
Overall, the study demonstrates that formulations C3 and C4 have a significant impact ($p < 0.05$) on couscous structure, improving its functionality while preserving quality. These findings also highlight open promising perspectives for future industrial applications.

Keywords
Couscous; fermented materials; culinary properties; microstructure.

T3-P-13

Valorisation biotechnologique des grignons d'olive : isolement et caractérisation enzymatique de souches fongiques

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Abstract
L'olivier (*Olea europaea* L.) constitue une culture d'importance majeure dans l'ensemble du bassin méditerranéen, en particulier en Algérie. L'extraction de l'huile d'olive génère des résidus solides appelés grignons, généralement sous-exploités et susceptibles d'engendrer des impacts environnementaux. Cette étude s'inscrit dans une démarche de valorisation de ce sous-produit en examinant la diversité fongique qu'il renferme et en évaluant le potentiel enzymatique des souches isolées. Des échantillons de grignons ont été prélevés dans deux huileries situées à Bordj Bou Arreridj et Khenchela (Algérie). Ces résidus ont servi de milieu pour l'isolement et l'identification de différents champignons. Six genres ont été recensés : *Penicillium, Aspergillus, Mucor, Rhizopus, Wallemia* et *Moniliella*. Les capacités enzymatiques de ces isolats ont été étudiées en ciblant plusieurs hydrolases, notamment la cellulase, la caséinase et l'estérase. Les genres *Penicillium* et *Aspergillus* se sont distingués par une production enzymatique particulièrement marquée, confirmant leur intérêt pour diverses applications industrielles. Les résultats obtenus montrent que les grignons d'olive constituent un substrat favorable à la croissance fongique et à la synthèse d'enzymes d'intérêt. Cette recherche apporte ainsi une contribution à la valorisation biotechnologique des sous-produits oléicoles, en cohérence avec les objectifs de développement durable et de promotion de l'économie circulaire.

Keywords
Grignons d'olive, Champignons, Enzymes, Valorisation biotechnologique, Économie circulaire, Développement durable

T3-P-14

Impact of tomato by-product incorporation on selected properties of extruded gluten free pasta

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Abstract

Tomato by-product (TBP) is a nutrient rich by-product that could enhance nutritional value of gluten free pasta, and support sustainable waste reduction. This study investigated selected quality properties of gluten free rice pasta fortified with different amount of TBP (0, 7.5 and 10 %). Gluten-free pasta was made using a single screw extruder EXP-45-32 (Zamak Mercator, Skawina, Poland). Cooking quality (cooking loss and water absorption capacity), textural properties (hardness and firmness) and specific mechanical energy were evaluated. The results showed that the increase of incorporation level increased significantly ($p<0.05$) cooking loss (8.35 – 14.47 %), WAC (116.12 – 131.52%), and specific mechanical energy (0.11 - 0.72 kWh/kg), and decreased both hardness (5.68 – 13.07 N) and firmness (318.5 - 401.25 N). TBP can successfully be used (less than 7.5%) in nutritionally valuable pasta formulations. The processing parameters optimisation may allow the application of TBP in the production of gluten free pasta fortification.

Keywords

Extrusion-cooking, tomato by-product, gluten free pasta, textural properties, cooking quality

T3-P-15

Hot spring thermophiles as emerging sources of glycoside hydrolases for sustainable agro-food applications

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Abstract

Extremophilic organisms have emerged as promising resources for overcoming environmental constraints. They are known to survive under diverse extreme conditions, such as high temperatures, elevated salinity, and acidic or alkaline pH values, making them ideal candidates for producing thermostable enzymes highly sought after in various industrial applications. Glycoside hydrolases from thermophilic bacteria, including amylases, cellulases, xylanases, and β-galactosidases, have attracted considerable research interest due to their remarkable thermostability and catalytic efficiency.

This study aimed to screen glycoside hydrolases from thermophilic bacteria isolated from the Ibainan hot spring in Algeria, evaluate their enzyme production, and assess their thermotolerance at different temperatures to identify the most efficient strains.

Preliminary qualitative screening of extracellular amylase, cellulase, and xylanase activities, as well as β-galactosidase production, was carried out using a basal medium supplemented with starch, carboxymethyl cellulose (CMC), xylan, and ortho-nitrophenyl-β-galactoside (ONPG), respectively. A total of 85 bacterial strains were isolated from the thermal spring. Among these, 52 exhibited amylolytic activity, 38 showed cellulolytic activity, 7 demonstrated xylanolytic activity, and 7 produced β-galactosidase. Strains capable of hydrolyzing starch, CMC, xylan, and ONPG were identified and quantitatively evaluated for enzyme production using colorimetric methods. This led to the selection of *Geobacillus* spp. strains Sd15 and H3 as the most efficient producers. These results pave the way for further screening and optimization of glycoside hydrolase-producing thermophiles. Our findings not only enhance the understanding of microbial adaptation to extreme environments but also highlight valuable sources of high-performance enzymes for developing more efficient, cost-effective, and environmentally sustainable agro-food bioprocesses.

Keywords

Prospecting, Glycoside Hydrolase, Thermophiles, Ibainan hot spring

T3-P-16

Évaluation de l'aptitude de l'orge à la panification pour la production de pain baguettes fermentées au levain et à la levure boulangère

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Abstract

La consommation d'aliments à base d'orge complète présente de nombreux avantages pour la santé cependant, l'orge n'a été que marginalement exploitée par l'industrie de la boulangerie, en raison de ses mauvaises aptitudes à la panification. L'utilisation du levain peut être une stratégie pour améliorer la qualité du pain d'orge. L'objectif de ce travail est d'évaluer et de comparer le potentiel technologique de la farine d'orge « Tichedrett » en panification, à travers l'élaboration de pains baguette fermentés soit au levain naturel, soit à la levure boulangère. Plusieurs formulations de pain baguette ont été testées, il existe celle qui est à base de farine d'orge seule, ou bien celle mélangée avec la farine de blé tendre (FBT) et/ou additionnée de gommes de guar et de xanthane comme améliorants. Deux types de farines d'orge ; les farines blanche et complète ont été employées dans les tests de panification. La farine blanche d'orge (FBO) a subi une fermentation à la levure boulangère (*Saccharomyces cerevisiae*) alors que la farine complète (FCO) a été fermentée au levain naturel préparé à base de la même farine. Un pain préparé par la farine de blé tendre est pris comme témoin. Selon les résultats obtenus, l'emploi de la FBO ou FCO seule donne un pain qui se caractérise par un volume spécifique réduit (1,27±0,0392 cm^3/g et 1,41±1,18 cm^3/g respectivement) et une perte d'eau élevée comparé au témoin. La substitution partielle de la farine d'orge par celle du blé tendre améliore la qualité du pain pour les deux types de farine d'orge. Les meilleurs résultats sont obtenus pour les formules : 55% FBO/45% FBT et 50% FCO/50% FBT. La formule 70% FCO/30% FBT améliorée avec 1% de gomme guar a été préférée par le jury plus que le pain témoin. Le pain à base de farine d'orge complète au levain naturel été plus apprécié par les dégustateurs que le pain à base de FBO. Par ailleurs, l'analyse de l'image de la mie des pains préparés montre que le pain d'orge est moins airé que le pain de blé tendre pour toutes les formules testées.

Keywords

Farine d'orge, levain naturel, levure boulangère, pain baguette, gomme de guar, volume spécifique.

T3-P-17

Olive oil incorporation in a spreadable margarine and its impact on both physicochemical and thermal properties

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Abstract

This study investigates the impact of Olive Oil incorporation on the physicochemical and thermal properties of a spreadable margarine (OOM) compared to a reference margarine (BM), as well as its influence on a formulated pound cake. Results reveal significant differences between the two formulations. OOM presents significantly higher peroxide value (2.6 meq O_2/kg vs. 0.1 meq O_2/kg, $p < 0.05$), indicating a higher content of unsaturated fatty acids and more susceptibility to oxidation. Regardless, its oxidative stability remains comparable to BM (21.72h vs. 21.38h). OOM exhibits a higher melting point (41.80°C vs. 36.36°C), suggesting a

firmer texture. Other parameters: moisture, acidity, salt, and pH comply with industrial standards. Fatty acid analysis (C4:0–C18:3) confirmed the presence of *cis*-oleic acid (C18:1), characteristic of olive oil. Differential Scanning Calorimetry revealed distinct thermal transitions: both margarines melt between 30–40°C and crystallize near –10°C, but BM shows a higher reorganization enthalpy (458.36 J/g vs. 340.34 J/g), while OOM demonstrates stronger crystallization (94.42 J/g vs. 72.39 J/g). Application to pound cake highlighted subtle structural differences: OOM-based cakes (OOMPC) displayed slightly fewer alveoli (728.57 vs. 737.02) and lower alveolar surface area (20.22% vs. 23.47%) compared to those prepared with butter, reflecting the effect of lipid composition on texture. These results demonstrate that incorporating Olive Oil in a spreadable margarine changes its thermal properties and affect its oxidative stability, consequently modifying its technological functionality and interactions with food matrices. Deep investigation on fat crystallization is essential to understand the role of the formed crystal network and the dynamic interactions among the formulated pound cake.

Keywords
Margarine, Olive Oil, DSC, Pound Cake

T3-P-18

Innovative plant-based biocides: insecticidal and repellent activities of *Ruta montana* and *Ruta chalepensis* essential oils against *Tribolium castaneum*

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Abstract
The growing demand for safe and eco-friendly pest control solutions has accelerated interest in natural bioactive products that can contribute to food protection and public health. Within this context, essential oils represent promising innovative alternatives to synthetic insecticides, which raise increasing concerns due to their toxicity and environmental impact. Among these natural resources, *Ruta montana* and *Ruta chalepensis*, two Algerian aromatic species rich in biologically active compounds, remain underexplored for their potential use in developing health-oriented natural biocidal products. Building on this need for safer and more sustainable alternatives, this study aimed to investigate and compare the insecticidal and repellent efficiencies of the essential oils (EOs) from *R. montana* and *R. chalepensis* against *Tribolium castaneum*, a major pest threatening stored grains and, consequently, food quality and consumer health. To achieve this objective, aerial parts of both species were collected, air-dried, and hydrodistilled using a Clevenger apparatus to obtain the EOs. Their chemical compositions were then characterized by GC-MS. Bioassays were performed to determine larvicidal and adult toxicity (LC_{50}) through contact exposure, while repellency (RC_{50}) was assessed using an area preference method. The chemical analysis and bioassay results provided clear evidence of differential activity between the two species. GC-MS analysis revealed that both essential oils were dominated by 2-undecanone (81.18% in *R. montana*; 79.04% in *R. chalepensis*). *R. montana* exhibited notably higher efficacy, with lower larvicidal (LC_{50} = 96 ppm) and adult toxicity values (LC_{50} = 23.91 µL/cm²) compared to *R. chalepensis* (LC_{50} = 108.9 ppm and 27.12 µL/cm², respectively). Repellency results similarly demonstrated the superior effectiveness of *R. montana* (RC_{50} = 15.39 µL/cm²) over *R. chalepensis* (RC_{50} = 27.04 µL/cm²). Altogether, these findings highlight the potential of *Ruta* essential oils as innovative natural biopesticides capable of enhancing food safety and reducing human exposure to harmful synthetic chemicals. Their strong insecticidal and repellent activities support their relevance in the development of plant-based products that contribute to sustainable pest control and improved public health.

Keywords
Ruta chalepensis, *Ruta montana*, Essential oils, innovative natural biopesticides, *Tribolium castaneum*

T3-P-19

Lipophilic bioactive fraction of olive pomace: A clean-label perspective

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Abstract
Olive pomace, the main solid residue of the olive oil industry, represents a largely unexploited source of bioactive compounds with potential applications in clean-label food development and sustainable resource management. While hydrophilic components have been widely studied, the lipophilic fraction is gaining attention for its potential to provide natural pigment, antioxidant protection, and aroma enhancement in food systems. Current literature indicates that olive pomace contains a variety of non-polar bioactive constituents with techno-functional relevance. However, their levels and distribution are strongly influenced by multiple factors such as olive variety, ripeness, extraction technology, and postprocessing conditions. As a result, available data remain fragmented, highlighting the need for more systematic studies integrating optimized extraction approaches with robust analytical characterization Recovering natural pigments and aroma-associated molecules from olive pomace offers a sustainable strategy to replace synthetic additives while enhancing the nutritional and sensory quality of foods. This approach emphasizes how by-products can be transformed into functional ingredients that meet innovation trends, promoting naturalness and circular economy principles. This contribution provides an overview of lipophilic constituents in olive pomace, discusses their potential functional applications, and identifies priorities for future research.

Keywords
Olive pomace, lipophilic bioactives, clean-label, sustainable valorization

T3-P-20

Meat-powder-fortified savory cookies: formulation and evaluation

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Abstract
In response to increasing demand for innovative, convenient, and naturally protein-enriched food products, this study proposes the formulation of savory cookies fortified with meat powder. The meat powder was prepared from seasoned meat subjected to drying, with treatment at 120 °C for 2 hours, identified as optimal for producing a stable, aromatic, and easily grindable powder. Four cookie formulations were developed by varying the proportions of meat powder, oat flour, and the type of binder (eggs/yoghurt). Sensory testing identified the optimal formulation containing 20 g of meat powder, 46 g of oat flour, and eggs as the binder. The resulting cookies were characterized by a low moisture content (16.66%), a high protein level (42.78 g/100 g), and significant lipid content (28.9 g/100 g), while carbohydrate content remained moderate (0.56 ± 0.075 g/100 g). Microbiological analyses confirmed the product's safety. Sensory evaluation showed good overall acceptability, particularly regarding the crisp texture and spicy aroma. These meat-powder-enriched cookies therefore represent an innovative, high-value protein snack suitable for diverse nutritional needs.

Keywords
Meat powder, Savory cookies, Protein enrichment, Food formulation, sensory evaluation

T3-P-21

Locust bean gum as an effective edible coating material: Formulation and assessment

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Abstract

Preserving the quality of strawberries after harvesting is a crucial issue, because it has a limited shelf life. A number of techniques, such as edible coatings, which are getting a lot of attention, increase the shelf life of strawberries. The study aims to formulate and evaluate an edible coating (EC) with locust bean gum (LBG) as the main component. The coating was developed by dissolving LBG in distilled water while stirring continuously for an hour. After the LBG content was optimized, glycerol was added as a plasticizer. Ascorbic acid (AA) was added as a preservative to develop a secondary formulation. The efficacy of the coatings was assessed on strawberries, comparing two treatments: EC_1 (LBG + glycerol) and EC_2 (LBG + glycerol + AA), against an uncoated control (EC_0). After being soaked in the coating solutions for a minute, the strawberries were allowed to air dry before being kept at 4°C. Weight loss, pH, microbial growth, and color were among the parameters that were evaluated on days 1, 7, and 14 of storage. The results indicated that, in comparison to EC_0, both EC_1 and EC_2 considerably decreased weight loss. Over time, the pH of all the samples reduced. During the initial storage period (days 1 and 7), the coatings also effectively inhibited microbial growth, with EC_2 performing better. Furthermore, coated samples particularly those with the EC_2 formulation maintained better luminosity and red color intensity. The finding shows that LBG is an effective base for EC. It provides a sustainable and biodegradable alternative to conventional packaging materials, improving food preservation and reducing environmental impact.

Keywords
Locust bean gum; edible coating; strawberry; preservation; biodegradable

T3-P-22

Study of the effect of incorporating oregano in the making of Lemzeiet couscous

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Abstract
The aim of this work is to study the incorporation effect of different concentrations of oregano (5%, 10%) on the microbiological, physicochemical and sensory qualities of couscous lemzeiet and then their comparison. Physicochemical analyses (Moisture, ash content, pH and acidity, protein content, fat content and total carbohydrate content) of the raw materials (fermented wheat, oregano) and Lemzeiet samples, showed that the incorporation of oregano mainly gave a significance increase in protein, fat and total carbohydrate content. Microbiological analyses of fermented wheat (enumeration and observation of the flora responsible for the fermentation of wheat) revealed that the number of lactic acid bacteria (1,8.105UFC/g) is higher than that of yeasts and molds. Finally, sensory analysis confirmed that the acidity decreases with the incorporation of oregano and allowed to demonstrate that the incorporated lemzeiet improved its smell and the stickiness.

Keywords
Lemzeiet, oregano, fermented wheat, incorporation, analysis

T3-P-23

Characterization of rutabaga powder and its potential use in functional food formulations

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Abstract
The global demand for natural and plant-based functional ingredients highlights the potential of underutilized root vegetables such as rutabaga (*Brassica napus* L. var. *napobrassica*). Rutabaga is known for its antioxidant, anti-inflammatory, antimicrobial and chemo-preventive properties. Despite its nutritional benefits, it remains underexploited in food formulations. This study was carried out to propose an alternative form of rutabaga consumption by converting it into a powder after drying, with the objective of assessing its potential for

valorization as a functional ingredient. After drying, grinding and sieving, the rutabaga powder was evaluated for its physical and hydration properties. Particle size and size distribution, bulk and tapped densities, flow characteristics and color parameters were determined. Hydration properties including water and oil absorption capacities, water absorption and solubility index, wettability, swelling power and water/solvent retention capacities were also measured. Moisture and ash content were analyzed according to AOAC methods. In addition, a hydroalcoholic extract was prepared in order to quantify the total phenolic compounds and evaluate the global antioxidant activity using DPPH, FRP and pHM tests. The results showed that the rutabaga powder had a relatively large particle size distribution with a D50 of 148,36 µm and a Span of 1,37. Bulk and tapped densities were significantly lower, indicating a less compressed structure, while the CI (29,74) and HR (1,425) suggested low fluidity. Hydration properties were notable with WAC and OAC of 4,323 ± 0,716 g/g and 2,75 ± 0,335 g/g, respectively, WAI of 6,263 ± 0,567 g/g, WSI of 39 ± 2,00 %, SP of 5,870 ± 0,60 g/g, wettability of 30,330 ± 1,00 s and WRC of 4,28 ± 0,0595 g/g. Ash and protein content were 4,50 % and 6,70 g/100 g DM, respectively. Rutabaga powder showed a high concentration of polyphenols (194,96 ± 3,00 mg GAE/100 g DM), flavonoids (122,67 ± 1,50 mg QE/100 g DM) and high antioxidant activity, in particular DPPH (21,860 ± 0,500 mg AAE/100 g DM), FRP (613,52 ± 7,07 mg AAE/100 g DM) and pHM (252,86 ± 7,62 mg AAE/100 g DM). Overall, the comprehensive characterization of rutabaga powder highlights its functional potential, combining favorable physical and hydration properties with high levels of bioactive compounds and high antioxidant activity. These attributes support its incorporation into diverse food formulations as a natural functional ingredient.

Keywords
Rutabaga powder, functional ingredient, physical properties, phenolic compounds, antioxidant activity

T3-P-24

Optimization and characterization of enriched Couscous with milk thistle (*Silybum marianum*) seed flour

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Abstract
Food fortification is a promising strategy for combating micronutrient deficiencies and reducing their prevalence. Milk thistle (*Silybum marianum*) seeds are known for their high nutrient content. In recent years, several studies have explored the fortification of couscous with various ingredients. The present study aimed to optimize the formulation of a couscous enriched with durum wheat semolina and milk thistle seed flour to enhance its nutritional value, technological and cooking properties, sensory attributes, and potential antioxidant activity. The effect of incorporating milk thistle (*Silybum marianum*) seed flour (MTSF) and the hydration level on the swelling index and disintegration degree of durum wheat couscous was studied using response surface methodology (RSM). The nutritional value, total phenol content, and antioxidant activity of the optimized couscous were determined, as well as it's technological and cooking properties. The results showed that the coefficients of determination (R^2) of the models were greater than 0.75, indicating an acceptable fit. The optimal formulation for the production of enriched couscous was obtained. Compared to the control couscous (CC, 100% durum wheat), the enriched couscous (EC) showed significant improvements ($p < 0.05$) in protein, lipid, ash, and fiber content, as well as a significant reduction ($p < 0.05$) in total carbohydrate content. Furthermore, the phenolic compound content and antioxidant activity increased significantly. Finally, the incorporation of milk thistle seed flour improved the technological properties, including bulk density, swelling index, and optimal cooking time, and reduced the degree of disintegration. Regarding organoleptic qualities, the addition of MTSF did not alter the couscous's organoleptic properties. On the contrary, it gave it a distinctive taste and aroma, appreciated by tasters. Fortified couscous contains higher amounts of nutrients, excepting carbohydrates, and total phenolic content (TPC) and antioxidant activity. This enrichment enhances also the technological, culinary quality and sensory profile of the couscous.

Keywords
couscous; milk thistle seeds; optimization; swelling; disintegration.

T3-P-25

The valorization of citrus peels in active packaging

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Abstract

The valorization of citrus peels, often considered waste in the agri-food industry, presents a major opportunity for innovation in the development of active packaging. Bitter orange peels (*Citrus aurantium*) are particularly rich in bioactive compounds such as polyphenols and flavonoids, which are recognized for their antioxidant and antimicrobial properties. The valorization process begins with the collection of the peels, followed by drying to eliminate moisture, then grinding them into a fine powder. This powder can be integrated into packaging matrices made from pectin and gelatin, thereby creating edible films that protect food while enhancing its organoleptic quality. Studies show that these enriched films exhibit a strong antioxidant capacity, measured by tests such as DPPH and ABTS, and help inhibit the growth of pathogenic microorganisms, thereby ensuring food safety. This approach fits within a circular economy by transforming waste into functional products. By integrating citrus peels into packaging, agricultural waste is reduced while meeting the growing demand for sustainable solutions. In conclusion, the valorization of citrus peels provides an innovative solution to the challenges faced by the agri-food industry, enhancing food safety and promoting sustainable practices. This initiative deserves further exploration and dissemination in academic and industrial circles.

Keywords
Orange peels; active packaging; valorization; biodegradable films; antioxidant activity.

T3-P-26

Potential use of eggplant-peel anthocyanins in developing a smart packaging for chicken meat freshness monitoring

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Abstract

Natural colorimetric pH-Indicators, particularly anthocyanins are gaining traction as safe and biodegradable alternatives to synthetic dyes. The aim of our study is to develop and characterize a novel, biodegradable film with dual functionality by incorporating eggplant (*Solanum melongena L.*) peel anthocyanins into gelatin-alginate based matrix. In this study, Anthocyanins from eggplant peel were subjected to extraction, lyophilization and incorporation into a gelatin-alginate based matrix. Three distinct formulas were conceived: F_C: the baseline control formula with no anthocyanins added, F_1: film formula containing 0,2mg/mL and F_2: film formula containing 2mg/mL. In order to test the potential of films to be used as bio-sensors, their pH-indication ability was measured by pH-dependent increase in green intensity (IGI), and in order to be used as an active film, the antioxidant activity was measured by DPPH radical scavenging activity, as well as Ferric Reducing Power. The color of the films was measured using a Color Vision System (CVS). Results showed that, the green intensity of films increased with increasing pH values from pH_1 to pH_{10}, which means that their sensitivity to

different pH is significant and therefore, their indication effect based on pH is well established. Additionally, the films F_1 and F_2 showed significant antioxidant activities, notably DPPH scavenging activity of 23,32 %, respectively, and Ferric reducing power activity of 30,013% and 70,82%, respectively. Meanwhile, the Fc shows the weakest antioxidant activities of 5,9% and 18,5% of DPPH scavenging activity and Ferric reducing power, respectively. Additionally, the ΔE of the film increased closely with the concentration of anthocyanins, confirming that the color intensity of the films increases proportionally with the pigment content. Our findings demonstrate that eggplant-derived anthocyanins can be successfully incorporated into biodegradable films to produce materials with pH-responsive color changes and intrinsic antioxidant properties. Such films show great potential for use as intelligent and active packaging for real time freshness monitoring in food systems and with a special focus on meat matrix.

Keywords
Functional packaging, active packaging, bioactive compounds, meat quality, shelf life

T3-P-27

Study of the technological and sensory quality of gluten-free baguette bread based on hydrothermally treated rice-corn formula

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Abstract
Our present investigation aims to study the impact of hydrothermal treatment (HTT) of rice-corn formula (RCF) on the technological and sensory quality of gluten-free baguette bread (GFBB) intended mainly for celiac patients. The used flours, soft wheat flour (SWF), improved RCF and unimproved RCF were characterized (moisture and ash content, particle size distribution, Bulk Density (BD), Water Absorption Capacity (WAC) and Oil Absorption Capacity (OAC), Swelling Volume (SV), Water Retention Capacity (WRC)). The GF Bread-making was carried out with native and hydrothermally treated (HTT) improved and unimproved CRF, then compared to wheat control bread (WCB). A technological characterization of the breads was carried out: specific volume (Vsp), baking weight loss (BWL), final moisture, the color of the crust and the crumb, crumb alveolar structure. The sensory quality evaluation of breads was carried out using a hedonic test and a ranking according to preference. The moisture and ash content of the flours were within the standards, and their particle size met the requirements for bread-making. Similar BD was noted for the improved and unimproved RCF. The improved RCF had the highest hydration properties (WAC, SV and WRC). Hydrothermal treatment (HTT) significantly increased the BWL for both types of GFBB compared to their counterparts with native RCF. In addition, it significantly increased the Vsp and final moisture of GFBB of improved RCF, however, no significant difference was observed in the moisture of GFBB of unimproved RCF. The HTT affected differently the brightness (*L**) of crumb and crust of GFBB and significantly reduced their reddishness (*a**) and yellowness (*b**). Alveolar parameters revealed a more regular and homogeneous crumb structure of GFBB of improved and hydrothermally treated RCF, with a considerable number of alveoli and better circularity and solidity. For the sensory quality, GFB of improved and hydrothermally treated C RF was the most appreciated by tasters. Indeed, the combination of HTT and the presence of improvers significantly enhance the technological and sensory quality of GFB based on RCF.

Keywords
Rice-corn formula, gluten-free baguette bread, hydrothermal treatment, starch gelatinization, technological quality.

T3-P-28

Sensory and microstructural analyses of an innovative bread enriched with fermented acorn and sorghum flours

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Abstract

Bread represents one of the most widely produced and consumed staple foods worldwide. Nevertheless, sustainability imperatives and contemporary consumer demands have driven recent innovations in bakery toward sustainable and health-promoting products, made from alternative, and even fermented, grains as substitutes for refined wheat. This work aimed to develop two dietary breads by replacing wheat flour with fermented sorghum and acorns with the goal of offering healthier products, while evaluating their sensory and microstructural profiles. Two central composite designs (CCD) were used to optimize the formulation of two enriched breads, based on technological parameters. A control bread made from wheat flour was used. The incorporation levels ranged from 3 to 30 g/100 g (w/w) for fermented acorn flour and from 3 to 25 g/100 g (w/w) for fermented sorghum flour. The optimal breads were then characterized for their sensory and microstructural properties: a hedonic test was performed with 60 panelists, and microstructure was conducted using a scanning electron microscope. The results showed an optimal bread with 4.12 g of fermented acorn flour and another with 5.47 g of fermented sorghum flour. Sensory analysis showed a significant preference for bread enriched with fermented acorn flour, with higher scores for texture and acidity (7.52 and 6.13, respectively). It was generally better appreciated than the bread enriched with fermented sorghum flour. The incorporation of fermented flours significantly improved the appearance, and aroma of breads. The microstructural examination revealed that the loaves made with fermented acorns exhibit a more open and uniform matrix, characterized by well-defined pores and good cohesiveness within the protein-starch network, indicating superior structural organization. Breads incorporating fermented sorghum reveal a porous structure, however, more fibrous and irregular compared to bread enriched with fermented acorns. Some areas of separation or disintegration are observed at × 1000 magnification; the surface shows well-incorporated rounded granules (× 2500) compared to that of the control. In conclusion, breads using fermented sorghum and acorns have distinct sensory profiles and improved microstructural textures. This demonstrates how challenging it is to develop novel sensory profiles while yet satisfying client demands.

Keywords

Fermented acorn, fermented sorghum, bread, sensory evaluation, microstructure.

T3-P-29

Techno-functional properties of dried and debittered daper berry powders (*Capparis spinosa* L.) for food applications

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Abstract

Caper berries (*Capparis spinosa* L.) represent an underexplored botanical resource despite their abundance in Mediterranean regions and their traditional use in local food systems. Beyond their known sensory and nutritional attributes, their transformation into functional ingredients remains insufficiently documented. Developing techno-functional powders from caper berries could open new opportunities for their valorization in innovative and health-oriented foods. This study evaluates the physical and techno-functional properties of dried and debittered caper berry powders to assess their suitability for agri-food formulation. Fresh fruits were hand-harvested in three Algerian regions (Mila, Sétif, and Bejaia) and processed using two preservation methods: (i) drying followed by grinding, and (ii) debittering through brining prior to drying and grinding. The powders obtained were analyzed for hydration properties, flowability (Carr Index and Hausner Ratio), and densimetric characteristics. Results show that the two powders exhibit similar Carr and Hausner values, indicating satisfactory flow properties. However, water-holding capacity (WHC) and water-absorption capacity (WAC) were higher in the dried powder compared with the debittered one. Densimetric parameters—including bulk, tapped, and true densities—were significantly different ($p > 0.05$) between the two powders. These findings confirm the technological relevance of both powders and demonstrate their potential as functional ingredients suitable for incorporation in a wide range of food matrices. Their hydration and flow properties

make them promising candidates for developing innovative formulations or improving the functional profile of conventional products.

Keywords
Capparis spinosa L., caper berry powder, debittering, hydration properties, techno-functional functionality.

T3-P-30

Elaboration of biopolymeric aerogels for vitamin D encapsulation

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Abstract
This study explores the development and characterization of a natural encapsulation system aimed at protecting and stabilizing vitamin D through the use of a biopolymeric matrix derived from Aloe vera gel and snail mucus (Helix aspersa Müller), further reinforced with sodium alginate and glycerol. The primary goal was to formulate microcapsules and biodegradable films capable of shielding vitamin D from degradation induced by environmental stressors such as light, heat, and oxidation, while concurrently enhancing its bioavailability and sensory compatibility for potential applications in nutraceutical, cosmetic, and pharmaceutical products.
Biochemical analyses confirmed that both Aloe vera gel and snail mucus possess high moisture content (98.14% and 97.28%, respectively) and contain functional hydrophilic compounds, including proteins, fibers, and mineral residues. Aloe vera gel presented 0.42% protein, 0.88% fiber, and 0.31% ash, whereas snail mucus contained 0.81% protein, 0.52% fiber, and 0.48% ash. These compositions underscore the suitability of both materials as stabilizing, film-forming, and structuring agents within an encapsulation matrix. The slightly acidic pH values of the natural extracts further contributed to the physicochemical stability of the formulations, promoting compatibility among polymers and creating favorable conditions for vitamin D preservation.
Rheological assessment of the Aloe vera–mucus blend revealed a pseudoplastic (shear-thinning) behavior, a desirable property for ionotropic gelation processes. When exposed to Ca^{2+} ions, the polymer mixture demonstrated efficient crosslinking, resulting in the formation of cohesive, homogenous, and mechanically stable microcapsules. The addition of sodium alginate further enhanced gel strength and encapsulation efficiency, while glycerol acted as a plasticizer, improving the elasticity and flexibility of the resulting films.
Overall, the findings indicate that the formulated biopolymeric system is biodegradable, biocompatible, and non-toxic, offering a promising natural alternative to conventional synthetic encapsulation materials. Its capacity to protect vitamin D from environmental degradation, combined with favorable rheological and mechanical properties, highlights its potential for wide-ranging applications. This system shows strong promise for future development in functional foods, skincare and cosmetic formulations, and pharmaceutical delivery platforms, where stability, safety, and enhanced bioavailability of active compounds are critical.

Keywords
Vitamine D, Biopolymers, Encapsulation, Aloe vera, FTIR

T3-P-31

Impact of the incorporation of carob powder on the physicochemical, colorimetric, and functional properties of traditional Couscous

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Abstract
Couscous is a traditional and widely consumed staple food in Algerian cuisine, serving as a major source of energy and complex carbohydrates. However, its nutritional density can be enhanced by adding functional ingredients, particularly those rich in fiber, bioactive compounds, and health-protective elements. In this

context, the enrichment of couscous with carob powder, known for its high content of soluble fibers, polyphenols, galactomannans, and natural sugars, appears as an innovative and sustainable strategy aimed at improving nutritional quality without radically altering dietary habits.
This study evaluates the impact of incorporating carob powder at different rates (0%, 10%, 20%, and 30%) on the physicochemical, colorimetric, and functional properties of traditional couscous. The formulations were prepared using durum wheat semolina according to the traditional couscous preparation process, then subjected to analyzes focusing on moisture, ash, dietary fiber, protein, lipids, as well as the content of bioactive compounds (total polyphenols, flavonoids) and antioxidant activity. At the same time, the colorimetric parameters of the CIELAB system (L*, a*, b*) were evaluated to determine the visual effect induced by the addition of carob. The results show that the enrichment with carob powder leads to a significant increase in fiber, minerals, and sugars. Conversely, proteins and fats gradually decrease. An increase in polyphenols and antioxidant activity, reflecting an enhancement of the functional potential and nutritional value of couscous. On the colorimetric level, a decrease in luminosity values (L*) is observed, accompanied by an increase in red (a*) and yellow (b*) tones, reflecting a progressive darkening of the product, attributable to the natural pigmentation of the carob and its content of bioactive compounds. These results highlight the relevance of carob powder as a natural functional ingredient to develop couscous enriched with fiber and antioxidants, meeting current expectations in terms of health, nutrition, and the valorization of traditional products.

Keywords
Couscous; Carob powder, Physicochemical properties; Antioxidants; Color

T3-P-32

Assessing the potential of UAE, PLE and SWE for sustainable recovery of *Cystoseira sp.* yield

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Abstract
There is significant evidence that many nutraceuticals, functional foods and pharmaceuticals use the same types of plant extracts. The extraction methods used to produce these extracts are also related to their biochemical and physicochemical properties. Three extraction techniques were compared in this study: (1) Ultra Sonic-assisted Extraction, (2) Pressurized Liquid Extraction, and (3) Subcritical Water Extraction. Each extraction technique was carried out under optimised conditions, and the yield of each extraction method was determined via weight comparison between extraction techniques. From this comparison it can be determined that there are statistically significant differences in extraction yields between the three methods. Pressurised Liquid Extraction had the highest average, and the lowest extraction yields were obtained using the Ultra Sonic-assisted Extraction technique. We postulate that the higher extraction yields for both the Pressurized Liquid and the Subcritical Water Extraction techniques are due to greater penetration of the botanical material by the solvent with the combined use of both heat and pressure. This study supports the continued use of pressurised extraction methods to increase the yield and sustainability of the production of phlorotannins and phenolics from Cystoseira species, as these compounds exhibit high levels of bioactivity.

Keywords
Cystoseira, Bioactive compounds, Extraction method, Yield, Bioactivity

T3-P-33

Optimization of phenolic content and antioxidant activity from *Cystoseira.sp* using RSM_Box Behnkem

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Abstract

Compounds from *Cystoseira* species, especially phenolics and phlorotannins, are increasingly explored for their antioxidant and functional properties, which makes them interesting candidates for use in food applications. In this work, we focused on improving the extraction of these bioactive molecules using Ultrasound-Assisted Extraction (UAE). To understand how the extraction conditions influence the recovery of active compounds, we used a Box–Behnken design within a Response Surface Methodology (RSM) framework. Time, solid-to-solvent ratio, and amplitude were selected as the main variables, while Total Phenolic Content (TPC) and DPPH radical-scavenging activity were used as responses. The statistical models showed good agreement with the experimental data, and the three factors had different degrees of influence on both TPC and antioxidant activity. In particular, the ratio and amplitude contributed strongly to improving extraction efficiency. The optimized UAE conditions predicted by the model led to higher levels of phenolic compounds and stronger antioxidant activity. These results highlight the usefulness of RSM for adjusting extraction parameters and show that *Cystoseira* extracts can be promising ingredients for future functional food formulations.

Keywords
UAE, Cystoseira, Optimization, RSM, Bioactivity

T3-P-34

Targeting inflammation with Bee venom: Insights from carrageenan and xylene acute models

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Abstract
Inflammation is a protective response of the host, but excessive or uncontrolled inflammation can cause tissue injury, thus contributing to chronic diseases. Natural bioactive products, such as bee venom, have gained attention for their therapeutic potential. Bee venom is rich mixture of biologically active peptides, which have been reported to exert anti-inflammatory and immunomodulatory effects. To investigate these properties, its activity was evaluated using two complementary in vivo models of acute inflammation. The carrageenan-induced peritonitis model was used to assess the effects of bee venom on exudative inflammation. In this model, carrageenan is injected intraperitoneally to induce fluid accumulation, leukocyte migration (particularly neutrophils) and cytokine release. Inflammatory activity is quantified by measuring exudate volume and neutrophils recruitment. The xylene-induced ear edema model was employed to evaluate vascular and neurogenic inflammation. Here, topical application of xylene on the ear induces vasodilation, plasma extravasation, and edema formation, which can be quantified by ear thickness. In carrageenan-induced peritonitis, bee venom treatment significantly decreased neutrophil infiltration (51%), indicating strong inhibition of acute leukocyte recruitment and mediator release.in the xylene-induced ear edema test, bee venom markedly reduced ear swelling (100% after 3h), demonstrating attenuation of vascular permeability and plasma leakage. Bee venom exhibits potent anti-inflammatory activity across distinct complementary experimental models. By supressing leukocyte migration in peritonitis and reducing vascular-driven oedema in the ear model, it targets both cellular and vascular components of acute inflammation. These findings support the therapeutic potential of bee venom as a natural anti-inflammatory agent.

Keywords
Bee venom, Inflammation, *In vivo, Edema, Peritonitis*

T3-P-35

From tradition to innovation: plant-based meat preservatives used in Mila, Algeria

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Abstract
Located in northeastern Algeria, the Mila region is characterized by remarkable plant diversity, including numerous medicinal species widely used in traditional medicine, food preparation, and livestock care. Recognizing the importance of these biological resources, this study seeks to promote and preserve them by exploring their potential applications in the agri-food sector. To this end, an ethnobotanical survey was carried out during two periods in 2023 and 2024 to identify medicinal plants traditionally employed for meat preservation and to document the related local knowledge and practices among 1,000 households in the Mila region. Data analysis performed using Microsoft Excel and SPSS revealed that 82 respondents reported the use of various plants representing 18 species in total for meat preservation. Of these, 71% were herbaceous species; leaves were the most commonly used plant part (67%); and the predominant preparation method was in powder form (94%). The findings provide a valuable ethnobotanical database for future research in the Algerian agri-food sector, particularly for evaluating the effectiveness of these plant species in natural meat preservation.
Keywords
Mila region, Agri-food sector, Ethnobotanical, Medicinal plants, Meat preservation.

T3-P-36

Caper (*Capparis spinosa*) young shoots: Debittering, bioactive composition, and potential for food use

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Abstract
Caper (*Capparis spinosa L.*) is traditionally exploited for its flower buds (capers), while other plant parts remain underutilized in human nutrition. This study investigates the valorization of young vegetative shoots, a tender yet highly bitter fraction. Young shoots were harvested at the tender stage, washed, and subjected to a debittering process consisting of successive water immersions to reduce bitterness. After gentle drying, extracts were prepared to determine polyphenols, flavonoids, chlorophyll a and b, and caroteinoids pigments using standard spectrophotometric methods. Antioxidant activities were assessed through DPPH and FRAP assays. A sensory evaluation was also conducted with a semi-trained panel to assess residual bitterness, texture, and overall acceptability. Analyses showed that debittered young shoots retained notable levels of phenolic compounds (180.52 ± 16.95 mg GAE/100 g DW) and flavonoids (75.80 ± 9.09 mg QE/100 g DW), indicating substantial preservation of the polyphenolic fraction despite the aqueous treatment. Carotenoids (36.27 ± 1.94 mg/100 g DW) and chlorophyll a (1.36 ± 0.14 mg/100 g DW) and b (4.13 ± 0.14 mg/100 g DW) were also well preserved, demonstrating the relative stability of liposoluble pigments during debittering. Antioxidant activities confirmed this bioactive potential: FRAP values reached 628.62 ± 0.51 mg AAE/100 g DW, indicating strong reducing power, while the DPPH assay showed an activity of 143.62 ± 1.57 mg AAE/100 g DW, reflecting significant radical-scavenging capacity after treatment. Sensory results showed an effective reduction of bitterness while maintaining the tender texture and characteristic vegetal aroma of the shoots. The panel reported a marked improvement in overall acceptability, suggesting potential for direct consumption or incorporation as a functional plant ingredient. Overall, debittered caper young shoots appear as a promising new plant resource, combining nutritional interest, noteworthy antioxidant activity, and favorable sensory attributes.
Keywords
Caper shoots; Debittering; Techno-functional properties; Antioxidant activity; Food applications

T3-P-37

Avancées en bio-conservation alimentaire : Exploitation du potentiel bactéricide des résidus de *Crocus sativus L.* contre les *Clostridium* pathogenes

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Abstract

Ces dernières années, l'intérêt pour de nouveaux agents antimicrobiens capables d'inhiber la croissance des bactéries d'origine alimentaire, ou de prévenir l'altération des denrées s'est intensifiée. Parallèlement, l'amélioration constante du niveau de vie, et l'évolution des attentes sociétales conduisent les consommateurs à chercher des aliments plus sains, sûrs et dépourvus de conservateurs de synthèse. Les feuilles de Crocus sativus L., généralement considérés comme un déchet issu de la production de safran, pourraient constituer une source de composés bioactifs naturels utilisables comme conservateurs alimentaires. Ce travail visait à évaluer les propriétés antibactériennes d'extraits aqueux de feuilles de safran, obtenus par macération (AQ-ME) et par ultrasons (AQ-UAE), contre des bactéries pathogènes et d'altération d'origine alimentaire. Deux types d'extraits aqueux ont été préparés : par macération (AQ-ME) et par ultrasons (AQ-UAE). Leur composition en polyphénols a été analysée. L'activité antibactienne a été testée par la méthode de diffusion en puits sur gélose. La Concentration Minimale Inhibitrice (CMI) et la Concentration Minimale Bactéricide (CMB) ont été déterminées pour les souches sensibles, et un test de cinétique de bactéricidie a été réalisé. Les acides gallique et chlorogénique constituaient près de 70% des polyphénols identifiés. Les deux extraits ont principalement inhibé les bactéries Gram-positives, notamment les Clostridium (C. perfringens, C. botulinum, C. difficile), avec des diamètres d'inhibition de 12 à 18 mm. L'extrait AQ-ME a montré des CMI/CMB plus basses (250 mg/mL) que l'AQ-UAE (500 mg/mL). À une concentration de 1×CMI, les deux extraits ont démontré une activité bactéricide contre les trois espèces de Clostridium. Les feuilles de safran, un sous-produit agricol, possèdent une activité antibactérienne prometteuse, particulièrement contre les bactérie Gram-positives comme les Clostridium. Ces résultats suggèrent leur potentiel comme alternatives naturelles aux conservateurs conventionnels.

Keywords

Feuilles de safran, Antibactérien naturel, CMI, Clostridium spp, Sécurité alimentaire

T3-P-38

Développement de films biodégradables actifs à base de cellulose extraite du gingembre (*Zingiber officinale*) : Caractérisation physico-chimique et potentiel pour l'emballage alimentaire

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Abstract

Face à la problématique croissante de la pollution plastique, la recherche de matériaux d'emballage biodégradables et fonctionnels constitue un enjeu majeur pour l'industrie agroalimentaire. Dans ce contexte, la présente étude porte sur l'élaboration de biofilms actifs à partir de cellulose extraite du gingembre (*Zingiber officinale*), incorporant un extrait hydro-alcoolique de gingembre afin d'enrichir la matrice en composés bioactifs. Les films obtenus ont été soumis à une caractérisation physico-chimique incluant la teneur en humidité, l'épaisseur, la couleur (paramètres CIELAB) et la perméabilité à la vapeur d'eau. Les résultats montrent une teneur en humidité moyenne de 11 %, une épaisseur de 0,006 mm, et des valeurs colorimétriques de L = 95,05*, a = −5,10* et b = 13,30*, traduisant un film clair à nuance jaunâtre, caractéristique des pigments naturels du gingembre. Ces propriétés indiquent une bonne homogénéité, une transparence satisfaisante, et une stabilité visuelle propices à une utilisation en emballage alimentaire. L'ensemble des résultats suggère que la cellulose issue du gingembre, associée à son extrait hydro-alcoolique, constitue une matrice biopolymérique prometteuse pour le développement de films biodégradables actifs capables de prolonger la durée de conservation des aliments, tout en valorisant les résidus végétaux et en réduisant l'impact environnemental des matériaux d'emballage traditionnels.

Keywords

Emballage; Biofilm ; actif ; Cellulose ; Conservation

T3-P-39

Development of innovative muffins enriched with *Moringa oleifera Lam* seed hull: Technological approach and product quality

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Abstract
The seed coat of *Moringa oleifera Lam*, still largely underutilized, is rich in dietary fiber and bioactive compounds. Its incorporation into bakery products offers a promising opportunity for functional and sustainable innovation, addressing the growing demand for nutritious foods with reduced agro-industrial impact. This study aims to valorize this seed coat by incorporating its powder into muffin formulations, with the objective of developing an innovative, nutritionally enhanced, and sustainable bakery product. The dried seed coat was milled and characterized for its nutritional composition, bioactive profile, and antioxidant activity (DPPH, ABTS, FRAP). The powder was then incorporated into a standard muffin recipe at various levels (2.5–10%), and the resulting products were evaluated for their nutritional and technological properties. The characterization of the ingredient revealed an exceptionally high fiber content (~71%), low lipid level (<2%), and strong antioxidant activity (DPPH >80%, ABTS >90%), confirming its suitability as a functional ingredient. Enrichment of the muffins resulted in a marked increase in dietary fiber (up to ~5.6% at 10% incorporation) and ash content, together with a progressive decrease in lipid levels, from 26.8% in the control to approximately 21% at the highest substitution level. Technologically, incorporation of the powder reduced volume (from 119.8 cm^3 to ~73 cm^3) and height, whereas density increased proportionally with the addition rate. Water activity and moisture displayed moderate variations, reflecting expected changes in structure and water retention. Overall, the integration of *Moringa oleifera Lam* seed coat significantly enhances the nutritional profile of muffins while introducing bioactive richness, confirming its value as a promising functional ingredient. This work highlights the sustainable valorization of an agro-industrial co-product and provides a pathway toward the development of innovative, health-oriented, and technologically optimized bakery products.

Keywords
Moringa oleifera; seed hull; functional muffin; dietary fibers; sustainable innovation

T3-P-40

Valorisation durable des sous-produits agro-industriels dans l'alimentation des petits ruminants : effets sur les performances de croissance et la qualité de la carcasse

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Abstract
La valorisation des sous-produits agro-industriels représente aujourd'hui une voie stratégique majeure pour renforcer la durabilité des systèmes d'élevage, réduire les coûts alimentaires et limiter les pertes post-industrielles. Dans ce contexte, la présente étude examine l'intégration de sous-produits localement disponibles dans les rations destinées aux petits ruminants et analyse leurs effets sur les performances de croissance ainsi que sur la qualité de la carcasse. L'objectif est d'évaluer si ces matières secondaires, souvent sous-exploitées, peuvent constituer des alternatives viables et économiquement avantageuses aux aliments concentrés conventionnels. L'expérimentation a porté sur plusieurs lots homogènes d'animaux recevant des régimes dans lesquels les concentrés étaient partiellement substitués par des sous-produits équilibrés en énergie et en protéines. Les variables mesurées comprenaient la consommation alimentaire, le gain moyen quotidien, l'indice de conversion, les poids vif et carcassier, ainsi qu'un ensemble d'indicateurs qualitatifs tels que le rendement, la conformation, l'état d'engraissement et des paramètres physico-chimiques de la viande (pH, couleur, pertes à la cuisson). Les analyses zootechniques ont été complétées par une évaluation économique portant sur le coût de l'alimentation et la rentabilité de la substitution. Les résultats montrent que l'incorporation modérée de sous-produits permet de maintenir, voire d'améliorer, les performances de croissance tout en préservant la qualité de la carcasse. Des niveaux trop élevés peuvent toutefois réduire

l'appétence ou altérer légèrement la digestibilité, soulignant la nécessité d'un équilibre nutritionnel précis. Sur le plan économique, la substitution partielle entraîne une baisse notable du coût des rations, ce qui améliore l'efficience globale du système d'élevage. Du point de vue environnemental, la valorisation de ces coproduits contribue à la réduction des déchets et à une meilleure circularité des ressources agro-alimentaires. Dans l'ensemble, cette étude met en évidence le fort potentiel des sous-produits agro-industriels dans la formulation de rations durables et innovantes. Leur utilisation représente une opportunité pertinente pour concilier performance zootechnique, efficacité économique et respect des enjeux actuels liés à la durabilité et à la sécurité alimentaire.

Keywords
Sous-produits agro-industriels ; Petits ruminants, Durabilité, Performances de croissance, qualité de la carcasse

T3-P-41

Formulation of biscuit flour enriched with soft wheat germ: A physicochemical approach

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Abstract
Soft wheat germ, a by-product of cereal processing, stands out for its exceptional nutritional richness. This study aims to evaluate the effect of the progressive incorporation of wheat germ flour on the physicochemical properties of flour used in biscuit production. Five formulations (F1–F5) were prepared by substituting 3% to 15% of soft wheat flour (type T55) with wheat germ flour. Analyses were carried out on both the raw materials and the blended flours to determine moisture, pH, titratable acidity, crude fat, ash content, water-holding capacity, particle size, and color. Standard procedures were used, including oven drying for moisture, Soxhlet extraction for fat, and muffle furnace incineration for ash. Results showed that adding wheat germ flour significantly modified the flour's physicochemical characteristics. pH increased from 6.72 to 6.95, titratable acidity from 0.029 to 0.117, ash content from 0.52% to 1.20%, and fat content from 1.41% to 2.32%, while moisture slightly decreased from 12.4% to 11.52%. The composite flours were mainly composed of medium-sized particles (177–75 µm), reaching up to 56.99%. Color analysis revealed a notable decline in lightness (L* value), dropping from 91.31 in soft wheat flour to 70.01 in wheat germ flour, indicating darker blends as substitution increased. Water-holding capacity also rose progressively, attaining 0.73 g/g for wheat germ flour and 0.51 g/g for the F5 formulation. In summary, the progressive inclusion of wheat germ flour improves the nutritional profile of biscuit flour - enhancing fat, minerals, and water retention - while altering color and texture. These findings support the current trend of enriching bakery products with nutrient-dense ingredients without compromising their technological properties.

Keywords
Biscuit, formulation, physicochemical, wheat germ.

T3-P-42

Development of a novel gluten free muffin enriched with chestnut flour: Physical, textural, sensory, and antioxidant characteristics

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Abstract
Chestnut fruit abounds in carbohydrates, proteins, unsaturated fatty acids, fiber, polyphenolic compounds, as well as vitamins and micronutrients, that are behind the health-promoting properties of this plant. This study investigates the potential of substituting rice flour (RF) with chestnut flour (CF) at levels of 10–50 % to produce a gluten free nutritionally healthy muffins. Regarding the studied muffins, the following were determined: the physical, textural, antioxidant, chemical composition, and sensory properties. The results of the technological

evaluation revealed an improvement in specific volume that is superior to that of the gluten-free control. The muffin enriched with 40 % of chestnut flour presented the best specific volume of 3.45 cm^3/g and the lowest final moisture. The incorporation of this additive enabled the development of gluten-free muffins with a good alveolar structure. The muffin enriched with 30 and 40 % of CF displayed the highest alveolus size and surface fraction (2.75 mm^2 and 39.56 %, respectively). The textural properties indicated a good value of the hardness and adhesiveness of enriched gluten-free muffins compared to control muffin with rice flour. The incorporation of this additive also resulted in a significant increase ($p < 0.05$) in total dietary fiber content from 2.86 g/100g for the control gluten-free muffin made with only rice to 15.63 g/100g in the muffins with 50 % CF. Chromatographic analysis (HPLC-ESI-MS/MS (high-performance liquid chromatography-electrospray ionization tandem mass spectrometry)) revealed a wide variety of phenolic acids. The total content of free phenolic acids and the sum of polyphenols increased with increasing content of the functional additive. Moreover, the antioxidant activity was positively correlated with the addition of CF, the content of free phenolic acids, and total polyphenols. Sensory analysis allowed ranking the gluten-free muffins with moderate levels of chestnut flour as the best (values above 8). Our research has demonstrated that our innovative gluten-free muffins, with the addition of chestnut flour, has a potential to be a source of polyphenolic compounds, including free phenolic acids, that are valuable for human health.

Keywords
Gluten-free muffins, chestnut flour; functional food, textural properties, antioxidant activity.

T3-P-43

Fusion of tradition and innovation: impact of oregano-enriched couscous on its physicochemical properties, food safety, and characterization by SEM and FTIR

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Abstract
Facing current challenges related to food safety and the growing demand for natural and functional products, this study explores the enrichment of traditional couscous with oregano powder (*Origanum vulgare* L.), an aromatic plant known for its antioxidant, antimicrobial, and nutritional properties. The objective of this work is to evaluate the physicochemical and structural effects of this incorporation, as well as its implications for the quality and safety of the final product. The enriched couscous was prepared with different proportions of oregano and characterized through the following analyses.
Physicochemical analyses: determination of moisture content, color, protein content, total phenolic compounds, and antioxidant activity.
Morphological observation by SEM (Scanning Electron Microscopy): used to visualize the microstructure, the distribution of oregano particles, and their impact on grain texture.
FTIR spectroscopic analysis: employed to identify interactions between oregano bioactive compounds and couscous components (proteins and starch), indicating a homogeneous and stable integration of functional molecules.
The results show that oregano enrichment significantly enhances the nutritional value and antioxidant activity of couscous while providing natural protection against microbial contamination. SEM observations revealed a more compact and homogeneous surface structure, whereas FTIR spectra highlighted new characteristic bonds, confirming beneficial chemical interactions. This approach represents a sustainable technological innovation that combines culinary tradition with modern food safety requirements, paving the way for the development of functional cereal-based products made with natural bioactive ingredients.

Keywords
Enriched couscous, Oregano, Physicochemical properties, SEM, FTIR.

T3-P-44

Valorization of agri-food co-products as an appetite suppressant dietary supplement

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Abstract
Obesity and overweight are today major health issues, constantly increasing in the world due to a dietary imbalance and an increasingly sedentary lifestyle. To meet this challenge, we offer a natural and innovative solution: Green Faim, an appetite suppressant formulated from valorized agri-food co-products. Green Faim is based on a functional combination of agri-food by-products. The scientific study conducted around this product has integrated several series of tests (in vitro, in vivo, in silico) to characterize its properties and evaluate its potential as a natural weight management supplement. The physicochemical analyses made it possible to determine the composition in Protein, lipid, sugar and pH and the gastric swelling test. The in vivo tests were carried out on rats subjected to a hypercaloric cafeteria-like diet in order to simulate experimental obesity; the objective was to evaluate the impact of Green Faim on appetite by evaluating food consumption and body weight changes and finally the data are processed in silico by SPSS. The analysis of physicochemical parameters revealed that our sample is rich in protein with a percentage of 15.08%, lipid 10.41%, sugar 2.61% and pH of 5.33 and for the swelling test gave an index of 9ml/g it's-to say that the product is capable of absorbing 9 ml of water which translates a feeling of rapid satiety, statistical analysis shows that the product has an appetite suppressant effect of 31.5% and a slimming effect of 25.1%. In conclusion, Green Faim represents a natural, economic and sustainable alternative to support the fight against obesity and overweight. Its physicochemical properties, its high swelling capacity and the positive results from in vitro, in silico and in vivo studies confirm its potential as an innovative dietary supplement promoting the regulation of appetite.

Keywords
Obesity, agri-food co-products, Green Faim, gastric swelling test, appetite suppressant

T3-P-45

Valorization of date seeds: A comparative evaluation of the antioxidant activity of oil and polysaccharides extracted from seeds

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Abstract
Date seeds, an abundant by-product of the date palm industry, represent a valuable source of bioactive compounds. Their valorization is part of a sustainable approach aimed at developing new ingredients with nutraceutical, cosmetic, and pharmaceutical potential. The objective of this work was to evaluate the antioxidant potential of two fractions derived from date seeds: the extracted oil and silver nanoparticles (AgNPs) synthesized from the extracted polysaccharides. The oil was obtained by Soxhlet extraction using hexane and was characterized for its total polyphenol content (Folin-Ciocalteu method). Antioxidant activity was assessed using the DPPH free radical scavenging assay. Water-soluble polysaccharides were extracted by aqueous maceration followed by ethanol precipitation. They were used as reducing and stabilizing agents in the green synthesis of silver nanoparticles. Their antioxidant activity was also evaluated using the DPPH assay. The oil showed a yield of 9% of dry weight, with an appreciable content of total polyphenols and significant antioxidant activity. The transformation of polysaccharides into nanoparticles considerably enhanced the antioxidant effect, with dose-dependent radical scavenging activity. These results highlight the potential of date seeds as a valuable natural resource. The oil, rich in phenolic compounds, and the polysaccharide-derived AgNPs demonstrate strong antioxidant potential. Their exploitation could contribute to the development of high value-added products and to the sustainable management of agricultural by-products.

Keywords
Date seed, Agrifood industry, Green synthesis, Polysaccharides, Vegetal oil

T3-P-46

Etude de l'activité protéolytique d'une souche autochtone isolée du fromage traditionnel *Klila*

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Abstract
Le fromage traditionnel algérien « *Klila*» est une matrice riche en micro-organismes indigènes pouvant posséder des activités fonctionnelles prometteuses. La présente étude vise la production et l'étude des enzymes protéolytiques d'une souche *Lactococcus* MS07, isolée de ce produit fermenté. Après fermentation, l'activité protéolytique a été dosée selon la méthode de Tsuchida *et al.* (1986). Les différentes propriétés de l'enzyme produite ont été ensuite étudiées à différentes température (30 à 80 °C) et à différents pH (pH 5 à 12). Les résultats ont révélé une activité intéressante dont les valeurs sont maximales à 30°C (et stable jusqu'à 70°C) et à pH 9. Cette protéase alcaline et thermostable souligne son potentiel comme biocatalyseur pour applications industrielles exigeantes. L'étude met ainsi en évidence l'importance d'utiliser des souches indigènes issues d'aliments traditionnels dans le développement d'aliments fonctionnels, contribuant à la fois à la sécurité alimentaire et à l'innovation biotechnologique.

Keywords
Klila, activité protéolytique, *Lactococcus*, production, bactérie lactique

T3-P-47

Formulation d'un lait végétal à base d'amande et de mélasse de caroube. Effet sur la santé

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Abstract
Cette étude a été menée dans le but de formuler un lait végétal à base d'amande, enrichi en mélasse de caroube ajoutée comme arôme et colorant naturel. Ce genre de boissons est considéré comme une alternative saine au lait animal, en particulier pour les personnes qui adoptent un régime végétarien, ou celles atteintes de diabète ou encore souffrant d'une allergie au lactose. La préparation du lait d'amande enrichi en mélasse de caroube a été adoptée après plusieurs essais dans le but d'obtenir la formule finale. Les étapes suivantes ont été suivies : Préparation du lait d'amande et de la mélasse de caroube, puis incorporation de la mélasse de caroube (ménagère et de commerce) à différents taux dans le lait d'amande (comme exemple 100 g de mélasse ménagère pour 400g d'amandes). La boisson végétale formulée a subi un contrôle de qualité (pH, acidité, taux d'humidité, densité, teneur en matière grasse et en protéines, degré Brix, taux de cendres, extrait sec total). Notons que deux laits ont été comparés : le lait d'amande (A) enrichi avec de la mélasse de caroube commerciale et le lait (B) auquel une mélasse de caroube ménagère a été ajoutée. Une évaluation sur le produit formulé a été effectuée afin de déterminer les caractéristiques sensorielles pouvant satisfaire le consommateur. Les résultats obtenus ont révélé une différence en termes de paramètres physicochimiques entre les deux boissons (A et B). De plus, une comparaison entre la boisson (B) et le lait chocolaté de marque « Candy Choco » a été réalisée du fait que la caroube est utilisée comme substitut du cacao. Les résultats ont montré un rapprochement dans les valeurs obtenues, ce qui constituerait une alternative au lait commercial. L'évaluation sensorielle a révélé une appréciation de la boisson préparée avec un pourcentage de 80%. Enfin, cette étude a contribué à promouvoir un produit végétal purement local présentant des effets bénéfiques pour la santé et pouvant concurrencer les produits traditionnels sur le marché.

Keywords
Lait végétal, amande, mélasse, caroube

T3-P-48

Development of aquaculture feed based on olive oil by-products and *Hermetia illucens* larvae

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Abstract
The FeedFish project aims to develop a sustainable fish feed production chain based on the use of local resources, mainly black soldier fly larvae (Hermetia illucens, BSF) and olive residues. This approach aims to reduce dependence on imported meal, which is costly and has a high ecological footprint, while supporting the regional economy. Initial trials have shown that incorporating BSF meal into fish diets results in high digestibility (>85%), growth rates comparable to or even higher than those observed with conventional meal, and improved feed conversion. In addition, the use of BSF residues as organic fertilizer has led to a measurable increase in soil fertility (up to +20% organic matter compared to an unfertilized control). These preliminary results confirm the potential of BSF larvae as an alternative protein source and organic waste as a sustainable agricultural input. By integrating local partnerships, knowledge transfer, and an applied research program, the FeedFish project aims to establish a circular aquaculture feed model that combines zootechnical performance, economic profitability, and a significant reduction in environmental impact.

Key words
Valorization of co-products, Hermetia illucens, Olive by-products, Fish feed, Sustainable aquaculture

T3-P-49

Effect of honey addition on physical properties, oxidative stability, and digestibility of margarine

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Abstract
The present study investigated the effect of adding honey on the physicochemical properties, oxidative stability, lipid digestion, and price of margarine produced on a pilot scale. The margarine containing honey (MH) was compared to a control commercial margarine (MC). Honey addition modified margarine color, pH, humidity, and solid fat content, which, however, were within the ranges set for margarine standards. MH also showed higher elastic modulus (G)' values than MC, which, however, did not impair margarine spreadability. Polarized light microstructural analysis showed that honey addition increased crystal dimension. Under accelerated storage conditions (45 and 60 ◦ C for up to 90 days), the oxidative stability of MH was significantly higher than that of MC. In addition, the presence of honey improved the efficiency of lipid digestion (66 %) compared to that of MC (54 %). Despite the higher price of MH (3.20 € /kg) than that of MC (2.75 € /kg), honey presents high potential application prospects in margarine, driven by its ability to increase product oxidative stability and to modulate lipid digestibility.

Keywords
Algerian honey, Oxidative stability, Structural properties, In vitro digestibility, Price

T3-P-50

Enrichment of quinoa baguette with faba bean, chickpea, and lentil flour to improve the physical properties through mixture design

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Abstract
The FAO introduced quinoa to Algeria in 2013 as a gluten-free pseudo cereal. Algeria has aimed at its development through research programs in the south of the country. Quinoa flour is one of the alternatives for wheat flour in baking bread because of its high nutritional value and suitability for people with celiac disease.

The purpose of this study is to incorporate faba bean, chickpea, and lentil flour into quinoa baguettes and to develop the physical properties of quinoa bread using a mixture design. The baked baguettes were evaluated for culinary quality based on specific volume, crumb firmness, and porosity. For the loaf specific volume, the fitted cubic-special model in the formulations of the rice, quinoa, and legumes (Faba beans, chickpea, and lentils) demonstrates a high significance ($p < 0,05$), and shows a very high adjusted R^2 (85,58- 91,98 %). The GFB formulation prepared with quinoa rice bean (QRB) presented the highest loaf specific volume, followed by formulations prepared with chickpea flour (CHF) and lentil (LF). The volume yields were significantly different among the breads, with the highest values for specific volume (>1.85 cm3/g) for QRB, (>1,68 cm^3/g) for QRCH, and (>1,65 cm^3/g) for QRL. The analysis of crumb firmness, indicating a significant difference ($p < 0,05$), and indicating a high R^2 (85,93- 97,43 %), the linear effects showed that legume flours (faba bean, chickpea, and lentil) tended to increase hardness when used alone or at high levels. Among all the single ingredients, BF had the strongest negative linear coefficient in the regression models, while CHF and LF had the strongest positive coefficients. However, all three models presented large negative ternary interaction coefficients. The porosity model shows a significance ($p<0,05$) with R^2 (96-97%). Our models reveal that binary and ternary interactions have stronger effects on porosity than single-component (linear) terms. The Q–B and Q–L pairings showed positive synergies that increased porosity, whereas certain R–Q and R–B/R–CH pairings produced antagonistic effects likely due to increases in batter viscosity that limit bubble expansion.

Keywords
Quinoa baguette, legume flour, physical properties, mixture design

T3-P-51

Production of precipitated calcium carbonate for applications as an additive in dietary supplements

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Abstract
This work focuses on the synthesis of precipitated calcium carbonate (PCC) from neritic limestone sourced from the Algerian El Khroub deposit, a material characterized by its high chemical purity and elevated whiteness. The primary objective is to support and enhance local production capacity. The purification and conversion process of calcium carbonate comprises three major steps: calcination, hydration, and carbonation. Nanotechnological approaches were integrated into the workflow to improve process efficiency and facilitate reaction pathways. Experimental parameters for each stage including temperature, reaction kinetics, and solid-to-liquid ratios were optimized. Structural and chemical characterization of the resulting precipitate, conducted via XRD, XPS, BET surface analysis, and complementary techniques, confirmed the total absence of impurities such as trace metals. Ongoing pharmacotoxicological assessments aim to validate the suitability of the synthesized calcium carbonate for applications within the food and nutraceutical sectors.

Keywords
Calcium carbonate, precipitation, nanotechnology, purity, dietary supplement

T3-P-52

Innovative pharmacological assessment of *Capparis Spinosa* L.: Antioxidant, anti-inflammatory and gastroprotective potential for phytomedicine development

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Abstract
Capparis spinosa L. (Caper plant) is a traditional medicinal species widely used in Mediterranean medicine to treat inflammatory disorders, gastric dysfunctions and skin infections. The present study investigates its therapeutic potential through a combined in vitro and in vivo pharmacological approach, aiming to explore its suitability for the development of an innovative natural health product. A methanolic extract of *C. spinosa* leaves was subjected to phytochemical profiling, which revealed a high content of polyphenols, flavonoids, alkaloids

and glucosinolates. The antioxidant potential was evaluated using the DPPH radical scavenging assay, demonstrating strong free radical inhibition, closely correlated to the total phenolic content. Antimicrobial activity was assessed against Gram-positive and Gram-negative pathogenic bacteria, showing significant inhibition zones particularly against *Staphylococcus aureus* and *Escherichia coli*. In vivo evaluation focused on anti-inflammatory and gastroprotective activities using carrageenan-induced paw edema and ethanol-induced gastric ulcer models. The extract significantly reduced inflammatory edema and demonstrated remarkable gastric mucosal protection, comparable to standard anti-ulcer drugs. Additionally, analgesic activity was observed using the acetic acid-induced writhing test, suggesting the presence of bioactive compounds capable of modulating pain pathways. Toxicological assessment revealed low acute toxicity, supporting its safety within therapeutic dose ranges. These findings highlight the promising potential of *Capparis spinosa* as a candidate for the development of innovative phytotherapeutic products. Further investigations, including bio-guided fractionation and clinical validation, are recommended to identify active components and accelerate their pharmaceutical valorization.

Keywords
Capparis spinosa, antioxidant, gastroprotective, antimicrobial, phytotherapy

T3-P-53

Capparis spinosa L.: Toward a sustainable natural antioxidant and antimicrobial innovative product

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Abstract
The growing demand for sustainable and natural health solutions encourages the exploration of Mediterranean medicinal plants with high added value. *Capparis spinosa* L. (caper plant), widely distributed in Algeria, stands out as a promising candidate for the development of innovative bioactive products. This study focuses on the biotechnological valorization of *Capparis spinosa* through methanolic extraction of leaves and roots, followed by phytochemical analyses and biological assessments. The obtained extracts were tested for their antioxidant activity (DPPH and FRAP assays) and antimicrobial effects against *Staphylococcus aureus*, *Escherichia coli* and *Candida albicans*. The results reveal a significant antioxidant capacity, with IC_{50} values comparable to ascorbic acid, along with marked inhibitory effects against the tested pathogenic microorganisms. These biological activities are mainly attributed to the high content of polyphenols and flavonoids, particularly quercetin and rutin, known for their protective effects against oxidative stress and microbial infections. Overall, *Capparis spinosa* represents a strategic resource for the development of natural antioxidant and antimicrobial health products, supporting a reduction in dependency on synthetic antibiotics while promoting the sustainable valorization of Algerian biodiversity. This approach contributes to responsible innovation, linking public health, plant biotechnology, and sustainable development.

Keywords
Capparis spinosa L., plant biotechnology, natural antioxidants, antimicrobial

T3-P-54

Evaluation of alpha amylase inhibitory activity and antioxidant activities of Algerian chickpea (*Cicer arietinum* L.) flour and derived milk

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Abstract
Recently, growing interest in legumes has emerged due to their beneficial effects on human health including a reduced risk of type 2 diabetes, cardiovascular diseases, certain cancers and obesity. These health benefits are primarily attributed to the rich nutritional composition of legumes and their bioactive compounds, such as flavonoids, phenolic acids, tannins, and saponins. Among these legumes, chickpeas (*Cicer arietinum* L.) hold a particular significance. They are a kind of bean with a long edible and medicinal history, chickpeas are remarkably rich in a variety of plant proteins, vitamins minerals and essential amino acids, contributing to a wide range of biological activities like antioxidant and antidiabetic. One notable antinutritional property of chickpeas is their ability to inhibit α-amylase, an enzyme involved in starch breakdown. The growing demand for plant-based milk alternatives beyond soy beverages is driven by different reasons, from health-related issues to environmental impacts. Therefore, developing protein-rich drinks from pulses, such as chickpea, offers a promising alternative to dairy, providing numerous health benefits. Notably, chickpea milk has shown a significant potential to inhibit α-amylase activity, contributing to the modulation of carbohydrate digestion and support blood sugar management. The study evaluated the α-amylase inhibitory activity, using iodine/potassium iodide (IKI) method, and the antioxidant activities (ABTS, DPPH assays) of methanolic extracts from chickpea milk and chickpea flour. The chickpea milk extract demonstrated a higher α-amylase inhibitory activity (22%) compared to the flour extract (14%). In terms of antioxidant ability, both chickpea milk and flour samples showed significant ABTS scavenging activity, with an inhibition percentage of 58% and 46 %, respectively. However, their DPPH radical scavenging activity was notably lower. These results underscore the nutritional value of chickpeas and highlight that the process of creating chickpea milk can enhance the bioavailability of its bioactive compounds. This improvement in the accessibility of key nutrients and phytochemicals positions chickpea milk as a promising functional beverage with substantial health benefits.
Keywords
α-amylase inhibition, Chickpea milk, Legumes, Antioxidant activity, Bioactive compounds.

T3-P-55

Formulation and characterization of a *cherbet*-type beverage enriched with whey and matcha tea: Experimental study at the CRSTRA-Biskra

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Abstract
Cherbet is a traditional Algerian lemon-based beverage appreciated for its refreshing character but limited in nutritional value. Whey, a nutrient-rich dairy by-product, remains underutilized despite its proteins and minerals. Matcha is known for its high polyphenol content and strong antioxidant potential. This study aimed to formulate an innovative functional *cherbet* enriched with whey and liquid matcha extract to enhance physicochemical quality, antioxidant capacity, and sensory acceptability. The main objective is to formulate a functional *cherbet* incorporating whey and different concentrations of matcha extract. Specific objectives include:
- Physicochemical characterization of raw materials ans formulated beverages;
- Evaluation of antioxidant activity;
- Assessment of microbiological safety;
- Sensory evaluation and determination of consumer preference among three formulations. Three formulations were developed using 10 ml (A), 5 ml (B), and 2.5 ml (C) of matcha extract per 100 ml. Physicochemical analyses included pH, titratable acidity, dry matter, ash content, and mineral profiling (Ca^{2+}, K^{+}, Na^{+}). Antioxidant activity was measured by DPPH inhibition. Microbiological analyses screened for FMAT, coliforms, *Salmonella*, *Staphylococcus aureus*, yeasts, and molds. Sensory tests were performed by 25 panelists. Matcha addition significantly modified the beverage's properties. The pH decreased from 2.81 (whey *cherbet*) to 2.55 in the matcha-enriched version, while titratable acidity reached 0.9 g/L. Dry matter increased from 5.7% to 6.4%, and ash content from 0.20% to 0.73%. Mineral analysis revealed 21.94 mg/L K^{+}, 23.26 mg/L Na^{+}, and an unexpected reduction of Ca^{2+} to 0 mg/L. Antioxidant activity improved, with DPPH inhibition increasing from 65.45% to

68.05%, confirming the functional contribution of matcha polyphenols. Sensory evaluation indicated that sample B (5 ml matcha) was preferred: 100% of panelists rated its homogeneity as "very homogeneous", 84% appreciated its green color, and it achieved the highest hedonic score (60% "good", 20% "very good", 8% "excellent"). Microbiological analyses showed absence of FMAT, coliforms, *Salmonella*, *S. aureus*, yeasts, and molds, confirming the product's safety. The incorporation of matcha into whey-based *cherbet* significantly enhanced acidity, mineral content, dry matter, and antioxidant activity, while maintaining excellent microbiological quality and strong sensory acceptance. Matcha-enriched *cherbet* therefore represents a promising functional beverage suitable for industrial development.

Keywords
Cherbet, whey, matcha, physicochemical analyses, microbiological analyses.

T3-P-56

Formulation et caractérisation de gummies fonctionnelles enrichies en composés bioactifs : vers une confiserie santé

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Abstract
Dans un contexte où la demande pour des produits alimentaires sains et fonctionnels ne cesse de croître, la valorisation d'ingrédients naturels riches en composés bioactifs représente une voie prometteuse pour l'innovation agroalimentaire. La présente étude s'inscrit dans cette perspective en portant sur la formulation et la caractérisation de gummies fonctionnelles à base d'infusion d'hibiscus (*Hibiscus sabdariffa*), de poudre de moringa (*Moringa oleifera*) et de mélasse de datte. Ces trois ingrédients ont été choisis pour leurs propriétés nutritionnelles complémentaires et leur potentiel synergique, notamment en matière d'activité antioxydante et de richesse en micronutriments. La formulation a été optimisée à travers des essais préliminaires visant à déterminer les proportions idéales des composants, tout en assurant un équilibre entre les caractéristiques physico-chimiques et sensorielles. Le protocole de préparation, incluant le mélange, la cuisson et le moulage, a été rigoureusement standardisé afin de garantir l'homogénéité, la stabilité et la reproductibilité du produit final. L'évaluation biochimique des gummies a porté sur plusieurs paramètres de qualité : teneur en sucres, taux de HMF, pH, teneur en cendres, en polyphénols et flavonoïdes, activité antioxydante, teneur minérale (Mg, Ca, K, Na) ainsi que temps de dispersion. Une analyse sensorielle réalisée auprès d'un panel de consommateurs a permis d'apprécier l'acceptabilité du produit en termes de goût, texture, apparence et odeur. Les résultats obtenus confirment que les gummies développées présentent un profil nutritionnel et fonctionnel intéressant, tout en valorisant efficacement des ressources naturelles locales. Ce travail illustre ainsi une approche éco-innovante contribuant à la promotion d'une confiserie fonctionnelle durable.

Keywords
Gummies, *Hibiscus sabdariffa*, *Moringa oleifera*, mélasse de datte, caractérisation

T3-P-57

Effect of bay leaf and basil as natural preservatives on the physicochemical, microbiological, and sensory properties of butter

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Abstract
Aromatic plants are known for their antimicrobial and antioxidant properties, making them promising natural preservatives in food. This study investigated the effect of incorporating bay leaf (*Laurus nobilis*) and basil (*Ocimum basilicum*) into butter. We analyzed physicochemical properties such as fat content, pH, moisture, and

photosynthetic pigments (chlorophyll a and b). Microbiological safety was assessed by monitoring total aerobic bacteria, coliforms, *Staphylococcus aureus*, and *Salmonella*. Sensory evaluation was performed using a trained panel and a hedonic test. Adding 2% bay leaf or basil maintained a high fat content (65 ± 4.04 mg/100 g for bay leaf, 62 ± 3.05 mg/100 g for basil) and significant levels of chlorophyll a and b. Microbiological tests confirmed product safety and reduced spoilage, while sensory scores indicated that these additions improved acceptability compared to the control. Overall, bay leaf and basil appear to be effective natural preservatives with real potential for enhancing the quality and shelf-life of dairy products.

Keywords
Laurus nobilis, Ocimum basilicum, Butter, Natural preservatives, Microbiological quality

T3-P-58

Enriched biopolymer films: Structural characterization, molecular dynamics insights, and functional properties for active packaging applications

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Abstract
This study presents an integrated experimental and molecular modeling approach to develop bioplastics based on gelatin, pectin, and beeswax enriched with *Lavandula officinalis* essential oil (EO) for active food packaging. Molecular dynamics (MD) simulations over 100 ns showed that EO-enriched bioplastics (BES) exhibited reduced solvent-accessible surface area (SASA) and lower radius of gyration (Rg), indicating a more compact and cohesive network. These features, combined with fewer hydrogen bonds, suggest decreased hydrophilicity and support the experimentally observed reduction in water solubility (from 34.4% to 14.7%). The altered free energy landscape of BES also indicated greater conformational flexibility. FTIR spectroscopy confirmed EO–polymer interactions through hydrogen bonding and ester associations. Thermal analysis (TGA/DSC) demonstrated increased thermal stability in BES (Td_max = 186.7 °C vs. 172.1 °C). Water vapor transmission rate (WVTR) significantly decreased (from 2.99 to 1.40 $g \cdot m^{-2} \cdot h^{-1}$), enhancing moisture barrier properties. Mechanical performance improved markedly, with Young's modulus rising from 3.4 to 21.8 MPa. Antioxidant activity increased substantially (DPPH: 78.5%; ABTS: 75.8%) due to the bioactive components in the EO. Application to strawberry preservation showed that BES films minimized water loss and better retained titratable acidity (TA) and total soluble solids (TSS) during storage. These results highlight the dual benefit of EO incorporation: enhanced functional and structural performance, along with active protection of fresh produce. The integration of MD simulations with experimental validation provides molecular insight into material behavior and confirms the potential of EO-based bioplastics as sustainable and efficient active packaging solutions.

Keywords
Bioplastics, essential oil, Molecular dynamics simulation, strawberry preservation, packaging.

T3-P-59

Influence du stress éthanolique sur l'activité lipasique de *Yarrowia lipolytica* cultivée sur margine et huile de friture usée

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Abstract
La capacité de *Yarrowia lipolytica* à produire des lipases extracellulaires en présence de substrats agro-industriels constitue un atout pour la valorisation de résidus. Cette étude examine l'activité lipasique de la souche *Y. lipolytica* L2 cultivée dans deux milieux distincts, huile de friture usée (WFO) et margine (OMW), soumis à un stress éthanolique croissant (0 %, 3 %, 5 % et 7 %, v/v). L'activité enzymatique a été déterminée à

partir du p-nitrophényl laurate après 48, 72 et 96 h d'incubation. Les résultats révèlent une induction nettement plus rapide dans la margine, où l'activité atteint 0,55 ± 0,11 U/mL à 5 % d'éthanol après 48 h, alors que le milieu à huile usée demeure faiblement actif (<0,05 U/mL). À 72 h, une augmentation marquée est observée avec l'huile usée, culminant à 0,32 ± 0,01 U/mL à 3 % d'éthanol, tandis que la margine présente une légère baisse, particulièrement à 7 % (0,08 ± 0,01 U/mL). Après 96 h, la margine maintient une activité élevée sous 3 % d'éthanol (0,44 ± 0,05 U/mL), contrairement au milieu huileux qui reste faible (0,05–0,09 U/mL). Dans les deux milieux, 7 % d'éthanol exerce un effet inhibiteur prononcé. Ces résultats montrent que la margine constitue un substrat plus favorable à la production rapide et soutenue de lipases, et que des concentrations modérées d'éthanol stimulent l'expression enzymatique, contrairement à 7 % qui entraîne une inhibition significative. Ce comportement différentiel souligne l'intérêt de la margine pour des applications biotechnologiques impliquant *Y. lipolytica* sous stress contrôlé.

Keywords
Yarrowia lipolytica ; Activité lipasique ; Stress éthanolique ; Margine ; Huile de friture usée.

T3-P-60

Study of enzymatic activities and exopolysaccharide production by actinobacteria isolates

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Abstract
Actinobacteria are Gram-positive bacteria characterized by their production of bioactive molecules of great importance in the biotechnological field. This work demonstrates the antimicrobial activity specifically, the antifungal and antibacterial activity of actinobacteria isolates coded AB1 to AB5 from the semi-arid soil of the Tébessa province. The study focused on the degradation capacity of five different substrate isolates and their ability to produce EPS (si.mplified polystyrene) from a submerged environment. The enzymatic activity of the actinobacteria isolates showed that all five isolates possess a good capacity for producing hydrolytic enzymes, including amylases, proteases, pectinases, cellulases, xylanases, and gelatinases. Among them, isolate AB3 proved to be potentially very active. The exopolysaccharides (EPS) produced by our isolates exhibit strong emulsifying power, which makes them particularly interesting in various industrial applications, especially in the food sector. In particular, the EPS of isolate AB4 stood out with a high emulsification index of 92.3%, indicating high efficiency in stabilizing emulsions. These results suggest that these EPS could be used as natural emulsifying agents in the agri-food and biotechnological sectors.

Keywords
Enzymatic activity, EPS production, soil, actinobacteria

T3-P-61

Contribution of corn silk valorisation to sustainable development and food innovation: optimization and application strategies

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Abstract
Natural products have gained great importance for medicine and food industry due to their effective antioxidant activity. Natural sources such as plants, herbs, fruits, and vegetables contain a variety of antioxidant compounds that can be extracted. In humans, these compounds aid in preventing oxidative stress diseases and counteracting oxidation processes. Some of these natural products will be consumed, but a large part will be lost. The reduction of postharvest losses is a fundamental challenge for sustainable development and innovation in the food sector. Corn silk, a major agricultural by-product generated during maize production,

represents an undervalued resource with significant potential for transformation. This review aims to explore extraction, optimization (using unifactorial design and response surface methodology), and characterization strategies for bioactive compounds in corn silk, including antioxidants, flavonoids, and dietary fibers. The applications of extracted compounds in food, nutraceuticals, and health products are examined, with an emphasis on enhancing nutritional quality and minimizing environmental impact. Integrative approaches that combine technological innovation, green chemistry, and circular economy models are discussed as pathways to promote waste reduction, resource efficiency, and food security. These findings underline the importance of reimagining by-product management as a driver of sustainable, healthy, and resilient food systems.

Keywords
Sustainable development, corn silk, food waste reduction, bioactive compounds, extraction, food innovation, circular economy

T3-P-62

Valorization of agri-food residues for the development of hemicellulose-based biodegradable packaging films

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Abstract
The growing demand for sustainable and health-conscious food packaging has accelerated the search for renewable and biodegradable materials. This study explored the extraction, characterization, and valorization of hemicelluloses obtained from local agri-food waste, including tomato peels, lemon peels, and olive pomace, for the formulation of biodegradable films. Hemicelluloses were extracted using a mild alkaline treatment, followed by selective precipitation. The extraction yields reached 16.96% for tomato peels, 11.65% for olive pomace, and 11.33% for lemon peels. FTIR spectroscopy confirmed the polysaccharidic nature of the isolates, revealing characteristic functional groups such as O–H, C–H, C=O, and C–O–C bonds typical of hemicellulosic structures. Three formulation protocols were tested to develop biodegradable films. The third protocol, comprising 0.04 g/mL hemicellulose, 1% starch, 0.5% silica, and 40% glycerol, yielded the most cohesive, flexible, and homogeneous film. The resulting biofilms were characterized for their physicochemical and barrier properties, including moisture content (18.66%), water solubility, and water vapor permeability. A soil burial test demonstrated complete biodegradation within 14 days, confirming their environmental compatibility. Post-formulation FTIR analysis indicated the preservation of the chemical integrity of the polymers, confirming that film formation did not alter the hemicellulose structure. These findings emphasize the potential of hemicellulose-based biofilms derived from agri-food residues as promising candidates for sustainable packaging applications. In particular, tomato peels provided the highest extraction yield, while lemon peel hemicelluloses showed excellent film-forming properties. This work highlights an efficient strategy for transforming local agri-food waste into high-value, biodegradable materials, contributing to the circular bioeconomy and the development of bioactive, environmentally responsible food packaging solutions.

Keywords
Hemicellulose, Agri-food waste, Biodegradable films, FTIR, Sustainable packaging.

T3-P-63

Engineering nanoliposome-biopolymer films from waste for smarter food preservation

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Abstract
The environmental damage caused by synthetic packaging underscores an urgent need for sustainable alternatives. Biodegradable materials, particularly protein-based biopolymers like gelatin, keratin, and collagen from renewable sources, offer a promising solution due to their biocompatibility, cost-effectiveness, and

versatility. Advancing beyond simple biodegradability, this research focuses on developing smart, active packaging that provides protective functions. A key innovation involves integrating nanoliposomes—vesicles capable of encapsulating both hydrophilic and lipophilic compounds due to their bilayer structure—into biopolymer matrices. This study specifically utilizes proteins derived from poultry processing waste to create biopolymer films. These nanoliposome-integrated films are engineered to function as sustainable active packaging, offering antioxidant and antimicrobial properties. The resulting composite material presents an eco-friendly alternative to conventional plastics, with significant potential for extending the shelf life of perishable goods like meat products.

Keywords
Smart packaging, biopolymer, nanoliposomes, agrowaste.

T3-P-64

Bio-emballages actifs à base de polysaccharides et d'extraits de *Thymus vulgaris*

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Abstract
Le travail présenté porte sur la mise au point de biofilms biodégradables actifs destinés à l'emballage alimentaire. Face aux impacts environnementaux et sanitaires des emballages plastiques conventionnels, cette étude s'intéresse à l'utilisation de biopolymères naturels, principalement l'alginate de sodium et la cellulose, enrichis en extrait hydroéthanolique de *Thymus vulgaris*. Cette plante aromatique, largement utilisée dans l'industrie agroalimentaire, est reconnue pour ses propriétés antimicrobiennes et antioxydantes, ce qui en fait un agent bioactif particulièrement intéressant pour la conception d'emballages actifs. L'objectif principal est de développer des films comestibles présentant des performances améliorées en termes de propriétés physiques, barrières et fonctionnelles grâce à l'incorporation de *Thymus vulgaris*. Les films élaborés ont été caractérisés à travers divers paramètres : humidité, épaisseur, couleur, opacité, indice de gonflement et perméabilité à la vapeur d'eau. Les résultats montrent que l'ajout de l'extrait de thym permet de réduire l'humidité des films et de diminuer leur perméabilité à la vapeur d'eau, indiquant une meilleure capacité barrière. L'épaisseur des films augmente légèrement grâce à la formation de nouvelles interactions au sein de la matrice polymérique, tandis que leur coloration naturelle est influencée par les pigments caractéristiques du thym. En outre, l'extrait entraîne une amélioration globale des propriétés barrières et une légère diminution de la biodégradabilité par rapport au film polymérique pur. Dans l'ensemble, ce travail souligne le potentiel des biofilms d'alginate-cellulose enrichis en *Thymus vulgaris* comme alternative durable aux emballages plastiques traditionnels. Ces matériaux bioactifs offrent des propriétés intéressantes pour la conservation des denrées alimentaires et constituent une voie prometteuse pour le développement d'emballages plus sûrs, plus respectueux de l'environnement et issus de ressources végétales locales.

Keywords
Biofilm, Thymus vulgaris, Bioemballage actif, propriétés antimicrobiennes et antioxydantes

T3-P-65

Impact of region and climate on some physicochemical characteristics of olive pomace

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Abstract
Olive pomace is the major by-products of olive processing industry, which is considered as a rich source of dietary fiber and other natural bioactive compounds.
The region and climate influence the composition of olive pomace through factors such as altitude, temperature, and humidity.The aim of this work is to determine the impact of region and climate on the

composition of olive pomace. To this end, we conducted an experimental study based on the presentation of techniques for performing a physicochemical analysis (pH, dry matter, mineral matter, fat content, and crude fiber) on pomace from different regions: Sétif, Bordj Bouariridj, and Boumerdes. These analyses were performed using referenced methods.The results obtained show that the pomace from the most humid region (Boumerdes) is richer in water (78%) and lower in fat (5.12%). In contrast, for the high-altitude Bordj Bouariridj region, which is a less humid area, the pomace has a fat content of 13.9% and a lower water content of 43%. The pomace sampled from the wilaya of Sétif had a fat content of 6% and a moisture content of 59%. The fiber composition of olive pomace is primarily influenced by the region (which determines olive varieties, altitude, soil, and agricultural practices) and the climate (which affects olive maturity and quality). These environmental factors modify the lignin, cellulose, and fat content, thus affecting the quality of the pomace: 62.8% for pomace from Boumerdes, 36.1% for Bordj Bou Arreridj, and 16.8% for Sétif. In conclusion, a dry climate results in less hydrated olives, producing pomace with a lower water content. The water content of pomace is inversely proportional to its fat content. Region and climate act as determining factors, influencing the fiber composition of olive pomace through olive variety, altitude, growing conditions, climate, and cultivation practices.

Keywords
Olive pomace, physicochemical composition, climate, region

T3-P-66

Actinobacterial exopolysaccharides as natural biosurfactants: Production and emulsifying activity

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Abstract
Growing environmental and health concerns regarding synthetic surfactants have intensified interest in microbially derived surface-active compounds, valued for their low toxicity, biodegradability, and biocompatibility. While biosurfactants are currently used mainly in pollutant remediation, their emulsifying, antiadhesive, antioxidant, anti-inflammatory, and antimicrobial properties offer promising opportunities in food processing and formulation. Actinobacteria are well-known producers of diverse bioactive metabolites, and their exopolysaccharides (EPS) have attracted particular attention due to their structural diversity and multifunctionality, notably as natural biosurfactants and emulsifiers. In the present study, five actinobacterial isolates previously obtained from semi-arid soils in eastern Algeria were cultured under controlled fermentation conditions. EPS produced after seven days were recovered by ethanol precipitation following biomass removal by centrifugation. Their biosurfactant and emulsifying properties were evaluated through emulsification assays in an EPS–benzene system, using Triton X-100 and PBS as positive and negative controls. All isolates produced EPS, although yields varied among strains. Isolate AB6 produced the highest EPS quantity and exhibited a strong emulsification index (92.85%), indicating notable biosurfactant potential. Conversely, AB7 showed the lowest EPS production and a modest emulsification index (50%), while AB8, AB9, and AB10 demonstrated intermediate performance. Overall, these findings highlight the considerable biotechnological potential of actinobacteria from Algerian semi-arid soils. Their ability to synthesize biosurfactant-active EPS, emphasizes the need for further investigations to more accurately assess their application potential, especially for food industry applications where they may enhance safety, functionality, and health benefits.

Keywords
Actinobacteria- Biosurfactant- Emulsifying agent- Food industry- Additives

T3-P-67

Bunium sp., a promising functional plant against oxidative stress and hyperglycemia

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Abstract

Bunium sp. (Apiaceae) is traditionally used for managing digestive and metabolic disorders, yet its biological activities remain poorly studied. The antioxidant and antidiabetic properties of medicinal plants are closely linked to their phenolic compounds and metabolic modulators, contributing to the reduction of oxidative stress and postprandial hyperglycemia (Re et al., 1999; Brand-Williams et al., 1995; Kwon et al., 2006). This study provides a preliminary evaluation of the antioxidant and antidiabetic activities of a 70% hydroethanolic extract of *Bunium* sp. Antioxidant activity was assessed using DPPH, GOR, and ABTS methods, revealing approximate IC_{50} values of 790 µg/mL, 300 µg/mL, and 480 µg/mL, respectively, while α-amylase inhibition showed an estimated IC_{50} of ~550 µg/mL. These results suggest that *Bunium* sp. contains bioactive constituents with moderate antioxidant power and promising antihyperglycemic potential, supporting its relevance as a natural source of nutraceutical phytochemicals. Further studies, including LC-MS/MS profiling and confirmatory enzymatic analyses, are needed to validate and quantify its therapeutic potential.

Keywords

Bunium, antioxidant activity, antidiabetic activity

T3-P-68

Quand les *solanacées* défient les microbes alimentaires : le cas du "jasmin de la nuit" (*Cestrum Parqui*) : Essais in vitro sur les principales bactéries alimentaires

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Abstract

Contamination from food is a major public health issue today, made worse by the growing resistance of microorganisms to synthetic antimicrobials. In this context, natural plant-derived substances offer a promising approach for the development of safer and more environmentally responsible alternatives. Night-herb- Jasmine (*Cestrum parqui*), a species of the *Solanaceae* family, is known for its richness in bioactive compounds, particularly alkaloids, terpenes, and saponins. The bioactive compounds were extracted with ethanol using the solid-liquid V-method (1:10), and a leaf extract called EE-F was selected for this activity. The antimicrobial activity was evaluated using the agar diffusion method. The bacterial support consists of ten bacterial strains responsible for the principal cases of food intoxication in Algeria: *Escherichia coli* ATCC 25922, *Pseudomonas aeroginosa* ATCC 27853, *Klebsiella pneumoniae* ATCC 4352, *Salmonella paratyphi* ATCC 14028, *Enterococcus faecalis* ATCC 2035, *Bacillus subtilis* ATCC 9372, *Bacillus cereus* ATCC 10876, *Micrococcus leuteus* ATCC 533, *Staphylococcus aureus* ATCC 6538, and *Listeria monocytogenes* CIP 78-38. Ciprofloxacin and Cefazolin were used as control standards. The polar ethanol fraction showed significant inhibitory power against faecal strains (*Klebsiella pneumoneae*) and two species of the genus *Bacillus* (the major contaminants of dehydrated foods and cereals), and a notable antibacterial effect was observed against *Staphylococcus aureus.*

Keywords

Cestrum parqui, leaf extract, food intoxication, in vitro antimicrobial activity, food bacteria

T3-P-69

Valorization of corn silk in vinegar

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Abstract

This study falls within an innovative approach to the valorization of agricultural by-products, through the exploitation of corn silk (Maydis stigma), a plant residue rich in bioactive compounds. The work aims to transform this neglected raw material into a functional vinegar via a double fermentation process: alcoholic

followed by acetic. The study includes the physico-chemical characterization of the raw material, monitoring of the production process, analysis of the properties of the resulting vinegar, and a sensory evaluation to assess its acceptability. A preliminary physico-chemical characterization of corn silk revealed high moisture content (67.13% ± 0.92), a neutral pH (7.2 ± 0.0), low sugar content (0.75 mg/ml ± 0.46), and a soluble dry extract of 0.9 °Brix ± 0.03, requiring adaptation of the fermentation medium. Alcoholic fermentation, carried out using Saccharomyces cerevisiae, yielded a must containing 6% ethanol (v/v ± 0.0), used as a substrate for acetic fermentation by Acetobacter. The final vinegar showed a pH of 3.5 ± 0.28, a density of 1.0010 ± 0.0, and an acetic acid content of 1.53% ± 0.70, indicating satisfactory acidification. The sensory analysis, conducted with a panel of 20 individuals, revealed good acceptability of the corn silk vinegar, both in terms of taste and aroma. These results demonstrate the technological and nutritional potential of corn silk vinegar as a natural alternative that valorizes an agricultural waste.

Keywords
Corn silk, vinegar, alcoholic fermentation, acetic fermentation, valorization.

T3-P-70

Nephroprotective effect of a functional flour based on mussel by-products in a model of renal dysfunction induced by a high-calorie diet

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Abstract
The valorization of marine by-products is part of the circular economy and the search for functional foods. Undersized mussels constitute a biomass rich in bioactive compounds with antioxidant and anti-inflammatory properties. Chronic kidney diseases, often associated with metabolic syndrome, represent a growing public health problem. This study evaluates the nephroprotective potential of a flour based on Mediterranean mussel by-products in a model of renal dysfunction induced by a high-calorie diet in rats. Mussel by-products were processed into flour following an appropriate thermal procedure. The study included 24 male Wistar rats (4-5 weeks, 100 ± 20g) divided into three groups (n=8): control (C) with standard diet, group subjected to a high-calorie diet for 12 weeks (HC), and group receiving the same diet supplemented with mussel flour (HCMF). Evaluated parameters included serum creatinine, blood urea, creatinine clearance, 24-hour proteinuria, urinary albumin/creatinine ratio, as well as serum CRP and TNF-α. Statistical analysis by ANOVA followed by Tukey's test ($P<0.05$). The high-calorie diet (HC) induced significant renal dysfunction ($P<0.05$): serum creatinine 2.3-fold higher, urea increased 1.8-fold, creatinine clearance decreased by 42%, proteinuria increased 3.1-fold, and albumin/creatinine ratio 2.7-fold versus C. The supplementation of mussel flour (HCMF) significantly reduced serum creatinine by 38% and urea by 35% versus HC ($P<0.05$), improved clearance by 52%, and reduced proteinuria and albumin/creatinine ratio by 45% and 41% respectively. Serum CRP (3.8-fold higher in HC) was reduced by 58% in the HCMF group, and TNF-α (4.2-fold increase in HC) decreased by 64% ($P<0.05$). This study demonstrates the nephroprotective potential of Mediterranean mussel by-product flour, effectively reducing renal alterations and systemic inflammation induced by a high-calorie diet, suggesting promising nutraceutical interest for the prevention of metabolic renal dysfunction.

Keywords
Nephroprotection, marine by-products, functional flour, high-calorie diet, renal dysfunction.

T3-P-71

Étude de l'activité antibactérienne de *Lactococcus lactis* isolé du lait cru de chamelle d'Algérie vis-a-vis de *Pseudomonas fluorescens* et *Staphylococcus aureus*

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Abstract

La contamination des aliments est un problème majeur pour le consommateur surtout durant la période estivale dans les pays méditerranéens. L'exploitation des interactions bactériennes est un nouveau moyen pour lutter contre les germes indésirables. Le présent travail rapporte sur l'évaluation de l'activité antibactérienne de quatre souches lactiques appartenant à l'espèce *Lactococcus lactis* isolées à partir du lait cru de chamelle et d'un fromage frais camelin d'Algérie. L'activité antibactérienne des différentes souches lactiques a été testée surs des souches psychrotrophes de *Pseudomonas fluorescens* et des souches de *Staphylococcus aureus* isolées à partir du lait de chamelle cru. L'activité antibactérienne a été déterminée à partir d'un surnageant d'une culture des souches de *Lactococcus lactis* sur MRS par la méthode de diffusion en milieu gélosé. Les résultats obtenus ont montré que les souches de *Lactococcus lactis* exercent une activité inhibitrice intéressante vis-à-vis des bactéries testées. Cet effet inhibiteur a été constaté pour les quatre souches de *Lactococcus lactis*, avec des différences d'une souche à une autre et d'une bactérie testée à une autre. Les souches de *Lactococcus lactis,* ont montré un pourcentage d'inhibition allant de 69 à 98% pour les souches psychrotrophes de *Pseudomonas fluorescens* et allant de 65 à 75% pour les souches de *Staphylococcus aureus.* Une vaste étude est nécessaire pour prendre en considération sur la nature protéique inhibant les souches bactériennes et leur concentration optimale afin de l'utiliser comme conservateur naturel pour inhiber la croissance des microorganismes indésirables dans les produits laitiers.

Keywords
Activité antibactérienne, *Lactococcus lactis, Pseudomonas fluorescens,* laitde chamelle

T3-P-72

Activité antibactérienne de souches bactériennes telluriques sahariennes

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Abstract
L'évolution constante de la résistance bactérienne aux antibiotiques est un enjeu majeur en santé humaine. Pour pallier cette situation de plus en plus inquiétante, de nombreux projets de recherche sont mis en place. Ce travail s'intéresse en premier lieu à la mise en évidence du pouvoir antibactérien de trois souches bactériennes (S1, S2 et S3), issues de trois échantillons de sols provenant de différentes régions du Sahara d'Algérie. Les isolats montrent une capacité à inhiber la croissance d'au moins deux des bactéries de référence testées. Les deux souches S1 et S2 se distinguent par une activité à large spectre, qui a permis l'inhibition du développement des bactéries à paroi Gram + (*S. aureus* et *B. cereus*) ainsi que celles à paroi Gram – (*E. coli* et *P. aeruginosa*). La Souche S3 est quant à elle active contre deux bactéries de Gram différent (*S. aureus* et *E. coli*). L'influence de la composition du milieu de culture sur la production d'antibactériens par la souche S1 est étudiée sur quatre géloses différentes et montre que les géloses PCA et GBA sont les milieux favorisant le mieux l'expression de l'activité antibactérienne chez cet isolat. Le bilan de cette étude est prometteur et incite, par conséquent, une poursuite de la recherche, notamment dans la caractérisation des molécules bioactives produites et l'identification des souches bioactives.

Keywords
Souches bactériennes sahariennes ; Technique des cylindres d'agar ; Activité antibactérienne.

T3-P-73

Cymbopogon schoenanthus : solution naturelle pour la protection des grains stockés

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Abstract
Les pertes post-récolte liées aux insectes des denrées stockées représentent un enjeu majeur pour la sécurité alimentaire, en raison de la dégradation quantitative et qualitative des grains, de la contamination et du recours massif aux insecticides de synthèse. Dans ce contexte, cette étude évalue le potentiel insecticide de l'huile

essentielle de *Cymbopogon schoenanthus* (CS) originaire d'Algérie, utilisée comme alternative naturelle pour la protection des céréales contre le charançon du riz *Sitophilus oryzae*. Évaluer l'efficacité insecticide de l'huile essentielle de CS afin de proposer une solution naturelle et durable pour le contrôle des insectes nuisibles. L'huile essentielle a été obtenue par hydrodistillation et caractérisée par chromatographie en phase gazeuse couplée à la spectrométrie de masse (CG-SM). L'activité insecticide a été étudiée selon deux méthodes : toxicité par contact et toxicité par fumigation, en exposant les adultes de *S. oryzae* à une gamme de doses croissantes d'huile essentielle. La CG-MS de l'huile essentielle de CS a révélé une prédominance de piperitone parmi les monoterpènes oxygénés. Les essais de toxicité par contact ont permis de déterminer une DL_{50} de 1,73 µL/mL après 144 h d'exposition, indiquant une forte efficacité de l'huile essentielle à faible concentration. En parallèle, les tests de fumigation ont montré une TL_{50} de 51,78 h à la dose de 0,048 µL/cm³, traduisant une mortalité rapide des insectes en atmosphère confinée. L'huile essentielle de CS provoque ainsi un effet létal direct sur les adultes de *S. oryzae*, ce qui suggère une action neurotoxique et une perturbation des fonctions physiologiques, en cohérence avec sa richesse en monoterpènes bioactifs tels que la pipéritone. Ces performances insecticides soulignent l'intérêt de l'huile essentielle de *Cymbopogon schoenanthus* comme biopesticide potentiel pour la protection des grains stockés, en substitution partielle ou totale des insecticides chimiques conventionnels.

Keywords
Cymbopogon schoenanthus, huile essentielle, activité insecticide, *Sitophilus oryzae*, biopesticide, grains stockés

T3-P-74

Origanum Floribundum : conservateur naturel contre les contaminations microbiennes

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Abstract
La contamination microbienne des aliments constitue un enjeu majeur pour la sécurité alimentaire, en raison des risques sanitaires induits et de l'utilisation massive de conservateurs de synthèse. Dans ce contexte, cette étude évalue le potentiel antimicrobien de l'huile essentielle (HE) et de l'extrait éthanolique (EE) d'*Origanum floribundum* (OF), originaire d'Algérie, utilisés comme alternatives naturelles pour la préservation des aliments contre les agents pathogènes et les altérateurs. Évaluer l'efficacité de l'HE et de l'EE d'OF pour inhiber la croissance de différentes souches microbiennes (bactéries Gram-positives, Gram-négatives et champignons) afin de proposer une solution naturelle et durable pour la conservation alimentaire. L'HE a été extraite par hydrodistillation des feuilles séchées puis caractérisée par chromatographie en phase gazeuse couplée à la spectrométrie de masse (CG-SM), mettant en évidence la prédominance du p-cymène, du thymol et du carvacrol. L'EE a été obtenu par extraction au Soxhlet à l'éthanol. L'activité antimicrobienne a été évaluée par méthode de diffusion sur disque, détermination des diamètres d'inhibition, ainsi qu'aux moyens des valeurs de CMI (concentration minimale inhibitrice) et CMB (concentration minimale bactéricide).L'huile essentielle d'*OF* présente une forte activité antimicrobienne, avec de larges zones d'inhibition, notamment supérieures à 50 mm pour les bactéries Gram positives et certains champignons, et autour de 25–30 mm pour les bactéries Gram négatives les plus sensibles. Les CMI restent globalement basses, en particulier contre *Staphylococcus aureus, Bacillus subtilis* et *Candida albicans*, ce qui confirme une action efficace à faibles concentrations. L'extrait éthanolique montre une activité plus modérée, avec des diamètres d'inhibition généralement inférieurs à ceux de l'huile essentielle, mais reste intéressant vis-à-vis de plusieurs souches bactériennes. Ces résultats positionnent l'huile essentielle comme principal candidat conservateur naturel, l'extrait éthanolique jouant un rôle complémentaire. Ces performances confirment l'intérêt de l'huile essentielle d'*Origanum floribundum,* et dans une moindre mesure de son extrait éthanolique, comme conservateurs naturels antimicrobiens, susceptibles de remplacer partiellement ou totalement les agents de synthèse dans l'industrie agroalimentaire.

Keywords
Origanum floribundum, huile essentielle, extrait éthanolique, activité antimicrobienne, conservateur alimentaire.

T3-P-75

Techno-functional optimization of gluten-free pasta formulated with legume flours

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Abstract
The aim of this study was to develop gluten-free pasta with enhanced nutritional and technological qualities by incorporating legume flours—specifically chickpea and lentil—alongside functional hydrocolloids. The objective was to identify the most effective flour–hydrocolloid combination capable of generating a structured, cohesive dough with improved cooking performance and sensory acceptance. The methodological approach included rheological analyses (tan δ, viscoelastic profile) to assess dough structuring, coupled with techno-functional tests such as cooking loss, texture evaluation, and sensory assessment to validate the performance of the formulated products. Results demonstrated that chickpea flour supported the formation of a more stable and coherent matrix, whereas lentil flour tended to weaken the dough structure. The synergistic action of two hydrocolloids—carboxymethylcellulose (CMC) and locust bean gum—played a critical role in enhancing dough elasticity and reducing cooking loss. The optimal formulation (100% chickpea flour + 0.02% CMC + 0.02% locust bean gum) exhibited a balanced rheological behavior, a relatively low cooking loss (~12.6%), and high sensory acceptability. Overall, this work highlights the strong potential of legume flours as strategic ingredients in the development of next-generation gluten-free pasta. Their incorporation not only improves the nutritional value of the final product but also meets the increasing consumer demand for functional, health-oriented, and technologically reliable gluten-free foods.

Keywords
Legumes, Gluten-free pasta, Hydrocolloids, Rheology, Techno-functional properties

T3-P-76

Production of bioactive Angiotensin-I converting enzyme (ACE) inhibitory hydrolysate from bovine casein using plant-based protease

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Abstract
Hypertension is a major chronic condition that increases the risk of death from cardiovascular, cerebrovascular, and renal diseases, making it one of the leading causes of mortality worldwide. According to the World Health Organization, the prevalence of high blood pressure among individuals aged 50–79 is estimated at 49% worldwide, indicating that nearly one in three adults globally suffers from hypertension. Angiotensin I-converting enzyme (ACE) is a key enzyme in regulation of blood pressure through two different reactions in the renin-angiotensin-aldosterone system (RAAS) and the kinin nitric oxide system (KNOS). For this, many synthetic ACE inhibitors, such as captopril, enalapril, fosinopril, lisinopril, and ramipril were identified and used for the treatment of hypertension. However, these synthetic inhibitors have side effects including coughing, taste disturbance and skin rash. Thus, one of the major challenges to today's world healthcare sectors is to identify ACE inhibitors from natural resources. The current study aimed to explore the ACE inhibitory activity of casein hydrolysates liberated upon cleavage with Cardosin A. Cardosin A, an aspartic acid proteinase, was purified from *Cynara cardunculus* L. flowers. ACE inhibition activity of hydrlysates was studied by RP-HPLC model. This method was based on the liberation of hippuric acid (HA) from hippuryl L-histidyl L-leucine (Hip-His-Leu, HHL) catalyzed by the ACE. Degree of Hydrolysis (DH) of casein hydrolysates was also measured. The results showed that the generated hydrolysates exhibited a potent angiotensin-converting enzyme inhibitory activity with a low DH.

Keywords
Hypertension, Angiotensin I-converting enzyme, Cardosin, Casein Hydrolysate, Degree of Hydrolysis

T3-P-77

Identification of aroma compounds in camel milk and its traditional derivative *Elgares*

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Abstract
The objective of the study was the identification of volatile compounds in camel milk and its traditional derivative product *Elgares*. Part of the camel milk was freeze-dried and the other part was used to prepare a sample of *Elgares* according to a traditional method. The analysis of aroma compounds was performed using an electronic nose. The results showed that camel milk had 15 identified compounds with higher concentrations of acetone (8.78%), hexanal (5.98%), and heptanal (3.08%). *Elgares* had more aroma compounds (21 compounds) mainly 3-Methyl-1-butanol (16.38%), Ethyl acetate (3.86%), and Butan-2-one (2.80%). Moreover, 8 groups of chemical compounds were identified in both CM and Elgares with higher alcohols being the most representative in *Elgares* and aldehydes in camel milk. Processing of camel milk into *Elgares* affected its aromatic properties, which are influenced by several factors that contribute to its unique aromatic profile.

Keywords
Camel milk, *Elgares*, aroma compounds.

T3-P-78

FTIR spectrum, nutritional properties and antioxidant evaluation of freeze-dried beta vulgaris powders by *in-vitro* and cyclic voltammetry methods: prospects for use as a natural colorant

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Abstract
Beetroot is one of the most widely used sources of colorants in powder or extract form as a natural red colorant in dry mixes, candies, jams, and jellies, serving as an alternative to synthetic dyes whose consumption has been linked to various side effects. This study highlights the antioxidant potential of freeze-dried *Beta vulgaris* powders. The nutritional and physicochemical properties of the powders (water, sugar, fiber, fat, and ash content) were evaluated. The total phenol and flavonoid content were also estimated using the Folin-Ciocalteu and AlCl3 methods, respectively. Antioxidant activity was assessed in vitro using DPPH, ABTS, and iron ion chelation capacity. Furthermore, a novel instrumental tool for evaluating antioxidant potential, cyclic voltammetry, was used to assess their electrochemical properties and redox potential. The functional groups of the powder were evaluated, and spectra were recorded using an ATR-FTIR spectrometer in a spectral range of 400 to 4000 cm^{-1}. The FTIR spectrum revealed the presence of important functional groups such as hydroxyl and carbonyl fractions, indicating the presence of bioactive compounds, including phenolic compounds and betalains. Due to their high bioactivity, assessed by spectrophotometric methods, the freeze-dried beet powders exhibited remarkable levels of radical scavenging and considerable metal chelation capacity. Furthermore, the voltammogram of the powders indicates their ability to donate electrons around the anodic wave potential. These results demonstrate the effectiveness of these powders in mitigating oxidative stress. The evaluated nutritional properties revealed desirable results, such as low moisture content, indicating efficient drying, and good nutritional values. These results make beetroot powder an ideal food additive, rich in nutrients and compounds, making it a suitable alternative to synthetic food colorants.

Keywords
Beta vulgaris, FTIR, Cyclic Voltammetry, DPPH, ABTS, Food colorant

T3-P-79

From byproduct to beverage: Valorization of dairy whey into a functional drink

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Abstract
The dairy industry generates substantial quantities of whey, a nutrient-rich byproduct that poses significant environmental challenges due to its high biochemical oxygen demand (BOD) and disposal costs. Whey valorization into functional beverages represents a sustainable strategy to mitigate pollution while creating value-added products enriched in proteins, lactose, minerals, and bioactive compounds. This study aimed to develop and optimize a whey-based beverage formulation that balances sensory acceptability, nutritional quality, and environmental sustainability. A two-phase mixture design approach was employed. Phase I comprised three control formulations with increasing whey concentrations (35%, 50%, and 70% v/v), water, and citric acid (according to Good Manufacturing Practices, GMP). Phase II consisted of three enriched formulations combining whey (350, 500, and 700 mL/L), fruit juice concentrate (325, 250, and 150 mL/L, respectively), water (325, 250, and 150 mL/L), sucrose, and citric acid. Six beverage prototypes underwent comprehensive evaluation, including: (i) sensory analysis (appearance, color, taste, acidity, aftertaste) and ranking tests by a trained panel; (ii) physicochemical characterization (pH, titratable acidity, total solids); (iii) nutritional profiling (protein, lactose, mineral content); and (iv) microbiological quality assessment. Formulation B (35% whey, 32.5% juice concentrate, 32.5% water, sucrose, and citric acid) achieved significantly higher sensory scores ($p < 0.05$) and demonstrated optimal balance between organoleptic properties and nutritional value. Ranking tests confirmed B35% as the most preferred formulation among all six beverages, exhibiting superior sensory attributes and acceptable physicochemical and microbiological parameters. This whey-based beverage formulation provides a viable, sustainable solution for converting dairy effluent into a nutritionally enhanced, consumer-acceptable product, thereby contributing to circular economy principles in the dairy sector. The optimized formulation (B35%) demonstrates commercial potential for whey valorization while addressing environmental concerns associated with dairy waste management.

Keywords
whey valorization, dairy beverage, sensory optimization, circular economy, sustainable food systems

T3-P-80

Innovative tablet formulation of *Saussurea lappa* root powder: Flowability and physicomechanical performance

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Abstract
Medicinal plants play a central role in modern phytopharmaceutical development, and *Saussurea lappa* (Indian costus) is widely recognized for its rich profile of bioactive compounds and therapeutic potential. As a resilient species traditionally cultivated in upland and degraded soils, its valorization into standardized solid dosage forms aligns with nature-based solutions by encouraging sustainable cultivation, supporting soil restoration, and promoting the responsible use of high-value medicinal plants. This study explored the formulation potential of S. lappa root powder by assessing its flowability, a critical parameter influencing powder handling, uniformity, compressibility, and overall tablet performance. Using standardized characterization and angle-of-repose evaluation, the powder demonstrated flow behavior consistent with pharmacopeial expectations, confirming its suitability for further development into innovative herbal tablets. These findings provide essential pre-formulation insights that support both the advancement of S. lappa-based phytopharmaceuticals and the integration of medicinal plant valorization within sustainable, restoration-oriented practices.

Keywords
Saussurea lappa; Herbal tablet formulation; Powder flowability; Nature-based solutions

T3-P-81

Artemisia Herba Alba and *Rosmarinus Officinalis* extracts: Natural alternatives for improving the preservation, nutritional quality, and sensory properties of chicken and beef

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Abstract

Meat products are highly susceptible to lipid oxidation, leading to safety and quality concerns. Plant extracts have demonstrated promising potential as natural antioxidants and preservatives in meat products. The primary objective of this study was to evaluate the effects of separately adding *Artemisia herba alba* and Rosmarinus officinalis extracts on the nutritional quality, oxidative stability, and sensory characteristics of chicken and beef (both minced and in sausage form). Meat samples, with or without additives (plant extract or Vitamin C), were stored under two different temperature conditions: at 4°C for 7 days (refrigeration) and at -18°C for 21 days (freezing). Results revealed that meats preserved with white wormwood (*Artemisia herba alba*) exhibited superior nutritional characteristics, particularly in terms of lipid content, with less pronounced MDA levels observed compared to those preserved with Vitamin C or without additives. TBA values recorded after the freezing period were 0.02 and 0.32 mg MDA equivalent/kg for chicken and beef meats supplemented with *Artemisia herba alba* extract, respectively. These values contrasted favorably with control samples (0.06 and 0.46 mg MDA equivalent/kg) and those treated with Vitamin C (0.04 and 0.36 mg MDA equivalent/kg). *Rosmarinus officinalis* extract also demonstrated high water retention capacity and significant lipid content preservation. From a sensory perspective, beef sausages treated with *Artemisia herba alba* extract exhibited improved flavor, texture, and juiciness, as well as a more appealing color, contributing to enhanced overall gustatory appreciation. *Artemisia herba alba* and *Rosmarinus officinalis* plant extracts have proven to be effective alternative preservatives in meat products, particularly as potent antioxidant agents.

Keywords

Meats, *Artemisia herba alba*, *Rosmarinus officinalis*, Preservation, Nutritional quality.

T3-P-82

Innovative gluten-free energy bar enriched with carob, moringa leaves, and pumpkin seeds

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Abstract

In an era where demand for healthy and functional foods is rapidly growing, developing innovative products derived from natural ingredients is vital. This study investigates the formulation of a gluten-free energy bar with exceptional nutritional and bioactive properties, crafted from locally sourced carob (Ceratonia silique L.) from Relizane, moringa leaves (Moringa oleifera L.) harvested in Blida, and pumpkin seeds (Cucurbita pepo L.) collected in Sidi Bel Abbès. These carefully selected ingredients are rich in bioactive compounds such as polyphenols, flavonoids, proteins, fibers, and minerals, which confer potent antioxidant and nutritional benefits. The formulation was meticulously optimized to produce a balanced product tailored for consumers seeking natural, gluten-free, and health-promoting options. The final product underwent comprehensive nutritional analysis, phytochemical screening to identify secondary metabolites, antioxidant activity evaluation via DPPH assay, and sensory testing to determine consumer acceptability. Results demonstrated a nutrient-dense bar containing 48 g/100 g carbohydrates, 9 g/100 g proteins, and 23 g/100 g fats, delivering 449 Kcal/100 g. The bioactive profiling confirmed high polyphenol and flavonoid levels accompanied by strong antioxidant capacity. These findings highlight the promising functional and sensory attributes of the developed energy bar, underscoring the valuable role of leveraging local natural resources for creating innovative, health-enhancing food products.

Keywords

Energy bar, carob, moringa, pumpkin seeds, antioxidants, gluten-free, food

T3-P-83

Physicochemical analysis, phytochemical study and antimicrobial activity of propolis and its incorporation in confectionery product

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Abstract

Propolis is known for its significant therapeutic properties, which are directly linked to its diverse chemical composition. To promote this natural product and give it a distinct identity, this study examined the physicochemical and biochemical characteristics, as well as the antioxidant activity, of a local propolis sample. The research was carried out in two main phases. In the first phase, the experimental analysis showed that propolis is acidic, with a natural pH of 5.6 and an acidity level of 4%. It is rich in phenolic compounds and flavonoids and contains 93% dry matter with a moisture content of 8.15%. The ethanolic extract demonstrated remarkable antimicrobial activity against several strains, except for *Escherichia coli*, which showed no sensitivity. The second phase involved developing an innovative recipe for propolis-based candy, in accordance with food quality and safety standards. Natural ingredients were used to achieve the optimal balance between taste and health benefits. Sensory evaluation and stability testing were conducted to assess consumer acceptance and product durability. The taste tests indicated a high level of approval, confirming the project's success in combining flavor with nutritional value. In conclusion, the study provides recommendations for expanding candy production and outlines directions for future research on additional applications of propolis in the food and health sectors. This work represents a meaningful step toward promoting natural ingredients to improve public health and enhance food product quality.

Keywords

Propolis, physicochemical analysis, phytochemical screening, antioxidant and antimicrobial activities

T3-P-84

Evaluation of the antibacterial potential of *Melia azedarach* leaf extracts (Algerian and Tunisian) against pathogenic bacteria through ROS induction

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Abstract

Melia azedarach L., a tree belonging to the Meliaceae family, is widely used in traditional medicine for its various pharmacological properties. In this study, we analyzed the phytochemical composition of hydro-methanolic leaf extracts of *M. azedarach* from different origins (Algeria and Tunisia) using High-Performance Liquid Chromatography (HPLC). This allowed us to identify various phytochemical compounds possessing important pharmacological properties, including antibacterial activity. The antibacterial efficacy of these leaf extracts and their modes of action against pathogenic Gram-positive and Gram-negative microorganisms were subsequently evaluated. Our results revealed the presence of phenolic acids and flavonoids across the different localities selected for this study. Furthermore, the hydro-methanolic extracts showed a broad spectrum of antibacterial activity, as well as an eradication of bacterial biofilm. These extracts are capable of inducing bacterial toxicity by disrupting the membrane integrity of the treated bacteria and by inducing oxidative stress through a significant increase in intracellular ROS levels. Similarly, our results show that *M. azedarach* leaf extracts induce lipid peroxidation by increasing MDA levels compared to untreated cells, and also reduce the synthesis of antioxidant enzymes (CAT and SOD). Our findings demonstrate that *M. azedarach* remains a plant with significant antibacterial potential and distinct modes of action that are closely linked to the origins of the specimen.

Keywords
M. azedarach L, ROS, Antibacterial potential, Biofilm, Mechanism of action

T3-P-85

Synergistic impact of laccase and sourdough on the quality attributes of gluten-based bread

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Abstract
Bread quality is strongly influenced by both formulation and processing, including the use of sourdough and enzymes. The aim of this study was to evaluate the effect of combining sourdough fermentation with the enzyme laccase on the quality attributes of gluten-based bread. Three sourdoughs (white wheat, wholemeal wheat, and barley) were prepared, and after preliminary trials, an incorporation level of 40 % sourdough was selected for its superior technological and quality characteristics. Laccase (10 or 20 ppm) was added to the formulation to assess its impact on bread crumb texture, moisture, and overall quality. Results showed that in wholemeal wheat sourdough breads, laccase significantly improved crumb softness: hardness decreased from 33.21 N (control) to 23.24 N (10 ppm) and to 12.97 N (20 ppm). Chewiness and gumminess also declined markedly. In white wheat sourdough breads, laccase had a modest effect, with crumb hardness slightly increasing from 17.22 N to ~18.6 N at 20 ppm, likely due to lower levels of phenolic compounds and fibers that facilitate laccase-mediated cross-linking. In barley sourdough breads, laccase produced only moderate improvements, suggesting that the β-glucan–rich matrix limits enzyme efficacy. The beneficial effect in wholemeal breads is attributed to laccase-catalyzed oxidative cross-linking of phenolic compounds within the fiber-rich matrix under acidic sourdough conditions, strengthening the gluten network and improving crumb structure. This enzymatic treatment reduced hardness, chewiness, and gumminess while preserving cohesiveness and springiness, producing a soft, cohesive crumb with improved moisture retention. These findings demonstrate that combining sourdough fermentation with targeted enzymatic treatment specifically laccase can significantly enhance bread texture, particularly in wholemeal sourdough breads. This approach provides a practical route for developing high-fiber, clean-label breads with superior sensory and structural quality. Considering the high global consumption of bread, and especially in regions such as Algeria, this formulation strategy offers the opportunity to produce breads that are healthier, more appealing, and free from synthetic additives.

Keywords
Sourdough, Laccase, Texture, Quality, Fermentation

T3-P-86

Development and optimization of an innovative biscuit recipe based on legumes

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Abstract
Biscuits are a category of widely consumed products for which nutritional innovation is increasingly sought. The present study aimed to develop and optimize an innovative biscuit based on durum wheat and legumes (lentils and chickpeas), evaluating its antioxidant potential and sensory characteristics.The biscuits were prepared according to a traditional recipe, with flour blends formulated using an optimal mixture design in the JMP statistical software. After baking, the biscuits were cooled and stored in food-grade bags at 4 °C. Phytochemical analyses were performed, including the determination of total phenolic compounds, flavonoids, and carotenoids, as well as the evaluation of antioxidant activity using FRAP and ammonium phosphomolybdate assays. Sensory analysis was also conducted to assess color, odor, texture, aroma, taste, and aftertasteThe results showed that the optimal ingredient proportions were 57.8 % durum wheat, 24.3 % lentils, and 17.8 % chickpeas, with total phenolics, flavonoids, and carotenoids contents of 194.33 mg GAE/100 g, 129.15 mg QE/100 g, and 13.48 mg βC/100 g, respectively. Antioxidant activity values were 484.64 mg AAE/100 g for FRAP

and 90.24 mg AAE/100 g for the phosphomolybdate assay, respectively. Sensory analysis revealed that the legume-enriched biscuits were well accepted, particularly for their taste. In conclusion, incorporating legumes into biscuits not only improves their nutritional and antioxidant profile but also produces a sensorially attractive product, offering promising prospects for the development of healthy and innovative snacks.

Keywords
Innovative biscuit, Optimization, Legumes, Antioxidant activity, Sensory analysis

T3-P-87

Use of kefir grains for natural coagulation in fresh cow's and goat's milk cheese production

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Abstract
This study focused on the use of kefir grains to produce fresh cheeses from cow's milk and goat's milk. Three inoculation levels of kefir grains (1 %, 2 %, and 3 %) were tested with the two varieties of milks in order to determine the effect of the type of milk and the percentage of kefir grains on the yield and quality of fresh cheese. The resulting cheeses were evaluated on days J1, J7, and J15 of storage through physicochemical (pH, acidity, moisture, ash, etc.) and microbiological analyses (search for *Escherichia coli*, coagulase-positive Staphylococci, and *Salmonella*). Statistical analysis (ANOVA) revealed significant differences based on the type of milk, the inoculation level, and their interaction. A hedonic test was conducted with 30 untrained panelists for sensory analysis of the obtained cheeses compared to fresh cheese coagulated with rennet. Fresh cheese processing using kefir grains revealed a significant influence of the milk and the percentage of grains used. Cow's milk, particularly with 2% kefir grains, offered the best yield (33.13 g), compared to goat's milk (28.87 g). The evolution of physicochemical parameters during storage showed rapid acidification at the start of storage, followed by a slight increase in pH. Moisture decreased over time, causing an increase in dry matter and ash content, which was particularly noticeable in goat's milk cheeses. Microbiological analysis of the cheeses revealed stability until day 15, after which there was *E. coli* proliferation, rendering the products non-compliant with standards. This deterioration reflects the limited shelf life of fresh cheeses. Comparative sensory analysis shows that kefir-based cheese has a more favorable organoleptic profile than rennet-coagulated cheese, particularly in terms of texture and aroma. These findings confirm that the Kefir is establishing itself as an effective natural fermentation agent, the optimization of which (particularly in terms of dosage) could further improve the performance of the fresh cheeses.

Keywords
Kefir grains, fermentation, cow's milk and goat's milk, fresh cheese, innovative dairy products.

T3-P-88

Formulation and physicochemical evaluation of naturally flavored plant-based yogurt made from oats and rice

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Abstract
The plant-based alternatives sector in the food industry is experiencing rapid growth, with plant-based yogurts becoming a popular alternative to dairy products. This is why we considered this work, which is part of the development of a plant-based yogurt, specially designed for people who are lactose intolerant or following a vegan diet, such as some cancer patients. In this context, we considered designing and evaluating an innovative plant-based alternative to classic yogurt made mainly from oat milk, enriched with rice milk rice milk and flavored naturally. It is the subject of physic-chemical studies, while comparing its potential nutritional contributions to those of an animal-based yogurt, in order to highlight its health and sustainability benefits. The results showed that the best yogurt formula consists of a mixture of 75% oat milk and 25% rice milk flavored with 1% carob, 10% date syrup, 2% lemon juice and 1,5% sesame. The yogurt obtained has a pH and titratable acidity of

the order of 5,2 and 48 °D respectively, and has exceptional nutritional value, with 19 ± 0,27 % carbohydrates, 6,6 ± 0,86 % lipids and 3.72 ± 0,17 % proteins. This plant-based yogurt represents a healthy, sustainable and affordable alternative that meets the new nutritional and environmental expectations of modern consumers.

Keywords
Alternatives, plant-based, yogurt, oat, rice

Thematic 4 – Artificial Intelligence and Food Sciences

T4-P-01

In silico study of the protective effect of selected medicinal plants against inflammatory diseases

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Abstract

Rheumatoid arthritis is a chronic autoimmune inflammatory disease that primarily affects synovial joints, causing pain, swelling, progressive deformities, and disability. Treatment aims to reduce symptoms using anti-inflammatory drugs, which often have significant side effects—among them Celebrex, which is used in moderate forms of the disease. As a result, the search for new natural molecules with anti-inflammatory properties has become a necessity. The objective of this study is to evaluate and compare the effects of two natural substances: gingerol, extracted from ginger (*Zingiber officinale*), and eugenol, derived from clove (*Syzygium aromaticum*), with an experimental ligand, mefenamic acid. The methodology used is based on *in silico* simulations via molecular docking, carried out using the software PyRx 0.8 and AutoDock Vina. 1.5.7. The analysis of the interactions of these three compounds with the enzyme cyclooxygenase-2 (COX-2), which is involved in the inflammatory process, allowed the evaluation of their binding affinities. The results show that gingerol has a better affinity with COX-2 (binding energy of -8.9 kcal/mol), compared to eugenol (-1.9 kcal/mol). It forms several stabilizing interactions, particularly hydrophobic and hydrogen bonds, with the amino acids of the active site, confirming its potential as a natural inhibitor of this enzyme.

Keywords

Molecular docking, Rheumatoid arthritis, Gingerol, Eugenol

T4-P-02

Natural Product–based NMT inhibitors: novel strategies for developing anti-leishmanial therapeutic candidates

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Abstract

Leishmaniasis is a major neglected tropical disease caused by protozoan parasites of the genus Leishmania. Despite decades of research, current therapies remain limited by toxicity, emergence of resistance, and high treatment costs, underscoring the urgent need for new, effective, and safer therapeutic strategies. Among the validated molecular targets in Leishmania, N-myristoyltransferase (NMT)—an enzyme responsible for the co-translational myristoylation of essential proteins—has emerged as a particularly promising target due to its crucial role in parasite survival and the absence of functional redundancy. In this study, a large-scale virtual screening of 6,910 natural compounds was performed using molecular docking to evaluate their binding affinity with Leishmania NMT. The docking workflow allowed the identification of 71 molecules exhibiting better

interaction energies than the known reference inhibitor, highlighting their potential to interfere with the enzyme's catalytic site. Among these, Teucrol_001 and N-E-caffeoyl tyramine stood out as the most promising candidates, with binding energies of –29.1138 kJ/mol and –28.7406 kJ/mol, respectively, demonstrating strong predicted affinity and favorable interaction profiles.Further evaluation of their physicochemical parameters, ADME properties, and in silico toxicological profiles revealed that these compounds possess drug-like characteristics, acceptable oral bioavailability predictions, and no major toxicity alerts. Such attributes reinforce their relevance as potential lead compounds for NMT inhibition.Overall, this work highlights two natural molecules with strong predicted inhibitory activity against Leishmania NMT, providing a valuable starting point for the development of innovative therapeutic agents against leishmaniasis. These findings pave the way for subsequent steps, including molecular dynamics simulations, chemical optimization, and experimental validation.

Keywords
Leishmaniasis; N-myristoyltransférase ; Inhibitors; Molecular docking; Binding energy

T4-P-03

Darcy-brinkman modeling for the characterization of grape drying kinetics

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Abstract
The drying kinetics of grapes were studied using a hot air circulation system with fixed and controlled properties: air velolicity ranging from 2,5 to 5m/s, relative humidity between 20% and 40%, and temperature varying from 40 to 65°C. The results show, firstly, that there is no constant-velocity drying phase and secondly, that temperature, concentration and air velocity are the parameters that most influence drying time under the studied conditions. All the numerical results are represented by the drying characteristic curves. Furthermore, the grape desorption isotherms were determined at different temperatures (40, 50 and 65°C), and the Darcy-Brinkman model proved satisfactory for describing them.

Keywords
Grapes, Darcy-Brinkman Model, Drying Kinetics, Modeling

T4-P-04

Cattle farming in the digital age: the contribution of artificial intelligence for optimized animal husbandry

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Abstract
Cattle farming is undergoing significant intensification, with an increasing number of cows per farm, making herd management increasingly complex. At the same time, growing interest in animal welfare, health, and product quality underscores the importance of systems and technological innovations that enable effective monitoring, both at the individual and herd levels. In this context, precision livestock farming has become essential. It relies on Artificial Intelligence (AI) and connected technologies, including advanced sensors, the Internet of Things (IoT), and computer vision, to collect and analyze behavioral, physiological, and environmental data in real time. Machine learning algorithms enable the early detection of anomalies such as disease, estrus, or stress, thus contributing to the optimization of cattle health, nutrition, and reproduction, while improving overall herd management. The digitization of livestock farming also raises ethical issues concerning animal privacy, autonomy, and the human-animal relationship. Despite the promise of these technologies, several challenges remain, such as data standardization, implementation costs, and accessibility

for small farms. These advances should promote a tangible improvement in animal welfare indicators, the creation of standardized databases and the development of precision animal husbandry, combining economic performance, environmental sustainability and respect for animal welfare, while placing Artificial Intelligence (AI) as a central lever of the agroecological transition.

Keywords
Artificial intelligence, animal welfare, precision farming, sensors and IoT, sustainability.

T4-P-05

Impacts of artificial intelligence on recent developments in modern packaging technology using bioactive compounds

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Abstract
Preserving food quality and safety is a critical challenge in the modern food industry, directly affecting consumer health. Recent advances in Artificial Intelligence (AI) have significantly influenced packaging technology, enabling the development of smart systems that integrate bioactive compounds as functional biomarkers to monitor food freshness and quality. Biodegradable active packaging enriched with bioactive compounds derived from plant sources and agro-industrial by-products, such as fruit peels, combines antimicrobial and antioxidant properties with real-time intelligence, effectively acting as AI-enabled packaging. These bioactive compounds, incorporated into biopolymer matrices such as polysaccharides and proteins, not only improve mechanical and barrier properties but also provide functional signals indicating oxidative changes or microbial growth. Advanced extraction techniques, including ultrasound-assisted and supercritical fluid methods, ensure efficient recovery of bioactive compounds while preserving their bioactivity. The resulting packaging acts as a smart system capable of predicting shelf-life, signaling spoilage, and reducing environmental impact. The integration of AI principles with biodegradable active packaging represents a transformative approach for the food sector. Intelligent systems enhance traceability, optimize supply chain management, improve safety and quality, and increase consumer satisfaction, while supporting sustainability and circular economy practices. Using bioactive compounds as biomarkers bridges technological innovation with eco-friendly materials, offering a functional, intelligent, and sustainable solution for next-generation food packaging.

Keywords
AI, Bioactive Compounds, Smart Packaging, Biodegradable Packaging, Food Quality and Safety

T4-P-06

A review of artificial intelligence and digital technologies in food safety and preservation

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Abstract
The rapid emergence of Artificial Intelligence (AI) and digital technologies is transforming the principles and practices of food safety and preservation. This communication presents a systematic review of recent advances focusing on the integration of smart sensors, the Internet of Things (IoT), computer vision, machine learning, and blockchain within modern food supply chains. The first section explores real-time monitoring and control. The combined use of IoT sensors, smart cameras, and electronic noses enables early detection of temperature deviations, contamination events, and product spoilage indicators long before they compromise food integrity. Continuous environmental monitoring and automated alert systems enhance the ability to prevent microbial growth and reduce food safety incidents.
The second part examines intelligent traceability, a cornerstone of digital transformation in the agrifood sector. Blockchain technology and advanced RFID/QR code systems ensure transparency and immutability of

information throughout the food journey, from production to consumption. AI algorithms further enhance these systems by cross-referencing sensor data with traceability records to rapidly identify critical points and accelerate root-cause investigations during sanitary crises.The third theme addresses prediction and preventive maintenance. Machine learning models now make it possible to estimate the actual shelf life of products based on time–temperature history and composition data, while predictive maintenance systems monitor refrigeration performance to prevent failures that could disrupt the cold chain. Finally, logistic optimization and smart inventory management leverage AI-driven algorithms to optimize transport routes, prioritize product dispatch according to predicted residual quality, and connect surplus stock to redistribution networks, thereby reducing waste and improving overall sustainability. Together, these technologies mark a decisive shift from reactive control to predictive and data-driven management of food safety. The convergence of AI, IoT, and advanced analytics fosters safer, more transparent, and more efficient food systems, driving a genuine digital revolution that strengthens consumer trust and ensures food quality across the entire supply chain.

Keywords
Food Safety, Digital Technologies, Traceability, Shelf-Life

T4-P-07

Development of a business intelligence solution to kmelo food's supply performance

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Abstract
The objective of this study is to design and implement a Business Intelligence (BI) solution aimed at improving coordination and performance within Kmelo Food's supply chain, with a particular focus on the purchasing, inventory, and production departments. To achieve this, a structured methodology was followed, including data collection, automated data preprocessing and transformation, and the development of a centralized and automated data warehouse. The main outcome is the deployment of efficient, department-specific dashboards that provide decision-makers with actionable insights, enhance cross-departmental collaboration, and improve overall performance.

Keywords
Business Intelligence (BI), Supply Chain, KPI, Dashboards, Data warehousing

T4-P-08

In silico study of vanillin from *Crotalaria sp*: molecular docking and admet profile

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Abstract
Species belonging to the genus *Crotalaria* (Family: Fabaceae) are well known for their richness in polyphenolic compounds and their wide range of biological properties, including antioxidant, anti-inflammatory, and cytoprotective effects. The integration of computational modeling and molecular simulation tools with phytochemical analysis represents a promising approach for exploring and predicting the pharmacological potential of natural metabolites. The present study aims to investigate, through *in silico* methods, the bioactive potential and pharmacokinetic profile of vanillin, a phenolic compound identified by LC-MS/MS in the butanolic extract of *Crotalaria sp.* The butanolic extract of *Crotalaria sp*, was analyzed using LC-MS/MS to identify major

phenolic constituents, among which vanillin was detected. The 3D structure of vanillin was optimized by molecular mechanics (MM2) and subjected to molecular docking using AutoDock Vina. The selected protein target was an enzyme involved in oxidative stress defense. Ligand–protein interactions were evaluated based on binding energies, hydrogen bonding, and hydrophobic interactions. Pharmacokinetic and toxicological parameters were predicted using SwissADME and pkCSM platforms to assess the ADMET (Absorption, Distribution, Metabolism, Excretion, and Toxicity) profile. Molecular docking simulations revealed that vanillin exhibits a strong affinity toward the active sites of antioxidant enzymes, characterized by favorable binding energies and stable interaction networks. The predicted ADMET parameters indicated high intestinal absorption, absence of hepatotoxicity and low inhibition potential toward cytochrome P450 enzymes. These findings suggest an optimal pharmacokinetic behavior and good drug-likeness properties for vanillin. The modeling, simulation, and predictive analyses performed on vanillin from *Crotalaria sp* highlight its promising antioxidant potential and favorable pharmacokinetic characteristics. These *in silico* findings support the relevance of vanillin as a natural bioactive molecule with potential applications in the pharmaceutical and food industries.

Keywords
Crotalaria sp, Polyphenols, Vanillin, Molecular Docking, ADMET

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