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Annals of Nutrition and Metabolism

Special Lectures

CT01

Effects of Bariatric Surgery and Whole-Body Vibration Training on Body Composition, Basal Metabolism, Physical Fitness, and Quality of Life in Morbidly Obese Patients

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Background: Morbid obesity, defined by a body mass index (BMI) of 40 kg/m^2 or higher, is a complex chronic condition with increasing prevalence in developed countries. Bariatric surgery is proposed as a potential intervention; however, it may lead to adverse effects such as reductions in bone mineral density (BMD) and muscle mass, and increased fracture risk. This study aims to investigate the effects of bariatric surgery and whole-body vibration (WBV) training on body composition, physical fitness, quality of life, and cardiometabolic markers.

Methods: Twenty-eight participants (14 females) aged 18 to 50 years, all having undergone sleeve gastrectomy, were randomly allocated into a control group or a WBV training group. The WBV group trained three times per week with increasing intensities and durations ranging from 30 to 45 minutes over a 4-month period. Measurements of body composition (using dual-energy X-ray absorptiometry and peripheral quantitative computed tomography), physical fitness (muscular strength, agility, cardiorespiratory fitness, and balance), gait biomechanics, cardiometabolic markers, quality of life, and physical activity levels were collected at four time points: pre-surgery, 45 days post-surgery, 6 months post-surgery, and 18 months post-surgery.

Results: The project is ongoing, and conclusions are preliminary. Initial findings suggest improvements in body composition, physical fitness, and quality of life in both groups. The WBV training was well accepted with no significant adverse reactions, indicating its safety and effectiveness. Preliminary data indicate less loss of lean mass and a smaller decrease in basal metabolic rate in the WBV group compared to the control group. It is anticipated that after 18 months, patients will achieve a healthier lifestyle, reducing the risk of relapse and enhancing their quality of life.

Conflicts of Interest: None

Keywords: Morbid obesity, Physical activity, Health, Exercise, RCT

Trial Registration: ClinicalTrials.gov NCT05695599. Registered on January 25, 2023.

CT03

Microminerals and Vitamin Levels: The Case of Chile in Latin America.

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Both vitamins and microminerals are essential elements for the functioning, growth, proliferation, and development of life. At both national and regional levels, there is little evidence that studies the levels of these elements. For their study, the 4 susceptible groups in the population should be considered: infants and preschoolers, women of childbearing age, pregnant women, and older adults.

We conducted a study on children aged 4 to 14 years in three cities in Chile: Antofagasta (north), Santiago (center), and Concepción (south). The results show a high frequency of overweight and obesity (over 50% in the 3 cities) and a high deficiency of Vitamin D (84% in Concepción), Vitamin E (8% in Antofagasta) and Vitamin B12 (9.8% in Antofagasta), followed by iron (26.7% in Concepción), zinc (20% in Santiago) and copper (26% in Antofagasta) deficiencies in the studied population.

On the other hand, a study was carried out on older adults who participated in the feeding program for the elderly (PACAM). A high deficiency of vitamin D (88%), vitamin B12 (34%), calcium (33%), and zinc (5.0%) was observed. A low percentage of older adults consumed the PACAM foods. When technological modifications (micro-encapsulation) were made to improve the bioaccessibility of the food (milk drink and soup), a considerable increase in the levels of vitamins (A, B12, and D) and calcium, iron, and zinc was observed.

These results show that, in Chile, there is a high deficiency of Vitamin D, iron and zinc in the population studied.

Conflicts of Interest: no conflict of interest

Keywords: microminerals; vitamins; deficiency; deficiency; risk groups

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CT4

Importance of Dairy Products in Nutrition and Health Throughout the Life Cycle

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Introduction: Dairy products (milk, cheese and yogurt) are foods that provide very important nutrients for humans. The contribution of high biological value proteins, calcium, phosphorus and various vitamins is remarkable. The consumption of dairy products allows improving the nutritional quality of the diet. In this regard, several research have demonstrated the importance of dairy products for human nutrition and health.

Objective: To present an updated review of the scientific literature about the importance of dairy products in nutrition and health throughout the life cycle

Methods: The literature review was performed and summarized in different databases, PubMed, Scopus, Web of Science, Scielo, ISI, and Ovid MedLine, highlighting the Importance of dairy products in nutrition and health throughout the life cycle (pregnancy, pediatrics, adults and the elderly). As well as in clinical applications (obesity, type 2 diabetes or cardiovascular disease), exercise and public health.

Results: Dairy products (especially milk, yogurt and cheese) are foods that play an important role during pregnancy and breastfeeding. Dairy promotes better fetal growth. Furthermore, these foods improve bone growth and mineralization in infants. In pediatrics (children and adolescents), dairy products play a relevant role in the quality of the diet, preventing undernutrition and obesity. Promoting growth (increased height) and mineral density. In adults and older adults, dairy products significantly reduce the risk of developing chronic pathologies (obesity, type 2 diabetes or cardiovascular disease). It is important to mention the protective effects of fermented dairy products such as yogurt. As well as in the preservation of bone mass, muscle mass and strength. Dairy products in nutrition programs, especially in children, to be very efficient in reducing childhood undernutrition in some Latin American countries.

Conclusions: Dairy products are important foods to improve the quality of diet and nutrition. Daily intake of dairy products (especially fermented ones) contributes to better health. Therefore, it is necessary to develop dietary and nutritional strategies that promote dairy intake.

Conflicts of Interest: the author declares no conflict of interest

Keywords: dairy products; milk; yogurt; cheese; growth and development; health; public health

CT06

Pathophysiology of Taste Disorders and Strategies for their Treatment

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Nutrient sensing plays an important role in ensuring that appropriate digestive or hormonal responses are elicited following the ingestion of fuel substrates. The well-characterized nutrient sensing mechanism involves lingual taste receptors that include heterodimers of G protein-coupled receptors (GPCRs) of the taste receptor type-1 (T1R) family for sensing sweet (T1R2-T1R3) and umami (T1R1-T1R3) stimuli, T2R family for sensing bitter stimuli, and ion channels for conferring sour and salty tastes. Recent evidence supports the concept that chemosensing also involves the enteroendocrine cells of the gastrointestinal tract through the release of signaling substances.

Taste disorders (TDs) are conditions characterized by alterations in gustatory function or perception. TDs are frequently associated with olfaction disorders; additional potential etiologies include metabolic diseases; drug toxicity; and taste pathway disorders (e.g., taste bud diseases; facial nerve diseases; glossopharyngeal nerve diseases; and brain stem diseases). TDs include mainly ageusia, complete- or severe-loss of the subjective sense of taste, and dysgeusia, characterized by alterations of the sense of taste which may range from mild to severe, including gross distortions of taste quality. TDs are frequent adverse events during antineoplastic treatments in cancer patients. However, limited attention has been given to these disorders. Their effects are related to the cytotoxic effects of chemotherapy on the cell's differentiation and proliferation in the taste bud or to chemosensory dysfunction that can cause neurological damage by acting directly on taste receptors or synaptic uncoupling during radiotherapy. Chemotherapy-induced TDs are highly variable (17%-86%).

The novel food approved by European Commission (EFSA), dried miracle berries (DMB), contains the natural taste-modifying protein miraculin, which has emerged as a possible alternative treatment for TDs. Recently, our research group have reported that habitual consumption of a standard 150 mg dose of DMB before each meal for 3 months in malnourished cancer patients with dysgeusia improves electrochemical food perception, nutritional status and quality of life in malnourished cancer patients receiving antineoplastic treatment. Also, the regular consumption of DMB has positive effects of n-3 PUFA status, biomarkers of cachexia and inflammation and oral and intestinal microbiota.

Conflicts of Interest: none

Keywords: taste disorders; gut receptors; cancer; miraculin; miracle berries

CE04
Preparing for Aging

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Nutrition in older adults is affected by various factors including diet, medical conditions, and socio-economic challenges. Chronic diseases in this age group necessitate specific diets, reducing food variety and essential nutrient intake. In Latin America, economic constraints, geographic location, and social issues often limit access to fresh, nutritious foods, leading to increased reliance on processed products. Age-related declines in nutrient absorption, appetite, and difficulties in chewing and swallowing further exacerbate nutritional deficiencies. Financial limitations significantly impede older adults' access to quality food, and inadequate nutritional education results in poor dietary choices, particularly in underserved communities.

With the increasing prevalence of cognitive decline, including Alzheimer's disease and other dementias, effective strategies to preserve cognitive function are urgently needed. Identifying safe, affordable, and well-tolerated interventions is crucial in healthcare. The COSMOS-MIND study, a 3-year randomized controlled trial with 2,262 participants, demonstrated that multivitamin/multimineral supplementation significantly benefits memory and executive function, especially in older adults with cardiovascular disease. However, further research and commitment from society and government are necessary given the growth and aging of the population in Latin America.

Conflicts of Interest: This lecture has been created for educational purposes to address the issues faced by the elderly population in Latin America and was sponsored by Haleon.

Keywords: Nutrition in Older Adults, Aging, Cognitive Decline, Cosmos Mind Study, Multivitamin, Multimineral.

Symposium Sessions

S01: Adding Evidence to Better Understand, Diagnose, and Treat Histamine Intolerance Due to DAO Deficiency

S01.1
New Horizons about the Origin of Histamine Intolerance

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Histamine intolerance can be defined as a disorder arising from reduced histamine degradation capacity in the intestine due to impaired diamine oxidase (DAO) enzyme activity, leading to its accumulation in plasma and the appearance of adverse effects. The objective of this conference is to review the existing evidence on the different suggested origins of histamine intolerance and to provide new data from different ongoing studies performed in the research group.

One of the more typically considered etiologies of DAO deficiency is the genetic origin. Four single-nucleotide polymorphisms (SNPs) in the DAO-encoding gene have been frequently related with a reduced histamine degradation capacity. The findings of a recent retrospective study suggest that histamine intolerance symptoms could be more related with a high load of risk alleles (homozygous) rather than the mere presence of one or more SNPs.

It has also been described as a temporary and reversible impaired DAO activity as a side effect of some drugs. However, scientific studies providing robust data on this topic are outdated and not supported by multiple experimental studies. Computational studies and *in vitro* assays that are being currently performed in our research group have shown an inhibitory effect on DAO activity by some widely used pharmacological drugs, being clavulanic acid, the strongest inhibitor identified so far.

Over the last few years, it has also been suggested that an alteration in the intestinal microbiota composition could be an underlying cause of this intolerance. Although scientific data on this topic is still scarce, the available results seem to indicate that patients with histamine intolerance could show a different intestinal microbiota composition in comparison with healthy individuals. Concretely, the results coming from two ongoing clinical

trials involving histamine intolerant patients highlight an altered ratio of Firmicutes/Bacteroidetes, as well as a lower proportion of bacteria related with gut health (e.g., *Prevotellaceae*, *Bifidobacterium* and *Faecalibacterium prausnitzii*). Moreover, beta-diversity was significantly different, with a higher heterogeneity of genera and species in the histamine intolerant group.

Conflict of Interest: none

Keywords: histamine intolerance; diamine oxidase; pharmacological inhibition; intestinal dysbiosis

S01.2
Diagnosis of Histamine Intolerance: Scientific Advances and Pending Challenges

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Although the first scientific references to histamine intolerance date from more than 30 years ago, it is significant that almost 50% are from the last first-year period, reflecting the growing interest of researchers in this disorder. Nevertheless, reaching a consensus on a diagnostic algorithm for histamine intolerance remains a pending challenge, mainly due to the low specificity and complex variability of symptoms and to the lack of validated diagnostic tools.

The combination of diagnostic criteria currently in use includes the appearance of two or more typical symptoms of histamine intolerance and the exclusion of other related disorders associated, such as food allergies or an underlying systemic mastocytosis. Then, the improvement or remission of clinical manifestations after the following of a low-histamine diet is used to confirm that dietary histamine is responsible for intolerance-associated symptoms. In this context, many efforts are currently underway to identify a non-invasive marker to establish a solid and clinically irrefutable diagnostic criterion. To date, the most studied approach is the determination of plasma DAO activity, although the lack of more representative data on population plasma DAO activity values accounts for the limited validity of this diagnostic test. Even being much more invasive, it has been suggested that DAO activity may also be measured in colon biopsy samples, providing direct information of the histamine-degrading capacity at intestinal level. On the other hand, and due to the genetic background of DAO deficiency, there is already the possibility of performing a noninvasive genetic analysis capable of identifying four of the genetic polymorphisms associated with reduced DAO activity from a sample of blood or oral mucosa, although evidence-based studies on the diagnosis potential of this test are still needed. Finally, the application of metabolomics as a tool for the identification of biomarkers of histamine metabolism in urine is also being challenged as a possible non-invasive new diagnostic strategy. In this sense, preliminary results have highlighted that individuals with histamine intolerance could have a different excretion profile of histamine and its metabolites in urine than normal individuals.

Conflict of Interest: none

Keywords: food intolerance; histamine intolerance; diamine oxidase (DAO); diagnosis; metabolomics

S01.3
Dietary Management of Histamine Intolerance: Strategies and Efficacy

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A low-histamine diet has been proposed as the main strategy for the preventive treatment of histamine intolerance. Conceptually, these diets exclude foods that patients associate with the onset of symptoms, primarily those that may contain histamine. We conducted a comparative review of low-histamine diets, highlighting great heterogenicity in the type of foods that are advised against for histamine intolerant individuals. In fact, only the exclusion of 32% of foods could be explained by the occurrence of high contents of histamine (fermented foods and beverages, fish derivatives and some vegetables). The presence of putrescine and cadaverine, which may interfere with histamine degradation by the DAO enzyme at the intestinal level, could partly explain why other foods that, do not contain histamine (ex. citrus fruits), avoided within the framework of a low-histamine diet.

The exclusion of many foods leads to restrictive diets and poor patient adherence. To address this, exogenous DAO enzyme supplementation is promoted to enhance intestinal histamine degradation in intolerant individuals. In 2017, the European Commission approved the DAO enzyme as a novel food, authorizing the formulation of porcine kidney protein extract with an enteric coating to ensure its integrity through the gastric environment. Our research group has addressed a DAO enzyme derived from the germination of edible legumes. This process provides a lyophilized, plant-based DAO with high enzymatic activity, suitable for formulating food supplements for histamine intolerant individuals, including vegetarians and vegans.

Regarding the effectiveness of both dietary strategies, different clinical studies have been developed over the past three decades. Regardless of certain limitations, such as a small number of patients or short intervention periods, available studies report favorable results in terms of improvement or total remission of symptoms frequently associated with histamine intolerance. The clinical effectiveness of the low-histamine diet and supplementation with

DAO enzyme, both of porcine and vegetable origin, is being validated through a prospective, single-center, double-blind, randomized, placebo-controlled intervention study. This study, which includes a design of 400 patients, will provide relevant information on the clinical efficacy of these dietary strategies.

Conflict of Interest: none

Keywords: low-histamine diet; DAO supplement; dietary management; legume sprouts

S03: Measurement of Food Intake Through Food Consumption Surveys

S03.1

Uruguay: the Road to the Food Consumption Survey

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Introduction: Evaluating food and nutrient intake and its relationship with diseases is vital for defining nutritional guidelines that improve population health, although measuring this intake is a major methodological challenge in nutritional epidemiology. Dietary surveys, such as Food Frequency Questionnaires (FFQs) and 24-Hour Recalls (24HR), are widely used to assess intake at individual and population levels, identifying intake inadequacies and contributing to the design of public health, nutrition, and agricultural policies.

Results: Uruguay has not developed a national food consumption survey for adults. In 2023, the Consumption Group of the School of Nutrition developed and validated an online, fully digital FFQ, containing the 60 most consumed foods, beverages, and preparations by the Uruguayan population.

In September 2023, an agreement letter was signed between the School of Nutrition and the FAO, where the Consumption Group of the School of Nutrition was committed to design a roadmap that establishes the necessary steps to obtain food consumption information of the Uruguayan population using a valid and reliable methodology.

Conclusions: Planning a population survey requires careful consideration of various aspects, from methodology to instrument selection, to obtain accurate and relevant data on dietary habits and population nutrition. Both 24HRs and FFQs have their advantages and limitations, and the choice depends on research objectives, available resources, and context. Clearly defining research questions and data collection intentions is crucial for a systematic and meaningful approach. Effective public policies should promote periodic measurement of food intake in population groups. Survey results will provide a solid foundation for developing effective food and nutrition policies.

Conflicts of Interest: none

Keywords: dietary intake; FFQ; food consumption surveys

S03.2

Food Consumption Survey in Mexico through the National Health and Nutrition Survey (ENSANUT)

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Results: Mexico's experience will be presented through the National Health and Nutrition Surveys (ENSANUT), which aim to analyze the health and nutrition panorama of the country's inhabitants, with specific objectives including estimating the prevalence of non-communicable diseases. To evaluate habitual food consumption and dietary patterns of the population, semi-quantitative FFQs for the seven days prior to the interview and 24HR questionnaires are used to capture detailed food consumption information from the day before the interview.

Conclusions: Planning a population survey requires careful consideration of various aspects, from methodology to instrument selection, to obtain accurate and relevant data on dietary habits and population nutrition. Both 24HRs and FFQs have their advantages and limitations, and the choice depends on research objectives, available resources, and context. Clearly defining research questions and data collection intentions is crucial for a systematic and meaningful approach. Effective public policies should promote periodic measurement of food intake in population groups. Survey results will provide a solid foundation for developing effective food and nutrition policies.

Conflicts of Interest: none

Key words: dietary intake; FFQ; 24HR; food consumption surveys

S03.3

The "Dose" or Dietary/Daily Exposure Estimated through Consumption Surveys: Consumption Frequency Forms Consumption Reminders for the last 24 hours (Results based on the ENSIN-Colombia)

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Objectives: *a*) To draw attention to the need to return to basic concepts of nutritional epidemiology, *b*) to propose indicators to approximate dietary dose or exposure in epidemiological terms adequately.

Methods: The 2015 Colombian National Survey of Nutritional Status (ENSIN-2015) provides an understanding of dietary habits and energy requirements of Colombians aged 0 to 64 y. Our research, conducted with utmost thoroughness, involved the use of Food Frequency Questionnaires (FFQ) and repeated R24H. The FFQ was administered to n=27659 [62.2%<18 years; 51.2% Female], and repeated R24H was carried out with n=9276 of 4638 subjects [64.8%<18 years; 58.8% Female]. Outputs. ***a***) The relative contribution (%) of the habitual intake of each food of interest, "the dose" to the required energy/day (kcal) (AR), *b*) The contribution index (%) or importance according to the dose of each item to the required energy/day (kcal) (CIx).

Results: Regardless of the calculated index, IR, AR, or CIx, rice was a determining food because it contributed 18.9% of the energy/day requirement of the Colombian population. Bread, pasta, tubers (potatoes, yucca, plantains), milk, cane water (*agua de panela*), and added sugar were also determining foods. In children under five years, formula milk, infant cereals, and compotes, in order of importance, accounted for 66.4% of the total required energy/day [1].

Discussion: Dietary exposure in Colombians is linked to the traditional food pattern. Ultra-processed foods and sugary beverage consumption contribute tiny relative to the requirement/day/energy. Usual intake differs from the current intake. Concurrent application of repeated R24Hs in at least one subsample and FFQ allows an approximation of the accurate dietary dose or exposure in a population or individual.

Conclusion: Results of dietary analyses, which can even be considered primary, are incorporated into the discussion of public policy elements to intervene rationally and provide evidence-based on transcendental aspects of the disease and health of individuals and populations. Nutritional education and portion size are key [https://www.sciencedirect.com/science/article/pii/S2949824424001332].

Conflicts of Interest: none

Keywords: dietary intake; food consumption surveys

S03.4

Methodologies for Measuring Food Consumption at the General Population Level: Results in Brazil

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Introduction: Evaluating food and nutrient intake and its relationship with diseases is vital for defining nutritional guidelines that improve population health, although measuring this intake is a major methodological challenge in nutritional epidemiology. Dietary surveys, such as Food Frequency Questionnaires (FFQs) and 24-Hour Recalls (24HR), are widely used to assess intake at individual and population levels, identifying intake inadequacies and contributing to the design of public health, nutrition, and agricultural policies.

Results: Different food surveys will be presented. All were conducted using probabilistic samples, with household interviews evaluating individual food consumption. One of the surveys, conducted every five years, the first module focuses on individual consumption, while the second addresses population aspects. The population is selected through sampling with probability proportional to the number of households per sector within each stratum. The second stage involves the random selection of households. University professors and professionals apply 24HRs to evaluate proteins and energy.

In another survey, the selected instrument was a dietary record carried out over a week in the population over 10 years old. This process extended over 12 months, covering 75,000 interviewed households. The dietary record was validated with doubly labeled water.

Conclusions: Planning a population survey requires careful consideration of various aspects, from methodology to instrument selection, to obtain accurate and relevant data on dietary habits and population nutrition. Both 24HRs and FFQs have their advantages and limitations, and the choice depends on research objectives, available resources, and context. Clearly defining research questions and data collection intentions is crucial for a systematic and meaningful approach. Effective public policies should promote periodic measurement of food intake in population groups. Survey results will provide a solid foundation for developing effective food and nutrition policies.

Conflicts of Interest: none

Keywords: dietary intake; food consumption surveys

S04: Management of Sustainable and Healthy Food and Nutrition Services: Current Challenges

S04.1
Management of Sustainable and Healthy Food and Nutrition Services: Current Challenges

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To recognize the challenges currently faced by managers of food and nutrition services to communities and some possibilities of approach, in the context of climate change, sustainable development goals, cultural diversity.

The management of food services requires a deep understanding of the role that food plays both in the promotion of health and nutrition, as well as in the prevention and treatment of diseases. This understanding goes beyond an epidemiological perspective focused solely on the hospital setting; It also covers socioeconomic and political considerations to address the interests and needs of the population in different sectors, such as corporate, community or institutional food services aimed at vulnerable populations or in special situations.

From this perspective, identifying management challenges becomes essential. This allows professionals to expand their possibilities of intervention and be more effective in responding to new global challenges, such as environmental sustainability in operational processes and effective management of human capital. All of this remains framed within the commitment to service quality and its contribution to human health.

Likewise, the identification of consumer trends can allow the professional manager of the service to plan food for groups considering current demands, not limiting themselves solely to considerations of nutritional adequacy. This favors the expansion of the focus of analysis of professionals in the area and allows them to remain relevant to market demands.

Conflicts of Interest: the authors declare do not have conflicts of interest

Keywords: food service; sustainable eating; environmental management; food environments, quality management, consumer behavior

S04.2
Challenges in Environmental and Sustainable Management of Food Service

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Introduction: The food service, by converting raw materials into served dishes, has an impact on the environment, directly through the use of energy for the operation of physical infrastructures, waste disposal, solid waste, among others, and indirectly through the impact of agri-food production, the manufacture of single-use implements and chemical products, as well as long-distance transport to ensure supply. La identificación de impactos ambientales y la implementación de acciones para reducirlos son parte de la gestión de estos servicios

Objective: To recognize the challenges faced in the management of food services to communities that minimize environmental impact and promote sustainable practices.

Methods: Based on the recognition of the high demand for energy and water resources, the generation of solid waste and dumping, the implications for the operation of the food service are analyzed in order to guarantee environmental sustainability and different practices referenced in the international sphere that contribute to the reduction of the environmental impact in the sector are presented.

Results: Environmental management in food services should be based on principles such as responsible consumption and production, efficient use of resources, waste reduction, and sustainable purchasing. This implies evaluating the entire chain from menu design, procurement of raw materials and inputs, through receipt, storage, production, and service, to the collection and disposal of unconsumed food. It also requires adopting various strategies that vary according to the characteristics of the service offered, such as the implementation of sustainable menus, waste management programs, the use of green technologies, and environmental performance monitoring systems, among others. In all cases, employee training and raising awareness among diners are considered key. Environmental management and sustainability of food services for communities improve efficiency, contribute to the conservation of natural resources, and help mitigate climate change.

Conflicts of Interest: the author declares do not have conflicts of interest.

Keywords: food service; environmental management; sustainable eating; food environments; waste management.

S04.3
Sustainable Eating in a University Environment

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Introduction: The University is recognized as a critical actor in achieving the Sustainable Development Goals. Their contribution to the 2030 Agenda is concretized by incorporating sustainability

into the different university actions. Following the guidelines of the University of the Republic of Uruguay, the Nutrition School has included sustainability in its institutional development plan through several projects. One of them is the "Sustainable Food Systems" project, started in 2015, which promotes sustainable eating to contribute to the human right to adequate food.

Objective: Share the results of the project and the challenges faced to continue promoting food with a positive social, environmental and economic impact.

Methods: The project includes six strategies: education, research, extension, collaboration with governments, integration of academic associations, and own resources management.

Results: The educational proposal includes courses and seminars aimed at training ethical professionals to tackle sustainable eating challenges and enhance capabilities for transforming food systems. The research focuses on analyzing food losses and food waste and the environmental impact of collective food services. Through the university's outreach function, we raise society's awareness of the benefits of sustainable eating and support the development of sustainable production and consumption practices. Contributions are also made to government policies, such as the National Strategy for the Prevention and Reduction of Food Losses and Food Waste and the Municipal Policy for the Prevention of Non-Communicable Diseases. Academic proposals related to the subject are shared and carried out with local and foreign university experts. The project's interventions in university food services focus on offering sustainable menus.

The challenges of the project include: increasing students' competencies to implement sustainable eating strategies by stimulating active participation in academic projects; increasing support for community initiatives to improve access to sustainable eating; optimizing the quality of university menus and analyzing alternatives to reduce their environmental footprint; strengthening national and international partnerships to share sustainable practices and develop interinstitutional projects; and continuing to collaborate with governments and companies to promote sustainable eating.

Conflicts of Interest: the author declares do not have conflicts of interest

Keywords: food service; sustainable eating; universities

S04.4
Sustainable Eating: Connecting with the Consumer in Foodservice Offerings

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Introduction: Some market segments desire foodservice offerings that emphasize sustainability, not just what is healthy for the human body. By understanding consumer preference and integrating them with professional practices in foodservices professionals can generate innovation and entrepreneurship in an area where new generations find "sustainable eating" more important.

Objective: Recognize development areas in foodservices based on sustainable consumption trends.

Methods: This presentation provides an overview of potential areas to work in foodservice, focusing on consumer trends in sustainable eating. In addition to international literature, the speaker shares the results of research studies conducted in Colombia to highlight specific characteristics in the Colombian food environment. The session will focus on three general types of developing areas: food-based, nutrient-based, and environment-based.

Results: The most common sustainable strategy reported in foodservice is reducing food waste. However, consumers are now seeking tangible solutions beyond traditional approaches. This session highlights the foods in demand by Colombian consumers who prioritize green consumption, such as minimally processed plant protein alternatives and plant-based milks. Additionally, it explores the potential of nutrient analysis of recipes that include criteria like carbon footprint, and discusses strategies for environmental support, including the use of eco-friendly flatware and informative signage aligned with consumers trends. Attendants will leave the session with new ideas to connect their work on foodservice with consumers expectations for sustainable eating.

Conflicts of Interest: the author declares do not have conflicts of interest

Keywords: food service; sustainable eating; food environments, consumer trends

S04.5
Quality Management in Food Services: Challenges and Opportunities

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Introduction: Food and nutrition services effectively manage the food processing and handling process, ensuring quality and food safety. The implementation of quality management systems (QMS) and food safety management systems (FSMS) requires commitment and capacity to meet both anticipated and unanticipated needs. These systems have a direct impact on the competitiveness and corporate image of companies. Among the most used systems to ensure food safety and quality are ISO 9001, Hazard Analysis and Critical Control Point (HACCP), ISO 22000 and Good Manufacturing Practices (GMP).

Objective: To recognize the challenges and opportunities in the implementation of quality and safety management systems in food services in the Latin American context.

Methods: This presentation provides an overview of the main barriers and opportunities for the implementation of quality and safety management systems in Food and nutrition services.

Results: The gradual evolution of FSN in Latin America, in terms of progress in the implementation of QMS and FSMS, contrasts with the high percentage of implementation (87%) of Latin American food exporting companies, which consider these systems as a competitive advantage. Comparative studies between Latin America and Spain see that a facilitating and commercially attractive environment, with common and clear legislation in terms of quality and safety, facilitates compliance with more complex quality standards. The QMS is one of the administrative

elements that has had the greatest impetus in recent years, but its limited development at the FNS level is due, among other factors, to the fact that most of these companies are small or medium-sized, highly dispersed, with limited financial options, and with an external and internal environment that fails to fully develop a culture that positions quality and safety as a key element for their development.

Conflicts of interest: the author declares that he has no conflicts of interest

Keywords: food services; food security; food safety management systems, quality management, sustainable eating

S05: Application of Precision Nutrition to the Study of Inflammation Associated with Metabolic Diseases

S05.1
Nutrigenetic Strategies to Reduce Inflammatory and Metabolic Markers in Patients with Chronic Diseases

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Introduction: Chronic low-grade inflammation is a complex biological process characterized by a low-intensity and prolonged immune response that can contribute significantly to the development of metabolic alterations. In this sense, nutrigenetic strategies, considering the interaction of genes with nutrients, could positively impact on the inflammation modulation, which is key in preventing and treating chronic diseases.

Objective: To analyze the role of nutrigenetic strategies to reduce inflammatory and metabolic markers in patients with chronic diseases.

Methods: The present review includes updated information on nutrient-dependent genetic variants associated with chronic diseases. The information analyzed has been reported in clinical trials, meta-analyses, systematic reviews, and transversal studies that propose nutrigenetic strategies that have a positive impact on key inflammatory processes relevant to chronic diseases such as obesity, diabetes, insulin resistance, cardiovascular diseases, and metabolic syndrome.

Results: Nutrigenetics assesses the influence of individual genetic variability on diet and the resultant risk of developing nutrition-related diseases. On this bases, nutrigenetic recommendations based on genetic variants in key genes (*LIPC, LPL, APOA5, APOA1, APOC3, ABCA1, FABP2, PPARG, CETP, IL-6, TNF-a, ADIPOQ, LEP, IRS, APOE, GPX-1, FTO*) related to oxidative stress, insulin resistance, energy homeostasis, lipids and inflammatory pathways, has been proposed as part of the precision nutrition considered as a potential tool that complement the standard dietary recommendations for the prevention and management of chronic inflammation-related diseases.

Conclusions: There is evidence that genetic variation at genes involved in the etiology of inflammation could interact with environmental exposures, such as diet, to modulate an individual's susceptibility to developing these diseases. Therefore, nutrigenetic recommendations as part of precision nutrition could offer actionable strategies for reducing the risk of developing chronic diseases.

Conflict of Interest: none

Keywords: inflammation; nutrigenetic; chronic diseases

S05.2
Anti-inflammatory Effect of Functional Ingredients in Metabolic Diseases

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Introduction: Globalization has generated a transformation towards an industrialized food environment with a predominance of ultra-processed foods rich in sodium, added sugar and fats, characteristic of the Western dietary pattern. Several studies have reported that excessive consumption of ultra-processed foods induces pro-inflammatory conditions associated with the development of metabolic diseases. Different strategies based on precision nutrition suggest the use of natural plant-derived extracts and/or dietary-derived ingredients to normalize inflammation associated with metabolic diseases.

Objective: To analyze the mechanisms that contribute to the anti-inflammatory activity of functional ingredients from foods or food by-products based on precision nutrition.

Methods: This review includes literature on the anti-inflammatory role of foods or food by-products according to precision nutrition. An experimental study with fifteen male Wistar rats was conducted to evaluate the effect on serum lipopolysaccharides and fatty acids after fifteen weeks of pitahaya (*Hylocereus undatus*) peel supplementation.

Results: Previous studies have linked the consumption of functional ingredients derived from food or food by-products with metabolic profiles and reduced the risk of obesity and chronic inflammatory diseases. Polyphenols have demonstrated anti-inflammatory activity through several mechanisms involving the

modulation of inflammatory signaling, reduction of inflammatory molecule production, diminishing recruitment and activation of inflammatory cells and regulation of cellular function and their antioxidant properties. Additionally, exert health benefits through the modulation of key enzymes involved in metabolic processes and, interestingly, through the inhibition of pathogenic bacteria, resulting in a reduction of endotoxins that induce pro-inflammatory immune response. The peel of pitahaya (*Hylocereus undatus*) is rich in dietary fiber and phytochemicals such as betalains, polyphenols, and flavonoids. Our research group found that supplementation with 300 mg/kg body weight of pitahaya peel reduces serum levels of lipopolysaccharides, and the profile of fatty acids associated with an inflammatory state.

Conclusions: The results suggest that functional ingredients from fruit by-products such as pitahaya (*Hylocereus undatus*) peel can modulate the gut microbiome, decreasing the excessive production and infiltration of lipopolysaccharides and regulating the serum lipidome in cafeteria-fed rats.

Conflict of Interest: none

Keywords: by-products; fatty acids; lipopolysaccharides; microbiota; polyphenols

S05.3
Prescription of Physical Exercise in the Management of Chronic Low-Grade Inflammation

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Introduction: Chronic low-grade inflammation is characterized by increased inflammatory markers that persist over time and are associated with the development of metabolic diseases. The factors triggering for this response are multifactorial; in addition to excess adipose tissue, pathogens and dietary components also promote an inflammatory response. Exercise, when prescribed in a personalized manner, has been scientifically proven to modulate inflammation. However, deliberate exercise can also increase or exacerbate inflammation.

Objective: To evaluate different physical exercise strategies that allow for personalized prescription to manage chronic low-grade inflammation.

Methods: This literature review presents the different physical exercise intervention strategies for managing chronic low-grade inflammation in various health conditions, primarily obtained from clinical trials.

Results: Clinical trials in individuals with obesity or other metabolic diseases such as diabetes and cardiovascular diseases, which are characterized by chronic low-grade inflammation, show that light to moderate intensity aerobic exercise-when progressive, dosed, and, tailored to each individual's initial physical fitness- can inhibit inflammatory responses by decreasing the activation of the NLRP3 inflammasome. This, in turn, reduces the synthesis of pro-inflammatory cytokines such as IL-1ß and IL-18. Additionally, structured physical exercise has been reported to induce epigenetic changes that improve the inflammatory status of those who engage in it regularly.

Conclusions: The prescription of physical exercise should be personalized according to the initial physical fitness of each individual and dosed to achieve better benefits and adherence to the program. Light to moderate intensity aerobic exercise has shown evidence for regulating chronic low-grade inflammation in humans.

Conflict of interest: none

Keywords: prescription; physical exercise; inflammation

S06: Lipid Behavior in Mature Breast Milk, Factors Affecting Lipids and Nutritional Requirements

S06.1
Lipid Behavior in Mature Breast Milk, Factors Affecting Lipids and Nutritional Requirements

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Introduction: The fatty acids (FA) content in mature breast milk lipids (MBML) is one of the most studied components due to its importance in the cognitive capacity of the human being, so there is a permanent interest in evaluating how to improve the FA profile of this nutritional component.

Objective: To characterize dietary intake, anthropometric nutritional status and plasma fatty acid content and its correlation with their content in the MBML.

Methods: The nutritional status of the mothers was evaluated by anthropometry, food frequency semiquantitative questionnaire and biochemical parameters in blood using gas chromatography. A total sample of 3000 ml of MBML was collected from 50 donor mothers in Medellín, Colombia.

Results: The content of unsaturated fatty acids (62%) in the MBML samples prevailed over saturated fatty acids (38%). In addition, the total fat found was higher than normally reported in the literature and no correlation was evident between the parameters studied and content of FA content in the mother and the MBML.

Conclusion: This finding is coherent, since if due to any of the 3 aspects studied, the fat content of MBML were to increase significantly or any of its components were altered, it could affect the health of the infant and MBML could not be classified as the ideal food for the infants.

Conflict of interest: none

Keywords: fatty acids; unsaturated fatty acids; breastfeeding; human milk

S08: Food Environments: Linkages Between the Agri-Food System and Dietary Health

S08.1
Changes in Food Production and the Causal Effect of Public Policies on Productive Support

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Introduction: Agriculture is a vital sector for Mexico's food security. The Mexican government has implemented public policies to support agricultural production, improve productivity, ensure resource sustainability, and reduce socioeconomic inequalities. These aim to drive agricultural development and improve farmers' living conditions through direct subsidies, enhanced competitiveness, sustainable agriculture, and reforestation efforts.

Objective: Evaluates the causal effect of Mexico's public policies on the cultivated area of different crops using municipal-level data from 2010 to 2023.

Methods: The Difference in Differences (DiD) technique was used to isolate the impact of these policies by comparing changes in cultivated areas before and after policy implementation across municipalities with different levels of support. Data on cultivated areas (2010-2023) and areas supported by these programs (2012-2022) at the municipal level were analyzed. Covariates related to agricultural structure and socioeconomic conditions were included to control for influencing factors. The analysis involved data preparation, application of the DiD model, incorporation of covariates, and estimation and validation of results, providing precise estimates of the policies' impact.

Results: Preliminary results from the DiD analysis indicate that municipalities receiving higher levels of support from public policies experienced significant increases in cultivated areas of targeted crops. Expansions in areas planted with cereals and legumes reflect the direct financial and technical support provided. The analysis suggests positive impacts on marginalized regions by enhancing agricultural productivity and providing sustainable livelihoods. Including covariates ensured robust estimates of the policies' effects.

Conclusions: This study provides empirical evidence on the effectiveness of Mexico's public policies in increasing cultivated areas of various crop groups. Using the DiD technique, we isolated the causal impact, revealing significant positive effects, particularly in the cultivation of cereals and legumes. The findings highlight the beneficial impact on marginalized regions, improving agricultural productivity and supporting sustainable livelihoods. This research underscores the importance of well-designed agricultural support policies in enhancing food security, economic stability, and environmental sustainability in Mexico's rural areas.

Conflict of Interest: none

Keywords: public agricultural policies; difference in differences (DiD); crop cultivation; Mexico

S08.2
Incorporation of Health and Sustainability in the Transformation of the Food Environment in Mexico

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Introduction: Recent scientific evidence has emphasized the importance of understanding contextual factors, specifically how food environment affects diet. Food environments are integral to food systems and play a critical role in shaping people's food choices. However, recent evidence suggests that current food systems are inadequate, contributing to a global syndemic of malnutrition and climate change, jeopardizing the food and nutritional security of both current and future generations. Therefore, focusing on food environments is essential for transforming food systems to become healthier and more sustainable.

Objective: The aim of this study is to calibrate the measurement of health and sustainability dimensions of food environments in Mexico using University City as a case study.

Methods: First, two instruments were developed to measure healthfulness and sustainability of the food environment around the Faculty of Medicine. This was followed by two rounds of mapping all food establishments within a 300-meters buffer, using the previously created instruments. The first round of mapping assessed the feasibility of the healthfulness instrument and identified potential fieldwork issues. During the second round, a sustainability instrument was applied together with the improvements of the healthfulness instrument to allow better measurement. Preliminary descriptive analysis has been conducted to evaluate these two food environment dimensions.

Results: The study area has 197 establishments selling food. Most of the establishments are restaurants (34%), followed by street food stalls (32%). In terms of healthfulness, most establishments are mixed (58%), this means that they sell both healthy and unhealthy foods, while 41% are unhealthy and only 1% are healthy. In terms of sustainability, data is currently being analyzed, where aspects such as food waste, plastic use, utility usage, and product properties were measured.

Conclusions: The results from this study provide a methodological innovation for future research in Latin American region to measure the healthfulness and sustainability dimension of food environments. Ultimately, these measures will enable the assessment of necessary changes that must be made to transform food environments in specific contexts.

Conflict of interest: none

Keywords: food environment; Mexico; sustainability; diet

S08.3
Traditional Food Supply System, Key to Food Security and Nutrition

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Introduction: Nutritional status, key to health outcomes, is related to diet quality. Several studies have examined the relationship between the availability of establishments in the modern food supply system and diet quality, but little research has been done on the traditional food supply system.

Objective: To analyze if the relationship between the availability of types of establishments in the traditional food supply system (small grocery stores, specialized stores, bakeries, *tortillerias*, territorial markets, central supply markets, *tianguis*) and the household purchases of ultra-processed food products is different from the relationship between the availability of establishments in the modern food supply system (supermarkets, discount stores, warehouse stores, convenience stores) with these same products, in a representative sample of the Mexican population in 2022.

Methods: Food purchases were estimated based on the information from the Mexican income and expenditure survey ENIGH. Densities of establishments were determined at the municipal level based on the national directory of economic units DENUE, except for territorial markets, central supply markets, and *tianguis*, which were estimated based on the municipal census. Two-part models were used to test the associations, while controlling for variables that have been associated with higher consumption of ultra-processed food. Density=#establishments/population.

Results: The density of convenience and discount stores were significantly associated with higher purchases of ultra-processed food. The same types of stores were significantly associated with higher purchases of ultra-processed sugar sweetened beverages, but the small grocery stores were also associated. On the other hand, specialized stores were significantly associated with higher purchases of fruits and vegetables, whereas the convenience stores, discount stores, supermarkets, and small grocery stores were associated with lower purchases of fruits and vegetables.

Conclusions: The types of establishments in the traditional food supply system in general were not associated with the purchases of healthy/unhealthy food, but it should be promoted, at least compared to two types of stores in the modern food supply system which are systematically associated with less healthy food purchasing patterns, namely convenience and discount stores.

Conflict of Interest: none

Keywords: food retail; diet; territorial markets; Mexico; ultra-processed food

S09: LATINFOODS Contributions to the Knowledge of the Composition of Regional Foods

S09.1
LATINFOODS Contributions to the Knowledge of the Composition of Regional Foods

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Introduction: Food composition data play a fundamental role in areas such as nutrition, health, agriculture, food industry, nutritional labeling, and trade. Foods vary in their composition due to different conditions, therefore, the composition of the same product may be different between countries/regions, leading to the need to develop national or regional data. The growing demand for this information in Latin America is not satisfied. At the international level, FAO promotes the generation and compilation of food composition (FC) data through the INFOODS project (International Network of Food Data System) of which the LATINFOODS Network is the Regional Center for Latin America (https://www.latinfoodsportal.net/latinfoods/index.php).

Methods: LATINFOODS is currently working on the Development of the Latin American Food Composition Portal (LATINFOODS Portal), which arises from the need to form a network of institutions that work in a harmonized manner regarding the quality of the information it provides. Its objective is to promote the production of food data from the countries that are part of the Network. The following steps involve: (i) preparation of the FC Data Aggregation Manual and Form; ii) preparation of the databases of the LATINFOODS network countries iii) Publication of the Portal.

Results: The steps for its creation were: (i) training in data compilation; (ii) incorporation of information quality control; (iii) estimation of the composition of the dishes usually consumed by the regional population.

The results achieved include: (i) preparation of the Manual and Form for the Compilation of FC data; (ii) development of the workshop for compilers from LATINFOODS countries (48 professionals from 15 countries); (iii) preparation of the Composition Calculation Form for prepared dishes; (iv) advance on the development of the LATINFOODS Portal website (https://latinfoodsportal.net/). Currently, 8 countries provide original FC data, totaling 800 foods/ingredients and/or preparations typical of each region.

Conclusion: It is expected that more Latin American countries will join the project, in order to provide quality information on the composition of foods in a harmonized manner, as proposed by FAO/INFOODS.

Conflict of Interest: none

Keywords: food composition; database; portal LATINFOODS; network

S09.2

Evaluation of the Nutritional Composition and Bioactive Components in Edible Wild Mushrooms from the Southern Forests of Chile

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Introduction: Wild edible mushrooms (WEMs) represent a little-studied natural resource. According to recent estimates, there are more than 12,000 species of mushrooms in the world, of which 2,000 are edible. In Chile there are approximately 53 species of WEMs. In the Valdivia Region, it is possible to find 30 different species, and among some of the most consumed by the local population are: Agaricus. macrosporus (Champiñon), Pleurotus ostreatus (Ostra), Boletus loyo (loyo), Grifola gargal (gargal), Ramaria sp (changle), species of Cyttaria (dihueñe), and species of Morchella.

Objective: The aim of this study was to identify the nutritional properties of WEM.

Methods: WEM were analyzed, determining the contents of protein (Kjeldahl method), total fat (Bligh & Dyer method), moisture and ash (thermogravimetric methods), carbohydrates, and fatty acid profile (GC-FID) (AOAC, 1995).

Results: The analyzed mushrooms (*Champiñón, Digueñe, Changle, Morchella, and Ostra*) exhibited similar moisture content, around 90%. The protein content varied from 34.5 ± 2.05 g/100g in *Digueñe* to 44.89 g/100g in *Changle*. There were significant differences in fat content (on a dry basis), with Oyster mushrooms having the lowest content (4.5 ± 0.41 g/100g) followed by *Digueñe* (6.66 ± 0.22 g/100g), and *Morchella, Changle*, and *Champiñón* mushrooms having 8.11 ± 0.60, 8.24 ± 0.82, and 8.58 ± 0.48 g/100g, respectively. The fatty acid profiles also showed significant differences in their unsaturated fatty acid content. *Digueñe, Changle*, and *Champiñón* mushrooms had oleic acid contents of 7.11, 36.025, and 0.72, respectively; linoleic acid contents of 37.16, 24.85, and 66.51, respectively; and α-linolenic acid contents of 19.67, 0.87, and not detected, respectively.

Conclusions: The analysis revealed that the fatty acid content in the studied mushroom species is variable. The atherogenic index (0.23 – 0.34) is consistent across the species and comparable to those found in shellfish and certain green algae. This indicates a predominance of unsaturated fatty acids, highlighting their potential as healthy food options.

Conflict of Interest: none

Keywords*: wild edible mushrooms; Digüeñe; Changle; Morchella*

S09.3

Study of the Physicochemical Composition and Bioactive Compounds in Virgin Olive Oils from the Huasco Valley, Atacama Region, Chile

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Introduction: In the Huasco Valley, located in the Atacama region of northern Chile, characterized by Mediterranean agriculture, the first variety of olive tree, 'Sevillana', was introduced 450 years ago. To add value to local olive oil production, the Huasco Valley, which has 1,200 hectares of planted olive trees and approximately 300 small and medium-sized producers, has established olive oil production under the "Denominación de Origen de Aceite de Oliva del Valle del Huasco" (Huasco Valley Olive Oil Designation of Origin). In this process, the varieties 'Sevillana', 'Empeltre', 'Frantoio', 'Manzanilla Chilena' and 'Arbequina' are considered as the basis for this product.

Objective: The objective of this research was to study the bioactive and sensory compounds of the varieties of virgin olive oils that make up the "*Denominación de Origen de Aceite de Oliva del Valle del Huasco*" (Huasco Valley Olive Oil Designation of Origin).

Methods: The study was carried out on five varieties of virgin olive oils (VOO) from the INIA Experimental Center of Huasco, *'Sevillana', 'Empeltre', 'Frantoio', 'Manzanilla Chilena'* and *'Arbequina'*. The following parameters were evaluated in the VOOs: free fatty acids, peroxide index, specific extinctions of the oils, tocopherols and sterols according to AOCS (1993). Fatty acid composition according to COI/T.20/Doc.nº.24. Phenolic and volatile profiles according to García-González et al. (2010). Sensory evaluation according to COI/T.20/Doc. no. 15 and COI/T.20/Doc.nº.22.

Results: All the oils were extra virgin quality. The *Sevillana* variety had the highest values of total phenols and alpha tocopherol with values of 815 and 259 mg/kg of oil, respectively. The varieties presented oleic acid contents between 61 and 75 g per 100 g of oil. *Frantoio* variety had the highest sterol content with 2009 mg/kg of oil with 95 % of β-Sitosterol. The sensory profiles were characteristic of each variety.

Conclusions: Each of these varieties contributes its differentiating characteristics in terms of unique functional, aromatic and productivity components, where varieties, climate, soil, traditions and science interact.

Conflict of Interest: none

Keywords: olive oil; bioactive compounds; Huasco Valley; designation of origin

S09.4

Evaluation of the Chemical Nutritional Composition of 35 Varieties of Chilean Beans in Raw and Cooked Form

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Introduction: *Phaseolus vulgaris L.* common bean, an important legume for human consumption, stands out for its protein, calories, vitamins, and phytochemicals associated with health benefits. Chile has a great diversity of ancient varieties of beans. About 1200 are stored in the germplasm bank of INIA *Quilamapu,* and little is known about their nutritional and culinary qualities.

Objective: To determine the proximate composition of 35 raw and cooked Chilean bean varieties and identify the varieties with the highest macronutrient content.

Methods: The germplasm bank of INIA, *Quilamapu, Chillán*, Chile provided 35 bean varieties. Proximate analysis (moisture, ash, protein, lipids, fiber, and carbohydrates) was carried out according to AOAC (2000). The Mattson pot was used for the cooking process; the cooking time was recorded once 80% of the seeds were perforated by the rods of the equipment. The analyses were carried out in triplicate.

Results: There is significant variability among the macronutrients of the beans, the raw bean varieties with the highest lipid content were *Curi* (4.647 ± 0.108 g/100g ps); protein, *Sapo* (24.834 ± 0.245 g/100g ps); carbohydrates, *Colihuado* (76.358 ± 0.540 g/100g ps); ashes, *Licantén* (6.762 ± 0.282 ps); fiber, *Licantén* (6.762 ± 0.282 g/100g ps) and calories, *Curi* (395.497 ± 3,590 kcal). The cooked bean varieties with the highest lipid content were *Quilapallar* (2.638 ± 0.152 g/100g ps); protein, *Coyuna* (24.688 ± 0.058 g/100g ps); carbohydrate, *Cabrito* (75.534 ± 0.233); ash, *Blanco Español* (4.504 ± 0.167g/100g ps); fiber, *Mantequilla* (4.906 ± 0.129 g/100g ps) and calories *Rubí* (390.970 ± 0.926 kcal). The variety with the shortest cooking time was *Torcaza* (0:32 ± 0:01 hours), and the longest cooking time was *Manteca* INIA (1:11 ± 0:09 hours).

Conclusion: Cooking impacted the nutritional quality of the different varieties of Chilean beans, which is valuable information for a better understanding of the various types of beans in the regional diet.

Conflict of Interest: none

Keywords: raw bean; cooked beans; cooking time

S10: Omics Analyses in the Study of Obesity

S10.1

Gene x Environment Interaction in Relation to Obesity: The Role of Mediterranean Diet

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Introduction: Several studies conducted in European adults have shown the interplay between the healthy Mediterranean Diet (MD) pattern and the genetic susceptibility to obesity, obtaining, in most cases, positive results in the obesity related indicators assessed, as a result of a high MD adherence. However, studies conducted in younger populations, to understand the early mechanisms underlying the gene x diet interaction effects, have been scarcely explored.

Objective: To show the latest findings in the available literature regarding the interplay between obesity genetic pathways and other environmental factors, represented by the MD adherence. We aim to describe the impact of genetic factors to reduce obesity through MD in European adult and young populations.

Methods: Through an exploratory review of the literature applying the subsequent selection criteria, we focus on explaining how interaction mechanisms have been considered in the available literature. Moreover, we describe different moderation approaches and the interpretation of the obtained results. Finally, to show how we could implement these findings at individual and community health promotion level.

Results: A limited number of studies were found in young European populations. A study carried out in European adolescents showed that the influence of high MD adherence on obesity was only observed in subjects with a limited number of risk alleles, also showing sex-specific differences, being the effect higher in females. Moreover, studies performed in European adults showed results in various directions. A study showed greater weight management through MD consumption in those individuals at high genetic risk. Finally, another study obtained that higher MD adherence was associated with lower body mass index and waist circumference, irrespective of their genetic profile.

Conclusions: Interaction analysis provides evidence to better understand how different environmental factors behave with each other, particularly using a nutrigenomic approach. Overall, it seems that the genetic predisposition to obesity could determine the impact of MD health benefits in both European adult and young cohorts. More research combining other exposome outcomes is required, integrating omics and personalized nutrition considering the MD pattern.

Conflict of Interest: none

Keywords: obesity; genetic risk; interaction analysis; mediterranean diet

S10.2
The Role of Mediation Analyses to Understand the Genetic Pathway to Obesity

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Introduction: Obesity is a chronic disease with a strong heritability component and a highly polygenic nature. Twin studies have shown that genetic factors can account for up to 80% of the variance in body mass index. However, not all individuals exposed to the same obesogenic environment develop obesity, indicating a complex interplay between genetic and environmental factors. Traditionally, research has focused on gene-diet interactions to identify individuals who may benefit more from specific interventions. Nevertheless, a comprehensive understanding necessitates exploring how environmental factors mediate genetic susceptibility to obesity.

Objective: To elucidate the role of mediation analysis in identifying the environmental factors that may explain genetic susceptibility to obesity.

Methods: Mediation analyses are used to understand the interplay between genetic and environmental factors in obesity. Mediation analysis allow the identification of underlying mechanisms behind the association between genetic risk and obesity outcomes. We review studies that have identified various environmental factors which partially mediate genetic susceptibility to obesity.

Results: Several studies have demonstrated that the genetic susceptibility to obesity is mediated by eating behaviors in both adults and children. Additionally, research has identified grey matter volume as a mediator and suggested that impulsivity may also play a role in this pathway. Early studies indicated that rapid growth during childhood mediates the risk of obesity in adulthood. Recent studies have expanded the scope to include other mediators such as leptin, education, physical activity, and depressive symptoms. Furthermore, recent findings highlight that poor diet quality also mediates the genetic susceptibility to obesity in adult populations.

Conclusions: Mediation analysis offers valuable insights into how environmental factors can elucidate genetic susceptibility to obesity. By understanding these pathways, we can develop personalized prevention and treatment strategies that target modifiable environmental exposures, thereby mitigating genetic risk and addressing obesity more effectively across the population.

Conflict of Interest: none

Keywords: obesity; genetic pathways; mediation analysis; environmental factors

S10.3
Multi-Omics Approaches in the Study of Obesity and its Co-Morbidities

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Introduction: Obesity, influenced by numerous factors, including genetics, is one of the most investigated, and remains partially unexplained. Body Mass Index (BMI) misclassifies around 30% of individuals and does not fully capture the range of metabolic health states. The relationship between obesity and impaired health is yet to be determined, as it could be a causal pathway, a confounding factor or share a common origin. To better understand these complexities, there is a need for more comprehensive clinical and molecular phenotyping of obesity, assessment of intricate molecular interactions over time, and consideration of the impact of the environment. Longitudinal multi-omics strategies and exploration of an individual's complete exposome might offer a promising new approach to disentangling these intricacies.

Objective: To explore the potential of multi-omics approaches in the deeper clinical and molecular phenotyping of obesity and its associated comorbidities.

Methods: Omics techniques have made it possible to analyze all molecules present in a biological sample, including DNA, epigenetic markers such as DNA methylation, and transcription products such as mRNAs or miRNAs, proteins, and metabolites. The term multi-omics is used to describe studies involving at least two omics layers, and it requires the integration of all data through machine learning techniques.

Results: Several recent multi-omics studies have been conducted to identify obesity phenotypes and responses to lifestyle

interventions. Our group has also made significant recent findings, exploiting eXplainable Artificial Intelligence for clinical decision support and early diagnosis of insulin resistance in a longitudinal cohort of 90 children. For this, we utilized multi-omics (genomics and epigenomics) and clinical data from the prepubertal stage.

Conclusions: Longitudinal multi-omics approaches offer valuable insights into disease prediction, deep phenotyping, biomarker identification, study of molecular interactions, and personalized medicine.

Conflict of Interest: none

Keywords: obesity; epigenomics; multiomics; machine learning; artificial intelligence

S11: Bioactive Compounds of Plant Origin: Presence in Food, Metabolism, Interaction with Microbiota and Health Effects

S11.1
Citrus Polymethoxyflavones: Study of their Content in Fruits and Industrial By-Products for their Possible Use as Nutraceuticals

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Introduction: Citrus fruits are an excellent source of dietary flavonoids providing large amounts of glycosylated flavanones. These fruits are the main and only dietary source of polymethoxyflavones (PMFs), fully methylated flavones. Previous studies have determined that PMFs are highly bioactive phenolics, with anticancer, anti-inflammatory, anti-obesity, antidiabetic, and neuroprotective effects. These properties and the possibility of reusing citrus peel have aroused interest in this type of compounds.

Objective: The aim of this work is to study the PMFs composition in citrus fruit evaluating the influence of species, cultivar, and ripening state, and to characterize the different wastes and by-products of the citrus fruit industry as a source of PMFs.

Methods: We collected 10 varieties of mandarins, 9 varieties of oranges and other citrus fruits such as lemon, grapefruit, chinoto, bergamoto, kumquat, limequat, and calamondin from the "*Jardín de las Hespérides*" of the University of Murcia (Spain) at three stages of ripening. Samples were extracted with methanol and analyzed by HPLC-DAD-ESI-IT MS/MS. Different by-products of the industrial production of citrus juice (juices, cloudy, essential oils, comminutes) will be provided by the company AMC Natural Drinks Food.

Results: Thirteen PMFs were identified in mandarin, orange and grapefruit, mainly isosinensetin, nobiletin, tangeretin and sinensetin. In general, the variety has more influence than the species in the total amount of PMFs, being the variety *De Wildt* in mandarin and *Sanguinelo* in orange the richest one. The PMFs content increased with the ripening stage. PMFs were also found in all industrial by-products analyzed, with the highest amount in mandarin and orange essential oils (~4 mg/mL) followed by orange cloudy (~500 μg/g) and comminute (~200 μg/g) and the lowest amount in the juices (10-20 μg/mL).

Conclusions: Advances in this field will allow the selection of the variety and the optimal state of maturity to obtain the highest concentration of PMFs and the use of by-products from the food industry for the preparation of nutraceuticals based on citrus PMFs contributing to circular economy.

Conflict of Interest: none

Keywords: polymethoxyflavones; citrus fruit; varieties; nutraceuticals

Funding: Ministry of Science and Innovation (project CITROXON) (PID2022-141981OB-100) and AGROALNEXT with NextGenerationEU funds (PRTR-C17.I1)

S11.2
Role of Gut Microbiota in the Metabolism and Bioactivity of Saffron Apocarotenoids

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Introduction: The main constituents of saffron flowers (*Crocus sativus*) are the apocarotenoids crocin and crocetin. Different properties have been attributed to these compounds. Neither the specific molecules or metabolites responsible for these effects nor the mechanisms of action involved in them have been sufficiently studied. An important factor is knowing their bioavailability and their possible interaction with the gut microbiota. Recent studies with mice point to the key role of the intestinal microbiota in the neurological effects of crocins/crocetin. It could be that unknown microbial metabolites derived from crocin/crocetin or changes in the fecal metabolome because of their interaction with intestinal bacteria are involved in the neurocognitive effects.

Objective: The main aim was to evaluate the interaction of saffron apocarotenoids with the gut microbiota through the study of the fecal metabolome.

Methods: We carried out *in vitro* studies by incubating fecal samples from different volunteers with pure standards of crocin and crocetin in an anaerobic chamber. Samples were taken at different times (between 0-5 days) after incubation. Different extraction and analysis protocols were applied through different analytical platforms (UPLC-ESI-QTOF and GC-MS). The data generated were analyzed using targeted and untargeted metabolomic approaches.

Results: The transformation of crocin and crocetin in humans was reported for the first time. Crocin was rapidly transformed into crocetin by losing all glucose molecules and in the process a group of intermediate crocins with different degrees of glycosylation were produced. Crocetin was also metabolized, and new microbial metabolites were identified for the first time: different

dicarboxylic acids produced by double-bond reduction and demethylation reactions of the crocetin molecule. Changes in other microbial metabolites such as fatty acids and bile acids were also found. Besides, interindividual variability has been observed in the metabolic profiles of different populations.

Conclusions: This work has given further and strong evidence of the role of human gut microbiota in the metabolism of the saffron carotenoids and open new research lines in the knowledge of their mechanisms of action related to health.

Conflict of Interest: none

Keywords: crocetin; crocin; fatty-acids; gut-microbiota

Funding: Seneca Foundation (Murcia, Spain) (project 20050/PI/22); AGROALNEXT with NextGenerationEU funds (PRTR-C17.I1)

S11.3

Dietary Phytochemicals Modulate the Bile Acids Metabolism through Gut Microbiota and May Help Improve the Metabolic Syndrome

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Introduction: It is widely recognized that a diet rich in bioactive compounds contributes to maintaining optimal health. Obesity and cardiovascular diseases, which are components of metabolic syndrome, have become a true pandemic. The relationship between bile acids and certain pathophysiological states related to cholesterol, lipid, and glucose metabolism, which influence the development of metabolic syndrome, is well known. This occurs due to the interactions of bile acids with specific intestinal receptors. Interestingly, the final group of bile acids does not depend on the host, as the intestinal microbiota converts them into different forms that may play a biological role. Intestinal microbes typically perform deconjugation, dehydroxylation, oxidation, and epimerization of bile acids. However, a new family of bile acids conjugated with amino acids, known as microbially conjugated bile acids (MCBAs), has recently been described, significantly expanding the number of bile acids produced by the intestinal bacteria.

Objective: Explore the secondary bile acids, including the diversity of the MCBAs, produced by the human gut microbiota and evaluate the capabilities of plant bioactive compounds to modulate them.

Methods: Total fecal samples of healthy individuals were incubated with primary bile acids, crocetin, and procyanidin C1. After bile acids extraction, the samples were analyzed by semi-untargeted metabolomics to explore the secondary bile acids, including the new MCBAs, and evaluate their modulation by plant bioactive compounds.

Results: The results showed the capabilities of the plant bioactive compounds to modulate the secondary bile acids including the MCBAs. In addition to these amino acid-conjugated MCBAs, new conjugation possibilities with other non-protein amino acids have also been described, further expanding the MCBA family. Furthermore, it has been demonstrated that certain phytochemical compounds found in grape and saffron can modify the gut microbiota, altering some of its microbial enzymatic activities related to the conjugation state of bile acids.

Conclusions: These new findings open new research opportunities to evaluate how dietary phytochemicals can modulate the gut microbiota to produce the desired bile acids, thus enabling better precision nutrition design.

Conflict of Interest: none

Keywords: bioactive compounds; gut-microbiota; bile acids; MCBAs

Funding: Seneca Foundation (Murcia, Spain) (project 20050/PI/22); AGROALNEXT with NextGenerationEU funds (PRTR-C17.I1)

S11.4

Advanced Nutritional Supplements for the Prevention of Metabolic Diseases in the Preclinical Phase

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Introduction: Plant-derived bioactive compounds are of great interest in research due to their possible use in the prevention of metabolic diseases. They include a wide range of diseases, including diabetes, hyperlipidemia or cardiovascular disorders. he use of nutritional supplements based on bioactive compounds, aims to prevent metabolic origin diseases when they are still in a pre-clinical phase. These plant-based supplements do not usually show undesirable side effects compared to other synthetic active ingredients.

Objective: The aim of this research is the design and development of advanced plant-based dietary supplements focused on preventing the development of metabolic diseases.

Methods: We carry out biotechnological treatments to isolate and concentrate these active ingredients, mainly polyphenols, and to improve their bioaccessibility, bioavailability and bioactivity. The extracts obtained are characterized and quantified using advanced analytical techniques (UHPLC-DAD-MS/MS). Considering the biochemical principles of the metabolic disorders studied, we also perform *in vitro* studies to demonstrate the bioactivity of these extracts. In the case of diabetes these studies have focused on three specific therapeutic targets: digestive enzymes such as α-amylase, enterocytes of the intestinal epithelium and the interaction with the intestinal microbiota, studying the multi-target effect of the individual compounds and the extract and its impact on different mechanisms of biological action. Finally, to validate the biological action of these extracts, clinical intervention studies are planned.

Results: Preliminary *in vitro* studies showed the multi-target effect of the extract and provided information about the mechanism of action and the most effective molecular structures of the different bioactive compounds present in the extract. This will allow the design the nutritional supplement in the most effective way to subsequently verify its biological activity in humans.

Conclusions: In this research line, nutritional supplements enriched in the compounds of interest and with potential to prevent metabolic disease in the preclinical phase will be obtained. *In vitro* and *in vivo* studies will aim to validate the biological action of these supplements.

Conflict of Interest: S. Albolafio, P. Tocabens, and JA. Garbayo are members of Niufarma S.L. Company

Keywords: bioactive compounds; polyphenols; nutrition; disease prevention

Funding: Ministry of Science and Innovation (project NEOTEC) (SNEO-20231059)

S11.5
Plant Oxylipins. New Bioactive Compounds in Plant Foods of Relevance to Nutrition and Health

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Introduction: A new group of compounds of plant origin have come onto the scene, the phytoprostanes (PhytoPs) and phytofurans (PhytoFs), which are derivatives of α-linolenic acid by oxidation reactions initiated by the attack of reactive oxygen species in plant tissues.

Objective: The aim was the characterization of plant oxylipins in fruits and vegetables describing their bioactive properties of them concerning inflammation, platelet aggregation, and oxidative stress issues.

Methods: The capacity PhytoPs and PhytoFs were evaluated in lipopolysaccharide (LPS)-stimulated THP-1 monocytic cells, through a panel of 21 PGs and PG's metabolites, analyzed by UHPLC-QqQ-ESI-MS/MS. Platelet activation and vascular cells as well as interactions with platelets and the endothelial EP3 receptor platelet and monocyte activation was assessed by flow cytometry in the presence of purified 9-D1t-PhytoP. Cell migration was studied using the human Ea.hy926 cell line by performing a scratch wound healing assay. The RNA expression of inflammatory markers was evaluated by RT-PCR under inflammatory conditions. Blind docking consensus was applied to the study of the interactions of selected ligands against the EP3 receptor protein.

Results: The evaluation of the capacity of the individual PhytoPs and PhytoFs to revert the modification of the quantitative profile of PGs induced by LPS revealed the anti-inflammatory ability of three PhytoPs and two PhytoFs induced by LPS. The $9D_{1t}$-PhytoP exerts prothrombotic and wound-healing properties. In endothelial cells, $9D_{1t}$-PhytP mimics the migration stimulus of PGE2. Computational analysis revealed that $9D_{1t}$-PhytP forms a stable complex with the hydrophobic pocket of the EP3 receptor by interaction with the same residues as misoprostol and prostaglandin E2 (PGE2), thus supporting its potential as an EP3 agonist.

Conclusions: Plant oxylipins can protect against inflammatory events, encouraging further investigations using plant-based foods rich in these oxylipins or enriched extracts. The 9-D_{1t}-PhytoP has the capacity to form procoagulant platelets, shows high endothelial migration rate and interacts with PGE2 main target receptor in platelets.

Conflict of interest: none

Keywords: plant oxylipin; phytoprostane; phytofuran; inflammation; oxidative stress

S12: Latin American Nutrition and Health Study (ELANS): Results and future perspectives

S12.1
Latin American Nutrition and Health Study (ELANS): Results and future perspectives

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Introduction: A group of Latin American researchers set out to carry out a study in Latin American countries using the same protocol for each one. The study began in 2013, and the first data came in 2015. With the participation of more than 200 researchers throughout the region, ELANS is the most extensive, comprehensive, and representative population study in the area.

Objective: To assess the nutrition situation in the Latin American urban population, 15- 65 years old, in representative settings in 9218 individuals by means of physical evaluation by anthropometry, questionnaires, and accelerometry.

Methodology: The Latin American Nutrition and Health Study (ELANS) was a large-scale, multi-country study conducted in 8 Latin American countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Peru, and Venezuela), resulting in over 86 papers published.

Results: Poor diet quality, with a low intake of vegetables, whole grains, fish, and yogurt. Only a small percentage met fruit and vegetable recommendations. High sugar intake was observed, especially in wealthier groups and younger people. High obesity prevalence and stunting rates were found. The study highlighted the coexistence of poor diet, sedentary behavior, excessive screen time, and high sugar and alcohol consumption.

Conclusion: Conducting multi-country research of this magnitude and quality was not without its challenges. Team coordination, standardized protocols, ethics approvals, and data collection and quality assurance were all complex tasks that required meticulous attention. The study's strengths included a common methodology, pilot testing, and the use of an adapted food composition database, which enabled cross-country nutrient intake comparisons. Overall, ELANS made important contributions to understanding nutrition challenges across Latin America and supporting evidence-based public health strategies.

Conflicts of Interest: MF is a speaker and member board for Abbott, CPW, Danone, Nestle, RB. This text is without conflicts.

Keywords: nutritional survey; physical activity; excess weight; nutritional risk

S12.2
A Comprehensive Narrative on the Origins of the Project and What We Learned

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The ELANS project emerged from the concerns of Latin American researchers in food, nutrition, and health, addressing the region's demographic, epidemiologic, and nutritional changes. The project's 86 papers—57 regional and 29 country-specific—highlight its extensive contributions. Analyses on anthropometry, physical activity, food consumption, micronutrient intake, diet quality, and food patterns have become crucial to Latin America's scientific context. These findings are utilized in reports by multilateral agencies like the Economic Commission for Latin America and the Caribbean (CEPAL) and the Food and Agriculture Organization of the United Nations (FAO) and serve as the basis for government policies and programs. The study provided insights into the nutrition transition in participating countries, socioeconomic disparities, health and nutrition inequalities, data quality, standardization, collaboration, capacity building, and policy implications. ELANS highlighted the importance of large-scale, multi-country research in shaping health and nutrition policies in Latin America. By recognizing these lessons, future studies can build on this foundation to drive meaningful change in the region, addressing challenges of scalability and sustainability in interventions. The project has proven invaluable in understanding the region's nutrition landscape, highlighting the necessity of accurate regional contexts and fostering collaboration for improved public health outcomes. ELANS demonstrated the value of comprehensive research, informing policies and programs, and emphasizing the critical need for ongoing studies to adapt to the evolving demographic and nutritional realities in Latin America. This foundational work supports the region's future health strategies, ensuring that interventions are effective, equitable, and sustainable.

Conflicts of Interest: For this symposium, the author declares no conflicts of interest as no funds from any institution were received. However, the author wishes to declare her personal conflicts of interest: Chair-elect of the LAHIDAN group at the Academy of Nutrition and Dietetics Chicago, USA. Consultant for the World Food Programme, Member of the UNICEF Nutrition cluster and FAO Food Security cluster, for the humanitarian emergency in Venezuela, and received funds from Abbott for the research of intake of proteins, fats, and choline based on the ELANS database.

Keywords: ELANS; data quality; standardization; programs and policies; future perspectives

S12.3
Latin American Study of Nutrition and Health: Main Findings

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The Latin American Nutrition and Health Study (ELANS) is a multicenter investigation including 9218 people aged 15 to 65 across eight Latin American countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Peru, and Venezuela. This study evaluated nutritional intake, physical activity levels, and anthropometric measurements in urban populations. It revealed a poorly varied diet, with deficient intake of food groups linked to lower chronic noncommunicable disease risk. For instance, less than 3.5% of participants met optimal consumption levels of vegetables, nuts, seeds, whole grains, fish, seafood, and yogurt. Only 7.2% met the World Health Organization's recommended fruit and vegetable intake, reflecting low dietary fiber and essential micronutrient intake, including calcium, vitamin D, vitamin E, and magnesium. High energy intake from total and added sugars was observed, particularly among women with high socioeconomic status and younger people. Poor diet coexists with unhealthy behaviors like sedentarism, excessive sedentary activity, and high consumption of sugar-sweetened beverages and alcohol. Another significant finding is the high prevalence of obesity, with Costa Rica and Venezuela having the highest rates (29%) and Colombia the lowest (16%). Stunting was most prevalent in Peru (47%) and least in Argentina (17%), while waist and neck circumferences were highest in Costa Rica (43%) and Chile (52%) and lowest in Colombia (23% and 26%). These findings can inform food and public health policies to improve eating habits and reduce obesity prevalence in the region.

Conflicts of Interest: none

Keywords: diet; diet quality; obesity; physical activity; micronutrients

S12.4
Achievements, Challenges, and Obstacles in Nutrition and Health Research in the ELANS Study

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In recent years, the scientific community has shown a growing interest in nutritional information that allows us to understand the behavior of populations in order to take informed measures to promote policies that favor health promotion and prevention of chronic pathologies. Taking this into account, multicenter studies such as ELANS provide valuable information regarding Latin-America that enable cross-country comparisons of nutritional status focused on energy and nutrient intakes, food patterns, and energy expenditure. During the planning and development of the research, some challenges were detected: team structuring and site selection, development of common protocols, ethical approvals, simultaneous collection of information, and assurance of its quality, which allows us to conclude that harmonization, pilot study, uniformity of procedures, high data quality control, and communication and collaboration across sites are mandatory in order to develop research of this type and quality. An important strength of ELANS apart from having a standardized methodology for field work is the selection and adaptation of a food composition database to make cross-country nutritional intake comparisons that allowed us to minimize systematic and random errors in nutrient intake estimations because between-country comparisons are particularly prone to error when different food composition tables are used to estimate dietary intake. Finally, it is important to recognize that like any research, ELANS has weaknesses that must be considered when using its information, the most important being, the inherent to cross-sectional studies such as the power to correlate dietary intake, physical activity, and nutritional status, but not its causal determinants.

Conflicts of Interest: none

Keywords: nutrition research; multicenter study; cross-country comparisons; energy expenditure; energy and nutrient intakes

S15: Strengthening Talent: Innovative Strategies for Human Resources Development in Nutrition

S15.1
Strengthening Talent: Innovative Strategies for Human Resources Development in Nutrition

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Introduction: The Institute of Nutrition of Central America and Panama (INCAP) has been a benchmark in the training and updating of professionals in the region. Through the Technical Department of Human Resources Development, it promotes academic programs aimed at different professional areas. This research aims to present the methodological models used to promote educational projects and programs designed to strengthen the competencies of technicians and health professionals in the region. Additionally, share the experience in Honduras to strengthen competencies in advocacy and resource mobilization for Food and Nutrition Security (FNS).

Objective: Showcase the processes driven by INCAP in Latin America to strengthen professional leadership in nutrition. Demonstrate the systemic model for capacity building and establishment, along with its effectiveness results. Present participants perspectives about the academic programs to generate strategies that facilitate learning. Share successful experiences applied in the context of Food and Nutrition Security (FNS) in Honduras.

Methods: With a descriptive and cross-sectional approach, the methodological models promoted by INCAP to strengthen human talent for leadership in nutrition will be presented, along with the systemic model for capacity building and its institutionalization. An analysis of quantitative data on the perceptions of participants in INCAP's academic programs with a future-oriented perspective will be presented. Results of the experience of strengthening Food and Nutrition Security (FNS) in Honduras will be showcased.

Results: Obtaining an overview of recommendations and key aspects to consider in training and strengthening human talent in health, nutrition, and Food and Nutrition Security (FNS) areas to promote opportunities and improvements.

Conclusions: It will provide information on the quality and impact of the training processes promoted by INCAP, identifying areas of opportunity, action, and improvement to influence work and institutional performance in nutrition.

Conflict of Interest: The authors declare no conflict of interest

Keywords: specialization; higher-education; institutional-dietetics; pediatric-clinical-nutrition; malnutrition; FNS; advocacy

S17: Chronic Childhood Malnutrition, a Pending Debt in the Region: Challenges

S17.1
Chronic Malnutrition: A Public Policy Challenge in Guatemala

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Introduction: Malnutrition in the first two years of life has consequences on adequate growth and development. The high rates of chronic malnutrition in Guatemala (46.5%) place it in sixth place in the world and first in Latin America. The Guatemalan population is experiencing food and nutritional transition. The nutritional profile includes protein-energy malnutrition in children under 5 years old; overweight, obesity, deficiency of iron, vitamin B12, folate and zinc, in children less than 5 years and women.

Objective: Analyze the available data and public policies for the prevention of chronic malnutrition in Guatemala.

Methods: Country reports, national statistics, government agreements and public policies related to chronic malnutrition in Guatemala were analyzed.

Results: The prevalence of chronic malnutrition in children under 5 in Guatemala has decreased from 62.2% in 1987 to 46.5% in 2015. This prevalence is higher in rural areas (53%), indigenous children (58%), mothers without education (67%) and mothers from the lowest wealth quintile (65.9%). Also, there are other problems associated with food and nutritional insecurity: low birthweight (11.4%), women´s height (≤145 cm, 31.2%) and overweight and obesity in women of childbearing age. Since 2005, Guatemala has a political-regulatory framework related to food and nutritional security integrated by the National Food and Nutritional Security Policy (POLSAN) and the National Food and Nutrition Security System Law (Decree No. 32-2005). The POLSAN includes a broader focus on malnutrition (acute malnutrition, chronic malnutrition, vitamin and mineral deficiencies, overweight and obesity) and not just malnutrition as well as a focus on food systems.

Conclusions: The complexity of the processes to prevent malnutrition in Guatemala requires effective governance. Current evidence on the most effective way to reduce chronic malnutrition encourages bringing cost-effective interventions to scale and strengthening prevention actions and the 1,000-day window of opportunity strategy. One of the main challenges is to socialize and implement the updated POLSAN and strengthen the investment on structural causes of malnutrition (social, economic and cultural aspects) and basic sanitation. It is necessary to promote development to eradicate malnutrition.

Conflict of Interest: none

Keywords: food policy; nutrition policy; food security policy; malnutrition; stunting; chronic malnutrition

S17.2
A new approach to Addressing Stunting in Ecuador

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Introduction: Stunting in children under two years old remains a critical public health issue in Ecuador. The latest National Survey on Child Undernutrition (ENDI 2022-2023) reveals significant prevalence rates, with 20.5% of nationwide children affected, and specific areas and vulnerable populations experiencing even higher rates, such as 33.4% among indigenous children. In response, Ecuador has developed the "Intersectoral Strategic Plan for the Prevention and Reduction of Chronic Childhood Malnutrition" (In Spanish "*Plan Estratégico Intersectorial para la Prevención y Reducción de la Desnutrición Crónica Infantil"* This strategic plan aims at addressing stunting in Ecuador, focusing on the crucial first 1,000 days of life.

Objective: This presentation shows how multiple politics of stunting have evolved over the last 36 years. It discusses the implementation and impact of the intersectoral strategic plan for stunting and presents the impact data from the ENDI survey.

Methods: The strategic plan entails collaboration across multiple sectors, including Public Health, Education, and social protection institutions. Key activities include improving maternal and child nutrition, enhancing healthcare services, and implementing educational programs for parents and caregivers. Insights into the prevalence and determinants of stunting were derived from the ENDI survey, which informed the political monitoring process.

Results: Initial results from the ENDI survey indicate a significant reduction in stunting, from 23.6% in 2018 to 20.1% in 2023. Data from the Ministry of Health, from 2015 to 2022, underlines the impact of these interventions: coverage for children under 24 months increased from 33.4% to 61.4%, and antenatal care coverage rose from 88.4% to 91.4%. Additionally, various activities were implemented through an intersectoral and interinstitutional approach, including educational programs, hiring community nutritionists, timely recruitment of pregnant women and children under two years of age, supplementation, and other community interventions.

Conclusions: Evidence-based policies demonstrate a viable model for reducing stunting. Coordinated efforts across various sectors, with support at the highest political levels, are essential. Countries must invest in these strategies, and sustained collaboration will be vital for further reducing stunting rates and ensuring long-term health benefits for Ecuadorian children.

Conflict of Interest: none

Keywords: politics; child health; health services; prevalence; stunting

S17.3
Comprehensive Policies for Addressing Chronic Malnutrition: The Case of Peru

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Introduction: Between 1990 and 2005, chronic malnutrition rates in Peru remained stagnant, particularly severe among the poorest 20% of the population, where rates fluctuated between 54% and 58% in Quintile 1 and between 40% and 43% in Quintile 2. This marked chronic malnutrition as the predominant health issue in these groups. In 2008, Peru implemented a public budget reform known as Results-Based Budgeting (RBB), coinciding with a significant political push to address chronic malnutrition. This initiative garnered unprecedented support from the Ministry of Finance, focusing efforts on evidence-based strategies.

Objective: This presentation showcases the role of an evidence-based strategy and how, when combined with RBB, it can accelerate the reduction of chronic malnutrition.

Methods: The RBB approach in Peru was characterized by several key elements: rigorous use of evidence to design strategies, consensus on priorities among stakeholders, rule-based budget allocation tied to performance, integration of budget rules with service delivery management, and a robust monitoring and evaluation system. A pivotal aspect of Peru's strategy was the swift implementation of comprehensive health interventions, including timely vaccination against rotavirus and pneumococcus, and monthly health check-ups for infants.

Results: Funding for these initiatives increased between 5 to 16 times, leading to rapid improvements in coverage, particularly in impoverished areas. Within the first year, health check-up coverage increased significantly by 15 to 16 percentage points in the two poorest quintiles. In the poorest regions, vaccination coverage doubled within two years, with rotavirus and pneumococcal vaccination rates soaring from around 40-50% to over 80-90%, and health check-up rates rising from 15% to 73%. From 2007 to 2016, Peru's efforts yielded remarkable results: chronic malnutrition rates in Quintile 1 dropped from 54.4% to 30%, and in Quintile 2 from 42.9% to 12.9%. The poorest department had a 19-percentage-point decrease in chronic malnutrition within three years.

Conclusions: Peru's experience underscores the feasibility of accelerating reductions in chronic malnutrition through targeted budget reforms and evidence-based strategies, highlighting the critical role of finance ministries in driving impactful social interventions.

Conflict of Interest: none

Keywords: results-based budgeting; child health; stunting

S18: Strengthening Maternal-Child Nutritional Care at the Primary Level of the Health System in Guatemala

S18.1
Strengthening Maternal-Child Nutritional Care at the Primary Level of the Health System in Guatemala

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Introduction: Guatemala's health systems face a significant challenge due to the triple burden of malnutrition affecting women of reproductive age and children under five years old. Strengthening nutritional care at the primary healthcare level is essential for improving health outcomes in these vulnerable populations. Although numerous studies have focused on improving the overall quality of health services, specific efforts to evaluate the Quality of Maternal and Child Nutritional Care (QMCNC) have been limited.

Objective: To adapt and contextualize indicators to evaluate the QMCNC within the Guatemalan health system.

Methods: A literature review of secondary sources and grey literature was conducted to explore previous experiences in Guatemala and other Latin American countries regarding evaluating and monitoring QMCNC. Official sources and documents from the Guatemalan Ministry of Health that could serve as inputs for identifying the structure of health systems and available data resources and records to measure the indicators once validated were reviewed. Cabinet meetings were held to identify potential areas where the indicators could be piloted in the future.

Results: Twenty-two QMCNC indicators were identified as a principal source of adaptation in the Guatemalan health system. Of these, 16 indicators have been previously implemented in Mexico: 2 for preconception, 4 for pregnancy, 2 for postpartum, 5 for childhood and 3 for preschoolers. The first and second levels of care of the Guatemalan health system provide primary health services focusing on preventing, diagnosing, and treating maternal and child malnutrition. Among the available resources in these units are daily consultation records and notebooks for children under five. Quetzaltenango and Huehuetenango were identified as departments that are highly likely to be suitable for validating these indicators due to their local relevance and potential for effective implementation.

Conclusions: These findings indicate that the adaptation and contextualization of the identified indicators are both viable and feasible within the Guatemalan setting. This sets the stage for effective adaptation, ensuring that maternal and child nutritional care can be accurately measured and improved in the Guatemalan health system.

Conflicts of Interest: none

Keywords: maternal and child health; malnutrition; quality of health care; primary health care

S20: Nutritional Composition, Health, and Dietary Communication

S20.1
NUTRIFEN®: Nutritional Composition Tool for Food and Beverages

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Introduction: Knowledge of the nutritional composition of foods and beverages available on the market is of great interest for evaluation intake and assessment of possible health risks, as well as to know the modifications in the reformulation that are being carried out in response to the demands of scientific societies and consumers.

Objective: To make known the online database NUTRIFEN® of the Spanish Nutrition Foundation (FEN) that is a valuable food and nutrition reference tool for health professionals and consumers and, most importantly, it is a database that is continuously updated.

Methods: NUTRIFEN is a project carried out by FEN and the Manufacturers and Distributors Association (AECOC), is a food and nutrition consultation database that collects information on most of the packaged products (food and beverages) available on the Spanish market. In which the data is continuously updated.

Results: It provides up-to-date nutritional information on a wide variety of products (65,000), allowing the user to search by brand or product name. NUTRIFEN® includes ingredient, allergen lists, and nutritional information based on current labeling regulations. Can be sorted by amount of energy and nutrients.

NUTRIFEN® is an ideal tool to know the ingredients and nutritional value of foods and beverages available in the market, as well as to study their reformulation compared with old databases of previous dates, so it can be used as information in the field of scientific and educational dissemination.

Conclusion: NUTRIFEN® represents an innovative and up-to-date tool that addresses the need for accurate nutritional information, contributing to a better food and nutrition understanding and promoting healthier decisions and choices in daily life.

Conflicts of Interest: none

Keywords: NUTRIFEN®; food databases; nutritional information; education tool; reformulation nutritional labeling; packaged food and beverages

S20.2
Low and No-Calorie Sweetener as a Tool for Sugar Control in Foodstuffs (Food and Beverages)

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Introduction: Overweight and obesity continue to be highly prevalent today. The sugar amount and energy density of foodstuffs (food and beverages) may be one of the factors contributing to this data.

Objective: To determine the main technological activity of low-calorie and no-calorie sweeteners in food products.

Methods: Analyze low-calorie or no-calorie sweeteners approved by the European Food Safety Authority (EFSA) and authorized by the European Commission (CE). In addition, also include new foods that have a sweetening function and have few or no calories. Also evaluate new compounds that are used as a strategy to make food products taste less sweet.

Results: There are 19 sweeteners approved and authorized by European institutions and authorities that have, if necessary, an approved Acceptable Daily Intake (IDA) and specific uses, conditions and restrictions depending on sweeteners and the type of food products where they are to be used. In addition, new food sweeteners such as monosaccharides and disaccharides and some proteins with a specific functionality as sweeteners have also been developed.

More and more combinations of sweeteners are being used to reduce or eliminate sugar content, and table-top sweeteners that incorporate probiotics or vitamins are beginning to be developed.

Conclusions: The use of low or no-calorie sweeteners in food products must reduce or eliminate the sugar content to contribute to a lower dietary intake and a lower caloric value or adjust to the healthy style datum.

They should be used to lower and adapt the degree of sweetness to the new organoleptic requirements of consumers.

Conflicts of Interest: none

Keywords: low and no calorie sweetener; sugar; foodstuff; reduction; food safety

S21: New Advances in the Study of Childhood Obesity and its Comorbidities. The IBEROMICS Project

S21.1
Using ObMetrics to Assess Cardiometabolic Alterations in Children and Adolescents with Obesity

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Introduction: Pediatric obesity is closely linked to the development of Metabolic Syndrome (MetS), but there is no international consensus on diagnosing MetS in children. Selection of a MetS definition requires the use of reference tables specific to ethnicity or age. Consequently, physicians face challenges assessing MetS due to the absence of standardized guidelines and tools.

Objectives: To evaluate the efficacy of a shiny app, named ObMetrics, for the assessment of MetS in pediatric populations (https://coblabugr.shinyapps.io/obmetrics/).

Methods: ObMetrics is a user-friendly Shiny app that automates calculation of each MetS component z-score (waist circumference, blood pressure, lipid profile, glycemia and insulin resistance). These calculations were applied to data from two large cross-sectional multicenter studies of Spanish children (GENOBOX and IBEROMICS), involving 2,235 participants aged 6-18 years. The children were categorized by obesity status—normal-weight, overweight, and obese—according to the International Obesity Task Force (2012) criteria.

Results: ObMetrics has been a suitable tool for the assessment of MetS in pediatric population in clinical research. We found an association between increasing degrees of obesity and elevated MetS z-scores, particularly for HOMA-IR, blood pressure, and HDL z-scores ($p<0.001$).

Conclusions: ObMetrics allows simple, reliable, and fast z-score calculations for the MetS. Permits quantification of the metabolic deterioration in pediatric patients as obesity increases, regardless of the cut-off points proposed by the different MetS definitions used.

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Conflict of Interest: none

Keywords: pediatric obesity; metabolic syndrome; cardiovascular diseases

S21.2
Study of Lifestyle Changes Associated with the Development of Childhood Obesity.

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Introduction: The current increase in the prevalence of obesity in children appears to be associated with lifestyle changes in diet, physical activity (PA), and sedentary behavior. The American Academy of Pediatrics (2023) highlights identifying social determinants of health for the diagnosis and treatment of childhood obesity.

Objectives: To determine the role of diet, PA and/or sedentary lifestyle in the pathogenesis of pediatric obesity and its changes after puberty.

Methods: GENOBOX cohort (cross-sectional), 1699 Spanish children (51.7% girls, 69.7% obese/overweight and 65.1% prepubertal) and PUBMEP longitudinal cohort through puberty, 94 Spanish children (55% girls). Diet and PA were measured using

validated questionnaires and accelerometry. The association with overweight/obesity and comorbidities was analyzed.

Results: Fifty-six percent of active children participate in sports clubs and have fewer screens in their rooms. Sedentary children show worse metabolic profiles. Children with high AP/S scores have better redox profiles. Healthy eaters, though more often overweight/obese (80.1% vs. 63.8%), have less abdominal fat and better metabolic profiles than those in the unhealthy eating cluster. Boys are more active, with activity gaps increasing post-puberty. Sedentary time rises by 50%, and PA declines. More children fail to achieve 60 minutes of daily moderate/intense activity (33.3% boys, 4.6% girls). Post-puberty, 75.5% of children remain in the same BMI category, while 6.3% increase by at least one category. Metabolic risk is higher in pubertal children.

Conclusions: Dietary patterns should be studied for cardiometabolic risk assessment, not just weight control, in overweight/obese children. Increasing extracurricular sports and limiting bedroom screens is crucial. Lifestyle intervention should start as early as prepubertal age.

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Conflict of interest: none

Keywords: childhood; adolescent; puberty; lifestyle; diet; physical activity; sedentary; obesity

S21.3
Novel Insulin Resistance Biomarkers in Childhood Obesity

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Introduction: Puberty is a time of metabolic and hormonal changes. It is associated with reduced insulin sensitivity that might impact future insulin resistance (IR) and type 2 diabetes in adults. Our group investigates the pathophysiology of childhood obesity, as well as the prevention and treatment of this condition, by identifying new clinical and childhood biomarkers. In an epigenetic-wide association studies (EWAS) in blood, we found differences in DNA methylation of genes such as isthmin-1 (ISM1), vasorin (VASN), and peptidase D (PEPD) in children with obesity and IR.

Objective: To identify novel biomarkers that may predict metabolic risk in children with obesity. Specifically, we focused on determining the serum levels of ISM1, VASN, and PEPD.

Methods: The study population is from two different cohorts, consisting of a longitudinal population of 90 pre- and pubertal children with overweight, obesity, and normal weight, and classified into IR status (PUBMEP study); and a cross-sectional cohort of children with obesity recruited at the pre- and pubertal stages with and without IR (n=240) (IBEROMICs study). Both cohorts have anthropometry, glucose, and lipid metabolism, biomarkers of inflammation and cardiovascular risk, as well as serum ISM1, VASN and PEPD levels measured.

Results: We found that serum VASN protein levels were significantly lower in children with obesity and IR, both at the prepubertal and pubertal stages. ISM1 serum levels were higher in obesity boys compared with overweight and normal-weight boys. Furthermore, ISM1 serum levels were positively associated with BMI Z-score, and negatively with myeloperoxidase (MPO) in boys. Serum PEPD levels were lower in prepubertal children with IR than non-IR. There was a significant negative correlation between serum PEPD protein levels and fat mass in prepubertal children.

Conclusions: We report an unprecedented study that provides a major step forward showing that ISM1, VASN, and PEPD might be important biomarkers of metabolic status in children with obesity and IR.

Conflict of Interest: none

Keywords: biomarkers; insulin resistance; childhood obesity

S22: Successes and Failures of Interventions in School Food Environments from Latin America

S22.1
Introduction to the Design and Evaluation of Interventions in School Food Environments, the case of NUTRENTO©

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Introduction: School food environments (SFE) are systems with multilevel mediators that can influence children's eating behavior and nutritional status.

Objective: To analyze the conceptual models that define SFE to propose assessment strategies and interventions that integrate elements for the promotion of healthy SFE.

Methods: With a review of the literature and an ecosocial approach, models, elements, livelihood, resources and determinant mediators of SFE were identified.

Results: The way in which SFE are conceptualized defines the indicators of evaluation and intervention, as well as their potential impact and sustainability. The dimensions of accessibility, availability, supply, promotion, affordability, convenience, desirability, infrastructure, regulations, community support, agricultural production, sustainability, information and nutritional quality of food are the most intervened aspects, but not always the actions can be sustainable within the system. For the design of interventions in SFE, the UNICEF and FAO model allows the integration of factors that interact dynamically in the eating behaviors of children and adolescents and considers food and nutrition education (FNE) as an articulating axis with other dimensions. Proposals for psychoeducational and digital interventions, focused on teachers, seem promising. The project NUTRENTOã integrates the teacher as a potential mediator to promote actions and elements of sustainable healthy school food environments, through strengthening elements of teaching practice and the EAN.

Conclusions: Assessments and interventions in FNE require a prior understanding of the interaction and weight of the elements that constitute them. Models need to be designed and tested with mediators of schoolchildren's food choices and practices, with approaches that participate within the FNE system.

Conflicts of Interest: none. This study was funded by the 2018 Call for Proposals of the Chile-Mexico Joint Cooperation Fund

Keywords: food environments; schoolchildren; evaluation; teachers

S22.2
Successes and Failures of Food and Nutrition Education in Interventions in School Food Environments

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Introduction: The Food and Agriculture Organization of the United Nations (FAO) published a study in 2013 conducted in 17 countries in Latin America and the Caribbean on Best Practices in Food and Nutrition Information, Communication, and Education (BP-ICEAN), which found the predominance of deficient or poor practices in developed programs, with an average of 60% for South American countries.

Objective: To identify factors of success and failure in food and nutrition education in programs conducted in AMAES regarding BP-ICEAN in South American countries between 2019 and 2023.

Methods: An observational and retrospective study was conducted using secondary sources by collecting articles published between 2019 and 2023, reviewing online databases such as Dialnet, Scielo, Google Scholar, and Elsevier, on food and nutrition education in primary and secondary school settings. The document review technique was used, and the analysis was conducted with a qualitative approach based on the content to relate the BP-ICEAN criteria and the respective elements found in the publications.

Results: The success factors in the selected experiences are related to an integral and multilevel approach that includes physical activity and the family environment, as well as the training of change agents according to the context. The failure factors or limitations in the development of nutritional education mainly focus on assuming it as a matter of topics, the absence of a clear pedagogical approach, a scarce presence of actions that can be maintained in the long term, and the absence of studies for the development of educational material or validation to facilitate the approach.

Conclusions: Nutritional education programs in the school environment present opportunities for educational action to improve concerning BP-ICEAN criteria, not only in the individual microsystem but also in the mesosystem, organizational, and environmental systems, where social determination has its main anchor point in educational diagnosis.

Conflicts of Interest: none

Keywords: nutritional education; school environments; school health

S22.3
Cultural Relevance as an Element of Success or Failure of Interventions in Healthy Sustainable School Food Environments

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Introduction: Schools must be safe and healthy environments in which children and young people can develop fully. To achieve this, it is necessary for the educational community to be an active part in the design and development of interventions, guaranteeing the existence of adequate physical environments and the creation of an environment of positive emotional and social well-being.

Objective: Design and implement a healthy and sustainable school model with cultural relevance on the island of Chiloé, Chili.

Methods: A diagnosis was made on 475 students from the Liceo Bicentenario insular de Achao on the island of Chiloé, aged 5 to 16 years. Nutritional status, knowledge and food practices were identified. Teachers were trained in healthy school environments, so that they could later develop the healthy and sustainable school model, considering the pillars of local culture, food education, school-home linkage, pedagogical gardens, limiting the supply of foods high in critical nutrients within the school, and the implementation of quality physical activity.

Results: 25.5% of the students are overweight and 32.1% are obese. A low knowledge and consumption of the foods recommended by the Dietary Guides for Chile was observed. 60.8% of students spend more than three hours in front of a screen. The model designed by the teachers was implemented within the framework of the institutional educational project and was linked to the curricular objectives established by the Ministry of Education.

Conclusions: Healthy and safe school environments in which children and adolescents can develop physically and emotionally, safeguarding healthy habits and the sociocultural aspects of the territories through dialogue and permanent commitment of the authorities, the school, the home and the community. community.

Conflict of interest: the authors have no conflict of interest.

Keywords: schools; students; educative community; sustainability; food education

S22.4

Is it Possible to Enhance Teachers' Self-Efficacy to Increase Nutritional Food Education?

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Introduction: Teacher self-efficacy is very important to implement effective nutritional food education (NFE) programs in schools.

Objective: To determine the content and construct validity of instruments that evaluate primary education teachers' self-efficacy, willingness to change, and knowledge of healthy eating, and to characterize the teacher's profile in NFE.

Methods: Content validation of psychometric evaluation instruments was carried out: self-efficacy, willingness to change, and knowledge in NFE, by 13 expert judges, and Aiken's V and Kendall's W tests were applied to evaluate agreement. In a sample of n= 261 teachers, exploratory factor analyses (EFA) and confirmatory factor analyses (CFA) were carried out on the factorial structure of the instruments, and structural equation modeling (SEM) was applied to characterize the teacher's profile in NFE.

Results: The content validation of the three instruments showed statistically acceptable values ($V \geq 0.86$), and the agreement between judges was statistically significant (Kendall's W <0.05). Factor analyzes revealed patterns of interest in the variables, grouping them into factors that suggest common underlying dimensions. The SEM revealed that willingness to change was a significant predictor of perceived efficacy ($p < 0.016$), and some characteristics of the educational profile were associated with specific behaviors and perceptions related to health and nutrition ($p < 0.001$).

Conclusions: Interventions could be tailored to address the specific needs and characteristics of different groups of teachers, based on their profiles and existing levels of self-efficacy and readiness for change in NFE.

Conflicts of Interest: none. This study was funded by the 2018 Call for Proposals of the Chile-Mexico Joint Cooperation Fund

Keywords: self-efficacy; availability to change; teaching profile; nutritional food education

S23: Healthy Cardiovascular Nutrition

S23.1

Introduction to Cardiovascular Nutrition

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Introduction: Cardiovascular diseases are the leading cause of death worldwide. Nutrition plays a crucial role in preventing and managing these diseases. This conference presents an introduction to the principles of cardiovascular nutrition, setting the stage for subsequent presentations on related topics.

Objective: The objective of this conference is to provide an overview of the most important aspects of cardiovascular nutrition, based on current scientific evidence, to improve the prevention and management of cardiovascular diseases.

Methods: A literature review was conducted of recent studies and articles indexed in Q1 and Q2 scientific journals such as the New England Journal of Medicine, Journal of the American College of Cardiology, British Medical Journal, Hypertension Journal, and The Lancet. The most relevant studies addressing the relationship between nutrition and cardiovascular health were selected.

Results: Principles of Cardiovascular Nutrition: A balanced diet rich in macronutrients and essential micronutrients supports heart health.

1. Mediterranean Diet: The PREDIMED study and others have shown that the Mediterranean diet significantly reduces cardiovascular events (source: New England Journal of Medicine).
2. Healthy Fats: Unsaturated fats, found in olive oil and nuts, are beneficial for cardiovascular health (source: Circulation).
3. Fruits and Vegetables: High consumption of fruits and vegetables is linked to a reduced risk of cardiovascular diseases (source: British Medical Journal).
4. Reduction of Sodium and Sugar: Lowering sodium and sugar intake is crucial for maintaining healthy blood pressure and reducing cardiovascular risk (source: Hypertension Journal).
5. Dietary Fiber: Adequate fiber intake from whole grains and legumes is associated with improved cardiovascular health (source: The Lancet).

Conclusions: Adopting a diet rich in fruits, vegetables, healthy fats, and fiber, while low in sodium and sugar, is essential for maintaining cardiovascular health. Scientific evidence supports the Mediterranean diet and other healthy eating habits as effective strategies for preventing cardiovascular diseases.

Conflict of Interest: none

Keywords: cardiovascular nutrition; mediterranean diet; healthy fats; fruits and vegetables; sodium reduction; dietary fiber; heart health

S23.2
Gut Microbiota and Cardiovascular Health

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Introduction: The intestinal microbiota synthesizes hormone-like molecules that can influence the development of cardiovascular diseases or promote cardiovascular health.

Objective: Explore the interaction between the intestinal microbiota and cardiovascular health and propose future strategies to address dysbiosis and its clinical implications.

Methods: Systematic Review of Clinical Trial, Meta-Analysis, Randomized Controlled Trial, Review, Systematic Review. Identified with the keywords through searches in Science Direct, Google Scholar, and Pubmed.

Results: Short-chain fatty acids produced by the intestinal microbiota have varied effects that modulate the permeability of intestinal endothelial cells, the activation of inflammatory cells, glucose regulation, and the feeling of satiety. On the other hand, hepatic bile acids are metabolized in the intestine into secondary bile acids, which act as long-distance signals that impact heart rate, cholesterol synthesis, and the integrity of the intestinal epithelium. Furthermore, choline metabolism produces trimethylamine, which is converted by hepatic FMO3 to TMAO, thereby exacerbating atherosclerosis. These effects, in turn, influence the development of cardiovascular diseases.

Conclusions: The composition of the intestinal microbiota and the proportion of these bacterial phyla can be affected by a variety of both internal and external factors. These include maternal prenatal factors, method of delivery, host genetics, immune response, feeding (whether breast milk or formula), feeding habits, use of antibiotics and other medications, environmental exposure, exercise, exposure to toxins such as tobacco smoke, emotional states, work and environmental settings, and lifestyles.

Strategies to maintain a healthy intestinal microbiota are mandatory for cardiovascular health, therefore, the consumption of natural and plant-based foods, physical activity, the consumption of probiotics, prebiotics, and synbiotics, the use of antibiotics, and actions to reduce TMAO, it is essential. In addition, the importance of continuing research in this field given the large number of factors that can cause intestinal dysbiosis, the variety of cardiovascular pathologies, and taking into account the diversity of factors that can influence each individual.

Conflict of interest: none

Keywords: microbiota; microbiome; cardiovascular disease

S23.3
Polyphenols and Cardiovascular Health

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Introduction: Polyphenols are bioactive compounds found in various plant-based foods, such as fruits, vegetables, tea, and cocoa. Their consumption has been associated with multiple health benefits, including cardiovascular protection.

Objective: To evaluate the impact of polyphenols on cardiovascular health, highlighting their potential to reduce the risk of cardiovascular diseases (CVD) through their antioxidant and anti-inflammatory properties.

Methods: A comprehensive review of recent studies exploring the relationship between polyphenols and cardiovascular health was conducted. The review included randomized clinical trials, observational studies, and meta-analyses published in Q1 and Q2 indexed journals over the past 5 years. Inclusion criteria covered studies measuring cardiovascular parameters such as blood pressure, lipid profiles, and inflammatory markers in relation to polyphenol intake.

Results: The reviewed studies suggest that polyphenol consumption is associated with a significant reduction in CVD risk. Flavonoids, in particular, have shown beneficial effects on lowering blood pressure and improving lipid profiles. Additionally, polyphenols were observed to modulate inflammation and oxidative stress, two key factors in the development of cardiovascular diseases.

Conclusions: Polyphenols possess antioxidant and anti-inflammatory properties that contribute to cardiovascular health. Including them in the diet may be an effective strategy for CVD prevention. However, further research is needed to determine the optimal dosage and the precise mechanisms underlying these effects.

Conflict of Interest: none

Keywords: polyphenols; cardiovascular health; antioxidants; inflammation; cardiovascular disease prevention

S23.4
Plant-based Diet and Cardiovascular Disease

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Introduction: Cardiovascular disease (CVD) is the main cause of death worldwide; Diet is one of the modifiable risk factors that has the most impact, thus, it is important to expand the understanding of plant-based diets (BPD) as an alternative dietary approach in the prevention and treatment of CVD.

Objective: The objective of this review was to recognize the current evidence on the types of BPD and their possible effects on cardiovascular health.

Methods: PUBMED, MEDLINE, and SCOPUS databases were searched, performing a review of studies published between 2014 and 2023 related to BPD and cardiovascular health.

Results: Plant-based eating patterns flexitarian, pecetarian, lacto/ovo vegetarian, and vegan are based on the selection of plant-based foods such as fruits, vegetables, nuts, seeds, legumes, whole grains, tubers, and vegetable oils, partially or totally avoiding animal-based foods.

It has been demonstrated that DBPs provide benefits for cardiovascular health by favoring the control of risk markers such as improvement of the lipid profile, reduction of LDL oxidation, control of glycemia and arterial hypertension, reduction of platelet aggregation and reduction of endothelial dysfunction.

The difference between a "healthy" DBP characterized by the inclusion of mainly fresh plant foods and an "unhealthy" DBP based largely on refined and/or ultra-processed plant foods is highlighted.

Among the possible mechanisms are a lower energy density, higher intake of bioactive compounds and polyphenols and fiber, and lower consumption of saturated fats and refined sugars; also considering that this type of dietary patterns can be associated with healthier behavior and lifestyles.

Conclusions: Well-planned plant-based diets are associated with lower cardiovascular risk and lower mortality. These benefits are mainly due to their high contribution of fiber and bioactive compounds. Also, limiting aspects such as low adherence and the risk of nutrient deficiency are highlighted, especially in the strictest models.

Conflict of interest: none

Key words: plant-based diet; cardiovascular disease; health, diet; vegan; diet; cardiovascular disease

S23.5
Coffee and Cardiovascular Diseases

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Introduction: Coffee is one of the most consumed beverages worldwide, and its impact on cardiovascular health has been the subject of numerous studies. While some researchers highlight its potential benefits, others point out possible risks associated with excessive consumption. This conference provides a review of recent scientific literature to offer a comprehensive view of the role of coffee in cardiovascular health.

Objective: To evaluate the relationship between coffee consumption and cardiovascular diseases by analyzing observational studies, clinical trials, and meta-analyses published in the last five years in Q1 and Q2 journals.

Methods: An exhaustive search was conducted in indexed journal databases, selecting studies that investigated the association between coffee consumption and various cardiovascular health parameters. Inclusion criteria were studies published between 2019 and 2024 in Q1 and Q2 journals that analyzed the effects of coffee on blood pressure, heart disease risk, blood lipid levels, and the incidence of arrhythmias.

Results: Most observational and cohort studies indicate an inverse association between moderate coffee consumption and the risk of cardiovascular diseases. Meta-analyses suggest that consuming up to three to four cups of coffee per day is associated with a significant reduction in cardiovascular events. Some controlled clinical trials have shown that coffee can improve lipid profiles and reduce inflammation markers. However, excessive coffee consumption can temporarily increase blood pressure in sensitive individuals and is not recommended for people with certain pre-existing cardiovascular conditions.

Conclusions: Moderate coffee consumption appears to have beneficial effects on cardiovascular health, likely due to its antioxidant and anti-inflammatory properties. However, it is essential to consider individual factors and potential adverse effects of excessive consumption. More studies are needed to clarify the underlying mechanisms and establish clear consumption guidelines.

Conflict of Interest: none

Keywords: coffee; cardiovascular health; cardiovascular diseases; antioxidants; blood pressure; blood lipids; arrhythmias

S24: Avenues to Meet Nutrient Requirements Within Balanced and Sustainable Diets

S24.1
Assessing the Environmental and Nutritional Benefits of Regenerative Agriculture on Arable Crops

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Regenerative agriculture has gained increasing interest in recent years thanks to its holistic view of agricultural systems; however, little is known about its environmental and nutritional benefits. In that respect, a first-of-its-kind project started in 2023 to evaluate the benefits of major regenerative practices on the nutritional quality of cereals, pulses, and oil seed crops, as well as on soil health and biodiversity. Those practices, which include minimum tillage, cover cropping, organic fertilization, integrated pest management, crop residue management, and rotation diversification, are being assessed one by one or in combination, across multiple locations worldwide using a standardized approach. The latter relies on comparing fields under regenerative agriculture to locally comparable conventional ones based on seed composition and on a broad set of soil and above-ground biodiversity indicators. This way, the project aims to provide a comprehensive, science-based assessment of regenerative agriculture and guidance on the best practices for major arable crops to promote their adoption. Ultimately, the project will expand to other crops towards providing tailored guidance for sustainable and nutritious crop production across multiple contexts.

Conflict of Interest: employee of Nestlé

Keywords: regenerative agriculture; nutritional quality

S24.2
Food Design for Sustainability, Food Security, and Nutrition

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Introduction: The proper development of a food product should take into account all the quality parameters that will contribute to its success; therefore, it is a very complex matter. To tackle this issue, a food chain approach must be adopted. The various steps of product development, starting from the selection of raw material through the definition of suitable processing and the possible formulation, can be segmented and combined with several human factors such as the physiological effects, the consumers' perception, and the decision taken by people working on the food chains.

Objective: This talk will focus on healthy foods targeting food digestibility, which is an emerging aspect of food science.

Results: A number of recent scientific discoveries about the functioning of the human gastrointestinal system suggested several possible targets for healthy foods design. They can be aimed at triggering different biochemical pathways and physiological functions, but a proper understanding of the digestion kinetic is the basis for designing proper foods for each target.

Smart feeding of gut microbiota is a number one nutritional priority and, the objective should be to provide the knowledge and the tools to design affordable and delicious foods for the benefit of the gut microbiota. In this lecture, some examples of how this can be realized by formulation, encapsulation, and processing strategies will be provided

Conflict of Interest: no conflict to declare. I received research funds from many food industries.

Keywords: antioxidant dietary fiber; plant cell intactness; smart processing

S24.3
Impact of Rising Temperatures on Maternal-Fetal Health and the Potential Protective Role of Micronutrient Supplementation

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Low and middle-income countries (LMICs) face a high-burden of poor pregnancy-related health that contributes to adverse birth outcomes and consequently increases neonatal morbidity and mortality, The conditions contributing to increased newborn risk include preterm birth, small-for-gestational-age (SGA), and low birth weight (LBW), that collectively define "Small Vulnerable Newborns" (SVN). Multiple factors, including suboptimal nutrition before and during pregnancy, maternal infections, psychological stress, and maternal comorbidities, contribute to SVN in LMICs.

Rising global temperatures pose significant risks to maternal and fetal health. Exposure to high ambient temperatures during pregnancy is associated with several adverse outcomes. Pregnant individuals are more susceptible to heat-stress due to physiological changes that increase their core body temperature and decrease their ability to dissipate heat. This vulnerability can lead to complications such as heat stroke, dehydration, and increased blood pressure, which may result in conditions like preeclampsia. Studies have shown that extreme heat exposure is linked to higher risks of preterm birth, low birthweight, and stillbirth. Heat waves increase the likelihood of preterm birth by approximately 16%, and stillbirth risk rises by 46% compared to non-heatwave periods. The mechanisms by which heat affects pregnancy outcomes include reduced placental blood flow, inflammation, and oxidative stress, which can impair fetal development. Studies have been largely conducted in high-income countries, and there is a major data gap on the health impact of heat stress in LMICs that have excessive numbers of vulnerable pregnant women and SVNs.

A recent study showed that micronutrient supplementation may mitigate some of the effects of heat exposure during pregnancy. Micronutrients such as zinc, selenium, and vitamins A, C, and E are crucial in reducing oxidative stress and supporting immune function, which is vital during pregnancy. These nutrients may enhance resilience against heat-induced complications by improving placental function and fetal growth.

Additionally, micronutrient supplementation before and during pregnancy can bolster maternal nutritional status, offering protective effects against environmental stressors. To optimize pregnancy outcomes and maternal health, further studies are needed to establish more evidence for micronutrient supplementation in heat-exposed populations.

Conflict of interest: MB=Nestle's CSV-council member; PC=none

Keywords: low- and middle-income countries (LMICs); maternal-fetal health; micronutrient-supplementation

S25: Immunonutrition and Sustainability

S25.1
Use of a Plant-Based Diet as a Sustainable Strategy to Reduce Adipose Tissue Dysfunction

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Introduction: The nutritional transition in Mexico has made it one of the countries with the highest obesity rates in Latin America. Overweight and obesity are pathologies characterized by an excess of body fat, associated with overeating, mainly saturated fats, and simple carbohydrates. The plant-based diet and the use of behavioral techniques have been shown to improve the health of patients suffering from metabolic problems.

Objective: To evaluate the effects of an intervention program with a plant-based diet on health indicators in adults with normal weight, overweight, or obesity.

Methods: A quasi-experimental study was conducted on Mexican adults between 18 and 49 years of age with normal weight, overweight, or obesity who practice an omnivorous diet. A dietary transition was implemented in 3 phases of 4 weeks each: plant-forward omnivorous whole-foods diet, ovo-lactovegetarian diet, and vegan diet. Group and individual support were provided based on the psychological model of biological health and on the contingency analysis for the modification of eating behavior. Glycated hemoglobin (HbA1c), serum lipids, adipokines serum levels, psychological distress, symptoms of depression, anxiety and stress, sleep quality, diet quality, and anthropometric variables were determined at baseline and at 12 weeks.

Results: There were significant changes in all study groups in HbA1c, total cholesterol, adipokines, and body composition when comparing the baseline to the end of the intervention program.

Conclusions: A 12-week dietary intervention program using a plant-based diet setting reduces adipose tissue dysfunction.

Conflict of Interest: none

Keywords: plant-based diet; contingency analysis; overweight; obesity; adipose tissue dysfunction

S25.2
Plant-Based Diets and Microbiota

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Introduction: A growing body of evidence supports the characteristics of a healthy microbiota and how to achieve a balance of the diverse microorganism groups to function properly and avoid any disturbance and dysbiosis. In this line, lifestyle has a predominant role, being diet one of the most important factors to consider.

Objective: To find out possible pros and cons related to the Mediterranean Diet and the plant-based diets to promote a healthy microbiota.

Methods: The electronic databases MEDLINE and the Web of Science were searched for relevant articles published throughout the last two decades (between 2006 and 2024).

Results: Despite the vast scientific literature around microbiota, there is still certain controversy about the involvement of different foods to achieve the best functional microbes in the organism. Indeed, the lack of consensus on what defines a healthy gut microbiota and the multitude of factors that influence human gut microbiota composition complicate the development of appropriate dietary recommendations for a healthy microbiota. Furthermore, the varied response to the intake of probiotics and prebiotics observed in healthy adults suggests the existence of potential inter- and intra-individual factors, which might account for gut microbiota changes to a greater extent than diet. Thus, the changing dietary habits worldwide involving consumption of processed foods and beverages, containing artificial ingredients, such as sweeteners, the high level of sedentary habits with an excessive screen addiction, the coincident rise in emotional disorders, and the worsening of other lifestyle habits, such as smoking habits, alcohol and drug consumption, as well as a failure in the sleeping quality and quantity, can together contribute to microbiota dysbiosis and health impairment, leading to the development of non-communicable chronic diseases, as well as a higher incidence of infections.

Conclusions: There is still a long way to go to know the extent to which certain intra- and interpersonal factors (such as sex, age, nutritional status, and basal microbiota) can affect the results of interventional studies and how to implement this knowledge to prevent and treat non-communicable diseases and promote health.

Conflict of Interest: none

Keywords: plant-based diets; microbiota; lifestyle intra and interpersonal factors

S25.3
Edible Insects: The Effect of Their Consumption on the Immune System and Their Relationship to Sustainability

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Introduction: The consumption of insects in the human diet has several nutritional benefits due to their high content and quality of proteins, fats, vitamins, and minerals. Moreover, one of the main advantages is that insect farming is more sustainable and efficient.

Objective: This study aims to describe the effects of edible insect ingestion and the bioactive compounds supplied by them on the immune system.

Methods: A search of the last five years in the database MEDLINE, under the PubMed and Web of Science platforms, was carried out.

Results: The feeding type during the developmental stages of the insect is a factor that directly impacts the nutritional composition and the level of bioactive compounds. *In vitro* studies show a higher antioxidant capacity of crickets, grasshoppers, silkworms, African caterpillars, and cicadas than orange juice or olive oil. This antioxidant capacity is due not only to the polyphenolic compounds but also to the proteins contained in insects. Moreover, the anti-inflammatory properties of hydrolysates of mealworm, cricket, tropical cricket, and silkworm pupae in macrophages and protein derivatives of edible silkworm pupae in human umbilical vein endothelial cells, treated with lipopolysaccharide have been described. In an immunosuppressed animal model treated with purified bee pupae peptides, an increased macrophage phagocytotic capacity, delayed-type hypersensitivity reaction, and higher IL-2, IFN-γ, and IgA, IgG, and IgM levels were observed. Although human studies are limited, the ingestion of cricket powder (25 grams/day) has been assessed for six weeks in a double-blind, crossover study, finding an association

of insect ingestion with a reduction in plasma TNF-α levels and an increase in *Bifidobacterium animalis* in feces. It is important to note that one of the main problems in the consumption of insects is their allergenicity, studies of enzyme hydrolysates are allowing us to find possible alternatives to reduce this problem.

Conclusions: Edible insects represent an interesting source of bioactive compounds, with beneficial effects on the immune system, but require further research with diverse species and different nutritional profiles.

Conflict of Interest: none

Keywords: edible insects; bioactive compounds; sustainable protein; immunonutrition

S27: Social Innovation Challenge to Improve Adolescent Women's Nutrition

S27.1
Food Consumption in Adolescent Girls: How Far are We from Recommendations?

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Introduction: Adequate energy and nutrient intake in adolescent girls are crucial for their health and that of their offspring. However, few studies evaluate food intake in this group.

Objective: To assess the consumption pattern and prevalence of risk of deficiency in the usual intake of energy and nutrients in a group of adolescent girls from Medellin.

Methods: This is a descriptive, cross-sectional study involving 1010 adolescents aged 14 to 20 years from the Popular, Manrique, and Villa Hermosa neighborhoods of Medellin. Food consumption was evaluated using a 24-hour recall (24HR), applied to all participants. A second 24HR was conducted on a random subsample (21%) to adjust for inter and intra-individual variability. Usual intake was estimated using EVINDI and PC-SIDE software and compared with the Estimated Average Requirement (EAR). To analyze consumption patterns, foods from the first recall were classified into six groups according to the Colombian Food-Based Dietary Guidelines (known in Spanish as *GABA*), and the Consumption Ratio Index, which is the ratio between consumed and recommended calories, was calculated. Descriptive statistics were used, and the prevalence of risk of deficiency in usual energy and nutrient intake was established using the Wilcoxon signed-rank test and the effect size with the Biserial correlation coefficient, using Stata 16 and Jasp 0.14.1.0.

Results: Most adolescents had a consumption of fruits, vegetables, dairy products, and proteins below the *GABA* recommendations, while intake of starches, fats, and sugars was equal to or above. There was evidence of an energy deficit and excessive intake of saturated fats and simple carbohydrates. Nearly all adolescents were at risk of deficiency in usual calcium and fiber intake; more than half in folate and iron, and one-third in proteins, thiamine, vitamin C, and zinc.

Conclusions: The food consumption pattern of adolescent girls in Medellin is inadequate and poses risks of significant nutritional deficiencies that can have deleterious short- and long-term effects.

Conflicts of Interest: none

Keywords: adolescent; women; eating; nutrients

S27.2
A Challenge of Nutritional Education and Social Innovation to Improve Adolescent Girls' Eating Habits

Restrepo-Mesa, S. L.[1]*; Cano-Pulgarín, K.*[1]*; Arias-Gutierrez, M. J.*[1]*; Murillo-Bedoya, D.*[1]*; Correa-Guzmán, N.*[1]*; Hernández Álvarez, C.*[2]*; Bergeron, G.*[3]

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Introduction: Nutritional education that promotes empowerment in food choices contributes to improving food consumption and dietary practices among adolescent girls.

Objective: To develop a nutritional education and social innovation challenge to promote healthy and conscious eating habits among adolescent girls in Medellin.

Methods: We designed an educational intervention based on a flexible learning pedagogical model developed by the International Center for Education and Human Development Foundation (known in Spanish as *CINDE*). This model has three levels of training (theoretical, practical, and communication). Educational sessions were tailored to the nutritional needs and risks previously identified among adolescent participants and encouraged their empowerment in making dietary and nutritional decisions. Each session included five stages: memory, game, reflection, practice, and challenge. Educational materials were created with adolescent participation. Training in innovation and entrepreneurship was provided to develop productive projects addressing the identified issues; the three best projects received funding and promotion in local markets.

Results: The nutritional education program, named *CERES* School, included six educational sessions on the following themes: Presentation of the characteristics of adolescents' food consumption; the body as a territory and healthy habits; key aspects of healthy eating; fruits and vegetables vs. ultra-processed foods; legumes and vegetable blends; dairy products and derivatives. The adolescents developed the following productive projects: healthy beverages, healthy breakfasts with available foods, consumption of local fruits and vegetables, recipes with vegetable protein, creation of healthy sauces and dressings, strategies to improve body perception, social media for disseminating nutrition content, physical activity for health. Educational materials

created included: a comic about adolescents' food consumption, a recipe book with healthy preparations, and a workbook for recording information, completing activities, and evaluating progress. Given the program's success, its reach was maximized with the design and implementation of a digital course that replicated the in-person educational sessions, validated and adjusted based on participant feedback.

Conclusions: Active participation and involvement of adolescent girls in the educational and social innovation process favored the sustainability and reach of the intervention.

Conflicts of Interest: none

Keywords: health education; entrepreneurship; adolescents; women; nutrition

S27.3
Transforming Food Consumption: Impact of an Educational Intervention on Adolescent Girls' Diets

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Introduction: Adequate nutrient intake and diet quality in adolescents are crucial for their development and the prevention of noncommunicable chronic diseases.

Objective: To compare nutrient intake and diet quality in a group of adolescent girls before and after an educational intervention.

Methods: A case-control study was conducted with 96 adolescents selected from a total of 1010 participants. The adolescents were divided into two groups: 48 participated in the intervention, and 48 did not; they were matched by age and community. Pre-test and post-test assessments were conducted to evaluate changes in knowledge and practices, and the 24-hour recall method (R24h) was used to assess the Global Diet Quality Score (GDQS) before and after the educational intervention named CERES School. Statistical tests such as the Wilcoxon signed-rank test, Mann-Whitney U test, paired and independent t-tests, and a multivariate linear regression model controlling for variables such as age, socioeconomic status, and physical activity were applied.

Results: The pre- and post-analysis revealed a significant acquisition of knowledge that favored decision-making in food purchase, selection, and preparation, increased daily water consumption, inclusion of nutrient-dense foods, reduction in the consumption of ultra-processed foods, and recognition of the nutritional value of fruits, vegetables, legumes, and dairy groups. A significant increase in the intake of energy, protein, fats, fiber, calcium, zinc, and various vitamins (A, B2, B3, B9, and C) was observed. Additionally, there was an increase in the consumption of fruits, vegetables, legumes, and fat-rich dairy products, and a decrease in the consumption of sweets and ice cream, improving the average GDQS scores. The educational intervention improved the total GDQS by 33%, controlling socioeconomic status, body self-perception, and physical activity.

Conclusions: The CERES School educational intervention achieved significant changes in nutrient intake and healthy food consumption, as reflected in the improvement of the GDQS.

Conflicts of Interest: none

Keywords: health education; feeding behavior; diet; nutrients; adolescents

S28: Lipophenols and Fatty Acid Oxidation Compounds. Use, Application, and Perspectives in Nutricosmetics

S28.1
Neuroprostanes Derived from Radical Oxidation of DHA: Promising Oxylipins for Health

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Introduction: Isoprostanoids are cyclic oxygenated metabolites, commonly known as isoprostanes (IsoP) derived from non-enzymatic oxidation of n-6 and n-3 polyunsaturated fatty acids (NEO-PUFA) (Galano et al. 2018) such as arachidonic acid (AA, C20:4 n-6); adrenic acid (AdA, C22:4 n-6) and eicosapentaenoic acid (EPA, C20:5 n-3). α-linolenic acid (ALA, C18:3 n-3) produced phytoprostanes (PhytoP), and docosahexaenoic acid (DHA, C22:6 n-3) led to neuroprostanes (NeuroP) (Morrow et al. 1990; Jahn et al. 2008; Milne et al. 2017; Galano et al. 2017). Evidence has emerged for their use as biomarkers of oxidative stress and more recently as bioactive lipids acting at the molecular level as secondary messengers; the latter ones are mostly related to n-3 PUFAs. Collectively, the existence of these NEO-PUFAs are not limited to mammalian specimens, they are found as well in our food such as nuts, seeds, and cocoa, depending on the type of PUFA (Ahmed et al. 2020).

Objective: This lecture will focus on the total synthesis of neuroprostanes generated from lipid oxidation of DHA and precisely their role in cardiovascular and neurodegenerative diseases.

Results: *In vitro* and *in vivo* studies on mice, rats, and cellular levels led to biological activities of neuroprostanes in cardiomiocytes, hearts, microglia cells, prostate cancer cells, microphages, and human neuroblastoma cells.

Conclusions: It is well known that DHA are recognized as cardioprotectors and neuroprotectors. The oxygenated metabolites of DHA, neuroprostanes are more bioactive lipids in cardiovascular neurological diseases.

Conflict of interest: none

Key words: neuroprostanes; docosahexaenoic acid; lipid peroxidation; microglial cell; total synthesis

S28.2

Hydroxytyrosol Lipophenols from Olive Oil and Other Compounds of Lipid Origin with Interest in Health and Nutricosmetics.

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Introduction: Hydroxytyrosol (HT) is one of the main phenolic compounds in olive oil with health benefits. HT derivatives esterified with different fatty acids (lipophenols, HT-FAs) have recently been identified in olive oil.

Objective: The effect of the food matrix and digestive enzymes on the bioaccessibility and bioavailability of HT-FAs was investigated using an *in vitro* model simulating gastrointestinal digestion (GI) and *in vivo* clinical trial with healthy volunteers, respectively, and the antioxidant and anti-inflammatory activities of HT-FAs was carried out by studying the modulation of human oxylipins.

Methods: The *in vitro* accessibility assay was developed by the Minekus method (2014). The *in vivo* bioavailability trials were carried out by a double-blind study including 20 volunteers who ingested 5 mg of HT through diverse food matrices. The *in vitro* bioactivity assay or HT-FAs was developed using a THP-1 monocytic cell line. All the HT metabolites and human oxylipins were measured by HPLC-QqQ-MS/MS.

Results: The pharmacokinetics of HT after administration of different food matrices showed that plasma concentrations were strongly dependent on the matrices used for consumption. The content of HT derivatives in the bioaccessible fraction of gut-digested extra virgin olive oil (EVOO) was higher compared to that obtained in the same fraction after complete gastrointestinal digestion. This trend was similar to virgin olive oil (VOO). HT-Oleic acid was the most abundant esterified derivative in the food matrix and digested products. HT and HT-FAs present in EVOO and VOO participate in the redox balance of THP-1 cells, acting as pro-oxidants in vitro. On the contrary, our outcomes strongly suggested the anti-inflammatory potential of both HT and HT-FAs.

Conclusions: HT-FAs present in EVOO and VOO are bioaccessible, increasing their concentration in the intestinal lumen beyond the content recorded in the food matrix. The generation of HT-FAs during intestinal digestion is strongly influenced by the lipase activity of pancreatin. High concentrations of free HT and HT-FAs show a pro-oxidant effect in vitro. HT and HT-FAs show anti-inflammatory potential.

Conflict of interest: none

Key words: lipophenol; hydroxytyrosol; bioaccessibility; bioavailability; anti-inflammatory properties

S28.3

Resveratrol Lipophenols. Nutrition and Importance in Health

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Introduction: Lipophenols consisting of a parent polyphenol esterified with a fatty acid, have been proposed as molecules with premium beneficial effects for health, derived from those already described in the literature for the respective component molecules. In this context, resveratrol lipophenols emerge as molecules with the potential to combine the benefits of resveratrol and a polyunsaturated fatty acid. Despite their plausible potential effects, his accentuated hydrophobic nature, the difficulty in obtaining them by chemical or enzymatic synthesis with good yields, and the scarcity of work related to their mapping in plants, in vitro and in vivo assays that shed some light on their potential efficacy, we recommend urgently addressing this task.

Objective: The first aim of this study will focus on mapping the presence and quantity of resveratrol lipophenols throughout the winemaking process and also, to improve resveratrol lipophenols solubility by employing cyclodextrins (CDs), as a preliminary step to later demonstrate its potential efficacy by *in vitro* and *in vivo* models.

Methods: The sample extraction was carried out by SPE and the Speed Vac centrifuge evaporation, detecting resveratrol lipophenols by HPLC-DAD-MS/MS. Critical micellar concentration (CMC) was used to determine complexation constant value (Kc).

Results: We have discovered for the first time the presence of resveratrol bound to different fatty acids in the winemaking process. To overcome the possible hydrolytic capacity of pancreatic lipases on these lipid molecules, we have encapsulated these lipophenols in cyclodextrins to determine their bioavailability in their original form and their metabolism, as well as to reveal the form of absorption and possible transport at the systemic level, which could be different from free resveratrol or resveratrol conjugated with glucuronides and/or sulfates.

Conclusions: Resveratrol lipophenols are present in winemaking process from must to wine as well as in leaf and stem parts. This leads us to believe that these molecules have a different metabolism and transport system to free resveratrol, which could modify the total bioavailability of this stilbene described to date.

Conflict of Interest: none

Keywords: lipophenol; resveratrol; cyclodextrin complexes; health

S28.4

Nutricosmetics. The Importance of Bioactive Compounds. Prevention of Skin Health inside and out

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Introduction: Nutricosmetics, a burgeoning field at the intersection of nutrition and cosmetics, is central to understanding how nutrients and bioactive compounds in our diet can significantly influence skin health and appearance. This holistic approach improves aesthetics and promotes dermatological health from the inside out.

Objective: Deepen the understanding of how bioactive compounds, including antioxidants, vitamins and minerals, contribute to the health and well-being of the skin internally and externally. We have studied their impact on the prevention of premature aging and the improvement of skin resistance against adverse environmental factors, to promote a holistic and preventive approach to skin care.

Methods: We will begin with a comprehensive review of the literature, examining scientific studies and meta-analyses in leading academic databases such as PubMed and Science Direct. This review will allow us to consolidate a robust theoretical basis on the beneficial effects of specific nutrients in preventive dermatology. Subsequently, we have conducted *in vivo* studies and practical evidence demonstrating the effectiveness of nutricosmetics in holistic skin care.

Results: The studies reviewed consistently show that certain antioxidants, essential fatty acids, vitamins, and minerals have a positive impact on improving hydration, elasticity, and visibly reducing signs of aging such as wrinkles and fine lines. Antioxidants such as vitamins C and E, coenzyme Q10, and resveratrol protect skin cells from environmental damage and promote collagen synthesis, essential for maintaining skin firmness and elasticity. Essential fatty acids, (Omega 3 and 6), are vital for maintaining cell membrane integrity, and improving skin hydration and texture. Minerals such as zinc and selenium, as well as B vitamins (niacin and biotin), reinforce the skin barrier, reduce inflammation, and support cell regeneration.

Conclusions: Our study revealed that bioactive compounds play a role in skin health, offering benefits that go beyond surface cosmetics to address skin wellness from an internal perspective. Antioxidants, essential fatty acids, vitamins, minerals, and other compounds such as hyaluronic acid and collagen have been shown to be effective in improving hydration, elasticity and the skin's ability to fight the signs of aging and environmental damage.

Conflict of Interest: none

Keywords: nutricosmetic; bioactive compounds; skin health

S29: Contributions To Nutrition from Biodiversity in Central America, the Role of Academia as a Promoter of Nature-Based Solutions

S29.1

What Evidence Exists between Biodiversity, Climate Change, and Malnutrition in the Americas?

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Introduction: The planet is suffering from environmental and health degradation, evidenced by climate effects and malnutrition among the population. The debate focuses on how to achieve greater sustainability, enhance climate resilience, and improve the efficiency of production systems and their social benefits, particularly in public health. Research and integrated actions addressing these issues are still scarce, despite the severe consequences that are constantly evident.

Objective: To identify scientific research on integrated actions related to food biodiversity, climate change, and malnutrition in the Americas.

Methods: An exploratory review was conducted on PubMed using the terms "climate change," "biodiversity," "malnutrition," and "America" in various combinations, with the criteria that articles had been published in the last 10 years, were systematic reviews, and were in English. Grey literature was excluded. The articles had to include human populations. Eleven articles were identified, and five met the criteria.

Results: The quality of the evidence was relatively weak, with the main challenge being the studies' inability to establish causal pathways for the observed effects. The identified reviews addressed the influence of demographic phenomena on biodiversity and its effects on indigenous populations; the effects on mental health; severe pollution threatening marine ecosystems and wildlife; and the negative socio-economic effects of the COVID-19 pandemic across all areas. Additionally, one study noted that growth retardation was the most frequently reported form of malnutrition in flood-affected areas, although there is little evidence of its effect on micronutrient deficiencies.

Conclusions: There are knowledge gaps, and it is proposed to identify indicators of nutritional resilience and adaptive interventions to climate conditions, based on evidence; as well as to establish policy recommendations that simultaneously address health, biodiversity, and climate change.

Conflict of Interest: none.

Keywords: diet; growth disorders; mental health; nutritional status; PubMed

S29.2

Characterization of Nutritional Components of Traditional Foods from Biodiversity in Honduras

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Introduction: Food and Nutritional Security in Central America shows vulnerability, with Honduras being one of the areas where many families are at risk. Vulnerable populations show a negative impact on their health due to nutritional deficiencies, lack of economic resources, and biodiversity. Honduras has an ethnobotanical variety, having documented species with great nutritional value.

Objective: Collect information on edible plant species from the biodiversity in the communities of the Departments of Lempira/ Intibucá, Honduras and determine its physicochemical composition to establish its nutritional value and uses as a palliative to nutritional food insecurity.

Methods: Diagnosis of the situation of food biodiversity was carried out through bibliographic review of ethnobotanical knowledge and participatory community surveys. The characterization of the collected foods included color and pH and their centesimal composition: moisture, ash, total lipids, protein, total carbohydrates, fatty acid profile, caloric value, minerals (Na, K, Mg, Mn, Zn, Ca, Fe, P), dietary fiber, vitamins A and C.

Results: From the information provided in the community surveys, a list of 23 edible species was identified. It was possible to prioritize 10 species to carry out nutritional composition analyses. Results showed that the components present in greater quantities are proteins and carbohydrates. *Chinapopos* (*Phaseolus lunatus*) had the highest protein content (20.31%) and *Carapules* (*Sambucus canadensis*) the lowest (1.01%). The ten species differed in terms of their nutritional composition. Regarding the mineral content, differences were also observed between the 10 species. The two species that presented a more complete mineral profile were *Chaya* (*Cnidoscolus chayamansa*) and *Pacaya* (*Chamaedorea tepejilote*). *C. chayamansa* presented Calcium (800 mg/100 g), Magnesium (157 mg/100 g) and Manganese (10 mg/100 g), it is important to highlight that it presented three times the content of Manganese and 87% of the iron required daily.

Conclusions: Plant species originating from Lempira and Intibucá have great nutritional potential. In general, evaluated foods have a low caloric value and an excellent profile of minerals. The nutritional value may vary depending on the preparation methods.

Conflict of Interest: none

Keywords: analytical methods; ethnobotanical; food composition; food insecurity

S29.3

Marine Macroalgae as a Sustainable and Healthy Food Alternative in Panama

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Introduction: Lack of protein and micronutrients affects many people, causing "hidden hunger" in 2 billion people, and in Panama it impacts children, indigenous communities and rural areas, causing iron deficiency anemia. Marine macroalgae are rich in proteins, vitamins, minerals and omega-3 fatty acids and low in calories. Since the 19th century in Panama they have been used as food and medicine, and since 2000, species such as *Gracilarias* and *Eucheuma* have been cultivated. This study examines the characterization of Panamanian Caribbean macroalgae and their growth in in-vitro cultures to optimize their utilization.

Objective: Evaluate the nutritional and functional potential of marine macroalgae from the panamanian caribbean to promote their integration into local and global food systems.

Methods: The growth of *Gracilariopsis silvana* and *Kappaphycus alvarezii* was evaluated in in-vitro cultures for 55 days using four media (AK, K, F, Z), with length, width and weight measurements and environmental parameters. Nutritional composition analysis, using fresh and dry samples, will determine the profile of proteins, lipids, carbohydrates, fiber, vitamins and minerals, completing the characterization of the algae.

Results: *Kappaphycus alvarezii* showed better growth in AK medium, while *Gracilariopsis silvana* developed better in K medium. These results optimize the culture conditions and prepare the macroalgae for seeding in the sea, guaranteeing their adaptation and growth. Nutritional composition analyses will be able to determine the profiles of proteins, lipids, carbohydrates, fiber, vitamins and essential minerals, which will confirm its potential as an alternative and sustainable food.

Conclusions: Marine macroalgae are a promising food alternative to improve nutrition in Panama due to their richness in essential nutrients. AK and K culture media proved to be optimal for the growth of *Kappaphycus alvarezii* and *Gracilariopsis silvana,* respectively, providing key information for their cultivation and seeding in the sea.

Conflicts of Interest: none

Keywords: food security, In-vitro culture, macroalgae, nutritional deficiencies, sustainable food

S29.4

Nutritional Value of Native Plants and Seeds in Guatemala: Opportunities for their Revaluation and Knowledge Recovery about their Use in the Prevention of Malnutrition

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Introduction: Historical documents on the diet of the Mayan people refer to the use of corn, beans, squash and a few other foods. However, there were other plants used with high nutritional value, among which the amaranth, the Ramon tree, the chaya and the chipilin stand out, which provide high levels of iron, folic acid, beta-carotenes, zinc, fiber and Omega 3 fatty acids, among others. Archaeological and ethnohistorical evidence demonstrates that the indigenous peoples originating from Mesoamerica managed to maintain what could be indicated as "*balance between culture and nutrition*", developing nutritionally complete diets that at the same time satisfied their cultural needs linked to religion, rituals, socialization, history, organization, among others.

Objective: Identify the use and nutritional value of native Guatemalan plants and seeds described in historical documents.

Methods: A search for documents was carried out in different databases on the use and nutritional value of native plants and seeds in Guatemala.

Results: Corn seems to be one of the basic foods of the Mesoamerican region; Nixtamalization as a fundamental contribution of the Mesoamerican peoples improved their nutritional qualities by adding calcium from lime, thus promoting the health of bones and teeth. Along with corn, beans and squash, they constitute the food group with the greatest symbolic relevance of the Mesoamerican region. Plants such as chiplin, chia or amaranth were used as a high-yield crop by the Mayan peoples, due to their high nutritional value.

Conclusions: Due to their nutritional potential, native plants and seeds could contribute to diversifying the diet, substantially improving nutrition, and contributing to food security and sovereignty. Schools of Nutrition, Medicine, and Agriculture have a great opportunity to promote the rescue of these foods as part of their training and extension programs.

Conflict of Interest: none

Keywords: food security; food sovereignty; native seeds; native plants; malnutrition

S30: Bioactive Compounds: New Challenges in Health and Food Safety

S30.1

Bioactive Compounds: New Challenges in Health and Food Safety

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Introduction: The Institute of Nutrition and Food Technology: *Instituto de Nutrición y Tecnología de los Alimentos "José Mataix Verdú" de la Universidad de Granada (INYTA)*, is a Research Institute belonging to the University of Granada (http://www.inyta.es). Its multidisciplinary research approach and activities, both basic and applied, focus on Human Nutrition and Food Technology.

Objective: To address and promote advanced topics related to food, nutrition and health, which constitute some of the current lines of research being carried out at INYTA.

Methods: Combined methodologies were applied to obtain chemical, molecular and omics data. The presentation evaluated the effects of cocoa polyphenols on learning and emotional behaviour in mice and analysed adult hippocampal neurogenesis. It was compared and searched for new key products from microbiota taxa to be further used as novel foods or commercialised products in food and biotechnological industries. Honey was also analysed, including its bioactive compounds and contaminants, and compared to syrups and substitutes. Additionally, high mountain honey production programs are designed to optimize bioactive compounds and minimize contaminants using interdisciplinary tools. Cross-sectional regulatory frame applies to strength, food quality and safety of these products.

Results: Integration of data results showed that cocoa polyphenols improve cerebral perfusion, plasticity, and neurogenesis, showing promising effects on learning and emotional behaviour in mice. On the other hand, omics research allows us to identify new probiotics, key enzymes, and metabolites useful for transferring to the food and health industries. Meanwhile, honey is a nutritious food with significant bioactive compounds, although it may contain contaminants depending on the collection area. High-mountain honey production programs can increase bioactive compounds and minimize contaminants using interdisciplinary techniques. The importance of scientific research and

regulations to ensure food quality and safety is particularly shown and emphasized.

Conclusions: Several research groups, leveraging synergies for specific projects and contracts. In this regard, INYTA has a very dynamic structure befitting a multidisciplinary research centre.

Conflict of Interest: none

Keywords: cocoa; polyphenols; probiotics; prebiotics; honey; omics sciences; INYTA

S31: The CORALS Project: Longitudinal Study to Determine Risk Factors Associated with Childhood Obesity

S31.1
CORALS: Spanish Study in Preschoolers to Assess Risk of Obesity Development

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Introduction: Childhood obesity has been recognized by WHO as a priority in 2013-2020 Global Plan of Action for the prevention and control of chronic noncommunicable diseases. The prevalence of overweight and childhood obesity in Europe is high, with a north-south gradient with a higher prevalence in southern countries as Spain. The ALADINO study in 2015 evidenced 21.5% of boys and 22.2% of girls were overweight, and obesity was 10.6% in boys and 11.8% in girls. Although causes of obesity are multifactorial, genetic susceptibility, modifiable risk factors such as diet, physical activity (PA) / sedentary lifestyle and other environmental factors favor its development.

Objective: To identify the risk factors of childhood obesity as well as quantify the risk of each of them through a longitudinal cohort composed of children initially from 3 to 6 years of age, in which it is intended to perform a follow-up of an average of 10 years.

Methods: Anthropometric measurements and body composition are conducted after a physical examination. Blood pressure and PA by accelerometers are also carried. A set of self-administered questionnaires are completed by parents or caregivers to collect information about lifestyle behaviors. In years 0, 3, 5, and 10, blood, urine, and faeces samples are taken to different analyses.

Results: CORALS is conducted in 7 Spanish centers with 1,509 children. In 2024, is the 5th year of follow-up with results published in impact factor journals, related to diet habits or PA.

Conclusion: Understanding the environment and behaviour of children is essential to promote public health initiatives directed to healthy lifestyles from early stages. Long-term studies are needed.

Conflict of interest: none

Keywords: childhood obesity; lifestyle habits; risk factors

S31.2
Determinants and Consequences of Eating Behaviour in Spanish Children

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Introduction: Eating behaviour in children is shaped from birth and influenced by a combination of biological, environmental, and social factors. Early feeding practices, such as breastfeeding and the method of introducing complementary foods, play a crucial role in the development of these behaviours. These practices

impact appetite regulation and food preferences, contributing to dietary intake patterns that can influence the risk of obesity.

Objective: To examine the determinants of eating behaviour in children and the subsequent impact on food consumption and obesity.

Methods: This review is based on data from the Childhood Obesity Risk Assessment Longitudinal Study (CORALS), which involved children aged 3-6 years from seven Spanish cities. The study used the Children Eating Behavior Questionnaire (CEBQ) to assess eating behaviours and the COME-Kids Food and Beverage Frequency Questionnaire to evaluate dietary intake. Additional literature on the psychosocial, environmental, and biological determinants of eating behaviour was also reviewed.

Results: Parenting styles and socio-economic status significantly influenced eating behaviors, with authoritative parenting and higher maternal education linked to healthier habits. Children with longer breastfeeding duration exhibited higher enjoyment of food and lower food fussiness. Methods like Baby-Led Weaning (BLW) correlated with greater food enjoyment and lower fussiness. In addition, higher scores on enjoyment of food were associated with increased intake of healthy foods, whereas high food responsiveness and emotional overeating were linked to higher obesity risk.

Conclusions: Understanding the determinants of eating behavior in children is crucial for developing effective interventions to promote healthy eating habits and prevent obesity. Early feeding practices, parenting styles, and socio-economic factors play significant roles in shaping these behaviors. Future research should continue to explore these relationships longitudinally to better inform public health strategies.

Conflict of Interest: none

Keywords: eating behavior; children; obesity

S31.3

Evaluation of Physical Activity and sedentary lifestyle in the CORALS cohort

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Introduction: Physical activity (PA) and sedentary lifestyle are recognized as modifiable risk factor for non-communicable diseases. Healthy habits in early childhood tend to persist throughout life. However, despite the World Health Organization's (WHO) efforts to promote a higher adherence to PA practice offering clear guides and adaptable interventions, insufficient levels of PA have been reported across all countries.

Objective: This study aims to evaluate the PA and sedentary patterns in Spanish preschool children using objective measures and compare these patterns by sex.

Methods: The Childhood Obesity Risk Assessment Longitudinal Study (CORALS) included 1509 preschoolers between 3-6 years old from seven Spanish cities. Intensity levels and time of PA were objectively assessed with accelerometers. Self-administered questionnaires completed by parents or caregivers provided additional information on extracurricular activities, screen time, and sleep patterns in 643 of these children with valid data.

Results: 67% of preschoolers met the PA international recommendations, with 72.1 min of moderate-vigorous PA (MVPA) per day. Boys exhibited higher levels of MVPA than girls, while both sexes practiced more MVPA as they grew older. Sedentary time was higher on weekends, and boys spent more time watching TV than girls. Involvement in extracurricular sports was reported by 67.5% of children, showing the boys a greater engagement in outdoor activities.

Conclusion: A relevant proportion of preschool children meet the international PA recommendations, showing variations influenced by gender, age, and days of the week, aligning with global trends in this stage of life. Future interventions should address gender-specific preferences and age-related changes to enhance the effectiveness of promoting active lifestyles in this population.

Conflict of interest: none

Keywords: childhood; growth; lifestyle; sedentary behavior

S31.4
Differences in the Microbiota of a Pediatric Population and Relationship with Ponderal Status

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Introduction: Gut microbiota has been identified as potentially being associated with ponderal status, but studies in children are scarce yet. In addition, the World Health Organization has defined Childhood obesity as a main issue and proposes its prevention in the 2013-2020 Global Plan of Action for the prevention and control of chronic noncommunicable diseases. Indeed, gut microbiota is in the process of being identified as a cause or consequence of overweight and obesity. Therefore, identifying it may be important to prevent or treat excess body weight in children. It must be noted also that excess body weight during childhood may possibly lead to adult obesity.

Objective: The main objective of the present study is to identify differences in gut microbiota according to the ponderal status of children aged 3-6 years old.

Specifically, assess the differences in microbiota diversity depending on quartiles of ponderal status, as well as associate these differences with eating status or dietary pattern.

Methods: Fecal samples of 1,186 children involved in the CORALS cohort were analyzed through Shotgun. Anthropometric measurements and adherence to the Mediterranean Dietary pattern (MED4Child questionnaire) were evaluated at baseline.

Results: Analyses are ongoing, but initial approximations present similar alpha diversity on gut microbiota depending on the ponderal status. Further associations and correlations need to be performed.

Conclusion: The sample size, although big, is quite heterogeneous, as children between 3 and 6 years old, do not present excess body weight. Indeed, future time points, which will be soon released, may shed more light on the potential role of gut microbiota around body weight, and how this relationship is established.

Conflict of interest: none

Keywords: childhood obesity; risk factors; gut microbiota

S32: Low/No Calorie Sweeteners' Use in Iberoamerica: The Science Behind Global and Regional Regulations and Recommendations

S32.1
Regulations and Intake Assessment of Low/No Calorie Sweeteners in Iberoamerica

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Introduction: As obesity rates increase, several countries in Latin America have implemented front-of-pack regulations, imposing black warning labels in the hope of curbing the consumption of sugars and other nutrients of concern. In the case of sugar reduction, it has resulted in reformulations of products with low and no-calorie sweeteners (LNCS). The increased availability of LNCS-containing products raises concerns about the potential risk of exceeding the Acceptable Daily Intake (ADI) especially in vulnerable populations.

Objective: To review the existing literature related to LNCS intake assessment in Iberoamerican countries in order to confirm the current status of intake levels in vulnerable populations and to share associated regulatory measures in the region.

Methods: An extensive search was carried out to compile the studies related to intake assessments of LNCS low and no-calorie sweeteners in Iberoamerica.

Results: The current review examined published data on the intake of all major LNCS: aspartame, acesulfame-K, saccharin, sucralose, cyclamate, and steviol glycosides both in the Iberoamerican populations during the past fifteen years. The data show there has been an increase in the number of consumers of low-/no-calorie-sweetened products especially due to the reformulation of a broad amount of products fueled by mandatory front-of-pack black warning labels imposed in high in sugar products, especially in Chile. Although the studies in some of the Latin American countries are limited in terms of design and focus primarily on certain population groups mainly children and pregnant

women, generally the studies conducted since 2009 do not raise any concerns as none of the sweeteners that have been examined show that the individual sweetener acceptable daily intake (ADIs) has been exceeded.

Conclusions: Based on the available scientific evidence, LNCS authorized by the regulatory bodies in Iberoamerica are safe for the general population and all the intake assessment studies performed show intake for vulnerable populations like children are below the Acceptable Daily Intake (ADI). It was concluded that there is no risk for the Iberoamerican population related to dietary exposure to LNCS.

Conflicts of interest: the author is a member of the scientific advisory panel of Heartland Mexico

Keywords: LNCS; sweeteners; intake; sucralose; aspartame; steviol glycosides

S32.2
Low/no Calorie Sweeteners for Weight Management and Cardiometabolic Health. Why are there Controversies?

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Introduction: Due to the impact that excess free sugars have on health, the World Health Organization (WHO) recommends reducing their consumption to less than 10% of total caloric intake (strong recommendation). Replacing sugars with low/no-calorie sweeteners (LNCS) seems to be a good strategy to achieve this goal. However, a conditional recommendation from the WHO states that LNCS do not confer any long-term benefit in reducing body fat, so they should not be consumed to achieve body weight management or reduce the risk of noncommunicable diseases.

Objective: Review the existing literature in relation to LNCS consumption and body weight in adults.

Methods: Using MeSH terms, an exhaustive search (primary and secondary studies) was carried out in different digital databases, for studies published in English and Spanish during the last 10 years, about the use of LNCS for body weight management in adults.

Results: The highest quality evidence (systematic reviews, meta-analysis, and short-term RCT), as well as that of prospective observational substitution studies (sugar replacement with LNCS), shows that the consumption of LNCS in sugar replacement leads to lower body weight and BMI. On the other hand, it is associated with a higher BMI and risk of obesity in long-term prospective observational studies. Observational studies, even those that minimize confounding factors, are unable to demonstrate a causal relationship but simply an association. Some results could be explained by reverse causality. To establish its conditional recommendation, the WHO guideline disregarded the RCT evidence and solely relied on prospective cohort studies.

Conclusions: Until high-quality evidence that can be translated into a strong recommendation is available, the short-term use of LNCS in moderation, as a replacement for sugar-sweetened products is acceptable for reducing overall calories and sugar intake, thereby helping to reduce the consumption of free sugars that is strongly recommended by the WHO.

Conflicts of interest: the author is a member of the scientific advisory panel of the International Sweeteners Association and of Heartland Mexico.

Keywords: LNCS; overweight; obesity; body weight; sweeteners

S35: Reconstruction of Healthy and Sustainable Traditional Diets in Latin America

S35.1
Variability of Food Groups in the Americas

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Introduction: Latin America is a region that has faced an epidemiological and nutritional transition, and changed lifestyles, and eating patterns, all due to the globalization processes that the population is currently facing. Therefore, the population currently faces malnutrition in children under 5 years old and obesity with chronic diseases in adolescence and adulthood, all of this without distinguishing any type of socioeconomic level.

Objective: Identify what is known about the variability of food groups currently used in Latin America

Methods: Different digital platforms were used, taking as evidence research carried out in the last two decades to the present. Using various words and/or titles to search for information such as food group, food group in Latin America, variability of food groups, and food guides in Latin America, among others. Likewise, various databases were used to search for information.

Results: Despite the constant research on the variability and feasibility of foods in Latin America that are accessible to each country, studies show that the recommendations proposed by the WHO for each age group are not achieved, with children and adults currently being the most vulnerable population. This deficiency in the intake of foods rich in vitamins and minerals is due in part due to the insertion of low-cost, ultra-processed foods in the diet that are quick to "cook", all this due to food globalization that has caused important changes in the traditional patterns of food consumption. Negatively affecting the health of the individual.

Conclusion: Since the dietary guidelines are a tool with solid and well-founded bases for each region of Latin America, there is a need for constant monitoring of the implementation plan for each one, as well as the evaluation of the effect and impact on the population's diet. Although they are educational tools, they must be well known by the population and at the same time help them make appropriate decisions in relation to the choice of their diet and the care of their health.

Conflict of interest: none

Keywords: foods; variability; food groups; Latin America.

S35.2
Average Intake of Macro and Micronutrients in Traditional Local and Regional Diets

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Introduction: In the past, the traditional diet of the Latin American population was based on the consumption of regionally grown products, the contribution of energy and nutrients met their daily needs, to maintain life and physical health, combined with physical exercise that complemented part of their lifestyle. The most consumed foods in the Region of the Americas were corn, wheat, a variety of potatoes, beans and other legumes, leafy vegetables, vegetable fats, and oil seeds, scarce protein products, among the most consumed, eggs, milk, and locally produced cheese. Their diet would be defined as a plant-based diet that offered the nutrients necessary for their subsistence. However, contemporary studies on energy and nutrient intake in the Latin American population show that the daily diet is characterized by including processed products that increase the amount of daily energy with a higher fat intake and sugars. It is important to resume the interest in returning to the consumption of traditional local diets that contribute to reducing the prevalence of diet-related diseases.

Objective: To describe the contribution of energy, macro, and micronutrients that make up traditional diets in the region of the Americas.

Result: The average energy intake of a traditional Latin American diet, based on 85% plant-based products and only 15% animal-based products, corresponds to between 1200 and 1500 calories, distributed in 70% carbohydrates, 10% protein, and 20% fat, and more than 25 grams of soluble and insoluble dietary fiber.

Conclusions: In recent decades, the global recommendation of health organizations has promoted that the population's diet is based on the consumption of products of plant origin, due to the relationship between diet and the multiple diseases of interest to public health. In times of apparent food scarcity in some regions of the Americas, it is possible to resume the intake of traditional diets that include locally produced foods to meet the demand for energy, nutrients, fiber, and water. It is necessary to provide education on the existence of healthy food to the new generations and contribute to maintaining safe, healthy, and sustainable consumption.

Conflict of Interest: none

Keywords: diet; nutrients; regional production

S35.3
Synthesis of a Systematic Review on Safe, Healthy, Sustainable, and Social Food in Latin America

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Introduction: Latin American society presents the same challenge and commitment that countries in the world have, to offer their population healthy and sustainable food. Since the beginning of this century, various actions and strategies have been proposed aimed at recovering food security and promoting the consumption of healthy, sustainable diets sufficient to meet the population's demand for energy and nutrients. In addition to promoting actions to adopt lifestyles and modify risky eating behaviors to reduce the prevalence of chronic diseases that affect them.

Objective: Identify actions to promote safe, healthy, and sustainable food carried out in Latin American countries with an impact on the development of diseases, and successful interventions in the prevention, promotion, and protection of health.

Results: 75% of the articles reviewed show interest in the Latin American population in modifying eating habits, in acquiring information on disease prevention related to diet selection; Social determinants involved in food selection are analyzed to reduce risks, especially during aging and to ensure the sustainability of the diet. Multiple factors define the appropriate selection of foods, which should be the subject of study.

Conclusions: The Latin American population needs a consensus to match the strategies applied in different countries of the Americas in order to ensure a healthy, sustainable diet that complies with the health standards and regulations of each country. In addition to strengthening the promotion of the consumption of locally produced foods and reducing processed foods that currently define the usual consumption of the population, due to the existing availability in the market. Strategies and interventions should be directed at reconstructing traditional diets that have been removed from the family diet to ensure optimal and sustainable nutrition for each member of Latin American families.

Conflict of interest: none

Keywords: food; healthy; sustainable

S36: Body Composition and its Determinants Throughout the Life Cycle

S36.2
Body Composition and Inflammatory Markers in Children and Adolescents

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Introduction: Inflammation is a natural response of the body to repair damage caused by infection or injury, but when the inflammatory process becomes chronic, it can be harmful to the body. Some environmental and lifestyle factors promote systemic chronic inflammation that may lead to several diseases such as cardiovascular disease, diabetes, and cancer. Body composition plays an important role in systemic chronic inflammation. Obesity is a condition in which the adipose tissue mass is altered, and the endocrine function of this tissue becomes impaired, contributing to an inflammatory state. The link between different body compartments, certain inflammatory markers, and the risk of developing non-communicable diseases has been extensively studied in adults. However, this relationship is not so clear in the pediatric age group and there are few studies on this subject in this population.

Methods: We conducted a research study with 264 Spanish children and adolescents of the GENOBOX study, to assess the relationship between different indicators of body composition and inflammatory biomarkers. Body compartments were evaluated through different measurements and indicators: weight, height, waist circumference (WC), body mass index (BMI), and triponderal mass index (TMI). Body composition was determined by Dual-energy X-ray Absorptiometry (DXA) obtaining data on visceral adipose tissue (VAT), fat mass, and lean mass. Simple linear regression models were performed with each of the biomarkers (hsCRP, IL8, TNF-α, adiponectin, leptin, and resistin) as dependent variables, and each of the body composition indices (z-scores) as independent variables.

Results: We found a positive association between fat compartments, measured by different methods, and the markers hsCRP and leptin, independent of the lean mass present, both in pubertal and prepubertal subjects. Resistin showed a negative association with fat compartments in the pubertal stage, a fact that adds to the controversies of previous research.

Conclusion: Given that this type of research is scarce in this age group, and based on our results, we suggest further study in future research.

Conflict of Interest: none

Keywords: body composition; inflammatory markers; children; adolescents

S36.3
Myokines, Body Composition and the Metabolic Health/Disease Relationship in Adults

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Introduction: Body composition is one of the main determinants of the metabolic health/disease relationship in humans. Skeletal muscle also affects this relationship because of its large ability to uptake and oxidize macronutrients, thus regulating energy storage, distribution, and expenditure, hence influencing the body weight and composition. Interestingly, the muscle endocrine function, through the release of myokines, has been linked to the pathophysiology of many chronic metabolic diseases which have an altered body composition. Therefore, it is possible to propose that part of the role of the myokines on metabolic health and disease relation is mediated through specific myokine-induced changes in body composition.

Objective: To summarize the empirical evidence on the relation between myokines, body composition, and metabolic health and disease.

Methods: A search of the main databases was performed using different combinations of the descriptors "body composition", "myokines", "musclin", "myonectin", "irisin", "CHI3L1", "and myostatin". No year, sex or language constraints were used. Epidemiological (limited to adults) and experimental articles were included. Information on relevant original articles was summarized as a scoping review. Our own research papers and experience in the field are highlighted as well.

Results: Epidemiological studies have shown either positive or negative correlations between some circulating myokines and absolute and relative indicators of global and regional body composition in humans with and without chronic metabolic diseases. Also, beneficial changes in some myokines after therapeutic interventions parallel beneficial changes in body composition. Mechanistic studies, mainly in murines and cultured cells, have shown a direct effect of several myokines on physiological and biochemical variables relevant to the regulation of body composition in mammals, such as: i) oxygen consumption, resting metabolic rate, mitochondrial function, and thermogenesis; ii) muscle mass; iii) lipolysis and redistribution of adipose tissue; iv) inflammation; v) hormones.

Conclusions: Evidence suggests that some myokines may play a role in the pathophysiology of chronic metabolic diseases through the modulation of body composition in adults.

Conflict of Interest: none

Keywords: skeletal muscle; myokines; body composition; chronic metabolic diseases

S36.4
The Importance of Body Composition Analysis in the Elderly

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The aging population is growing in Latin America. Uruguay leads this trend by having the oldest population in the region, with the consequent rise of age-related diseases and disability, and an economic burden of health and social costs.

Early detection of malnutrition is a key issue in the nutritional assessment of this population group. There are physiological modifications in different body components with nutritional consequences that cannot be properly assessed through general indicators like body mass index. Gender differences in body composition are present throughout the life cycle. Into the fifth decade of life, men and women lose muscle mass, but women often gain more fat, even if their weight is stable. There is great interest in defining body fat ranges linked to optimum health in the elderly. However, there has not been yet a consensus on the definition of optimal ranges and their link to morbidity and mortality. On the other hand, it is important to assess the muscle compartment. Muscle strength, muscle quantity or quality, and physical performance are key elements to assess, confirm, and identify the severity of sarcopenia.

Muscle quantity can be assessed by different techniques. which requires detailed knowledge of the instruments and reference values necessary to assess this component. A simple anthropometric measurement like calf circumference is considered essential in the basic evaluation. For clinical purposes, bioelectrical impedance analysis (BIA) allows a closer approximation to fat-free mass or even estimation of total or regional muscle mass. These indicators are relevant to confirm sarcopenia's presence.

Different BIA prediction equations have been developed for the estimation of fat-free mass, skeletal muscle mass, or appendicular skeletal muscle mass and were validated with different reference methods. More advanced techniques, such as Dual X-ray Absorptiometry, measure global and regional body components and allow the determination of appendicular lean soft tissue.

Integrating the information obtained from the nutritional analysis of body composition into the geriatric assessment allows personalized and early individual intervention and focuses actions, enabling the maintenance of physical function and promoting healthy and active aging.

Conflict of Interest: none

Keywords: body composition; elderly; muscle mass

S37: Contributions to Food and Nutritional Security Research in Native Honduran Population

S37.1
Surveillance in Food and Nutrition Security: Approach in the Indigenous Lenca People of Honduras

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Introduction: According to the results of the Population and Housing Census of Honduras (2013), the Indigenous population was 601, 824 (7.25%), 89% lived in a rural environment; 454, 672 belonged to the Lenca ethnic group, with 82% established in the West. According to estimates from a study conducted in 2017, 95% of this ethnic group was experiencing some level of food insecurity.

Objective: To evaluate food security (FS) in a sample of the Lenca ethnic population to promote the adoption of appropriate public policies.

Methods: The study is exploratory and descriptive, carried out in 2023, which included Lenca participants aged 20 and over from the municipality of Intibucá, Honduras. The universe was 905 Lenca households from five communities. The sample size was estimated at 63 households. Surveys were applied to estimate the socioeconomic situation and FS, using the Latin American and Caribbean Food Security Scale (ELCSA) composed of a questionnaire of 15 questions with three possible selective answers (yes, no and I don't know), applied to heads of household, and classifying households into four categories, depending on the number of positive responses and whether they have members under 18 years of age.

Results: 70 socioeconomic and FS surveys were administered to heads of households. The minimum age was 23 and the maximum was 69 years old. 100% of those surveyed mentioned that they allocated most of their income to food, and secondly to transportation, water, and electricity costs. The proportion of households with FS was 22.9%, mild food insecurity 60.0%, moderate 10.0%, and severe 7.1%. These latter levels have been reduced compared to the study carried out in 2017 (n=66) of 39.4% and 15.1%, respectively, which is of benefit to the population.

Conclusions: An improvement in socioeconomic conditions is evident, and a decrease in the proportion of moderate and severe food insecurity in the Lenca population.

Conflict of Interest: none

Keywords: ELCSA; food insecurity; indigenous people

S37.2

Practical Research Methods, Ethical Aspects, and the Worldview of the Lenca Indigenous People

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Introduction: Indigenous communities lack formal recognition of their territories and natural resources, with 43% living in poverty, more than double the rate of non-indigenous people (World Bank, 2023). A 2017 study on Food and Nutrition Security (FNS) in the Lenca population (LP) of Honduras, the largest ethnic group in the country, showed a high prevalence of food insecurity. The LP have a worldview based on harmony with nature, family farming, and religious traditions that promote indigenous collectivity.

Objective: To present the practical methods, ethical aspects, and the importance of the Lenca ethnic group's worldview during the research.

Methods: The interventions were planned as comprehensive strategies from academia to address agricultural production, field schools, nutritional education, and direct linkage with local indigenous organizations, with a gender focus. This included direct contact and exposure to the livelihoods of the studied population. The studies were approved by the bioethics committee of the National Autonomous University of Honduras, and the research team completed the required human research course. The interventions included not only research but also projection, provision of supplies, and improvements for the FNS of the communities.

Results: There are formal data on the FNS of the LP in Honduras, supported by scientific and technical evidence. These data have guided interventions in the public, private, and academic sectors to address the main deficiencies of the LP. Projects have been implemented to strengthen agricultural production and improve access to basic services, as well as technical training in FNS monitoring. Additionally, the need to highlight this minority population and their disadvantage in public health and FNS has been emphasized, promoting and respecting their indigenous worldview.

Conclusions: There is evidence of an improvement in socioeconomic conditions and a reduction in the proportion of moderate and severe food insecurity in LP. However, due to the high level of poverty, the challenge of improving the Lenca population's conditions remains significant.

Conflict of Interest: none

Keywords: food insecurity; indigenous people; worldview

S37.3

Nutritional Status, Critical Nutritional Indicators of the Honduran Ethnic Population

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Introduction: Nutritional status is a determining factor in the health and well-being of populations. In Honduras, ethnic populations face unique challenges due to their geographic location, limited access to health services, and cultural food practices. Evaluating critical nutritional indicators is essential for developing intervention strategies that improve their quality of life. Through an inclusive approach, significant and sustainable improvements in nutritional status can be achieved.

Objective: To evaluate the nutritional status in a sample of the Lenca ethnic population to promote the implementation of public policies that reduce the prevalence of diseases related to malnutrition.

Methods: This exploratory and descriptive study includes Lenca men and women aged 20 and older from the municipality of Intibucá, Honduras, in 2023. The sample size was estimated at 63 households. Nutritional status was directly evaluated through measurements of body mass index (BMI), body composition, fasting glucose, and hemoglobin.

Results: According to the results, there is a significant difference between Lenca men and women in terms of BMI and visceral fat percentage. Among Lenca women, 48.57% did not reach 145 cm in height. In terms of the men, 40.90% were overweight, and 20.45% were obese. On the other hand, 28.57% of the women were overweight, and 34.28% were obese. No significant differences were found in fasting glucose levels between men and women, with a mean of 112.00 ± 27.81 mg/dL (hyperglycemia). Additionally, 15.62% of the men and 21.42% of the women had anemia.

Conclusions: The nutritional status of the Lenca shows a double burden of malnutrition, with short stature in women, anemia, overweight, obesity, and hyperglycemia in both sexes. This complex situation requires immediate attention and actions to prevent and control diet-related diseases, thus contributing to their well-being.

Conflict of Interest: none

Keywords: malnutrition; nutritional status; obesity

S37.4

Indigenous People in Honduras: Cultural Importance for Food Security from a Social and Educational Ecosystem within a State of Law

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Introduction: The cultural importance of indigenous peoples for food security (FS) is supported by the report "The State in Honduras in Social and Educational Programs and Projects for Human Development in Indigenous Peoples in Honduras" (CLACSO, 2023). The educational and cultural ecosystem of indigenous peoples has faced significant restrictions on public participation and leadership for decades, with limited association with local governments and minimal incentives for sustainable human development.

Objective: To contribute to the scientific debate on the importance of the everyday practices of indigenous peoples for their FS, within the context of a State of Law in Honduras.

Methods: Interpretative, phenomenological approach using qualitative techniques including focus groups, semi-structured interviews, and observation of Lenca culture in its natural and real context.

Results: The methods to strengthen and reconfigure the use of traditional autonomous practices in local production and distribution are valued precariously, as the cultural dimension has been promoted more as a tourist attraction than as a collective meaning. The demand for association opportunities among Indigenous peoples tends to become politicized, diverting attention from their everyday cultural customs and traditions, resulting in a weak system for guaranteeing a State of Law. The lack of a sustainable strategy is incongruent with the creation of a solid cultural fabric necessary for developing public policies oriented toward food security.

Conclusions: The social and educational fabric of Indigenous communities does not approach a sustainable ecosystem for common well-being. It is necessary to develop gnoseological dimensions that comprehend the knowledge of the origin and the nature of the human being; an anthropological dimension that integrates and characterizes their culture; and an axiological dimension that encompasses moral, ethical, and spiritual values. An ecosystem with FS aligned with the State of Law will position the importance of food sovereignty, granting these communities the right to cultivate and preserve their practices.

Conflict of Interest: none

Keywords: food security; Indigenous people; state of law

S38: Exploring One Health in Everyday Life: Strategies for a Balanced Life

S38.1

Exploring One Health in Everyday Life: Strategies for a Balanced Life. Introduction

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Understanding the impacts of climate change on biodiversity and ecosystem services is a pressing challenge. As global temperatures rise due to increased atmospheric greenhouse gases, species and ecosystems worldwide will experience significant stress. However, the nature and magnitude of impacts vary considerably depending on local environmental conditions. There is an urgent need to better predict how climate change will alter the distributions, interactions, and functional roles of organisms across spatial scales.

This project aims to develop spatially explicit models of climate change impacts on communities and food webs. We will focus on [region] as a case study due to its highly diverse but threatened ecosystems. First, we will compile comprehensive species occurrence and trait databases for major taxonomic groups. Environmental niche modeling will be used to project potential future distributions of individual species under different climate scenarios. Second, we will construct quantitative food web models for representative habitat types based on published diet data and field observations. Dynamic energy budget theory will be applied to link physiology and life history traits to an individual's role within their community.

By integrating projections of climate-driven range shifts with food web modeling, we can simulate how climate change may restructure biotic interactions and alter ecosystem functioning over the coming decades. This integrative approach will provide scientists and conservation planners with spatially explicit forecasts of climate change winners and losers and help identify areas of high vulnerability or resilience within the region's biodiversity hotspots. Our results may also offer insights into climate change impacts applicable to other biodiversity-rich but threatened regions worldwide.

Conflict of interests: none for the text (MF is a speaker and member of Boards for Abbott, CPW, Danone, Nestle, RB)

Keywords: one health; sustainability; food models; climate

S38.2
How is the Management of "One Health" in the Food Chain

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Introduction: The main challenge of the food chain is traceability from the harvest to the table. To achieve best practices in social, environmental, nutritional, and economic aspects, behavior must change, mainly regarding the people involved in and the environment surrounding food production. Even with food waste, millions of people suffer from some form of food security, which also promotes social and environmental disparities. Looking at food production from a whole perspective is the only way to guarantee the planet's survival.

Objectives: Share the best practices in the food sector - public and private - applying One Health in the food chain.

Methods: The best practices and acknowledgment to be shared are obtained from the public and private food sectors through dealing with technical professionals who work directly in this field, always having scientific knowledge to deploy One Health guidelines from WHO.

Conclusion: The food sector is also looking to understand the concept of One Health through science. It is extremely important to share practices among countries, regions, and the public and private sectors for suitable deployment for nutritional, social, and environmental improvement in the food chain. The goal is to improve social, nutritional, and environmental status, assuming that the WHO "One Health" aims to make life on the planet possible for everyone—people, earth, society, fauna, and flora—plants and animals.

Conflict of Interest: CEO of VIVA Nutrition Consulting, which serves the private food sector

Keywords: social and environmental impact; food waste; food chain; food sector; nutrition; economy

S38.3
The Power of Nutrients on the Health of the Population

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Introduction: Over the years, scientific evidence has demonstrated the specific importance of nutrients in terms of prevention and intervention to prevent the development of chronic degenerative diseases. Different factors favor the speed of aging, including genetic factors, physical activity, anthropometry, associated illnesses, Human Development Index (public health), and nutrition. In this aspect, food, the nutrients ingested, including macro and micronutrients, are vitally important for better and more adequate health.

Objectives: Demonstrate that scientific studies related to food intake, which include macro and micronutrients, and the non-development of chronic degenerative diseases favor *agerasia,* that is healthy aging.

Methods: The compilation of scientific epidemiological, randomized, prospective, intervention, systematic review, and meta-analysis studies demonstrating the effectiveness of certain nutrients in preventing chronic degenerative diseases.

Conclusion: Through these compiled studies related to different foods consumed in daily eating, including various types of fats, carbohydrates, and proteins, it is concluded that adequate eating habits related to macro and micronutrients favor *agerasia*. In other words, the Hippocratic saying of the power of nutrients as preventive and therapeutic agents is corroborated.

Conflict of interests: none

Keywords: nutrients; health aging; longevity; associated diseases

S38.4
Individual Food Guidance Based on the Concept of "One Health"

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Introduction: Nutrition science aims to provide adequate nutritional status and, consequently, good health. The tools used by the health team to achieve nutrition objectives must take into account individual aspects such as present nutritional status and diseases, morbidity risks, and other clinical aspects, as well as social, cultural, educational, and physical aspects, as well as food preferences and food availability (community and in-home level). Finally, nutrition education should be enhanced to minimize food losses, food conservation, and food replacement.

Objectives: To show the importance of individualized food and nutrition guidance in achieving adequate health.

Methods: The improvement and acknowledgment of nutrition tools to deal with individuals in order to provide good nutrition status and health, food choices, and environmental sustainability based on scientific knowledge.

Conclusion: Scientific epidemiological research, well-designed, is the basis for providing nutritional knowledge to ensure nutritional education on an individual scale aimed at improving nutritional status, assuming that the WHO "One Health" focus must be taken into account to preserve the Lives of all species.

Conflict of Interest: none

Keywords: nutrition counseling; food choices; food preferences; nutrition education

S39: Prevention of Childhood Obesity and Its Comorbidities

S39.1

Randomized Clinical Trial for the Prevention of Obesity in Children by Mediterranean Lifestyle Intervention. Results after One Year. Meli-Pop Study

Moreno, L. A.[1,2]; Larruy, A.[1,2]; Vázquez-Cobela, R.[1,3]; Llorente-Cantarero, F. J.[1,4]; De Miguel-Etayo, P.[1,2]; Picáns-Leis, R.[3]; Pastor-Villaescusa, B.[5]; Leis, R.[1,3]; Gil-Campos, M.[1,5] on behalf of the Meli-Pop study investigators

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Introduction: Obesity in children is a public health problem worldwide. Therefore, it is necessary to implement preventive measures to reduce the prevalence of this disease and its associated complications.

Objective: To assess the efficacy of an intervention during early childhood, based on the promotion of a Mediterranean dietary pattern and regular physical activity (PA), compared with a control group, on body fat composition after one year of follow-up.

Methods: This is a randomized controlled multi-centre clinical trial, in a cohort of children aged 3 to 6 years with a baseline. of body mass index (BMI) < 30 kg/m^2 (adults equivalent), and at least one parent with a BMI > 25 kg/m^2. The trial has two arms and was performed in Primary Health centers in 3 Spanish cities: Córdoba, Santiago de Compostela, and Zaragoza. The control group received usual care from healthcare professionals, while the intervention group received education on the Mediterranean lifestyle (diet and PA), provision of extra-virgin olive oil and fish, to be consumed at least twice a week, and free PA sessions (three 60-minute sessions of moderate-vigorous activity per week). Body fat composition and cardio-metabolic markers were measured at baseline and after 12 months.

Results: We contacted 1,500 families and 246 accepted to have a 1st examination and enter the run-in period. 206 finally accepted to participate in the trial and were randomized (96 control, 110 intervention, 103 boys and 103 girls). 170 children completed the follow-up period (75 control, 95 intervention). In those completing the protocol, BMI, BMI z-score, fat mass index, and fat mass index z-score changes were significantly lower in the intervention than in the control group, but only in girls. There were no significant results for other body composition indices or in boys.

Conclusion: The intervention promoting Mediterranean lifestyles was effective in terms of BMI, BMI z-score, fat mass index, and fat mass index z-score, but only in girls. More efforts should be deployed in boys to sustain the intervention for a longer time.

Conflict of interest: none

Keywords: childhood obesity; lifestyle habits; Mediterranean diet; randomized clinical trial

S39.2

Experience of the Intervention with Physical Activity in The Meli-Pop Study During the First Year of Follow-up

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Introduction: The inclusion of intervention programs with physical activity (PA) has acquired relevance due to the health benefits, and especially to contribute to the prevention and treatment of childhood obesity from an early age.

Objective: To evaluate compliance with 24-hour PA recommendations (180 minutes/day of PA, and 60 minutes/day of moderate-intense PA [MVPA]), as well as the risk of obesity, in two groups of children aged 3 to 6 years at risk of developing overweight or obesity, with or without a 1-year Mediterranean lifestyle intervention.

Methods: MELIPOP is a randomized clinical trial carried out in three Spanish cities. Boys and girls with normal weight and at risk of developing obesity were included when their parents had, at the beginning of the study, a BMI ≥25 kg/m2. They were randomly assigned to a control or intervention group. The intervention, maintained for one year, consisted of 2 sessions a week of scheduled 60-minute physical exercise, in addition to encouraging the practice of daily PA, and including scheduled sessions of nutritional education and provision of fish and extra virgin olive oil. Anthropometric measurements were carried out; and PA levels and time, as well as the evaluation of sedentary time, were measured by accelerometry.

Results: Preliminary data were obtained from 108 boys and girls (intervention group [IG]: 63; control group [CG]=45) to be included in the statistical analyses, after one year of intervention. There were no significant differences between both groups in terms of compliance with the recommendations, both at the beginning of the study and after one year of follow-up. IG participants went from 54% compliance to 62%, while CG participants decreased from 66% to 65%. There were no changes in inactivity time after the intervention in both groups.

Conclusion: The boys and girls who participated in the MELIPOP study maintained the degree of compliance with PA recommended at preschool age. To assess the anthropometric evolution and adherence to recommendations at these ages, it is necessary to continue longer-term intervention programs.

Conflict of interest: none

Keywords: childhood obesity; lifestyle habits; risk factors

S39.3
Plasma Metabolome Profile in Children at Risk of Obesity After Intervention with Mediterranean Diet for One Year

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Introduction: Non-communicable chronic diseases arise partially from unhealthy lifestyle behaviors (obesogenic diets and insufficient physical activity (PA)). Childhood obesity is one of the greatest challenges for public health. Metabolomics, a technology that identifies metabolites and enables discovery of networks between these molecules and the phenotype, permitting the integration of lifestyle factors and the identification of novel risk biomarkers of health and disease.

Objective: To investigate the relationships between lifestyles, plasma metabolomics, and cardiometabolic risk in the MELI-POP cohort, providing molecular targets capable of measuring, monitoring, and predicting these interactions.

Methods: The DIVERSE project, a component of the MELI-POP cohort (randomized clinical trial) conducted in three Spanish cities, that includes 225 children aged 3-6 years with normal weight but with at least one parent having a BMI ≥25 kg/m². Children were randomized into a control group (n=105) or an intervention group (n=120) that followed Mediterranean diet and PA practices for one year. Intervention included nutrition and PA education (receiving fish, extra virgin olive oil, and 60-minute PA per week). Anthropometric measurements, dietary intake, PA, and sedentary time, and plasma samples for polar compounds and lipidomics (using GC-QTOF-MS and LC-QTOF-MS, respectively) analysis at the beginning and end of the study. Longitudinal changes were analyzed using generalized linear mixed models with the R package lmer4.

Results: Our results will help identify new cardiometabolic risk biomarkers associated with diet and PA, to a better understanding of factors that contribute to childhood obesity.

Conclusion: Identifying specific metabolic signatures of dietary and PA biomarkers will provide information for establishing precise recommendations for clinical practice guidelines for the prevention of childhood obesity and cardiometabolic risk.

Conflicts of Interest: none

Keywords: obesity; cardiometabolic risk; metabolomics; Mediterranean diet; physical activity

S39.4
Effects of Lifestyle Intervention Programs in Pediatric Steatotic Liver Disease

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Introduction: Metabolic dysfunction-associated steatotic liver disease (MASLD) is the most common cause of chronic liver disease in children, mainly due to the worldwide increasing prevalence of overweight and obesity. MASLD encompasses a broad clinical spectrum, ranging from simple steatosis to steatohepatitis and fibrosis. This progression predisposes individuals with MASLD to heightened risks of morbidity and mortality, establishing it as the primary indication for adult liver transplantation. Pediatric MASLD affects 30-40% of children with obesity. Currently, there are no pharmacological options for MASLD in children. Therefore, lifestyle modification is the primary treatment option.

Objective: To examine the effects of dietary and exercise intervention programs on hepatic fat in children with overweight or obesity.

Methods: The effects of nutritional and/or physical exercise interventions on the percentage of hepatic fat measured by magnetic resonance imaging in children and adolescents with overweight or obesity were analyzed.

Results: The restriction of either free sugar intake or sugar-sweetened beverage consumption reduces hepatic steatosis in children and adolescents. Physical exercise reduces hepatic fat content independently of body weight loss.

Conclusions: Family nutritional education based on reducing the consumption of sugary beverages and added sugar in the diet, as well as physical exercise, are effective therapeutic strategies in the prevention and treatment of pediatric hepatic steatosis.

Conflicts of Interest: none

Keywords: liver steatosis; exercise; sugar; diet; children

S40: Maternal and Child Nutrition and Development

S40.1
Intake and Metabolism of N-6 and N-3 Polyunsaturated Fatty Acids: A Link to Pregnancy and Breastfeeding

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Introduction: Polyunsaturated fatty acids (PUFAs) of the n-6 or n-3 series play a relevant role in growth and development during pregnancy and breastfeeding. Specifically, arachidonic acid (C20:4n-6, ARA) of the n-6 PUFA family and docosahexaenoic acid (C22:6n-3, DHA) PUFA of the n-3 series.

Objective: To present an updated compilation of the scientific evidence on intake and metabolism of n-6 and n-3 PUFAs, with focus on DHA and ARA during gestation and breastfeeding.

Methods: The literature review was performed in different databases, PubMed, Scopus, Web of Science, Scielo, ISI, and Ovid MedLine, highlighting the intake, metabolism, and importance of n-6 and n-3 PUFAs (especially DHA and ARA) during pregnancy and lactation period.

Results: N-6 and n-3 PUFAs, mainly ARA and DHA, play a relevant role in the neurological, visual, and cognitive development of infants. Both fatty acids can be provided by the diet and synthesized from essential fatty acids, linoleic acid (C18:2n-6, LA) and alpha-linolenic acid (C18:3n-3, ALA). Currently, there is a very low intake of DHA and high intake of LA, which can alter the availability of DHA for the fetus or infant. Furthermore, the high prevalence of obesity during pregnancy and breastfeeding is decreasing the supply of DHA and even ARA for the infant.

Conclusions: Ensuring adequate intake of n-6 and n-3 PUFAs, particularly DHA and ARA during pregnancy and lactation is relevant to ensure normal growth and development. Currently, dietary imbalances (high LA intake) and obesity can reduce the synthesis and availability of DHA and even ARA at this stage of life. Therefore, it is important to improve dietary advice during pregnancy and breastfeeding on the intake and importance of n-6 and n-3 PUFAs.

Conflict of Interest: none

Keywords: n-6 or n-3 PUFAs; DHA; ARA; diet; pregnancy; breastmilk; growth; development

S40.2
New Non-invasive Methods to Evaluate Gut Status in Infants

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Several studies reported that mRNA expression analysis of exfoliated intestinal cells could disclose relevant information about the biological situation of the intestinal epithelial tissue obtained non-invasively. Around 1/3 of human epithelial cells of the colon are exfoliated and drop in feces every day. This offers to us the possibility to explore the gene expression of gut cells thanks to the great sensibility of techniques available using picograms of RNA samples.

Gene expression from gut exfoliated cell presents in stool closely matched with the transcriptome of the small gut mucosa allowing to obtain a non-invasive gut sample for transcriptome analyses. With such methods, we are able to detect the expression of almost 20800 genes, including genes regulating intestinal proliferation and differentiation using non-invasive stool samples. This is of major interest especially in early infancy stages, when gastrointestinal maturation is maximal affecting nutrient absorption, gut immunological tolerance, and gut-brain axis response.

We optimized such technique in children from 18 months of age with overgrowth with respect to normogrowth and used it in the NELA cohort to discern the changes in gut metabolism in children with catch-up. This methodology has been also used by our group to evaluate the effect of polyamine content on breast milk on gut health in children at 3 months of age. This methodology is also valuable for exploring the interaction between diet and microbiota; this has been done in recent studies with a low number of subjects and low statistical power. The integration of such information is a key issue to improve early nutrition for promoting gastrointestinal health in children and adults.

Conflict of Interest: none

Keywords: exfoliome; stool; gut; children

S40.3
Updates on Breakfast Habits during Childhood and Adolescence

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Introduction: Traditionally, breakfast has been identified as the most important meal of the day; however, children and adolescents often tend to skip it. In addition, it has been considered as a key component of a healthy diet. However, there is currently some disagreement of opinions about its importance, mainly in adults. In children and adolescents, consuming breakfast has been associated with better weight control, better cognitive function, and cardio-metabolic health.

Objective: To present an updated review of the evidence on the effect of breakfast consumption on food and nutrient intake, during childhood and adolescence.

Methods: In 2020, two Systematic reviews and meta-analyses were performed according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) guidelines. We will review several findings to update our last research. Furthermore, we will review studies that have examined the relationship between breakfast consumption or skipping breakfast and different lifestyles in children and adolescents.

Results: Several studies have observed that the highest proportion of children were breakfast consumers, however, during adolescence, this proportion decreased. Several findings have observed that those children and adolescents who ate breakfast had a higher daily intake of energy, carbohydrates, fiber, and protein, as well as a higher intake of vitamins and minerals compared to those who skipped breakfast. Furthermore, different authors have shown that breakfast consumers had a daily healthier diet than breakfast skippers.

Conclusions: Breakfast seems to have a positive effect on daily energy and macronutrient intake, as well as supporting leading to a healthier diet. The inclusion of breakfast makes it possible to include a better balance of the overall diet and it is associated with a better nutritional profile.

Conflict of Interest: none

Keywords: breakfast consumption; children; adolescents; skip breakfast

S40.4
Global Trends in the Cardiovascular and Emotional Health of Adolescents. New Challenges in Public Health

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Introduction: The cardiovascular and emotional health of adolescents is a crucial area of research due to its impact on overall well-being, high incidence, and connection to long-term chronic diseases.

Objective: To design a research project evaluating the impact of lifestyle behaviours adopted during adolescence on long-term cardiovascular health, and to analyse the relationship between excessive social media use and adolescents' mental and emotional health, considering current lifestyle behaviours.

Methods: The CHIARA (Cardiovascular Health in Adolescents from Aragon) project follows adolescents (14-16 years old) from a representative cohort in Aragon, born in 2009-2010. They have been followed monthly since 12 months old and yearly since 7-8 years old. This project is funded by the Spanish Government through the Strategic Action in Health 2023 call (PI23/01771).

Results: The tools used in this project will help reveal associations between lifestyle habits adopted during adolescence and effective stress management, and long-term cardiovascular health. The longitudinal design will allow to correlate also with previous exposures like perinatal factors. Additionally, it is expected to identify associations between excessive social media use and mental and emotional health issues in adolescents, possibly affected by lifestyle behaviours.

Conclusions: The study will show that altered cardiovascular risk markers are already observed during adolescence. Furthermore, findings are anticipated to underscore the need to address excessive social media use as a significant risk factor for adolescents' mental and emotional health, suggesting potential strategies to mitigate these negative effects. The longitudinal nature of this cohort, with data collected from birth, will provide valuable insights into how early life experiences and behaviours influence health outcomes over time, reinforcing the significance of long-term monitoring and early preventative measures.

Conflict of Interest: none

Keywords: cardiovascular health; mental health; adolescence; longitudinal representative cohort; lifestyles

S41: Beyond Breastfeeding, Evidence to Support Action on Breastfeeding Women's Health and Nutrition

S41.1
Food and Nutrient Intake in Lactating Women: A Priority for Supporting Maternal-Infant Nutrition

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Introduction: The nutritional status of lactating women is fundamental for maternal and child health. However, after delivery, attention often focuses on the newborn and breastfeeding, which can overshadow the importance of maternal health.

Objective: To analyze the risk of energy and micronutrient deficiencies in lactating women based on three Colombian population-based surveys.

Methods: Secondary analysis of Colombian surveys (ENSIN, ENSANI, PANA) was performed using a dietary intake evaluation system based on the adjusted 24-hour recall (R24h). The Evaluation of Dietary Intake (EVINDI®) and Program for the Estimation of the Distribution of Intake (PC-SIDE®) software were utilized. The Intake Ratio Index, the ratio of calories consumed from food groups to recommended calories, was calculated.

Results: According to the National Survey of the Nutritional Situation in Colombia (ENSIN) 2015, Food and Nutritional Insecurity (FNI) affected 42.8% of households with lactating women. The Food and Nutrition Profile of Antioquia 2019 (PANA) identified that FNI affected 79% of lactating households; 71.4% did not meet their energy requirements, and more than 80% did not meet the recommendations for protein, vitamin A, folate, calcium, zinc, and vitamin C. This situation is even more alarming among ethnic groups (ENSANI). In a study of women from 24 indigenous communities in Colombia, 94% consumed less than 90% of the required energy. The prevalence of risk of deficiency in usual intake exceeded 90% for nutrients such as fats, zinc, calcium, folate, and vitamin A. These issues are further exacerbated by unbalanced food consumption patterns that do not align with dietary guidelines for Colombian lactating women.

Conclusions: In Colombia, lactating women face high risks of deficiencies in essential nutrients crucial for their health and the nutrition of their children during the first thousand days of life. This underscores the need to establish care strategies beyond breastfeeding to identify and address risks in a timely manner and reduce the intergenerational cycle of malnutrition.

Conflicts of interest: none.

Key words: food consumption; anthropometry; food insecurity; lactating women; health care; public policy

S41.2
Transfer of Fatty Acids to the Neonate through Human Milk

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Introduction: During lactation, there is an increased need for energy and nutrients, making this period critical for maintaining maternal and infant health and ensuring the baby receives the necessary nutrients, especially fatty acids.

Objective: To review the effect of maternal diet on the fatty acid content of human milk.

Methods: A narrative review was conducted using search engines ClinicalKey, PubMed, and SpringerLink, with the keywords (Fatty acids) AND (Human milk OR Breast milk) AND (Lactating woman OR Maternal Nutrition OR Body Mass Index) AND (Infant OR Child). Forty-three articles and other literature from the past five years were included.

Results: A relationship was found between food consumption and levels of PUFA, Trans Fatty Acids (TFA), and Short-Chain Fatty Acids (SCFA) in milk. Through human milk, the newborn receives PUFA such as arachidonic acid (ARA) and docosahexaenoic acid (DHA), as hepatic conversion of precursors is insufficient to meet neurodevelopmental requirements. TFA, such as Conjugated Linoleic Acid (CLA) and its isomer Rumenic Acid (RA), have been associated with bone formation, growth modulation, and infant immunity. SCFA such as acetate, butyrate, and propionate are metabolites with low endogenous production during the first four years of life and are crucial for infants to develop intestinal mucosa, regulate and promote cell cycles, modulate inflammatory processes, strengthen the immune system, and prevent allergies. Maternal microbiota can influence the content of SCFA in milk, with diets high in sugars and saturated fats and low in fiber potentially affecting the abundance of bifidobacteria and increasing genera associated with health disorders like Enterobacter spp.

Conclusion: Fatty acids are crucial for infant health, and their regulatory mechanisms in human milk are influenced by maternal nutrition.

Conflicts of interest: none

Key words: lactating woman; newborn; human milk; fatty acids

S41.3

New Lipid Compounds in Human Milk and Their Relationship to Maternal and Infant Health

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Introduction: In the last decade, from a lipidomic perspective, a pathway has been opened to the possibility of identifying promising new lipid metabolites such as lipophenols (LF), plant oxylipins (PO) and fatty acid hydroxyl esters (FAHFA) from maternal diet, clinical markers of oxidative stress (OS), and inflammation such as human oxylipins (HO), related to perinatal pathologies, in the mother, fetus, newborn, and offspring. However, there remains controversy about the effects of nutritional supplementation.

Objective: To review the metabolic implications of HO and the effect of dietary supplementation on the modulation of lipidomic markers of OS and inflammation during the perinatal period.

Methods: Human clinical studies and dietary intervention trials were reviewed. Measurement of LF, PO, HO, and FAHFA in biological samples (urine, breast milk, and feces) by UHPC-QqQ-MS/MS.

Results: Increased OS occurs during the perinatal period as a result of increased metabolic turnover and increased tissue oxygen requirements. Reduced antioxidant capacity during gestation may contribute to perinatal and postnatal disorders. Therefore, the protection of the newborn from OS has become a health priority. Considering the increased nutritional requirements during gestation and lactation, increased intake of specific nutrients or certain supplements such as n-3 PUFA (DHA and EPA), important in modulating oxylipins, which reduce the abundance of OS markers and increase anti-inflammatory lipid mediators, is recommended.

Conclusions: Progress has been made in the development of analytical tools on the biological implications of PO, LF, and FAHFAs, generated from food and HO produced by pregnant and lactating women, transferred to their offspring, as lipidomic markers of OS and inflammation in the perinatal state. This is an opportunity to correct reproductive disorders, in the context of lipidomic, by adjusting dietary interventions. Maternal n-3 PUFA have a relevant role in modulating the oxylipin lipidome, reducing the OS markers and increasing the anti-inflammatory lipid mediators. Future research examining n-3 PUFA composition, natural sources of supplementation, dosage, n-6/n-3 ratio, timing of administration, and baseline diet of pregnant women should be conducted to reach a valid conclusion.

Conflicts of interest: none

Keywords: lipid markers; oxidative stress; oxylipins; human milk; supplements; perinatal.

S42: ACOFANUD Symposium: Innovation in Food and Nutrition

S42.1

Socio-environmental Conflicts and their Implications for Food Insecurity: The Case of Antioquia-Colombia

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Introduction: The phenomenon of food insecurity cannot be understood in isolation from socio-environmental conflicts, as land use and concentration, mining, extensive livestock farming, and increasing urbanization, among others, have long been increasingly linked to the production and reproduction of hunger. Antioquia is Colombia's second most populated department and is also characterized by its cultural and ethnic diversity. It also has varied ecological systems such as mountains, savannah, coast, and jungle, which give it an important biodiversity. However, Antioquia is one of the departments with the greatest social inequality and high levels of household food insecurity (HFI), as 67% of households suffered from this phenomenon in 2019.

Objective: The purpose of the study was to identify descriptive patterns between agricultural and mining production and the prevalence of HFI in Antioquia.

Methods: A descriptive comparison of HFI, evaluated by the Latin American Food Security Scale in the nine subregions of Antioquia in 2019, along with the agricultural and mining production, to find geographical patterns and time trends, geographic divisions, heat maps, and time series. It was carried out using the leaflet package of R using the municipal coordinates based on the DANE national geographic profile.

Results: The highest prevalence of moderate and severe HFI is found in the Urabá subregion (>50%), followed by the subregions *Bajo Cauca, Nordeste,* and *Magdalena Medio* (between 30% and 50%) where there are higher land uses in a few products. On the other hand, the subregions with a lower prevalence of HFI (*Valle de Aburrá* and *Oriente*) have productions of various products on a smaller scale, in contrast to the subregions with higher HFI, which have large productions in a few categories. In terms of livestock, the regions with the highest prevalence of HFI have high production of cattle and low production of poultry and swine, which are present in the areas with the highest HFI.

Conclusions: Subregions characterized by agricultural and extractive activities that use large areas of land have the highest prevalence of moderate and severe HFI.

Conflicts of Interest: none

Keywords: food insecurity; socio-environmental conflicts; food sovereignty

S42.2

Experimental Methods in Functional Food Innovation: Effects of the Biocompounds of Golden Berry in the Reversal of Obesity

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Introduction: The golden berry (*Physalis peruviana*) is a fruit native to the Andes of South America, rich in vitamins A - C and dietary fiber that is attracting attention for its nutritional properties and health benefits.

Objective: Identify the effect of golden berry (*Physalis peruviana*) consumption on obesity and its complications using human and animal models.

Methods: In healthy adults, isotope labeling LC-MS was used to analyze the effects of daily cape gooseberry consumption. In an animal model of obese and hyperglycemic rats, a diet with cape gooseberry was supplied for 16 days. After treatment with cape gooseberry, urinary markers, biochemical and genetic parameters were analyzed.

Results: The results demonstrate that golden berry (*Physalis peruviana*) biocompounds participate in the regulation of important metabolic pathways that affect insulin signaling and adipogenesis. Daily consumption of golden berry (*Physalis peruviana*) can positively influence the reduction of adipose tissue and the improvement of biochemical profiles related to glucose metabolism.

Conclusions: These findings indicate that daily consumption of golden berry (*Physalis peruviana*) could be a valuable tool in the prevention and treatment of obesity and associated diseases.

Conflicts of Interest: none

Keywords: biocompounds; *physalis peruviana*; obesity; insulin signaling; adipogenesis.

S42.3

Gastronomy and Sports Nutrition: Applications, Trends and Challenges

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Introduction: The transformation of food into complete dishes is an ancestral practice that reflects the cultural and territorial identity of the population. Gastronomy, beyond the gourmet, connects deeply with nutrition and dietetics to promote wellbeing and sustainability. This synergy is especially relevant in the sports field, where nutrition plays a crucial role in the performance and recovery of athletes.

Objective: To design and apply a sports gastronomy methodology, called *GastroSport*, in order to optimize the physical performance and health of athletes through the integration of nutritional and gastronomic principles.

Methodology: This project was developed in several phases:

- Validation: Technology watch.
- Design: Selection of foods representative of Colombian gastronomy and formulation of recipes based on nutritional requirements.
- Prototype: Preparation and testing of recipes.
- Application: Implementation of the *GastroSport* methodology and development of a food guide.
- Value Generation: Development of a business model to create, deliver and capture value to the food guide.

Results: The project resulted in the publication of a book entitled "PRACTICAL FOOD GUIDE FOR BEFORE, DURING AND AFTER TRAINING OR COMPETITION - flavors that boost your performance: (*"GUIA PRÁCTICA DE ALIMENTACIÓN PARA EL ANTES, DURANTE Y DESPUÉS DEL ENTRENAMIENTO O LA COMPETENCIA - sabores que impulsan tu rendimiento"*). This guide offers key concepts of sports nutrition, and 27 recipes designed to satisfy the needs of the athlete. Additionally, the *GastroSport* methodology has been applied in gastronomic workshops at *CESNUTRAL*, demonstrating potential effectiveness in improving athletes' performance and adherence.

Conclusions: This work reflects the collaboration between students and professionals in Nutrition and Dietetics, gastronomes and chefs, to improve dietary strategies in athletes. The *GastroSport* guide and methodology offers an innovative approach that combines science, taste and conscious enjoyment, promoting both physiological health and the pleasure of eating.

Conflict of Interest: none

Keywords: gastronomy; sports nutrition; gastrosport; sports performance; recipes

S43: Social Contexts and Cultural Aspects of Food in the Work of the Dietitian-Nutritionist

S43.1

Alimentary backgrounds and symbolisms in nutritional investigations

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Introduction: Alimentary field refers to the production, distribution, and availability process of food in the localities, as well as the different ways of acquiring food at home, the cooking methods, and commensalisms. Food and alimentation meaning for communities, which "has been generated by the cultural environment" (Gracia, 1996) is also part of this field.

This is how the daily activity of eating generates culinary symbolisms and grammatics, which are specific to each social group, depending on their locality, and ethnics. Alimentation specificity in every human group is defined by the food that they consider edible, as every individual does not eat everything that could be eaten, because even though they are omnivores, individuals are also picky. That is why "in the range of possibilities (and availabilities) (...) classify what is edible and what is not, what is preferable and what is not, what is recommended and what is not, and, of course, what is affordable and what is not" (Gracia, 1996).

Objective: Comprehend the alimentary act's complexity and its importance in the dietist nutritionist's training and formation.

Methodology: Diverse research works with a qualitative focus, more specifically, from a focused ethnography using techniques like in-depth interviews in different populations like mothers, fathers, and adolescent women. Likewise, observations of the different scenarios where food is obtained, prepared, and consumed.

Results: The alimentary selection and consumption in the different research groups are influenced by economic factors, local-level food availability, food preferences and alimentary traditions, and by the individuals' ideas of healthiness.

Conclusions: Due to its relevance, the sociocultural dimension must be thoroughly interpreted during the Dietist Nutritionist formation. From this interpretation, situations so valuable as the relationship between individuals and food are identified, and its relevance and social worth, which contributes to more human and contextualized alimentary investigations.

Conflict of Interest: none

Keywords: social context; sociocultural aspects; nutritionist dietitian; nutritional practice

S43.2

Community Dining Halls in Cali: Food Experiences from the Social and Cultural Perspective of the Women Managers

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Introduction: In the profession of the Nutritionist Dietitian (ND), understanding social realities is essential for contributing to social change and peace in Colombia. However, it has been described that in Latin American training environments, the social vocation of NDs often remains at a commonsense level and does not manifest during their undergraduate training, leading to a predominance of the biomedical perspective.

Objective: Identify the social and cultural characteristics of community dining halls in Commune 18 of Santiago de Cali from the perspective of the women managers.

Methods: This qualitative study, utilizing a service-learning approach with Nutrition and Dietetics students, involved community dining hall women managers who participated through informed consent. Systematic observations and semi-structured interviews were conducted during field visits, with interviews recorded and transcribed. The analysis employed the five dimensions of the socio-anthropological concept of Social Food Space.

Results: In March 2024, visits were conducted with 10 female managers, mostly heads of households aged 40 to 60, who voluntarily worked with other cooks to provide 50 to 100 daily meals prepared in domestic spaces. The community's efforts, especially leadership, significantly influence the availability of meals. In the culinary space, care in food preparation aims to create a sense of home and health. In terms of consumption habits, there is a strong commitment to meeting the needs of those relying on the dining hall, whether taking food home or consuming it on-site. Additionally, the focus on temporality highlights the attention given to children and the elderly, with some dining halls operating without government support.

Conclusions: The social and cultural characteristics of community dining halls are shaped by community participation, a complex factor that reveals particular configurations, notably the role of the "manager," typically a female leader. The food and its consumption reflect the outcomes of survival efforts, with the impact of temporality being a crucial determinant.

Conflict of Interest: none

Keywords: poverty; collective feeding; qualitative studies; nutritionist

S43.3

Food and cultural environments inside localities of indigenous populations in Mexico

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Introduction: Dietary change in Mexico is being expressed in the substitution of healthy foods for industrialized foods and beverages. The change in lifestyle and the consumption of ultra-processed foods with low nutritional quality, high in fats, sugars and simple carbohydrates, are factors which greatly influence the epidemic obesity suffered by the Mexican population.

Objective: The paper demonstrates that the food choices made by the indigenous populations inside of central Veracruz (Acatlán y Tequila, Veracruz) represent intergenerational disputes between different meanings on *good food*.

Method: Between January and June 2024, fieldwork was carried out to support this research. The principal resource to collect the information was ethnographic methodology. In each locality, two interviews were applied to women of two different age groups: firstly, between sixty and eighty-five years old; secondly, among thirty and fifty-five years old. The information was validated by the saturation criterion and the Constant Comparison Method were used for data analysis.

Results: Older women assign meanings of good food to products grown on their farmland, locally called milpa. These foods are consumed in a variety of ways and are culturally appropriate with historic cultural roots. Younger women live in a modern food environment with access to ultra-processed foods through convenience stores. They refer to ultra-processed foods with narratives linked to the medical discourse that is transmitted in mass-media. They value foods that include legends such as added vitamins and iron to feed their families. They trust the regulatory institutions of the state and do not consider propaganda to be misleading.

Conclusion: The obesogenic environment has expanded throughout Mexico through convenience stores that facilitate access and the mass media that promote the need for them through misleading advertising. The meaning of good food is an area of dispute in localities where extended families with members of different ages live together.

Conflict of Interest: none

Keywords: dietary changes; obesogenic environment; cultural environment

S45: Relevance of Plant Nitrate Intake in Oral and Cardiovascular Health by the PhD in Translational Nutritional Sciences

S45.1
Relevance of Plant Nitrate Intake in Oral and Cardiovascular Health by the PhD in Translational Nutritional Sciences

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Introduction: Periodontitis is associated with modifiable risk factors, such as poor oral hygiene, diet, smoking, and socioeconomic determinants, which have been linked to increased cardiovascular risk in the population. Dietary vegetable nitrate intake has been associated with improved oral and cardiometabolic health. Therefore, it is essential to clarify the potential health effects of plant nitrate intake to health professionals for its application.

Objective: Support for plant nitrate intake and its translational application in the care of patients with oral diseases and cardiovascular risk.

Methods: The search for scientific literature on nitrate ingestion through vegetables and its potential effects on oral and cardiovascular health in a preferably Iberoamerican population in the last 5 years was conducted in PubMed and recognized books. Analysis of selected articles and books to generate the message of the three papers: oral diseases and their relationship with cardiovascular risk, intake of plant nitrates and their mechanisms of action in oral and cardiovascular health, and nutritional interventions with plant nitrates in the therapy of oral and cardiovascular diseases in Iberoamerican population.

Results: Periodontitis is associated with an increased risk for the development of cardiovascular disease due to systemic inflammation as an etiological link; by metastatic infestation, it can reach different anatomic organs and cause pathological changes. Stimulating the nitrate-nitrite-nitric oxide pathway with nitrate-rich foods such as lettuce, spinach, beets, radish and celery, in conjunction with a healthy diet, could contribute to improve oral microbiota and clinical parameters in periodontal diseases, better blood pressure control, enhance endothelial function, reverse metabolic syndrome and produce anti-diabetic effects. The adequate consumption of vegetables in the population has been established by various dietary guidelines in general and is a fundamental element for a healthy and sustainable diet worldwide.

Conclusions: The gaps in the scientific evidence invite us to continue the efforts to increase evidence about the intake of vegetables rich in nitrate and its clinical applications in oral and cardiovascular health.

Conflict of Interest: none

Keywords: nitrate; vegetables; periodontitis; cardiovascular risk

Oral Communications

Healthy Nutrition in the Life Cycle and Clinical Nutrition

O01
Effect of Consuming a Mix of Brazilian Nuts on Energy Metabolism and Body Composition in Women with Excess Weight: Study of Brazilian Nuts

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Introduction: Current literature suggests that nut consumption can modulate energy metabolism, favoring body weight control. However, there are still few randomized controlled clinical trials that have evaluated these effects.

Objective: To evaluate the effect of acute and chronic consumption of a mix of nuts containing cashews and Brazil nuts associated with a calorie-restricted diet on energy metabolism and body composition in overweight women.

Methods: Clinical, randomized, controlled study with 37 women (BMI ≥ 27 kg/m2), randomly assigned to two groups: mixed nuts (MN) and control (CT). During 8 weeks of intervention, they followed a restricted diet of 500 kcal/day; the MN group consumed 15 g of Brazil nuts plus 30 g of cashews per day, while CT had a nut-free diet. At the beginning of the study and after 8 weeks, they consumed a drink according to the assigned group. In the fasting and postprandial periods, resting metabolic rate (RMR), diet-induced thermogenesis (DIT), and fat oxidation were evaluated.

Results: The acute response to consumption of a drink containing a mix of Brazilian nuts resulted in greater postprandial fat oxidation compared to CT (p=0.048). However, RMR and DIT were similar between groups with no effect after 8 weeks. Within the MN group, chronic consumption showed a greater tendency

toward fat oxidation (p=0.060) and changes in body composition with a significant loss of fat mass.

Conclusions: The present clinical study adds to the current scientific evidence on the effect of consuming nuts on energy metabolism. Thus, the nut mix stands out as a functional food with a beneficial nutritional profile, including oleic fatty acid as a possible adjuvant in the loss of body fat. However, long-term studies are needed to evaluate the effect of chronic consumption of cashews and Brazil nuts.

Conflicts of Interest: none

Keywords: obesity; resting metabolic rate; diet-induced thermogenesis; fat oxidation

O02

Low Polyphenol Intake and Inflammatory Diets are Associated with Increased Risk Factors for Cardiometabolic Diseases in Colombian Adults

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Introduction: Inflammation plays an important role in the development and progression of cardiometabolic diseases. Dietary polyphenol intake is associated with a lower risk of inflammation-related chronic diseases and with the improvement of metabolic disturbances. Little is known about the level of polyphenol consumption in Colombia and its connection to cardiometabolic health.

Objective: To assess the relationship between polyphenol intake and cardiometabolic health-related variables in Colombian adults. Additionally, we investigated the association between polyphenol intake and inflammation contributed by the diet, using the dietary inflammatory index adjusted by energy (E-DII).

Methods: We conducted a cross-sectional study in which we collected data on polyphenol intake from Phenol-Explorer v.3.6 and E-DII from 24-hour dietary recalls of 459 Colombian adults (51.6% females; 18–62 years old) and determined their relationship with demographic, gut microbiota, and cardiometabolic health parameters (Act 14-24-588, 28/05/2014; Bioethics Committee of SIU–Universidad de Antioquia).

Results: The study population consumed an average of 1168 ± 914 mg/day of total polyphenols. Phenolic acids and flavonoids were the most consumed polyphenol classes. Men consumed more polyphenols than women, and those aged 41-62 years consumed more polyphenols than the 18-40 age group. Participants with medium or high polyphenol intakes (>1000 mg/day) had diets with lower inflammatory potential (E-DII <0.1), reduced BMI (<27.8 kg/m^2), and adiposity (relative fat mass <33.9%), as well as the lowest leptin (<6.5 ng/mL) and leptin/adiponectin levels. They displayed better glucose metabolism, insulin sensitivity, and glucose tolerance. In addition, those with low polyphenol intake had higher levels of potentially harmful gut bacteria. Noteworthy, participants consuming diets with higher inflammatory potential and lower polyphenols exhibited greater systemic inflammation, as measured by hs-CRP (>3 mg/L).

Conclusions: Low polyphenol intakes and inflammatory diets were associated with poor cardiometabolic health. Our results highlight the importance of promoting antioxidant and anti-inflammatory diets rich in fruits, vegetables, and whole grains to preserve health in the adult population.

Conflicts of Interest: Vidarium is a research center funded by companies of Grupo Empresarial Nutresa.

Keywords: leptin; adiponectin; body mass index; relative fat mass; glucose metabolism; cross-sectional study

O03

Factors Associated with Adherence to Antiretroviral Therapy in HIV/AIDS Patients at Hospital General Santa Teresa, Comayagua, 2020-2021.

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Introduction: Antiretroviral therapy (ART) aims to achieve viral load suppression, restore immune function, decrease morbidity and mortality, prevent HIV resistance to ART, prevent clinical progression of infection, and improve quality of life.

Objective: To analyze the factors associated with adherence to antiretroviral therapy in patients with HIV/AIDS linked to the Comprehensive Care Service (CCS) of the Santa Teresa General Hospital (STGH), Comayagua, from June 2020 to March 2021.

Methods: Analytical, cross-sectional study, a universe of 281 active patients linked to the SAI-HGST with more than 6 months on ART, a sample of 210 (95%CI, 5% error). Protocol approved by Bioethics Committee of Honduran Institute of Social Security. A questionnaire-type instrument included sociodemographic data, individual factors, medication, health provider, and health system, and the SMAQ questionnaire to assess adherence. The database was created and analyzed in Epiinfo v.7.4.2.0, and descriptive analyses and multiple logistic modeling were performed.

Results: 210 patients interviewed, male 108 (51.4%), aged 30-44 years (39.8%), general population 168(80.0%), 116(55.2%) had adequate nutritional profile (BMI 18.5-24.9 kg/m^2) 55.2% (55%) had an estimated 59.5% adherence to ART, found to be associated with factors related to the person (absence of stable home ORc=0.49; ORaj=0.45; 95%CI=0.24-0.84, p=0.0131, poor motivation to ART ORc=0.11; ORaj=0.12; 95%CI=0.03-0.38, p=0.0003 and alcoholism ORc=0.31; ORaj=0.12; 95%CI=0.03-0.38, p=0.0003). 0131, low motivation to ingest ART ORc=0.11; ORaj=0.12; CI95%=0.03-0.38, p=0.0003 and alcoholism ORc=0.31; ORaj=0.37;

CI95%=0.15-0.93, p=0.03), with ART (stigma to ingest therapy outside home ORc=0. 45; ORaj=0.46; CI95%=0.22-0.94, p=0.0126), and with those related to the healthcare provider/health service.

Conclusions: Low percentage of adherence to ART and given that the associated factors were mainly related to the individual, interventions should be reoriented to these factors.

Conflicts of Interest: none

Keywords: treatment adherence and compliance; HIV, ART, acquired immunodeficiency syndrome

O04

Body Image and Drunkorexia Risk in Mexican Adults with and Without Borderline Personality Disorder

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Introduction: Drunkorexia can be defined as a set of compensatory behaviors before, during, and after drinking alcohol in order to avoid alcohol-related weight gain and/or to enhance the psychoactive effects of alcohol; some of the behaviors that can be identified are dietary restraint, intense exercising, vomiting, and use of laxative and diuretics (Hunt & Forbush, 2016). Borderline Personality Disorder (BDP) is defined as a dominant pattern of instability of interpersonal relationships, self-image and affects, and intense impulsivity that begins in early adulthood, with some comorbidities as eating disorders; both body disturbance and dissatisfaction are risk factors for Eating Disorders (ED).

Objective: The study aimed to compare the level of body disturbance and dissatisfaction and drunkorexia risk in a representative sample of Mexican adults in an age range of 18 to 30 years old with and without Borderline Personality Disorder.

Methods: A non-probabilistic sample of N=426 case and control people was used, n1=72 participants with BPD and n2=354 students, both groups in an age range of 18 to 30 years. A comparative cross-sectional design was used; the scales application, including CEBRACS (Rahal, 2012) to measure drunkorexia risk, were done in a single session, following the ethical considerations for conducting non-intrusive research proposed in the General Health Law of Mexico.

Results: Statistically significant differences were found in body disturbance ($F(1, 420)=12.005$, $p=.001$), body dissatisfaction ($F(1, 416)=5.295$, $p=.022$), and drunkorexia risk ($F((1, 425)=34.345$, $p=.000$) by comparison group; in all three variables, participants with BPD presented higher levels of risk compared to the control group.

Conclusions: The findings are relevant due to the complexity in the research and treatment of BPD and ED.

Conflicts of Interest: none.

Keywords: Drunkorexia; BPD; body image; ED; Mexican adults

O05

Gestational Diabetes Mellitus and Iron Nutritional Status Assessed by Intake, Supplementation, and Biomarkers in Pregnant Women attending the Maternal-Fetal Medicine Service at "Dr. Juan I. Menchaca" Civil Hospital in Guadalajara

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Introduction: Gestational Diabetes Mellitus (GDM) is a common metabolic condition during pregnancy, characterized by glucose intolerance that poses risks to both the fetus and the mother. Iron is essential during pregnancy; however, in excess, it can be dangerous as it generates free radicals that damage tissues and interfere with insulin function.

Objective: The aim was to demonstrate if women with GDM had higher iron intake and levels than those without GDM.

Methods: A case-control study evaluated the iron status in pregnant women with and without GDM through laboratory tests, dietary analysis, and supplementation.

Results: Contrary to the initial hypothesis, dietary iron consumption was higher in women without GDM (cases=9.9 mg/day, IQR 4.4 vs controls=12.7 mg/day, IQR 6.6, $p <0.000$). This statistical significance was maintained when qualitatively analyzed according to SDG requirements, where 100% of cases and nearly 90% of controls had insufficient consumption ($p=0.02$). Supplementary iron intake showed no significant differences (65.7 mg/day for cases and controls; $p>0.05$). Similar findings were observed with hemoglobin and ferritin biomarkers ($p>0.05$).

Conclusion: This study highlights the importance of additional longitudinal research with representative samples and precise laboratory tests to better understand the relationship between iron and GDM. Furthermore, it underscores the need for timely nutritional monitoring during pregnancy to reduce deficiencies and excesses of macro and micronutrients as crucial as iron.

Conflict of Interest: none

Keywords: gestational diabetes mellitus; iron; supplementary iron; dietary iron; iron biomarkers

O06

Detection of Banned Doping Substances from the World Anti-Doping Agency (WADA) List in Food Supplements - What are the Consequences for Sport and Health?

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Introduction: The use of dietary supplements is increasing among amateur and professional athletes, year after year. In previous studies, mainly prohormones and/or stimulants have been found to contaminate 12-58% of the products analyzed.

Objective: The aim is an in-depth food safety study analyzing 70 WADA doping substances in 171 dietary supplements marketed in the Spanish market.

Methods: 171 nutritional supplements consisting of 32 proteins (whey, vegan, casein, and beef), 27 BCAAs, 26 multivitamin supplements, 25 glutamines, 29 recovery supplements, and 32 creatines were analyzed. The extraction and analysis method are based on a standardized and optimized method using UHPLC coupled to mass spectrometry with quadrupole time of flight technology for the analysis of 70 doping substances included in the World Anti-Doping Agency list (WADA).

Results: The compounds mostly present in the dietary supplements were octodrin (39.7%), SR9009 stenabolic (35.1%), propylhexedrine (17.5%), andarine (14.6%), phenbutrazate (12.3%), and stanozolol (9.9%). Proteins, BCAAs, multivitamin supplements, glutamines, recovery supplements, and creatines had 46.9%, 83%, 77%, 52.6%, 60.9%, and 90.9% contamination with 1-15 WADA prohibited substances for each product tested, respectively.

Conclusions:

- Public health problems due to the high percentage of contaminated products.
- Predominance of SARMS, steroid hormones, and psychotropic and stimulant substances.
- Even though 70 substances are evaluated, a total of 35 substances are often repeated in products in various forms.
- The invalidity of the label "Informed-sport trusted by sport".
- There are some products in the pharmaceutical category that are minimally contaminated.
- Need for control of nutritional supplements including traceability, control of origin of ingredients and batches.

Conflict of interest: none

Keywords: food-supplements; WADA list; doping substances; sport; athletes; public health

O07

Association between Adherence to a Mediterranean Dietary Pattern and Body Composition in Preschool Children. CORAL Study

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Introduction: Mediterranean diet (MD) has been found one of the dietary patterns that benefits against the onset of obesity and related co-morbidities in adults and some studies in children.

Objective: To assess the association between the MD pattern and body composition and the prevalence of overweight and obesity in Spanish preschool children.

Methods: Data from 1218 participants aged 3-6 years were included in the CORAL Study cohort. Two indexes of adherence to the MD were used: 1) the MED4CHILD index, and 2) the same index computed with the data from the COME-Kids-Foods-and-Beverage frequency questionnaire (MED-COME-Kids-F&B-FQ). Body composition indexes (BMI, BMI z-score, Fat Mass Index (FMI), and FMI z-score) were computed from anthropometric measurements. Linear regressions were performed to assess the association between the indexes (MD and body composition). Adherence to MD in relation to body composition was examined through multivariate analysis of covariance (ANCOVA), adjusting for gender and considering the interaction between gender and adherence to MD questionnaires. The risk of obesity based on adherence to MD indexes was estimated using odds ratios (OR).

Results: Significant associations between MED-COME-Kids-F&B-FQ index and BMI and BMI-Z-score were observed in both genders. ANCOVA revealed significant differences in BMI and BMI-Z-score for both sexes for MED-COME-Kids-F&B-FQ and for boys for the MED4CHILD. FMI-z-score showed differences for the MED-COME-Kids-F&B-FQ. A low adherence to MD (MED4CHILD) was related to a high risk of overweight/obesity (OR:1.547; 95% CI:0.977-2.449).

Conclusion: Adherence to the MD was significantly associated with favorable body composition indices in Spanish children, also showing a low likelihood of being overweight or obese.

Conflicts of Interest: none

Keywords: Mediterranean diet; children; body composition

O08

Effects of Nutritionally Improved Bakery Products on Cardiometabolic Markers in Children with Overweight and Obesity: the MEDKIDS Study.

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Introduction: Childhood obesity and its comorbidities are risk factors for cardiometabolic diseases. Dietary products commonly consumed by children often lack optimal nutritional profiles. High consumption of whole grains has been associated with a lower risk of cardiometabolic diseases. Therefore, the food industry, through innovation in products with improved nutritional profiles, may contribute to childhood obesity prevention.

Objective: This study evaluates the effect of nutritionally improved bakery products versus conventional products on cardiometabolic markers in Spanish children with overweight and obesity, within the context of the Mediterranean diet.

Methods: A randomized crossover-controlled trial with two 8-week experimental periods, separated by a 5-week washout period. Children aged 6-12 years with overweight or obesity were randomly assigned to consume either nutritionally improved bakery products (Intervention group) or conventional products (Control group) as part of their usual diet. The improved bakery products featured a sourdough starter, wholegrain cereals, reduced sugars and saturated fats, and increased fiber content. Additionally, all participants received weekly dietary plans and recommendations following the Mediterranean diet. Blood samples were collected at the beginning and at the end of each period to determine lipid profile, fasting glucose, insulin, apolipoprotein A1, and apolipoprotein B concentrations. A repeated measures model was applied to calculate differences between the beginning and the end for both the intervention and control groups.

Results: A total of 31 participants (mean age 11.25 ± 1.38 years) who completed blood extraction procedures were included. Intervention and control groups showed positive effects on HDL-cholesterol, LDL-cholesterol, non-HDL cholesterol, fasting glucose, insulin, and apolipoprotein A1 concentrations. Intervention and control groups exhibited lower values in apolipoprotein A1 (p=0.024, p=0.014) and insulin concentrations (p=0.037, p=0.006). Furthermore, a significant reduction in fasting glucose concentrations (p=0.034) was observed in the control group.

Conclusions: Inclusion of bakery products has positive effects on cardiometabolic markers in both groups. Further analysis is needed to assess the absence of carry-over, period, or sequence effects.

Conflicts of Interest: none

Keywords: childhood obesity; bakery products; lipid profile; glucose

O09

Professional weighted Clinical Nutrition Activities Score: a proposal

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Introduction: At the hospital level, the role of the nutritionist is fundamental for the patient's recovery.

Objective: To develop a weighted scoring system to evaluate the activities of clinical nutritionists (NCs) in Latin America.

Methods: A cross-sectional study was conducted with a convenience sample of 1222 volunteer NCs from 13 countries, between July 7 and September 3, 2022. The identified functions were assessed using Professional Weighted Activity Scores (PwAS). This system seeks to provide a detailed assessment of nutritionists' performance in various professional activities. The PwAS included 19 questions on the specific responsibilities of the NCs. Scoring was: 3 if they always performed the activity, 2 if they sometimes, and 1 if they never did. An additional score was assigned according

to importance, previously defined by a group of experts. The total score ranged from 50 to 150. The research was approved by the Scientific Ethics Committee of the Universidad de Playa Ancha, Valparaíso, Chile. To analyze the data, a stepwise linear regression model was used, keeping the variables with a probability of association of 0.10. The association was presented with beta coefficients per unit score, with a significance level of $\alpha < 0.05$ and a 95% confidence interval.

Results: PwAS was positively associated with more years in the profession (Beta: 0.028, 95% CI: 0.004, 0.051) and more specializations (4 or more, Beta: 2.294, 95% CI: 1.031, 3.557). In contrast, working in hospitals of lower complexity (Beta: -1.037, 95% CI: -1.443, -0.630) and having more reasons for not performing the activities (3 or more, Beta: -3.105, 95% CI: -4.111, -2.099) were negatively associated with PwAS.

Conclusions: The PwAS is a valuable tool to evaluate and improve NC practices in Latin America, contributing to the quality of nutritional care. This study highlights the importance of experience, specialization, and work environment in the professional performance of NCs, providing a solid basis for research and policies in this field.

Conflict of interest: none

Keywords: nutritionist; clinical nutritionist; nutrition care

O10

Differential Behavior of Cytokines and Adipokines in Patients with Type 2 Diabetes Mellitus with or without Metabolic Syndrome

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Introduction: Type 2 diabetes mellitus (T2DM) is considered a chronic low-grade inflammatory disease; however, not all patients behave the same way. We hypothesize that proinflammatory and inflammatory cytokines and adipokines in patients with type 2 diabetes mellitus are different, depending on the presence or absence of other markers related to metabolic syndrome (MetSyn).

Objective: To analyze the relationship between type 2 diabetes mellitus, metabolic syndrome, and adipokines and cytokines.

Methods: Data from 93 adult patients with T2DM were divided into two groups, with or without metabolic syndrome according to ATTP diagnostic criteria. Adipokines (adiponectin, leptin, and resistin) and cytokines (Interleukins 1β, 4, 6, 8, 10 and 12, TNF- α, TGF-β, INF-γ, MCP-1) were compared between groups by Student's t-test and bivariate correlations were also analyzed.

Results: Patients with MetSyn showed higher values of most of the markers, except for IL-1β, IL-4, and INF-γ. However, only IL-8 and IL-10 showed statistically significant ($p<0.05$) differences. Significant positive correlations ($p<0.05$) were found between the time of evolution of T2DM, total cholesterol, HDL-cholesterol, and non-HDL cholesterol with INF-γ; time of evolution with TNFα, and total and HDL-cholesterol with IL-1β in the non-metabolic syndrome group. Whereas in patients with MetSyn, negatively significant correlations ($p<0.05$) were observed between INF-γ and time of evolution; IL-1β and total cholesterol, LDL-cholesterol and non-HDL Cholesterol; IL-8 and LDL-cholesterol and HOMA-B; IL-12 and glucose, total cholesterol and non-HDL-cholesterol; and Leptin with Hb1Ac, glucose, and BMI.

Conclusions: Our data indicate that inflammation and metabolism in patients with T2DM are different in relation to the presence or absence of additional risk factors, suggesting the need to further evaluate individual conditions to improve treatment.

Conflict of interest: none

Key Words: type 2 diabetes mellitus; inflammation; metabolic syndrome

Nutritional Epidemiology and Challenges of Public Health in Latin America

O11

Biases in Food Choice and Their Implications for Public Policy: A Literature Review

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Introduction: This paper addresses the complexity of food decision-making, highlighting its multifaceted nature and the influences of emotional, social, biological, economic, and cultural factors. It examines how people choose foods, revealing that decisions are influenced more by intuitive thinking than by conscious reflection, exploring heuristic reasoning in decision-making.

Objective: To describe the biases identified in food choice and discuss how they can be considered in public policy formulation.

Methods: The PRISMA guidelines were followed to conduct a database search using terms related to biases and heuristics in food choice. Duplicates were removed, and titles and abstracts of the articles were reviewed, excluding those that did not meet the inclusion criteria. Eligible articles utilized quantitative and qualitative methodologies and secondary data analysis. After reviewing titles and abstracts, 12 articles were selected.

Results: From a rationality perspective, consumers should integrate information to make optimal decisions, but instead, they use simplification shortcuts (heuristics) to minimize decision difficulty. However, the use of these shortcuts can lead to incorrect judgments and systematic errors known as biases. Fifteen types of biases related to food choice were documented, with the most relevant being attribution, anchoring, availability, loss aversion, and status quo biases.

Conclusions: Applying behavioral economics approaches can contribute to improving consumer decision-making. This review highlights the importance of the most relevant heuristics and biases in food choices that can be considered in public policy formulation.

Conflicts of Interest: none

Keywords: biases; food choice; heuristics; behavioral economics

O12

Dietary Intake of Indigenous Children and Adolescents in Colombia

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Introduction: Indigenous communities in Colombia have long-faced longstanding vulnerabilities, which are evident in the inadequate dietary intake of children and adolescents.

Objective: To evaluate the dietary intake of Colombian indigenous children and adolescents aged 0 to 18 years.

Methods: A cross-sectional descriptive study was conducted using secondary data from the National Study on the Food and Nutritional Situation of Indigenous Peoples of Colombia 2013-2019. (Estudio Nacional de la Situación Alimentaria y Nutricional de los Pueblos Indígenas de Colombia – ENSANI). Dietary intake was assessed using a 24-hour recall (24HR). Statistical analysis included non-parametric tests and assessments of normality and homoscedasticity, with a p-value < 0.05 considered significant.

Results: The sample consisted of 6,824 individuals under 18 years. Of these, 67.0% of infants under 6 months were exclusively breastfed, while approximately 20.0% consumed both breast milk and complementary foods, indicating early introduction of complementary feeding. From 12 months onwards, food consumption becomes the primary mode of feeding. In all age groups, the consumption of traditional foods was reported, with game meat (41.9%) being the most common, followed by cereal-based products (19.6%) and non-fermented traditional beverages (17.5%). The Consumption Ratio Index (CRI) indicated that only the cereal and sugar group met the recommended consumption levels for the different age groups.

Conclusions: The dietary intake of indigenous children and adolescents in Colombia does not meet the recommendations for their age groups. Strategies to promote exclusive breastfeeding, the appropriate introduction of complementary feeding, and improved feeding practices for infants and adolescents are essential to support the food culture of these communities and promote optimal nutrition for individuals under 18 years.

Conflicts of Interest: none

Keywords: nutrition; food and diet; Indigenous populations health; growth and development; breastfeeding

O13

Association between Dietary Patterns and Sustainable Lifestyles in Iberoamerica

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Introduction: Dietary sustainability goes beyond nutrition and the environment to include economic and sociocultural dimensions; however, whether associations exist between dietary patterns and sustainable lifestyles (SLEs) is not known.

Objective: To associate dietary patterns with SLEs in Ibero-American adults.

Methods: Cross-sectional, multicenter, analytical study. The population consisted of adults (+18y), both sexes, residing in one of the 14 Iberoamerican countries participating in the study (Argentina, Bolivia, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Nicaragua, Guatemala, Mexico, Panama, Paraguay, Peru, Spain, and Uruguay). Convenience sample was taken applying an online form, and both the food survey and the SLEs survey were validated using the Lawshe method, which was disseminated through different social networks. It included sociodemographic variables, dietary patterns, food consumption, and activities of daily living. The SLEs score was obtained by considering questions about food and shopping, transportation, recreation and self-care, and environment. To study the association between dietary patterns and SLEs, linear regression was used, adjusted for age, sex, country, smoking, physical activity, and BMI.

Results: A total of 5800 valid responses were obtained, 78.7% were women, the mean age was 34.6 years (standard deviation [SD] 12.35), the mean BMI was 25.30 kg/m2 (SD 5.22). They did not smoke (76.4%), and did not engage in physical activity (54.8%). Compared to the omnivorous diet, the vegan (β: 12.3, 95% CI: 8.3-16.3), ovo-dairy vegetarian (β: 12.3, 95% CI: 8.3-16.3), ovo-dairy vegetarian (β: 7.0, 95% CI: 4.4-9.5), pescovegetarian (β: 5. 0, 95% CI: 1.8-8.9), Mediterranean (β:4.8, 95% CI: 3.3-6.2), flexitarian (β: 3.4, 95% CI: 1.7-5.1), paleolithic (β: 3.2, 95% CI:0.3-6.1) were directly associated with EVS. While keto diets (β: -1.9, 95% CI: -5.9-2.0) and western (β: -5.3, 95% CI: -6.5-4.1) diets were inversely associated with SLEs.

Conclusions: Plant-based diets, especially vegan diet, were shown to be associated with SLEs, on the contrary, Western diet was inversely associated.

Conflicts of Interest: none

Keywords: plant-based diet; vegan diet; Western diet; sustainability.

O14

Association between Physical Activity, Sedentary Behavior, and Sustainable Lifestyles in Ibero-America

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Introduction: Environmental pollution, global warming, and deterioration of the natural environment have led to sustainable lifestyles (SL) becoming a growing practice over the last decade. Those who opt for this lifestyle have a higher level of physical activity (PA) in addition to concern for the environment and circular economy.

Objective: To determine the relationship between PA and sedentary behavior with SL in Ibero-American adults.

Methods: A multicenter study was conducted, including adults of both sexes, aged over 18 years, and residents of 14 participating countries (Argentina, Bolivia, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Spain, Guatemala, Mexico, Panama, Paraguay, Peru, and Uruguay). Participants completed an online survey, validated by the Lawshe method. Questions referred to sociodemographic variables, dietary patterns, food consumption, lifestyles, and sustainable practices. The SL score considered questions related to food and shopping, transportation, recreation and self-care, and environment. To study the association between PA and sedentary behavior with SL, linear regression was used, adjusted for age, sex, country, smoking, and body mass index (BMI).

Results: 6,130 participants were included (78.21% women, 34.9 ± 12.55 years), BMI 25.29 ± 5.19 kg/m^2, non-smokers (75.84%), did not engage in PA (54.81%), and SL score of 141.19 ± 22.49. Meanwhile, it was 141.11 ± 18.03 for those who did not practice PA and 145.55 ± 17.29 for those who did. Scores for sedentary behavior were 147.81 ± 17.50 (low), 144.01 ± 16.91 (medium), and 140.80 ± 18.43 (high). Compared to those who do not practice PA, those who do PA have a higher SL score (β: 4.7, 95% CI: 3.8; 5.6). While compared to individuals with low levels of sedentary behavior, those with medium (β: -3.2, 95% CI: -4.6; -1.7), and high (β: -5.0, 95% CI: -6.4; -3.6), levels have lower SL score.

Conclusions: There is a positive relationship between the level of physical activity and SL, while sedentary behavior is inversely related.

Conflicts of Interest: none

Keywords: physical activity; sedentary behavior; sustainability

O15

Barriers to the Implementation of Healthy Feeding in Schoolchildren as Perceived by Mothers in Rural Honduras: A Case Study

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Introduction: In Honduras, according to the Observatory of Food and Nutritional Security in 2023, 21.5% of children between 6 months and 12 years of age are overweight and 17% are underweight. This situation increases the incidence of non-communicable diseases in the population, which entails significant social costs. Therefore, it is crucial to promote a healthy lifestyle from childhood, either through the family or school environment, to reduce the socioeconomic impact generated by poor feeding habits.

Objective: To analyze the barriers perceived by mothers in relation to the promotion of healthy diets for children aged 6 to 12 years.

Methods: A qualitative study was conducted through a case study approach of a school population in the dry corridor of Honduras. Five focus groups were conducted with 8 participants to discuss the perceived barriers to implementing healthy feeding. The qualitative analysis had a socio-ecological approach to understand the barriers from a family, school, and community point of view. The transcribed interviews were analyzed in ATLAS.ti®.

Results: The results revealed several significant barriers. At the family level, economic constraints, lack of nutrition education, children's preferences for junk food, and differences in dietary tastes within the family. At the school level, the limited availability of healthy food options in the school store and the absence of nutrition education in educational institutions were highlighted. At the community level, the high cost of healthy foods, the lack of local markets with fresh produce, and the lack of nutrition professionals.

Conclusions: The need to address these barriers in a comprehensive manner was highlighted, implementing strategies that include nutrition education, promotion of family farming, and improvements in the availability of healthy foods at home, school, and in the community, to promote healthy eating habits and health.

Conflicts of interest: none

Keywords: healthy diet; school children; healthy lifestyle; health promotion

O16

Here I Live, Here I Eat, Here I Get Sick. Diet and Anemia in Children and Adolescents with a Prison-Raised Component, an Invisible Problem

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Introduction: The raising of infants deprived of liberty is a complex and invisible situation. Although nutritional health during early childhood and adolescence is crucial for growth and development, the feeding of infants and adolescents in penitentiary centers has not been adequate, being a risk factor for deficiency diseases such as anemia.

Objective: To evaluate the association of nutritional components with the prevalence of anemia among children and adolescents living in prisons in the State of Mexico.

Methods: Cross-sectional study in 43 participants in prison, 18 under three years old and 25 with an average age of 19 years. Twenty-four-hour recalls were applied for the analysis of food consumption. Intake of nutritional components was estimated using the Mexican Food Equivalent System and Nutrimind® software. Mean intakes per component were compared with respect to the Nutrient Intake Recommendations for Mexicans. Anemia was defined by capillary hemoglobin based on WHO criteria. Pearson's correlation coefficient was used to analyze the relationship between dietary iron and capillary hemoglobin. The association of iron intake with anemia was estimated by relative risk. Statistical significance in all analyses was considered when $p \leq 0.05$.

Results: Regarding diet, 60% of the children had excessive energy and lipid intake, 48% protein deficiency, and 30% iron deficiency. Mean iron intake was 6.0 ± 1.7 mg/d. Low iron and protein intake was associated with low capillary hemoglobin levels. The prevalence of anemia was 7%. Those who did not consume sufficient dietary iron had a 2.6-fold increased risk of anemia ($p \leq 0.05$).

Conclusions: Intake of energy and dietary nutritional components in children living in prison is inadequate. In this population, the prevalence of anemia is high. Inadequate diet is a risk factor for the prevalence of anemia in the child prison population.

Conflicts of interest: none

Keywords: diet; anemia; children; prison

O17

Relationship of Stress with the Nutritional Status of University Students in Querétaro, Mexico.

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Introduction: In recent years the increase in psychological illnesses (stress, anxiety, depression, etc.) has been increasing and this has directly affected people's general health, but since the contingency carried out in some countries, university students have been one of the groups with the highest prevalence in this phenomenon and this has been related to a decrease in their quality of life and health.

Objective: The objective of this study was to evaluate the prevalence of stress in Mexican university students and how it affects their nutritional status and overall health.

Methods: With prior informed consent, 467 young people of both sexes from the Autonomous University of Querétaro participated in this study in 2023. Anthropometric data (weight, height, waist, and hips), and body composition data were collected using bioimpedance and a fasting blood sample for the evaluation of metabolic risk markers (Gluc, Col, TG, HDL, LDL). In addition, a 14-item questionnaire was applied to determine the prevalence of perceived stress and thus be able to carry out the statistical analysis of the data to evaluate the relationship of this condition with the nutritional status and health of the participants.

Results: 58% of the participants were women. The prevalence of overweight and obesity was found to be 36%. According to the data from the Perceived Stress Questionnaire, it was found that all participants in some way perceived themselves to have stress. 4.07% reported low stress, 79.23% moderate stress, and 16.70% high stress. Perceived stress did not significantly affect women's nutritional status, body composition, and biochemical markers, but was indirectly associated with body fat in men and directly associated with triglycerides.

Conclusions: The perception of stress affects the nutritional status and health of young university students differently depending on their sex, mainly impacting body fat and serum fat variables.

Conflicts of Interest: none

Keywords: obesity; stress, nutritional status; metabolic risk markers

O18

Assessment of diet quality in pregnant women in Granada

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Introduction: Mediterranean Diet (MedDiet) has a beneficial impact during pregnancy, promoting maternal well-being and supporting the intellectual development of the baby.

Objective: To assess the diet quality through adherence to the MedDiet in pregnant women before and during pregnancy.

Methods: An observational study was conducted at the San Cecilio University Hospital in Granada using a questionnaire that had been previously evaluated by a panel of experts. This questionnaire assessed dietary habits and prenatal follow-up of pregnant women (IR 4/2019). The questionnaire consisted of 63 items divided into 6 sections, which included: sociodemographic data, nutritional education during midwife consultations, weight control during pregnancy, pregnancy follow-up during the COVID-19 pandemic, dietary habits before and during pregnancy using the Mediterranean Diet Adherence Screener (MEDAS-14) as a reference for a healthy diet, and nutrition knowledge. Data were processed using SPSS version 28.0.1.0 (142).

Results: Out of a total of 392 pregnant women surveyed, data from 378 participants with an average age of 33.4±5.0 years were included. The paired samples T-test showed a significant increase ($p=0.011$) in adherence to the MedDiet during pregnancy from 8.17±2.12 to 8.34±2.07. The foods that most contributed to this increase were fruits, vegetables, and nuts, as well as a decrease in red meat, soft drinks, and butter. When separating into groups of high (MEDAS ≥ 9) and low adherence (MEDAS < 9), it was observed that pregnant women in the high adherence group decreased their adherence during pregnancy ($p=0.011$), while those in the low adherence group increased their adherence during the same period ($p<0.001$). Furthermore, Pearson's correlation coefficient showed a negative association between pre-pregnancy body mass index and adherence to the MedDiet both habitually (-0.181, $p<0.001$) and during pregnancy (- 0.128, $p=0.13$).

Conclusions: Despite improvements, pregnant women in Granada show low adherence to the Mediterranean Diet. Enhancing nutritional education and emphasizing the dietitian-nutritionist's role could improve their diet quality and serve as a basis for future research.

Conflict of Interest: none

Keywords: diet quality; Mediterranean diet; pregnancy; MEDAS-14

O19

Relationship between Dietary Habits and Lifestyles with Body Mass Index in University Students of Nutrition and Dietetics

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Introduction: The transition from high school to university is a critical time to establish healthy lifestyles, including dietary habits and physical activity. Studies have identified that these factors could impact body mass index (BMI).

Objective: To analyze the relationship between dietary habits and lifestyles on the BMI of university students in Nutrition and Dietetics.

Methods: The data comes from a multicenter study with a representative sample of 251 students enrolled in the Nutrition and Dietetics degree program (2018) at a public university in Colombia. Weight, height, and waist circumference (WC) were obtained by trained personnel using the ISAK protocol, and WHO criteria were used to obtain BMI. A self-administered questionnaire was applied to the students with questions on lifestyle and a frequency of consumption was performed. A theoretical index was constructed from the frequencies of 34 food groups. Fisher tests and a post hoc analysis with Kendall-C Tau correlation were performed. Two classification trees were generated with BMI from the analyzed lifestyle variables to determine which variables influence BMI.

Results: Average age was 21.97 years (±2.84). Higher food expenditure ($p<0.129$), healthy eating index ($p<0.0005$), and the affiliated health system were associated with a normal BMI. Analysis by food groups evidenced an unhealthy pattern with frequent consumption of high-sodium sauces ($r=0.142$; $p<0.0050$), canned foods ($r=-0.111$, $p<0.0344$), sugars and sweets ($r=-0.0048$; $p<0.04948$), chocolates ($r=-0.082$; $p<0.0149$), *panela* ($r=0.072$; $p<0.0129$), soft drinks and sugary drinks ($r=-0.113$, $p<0.0030$), non-sugary soft drinks ($r=-0.160$; $p<0.0005$), alcohol ($r=-0.165$; $p<0.0040$) and energy drinks ($r=-0.180$; $p<0.0005$) were significantly associated with overweight, although with a weak correlation.

Conclusions: Dietary habits of nutrition students can be categorized as healthy, and that these do not lead to a higher BMI. Instead, it is other lifestyle variables or health inequities that may have a greater impact on BMI.

Conflict of Interest: none

Keywords: university students; body mass index; dietary habits

O20

Systematic Review of the Burden of Child Malnutrition in Colombia and its Economic Impact

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Introduction: The burden of child malnutrition in Colombia is a crucial public health issue linked to socioeconomic inequalities and productivity levels in the country. A general burden study was conducted in 2014, but recent specific data on child malnutrition is lacking. This research aims to examine the burden of child malnutrition, considering associated costs and loss of years due to disability or premature mortality.

Objective: To analyze the burden of disease attributable to child malnutrition in Colombia and its economic impact.

Methods: A systematic literature review was conducted to synthesize information on malnutrition burdens globally and in Colombia, focusing on non-hospitalized patients.

PECOT Question Characteristics: Population: Children under 5 years, exposure: acute and chronic malnutrition, control: eutrophic children with adequate growth, outcome: low birth weight, acute and chronic DNT, psychomotor developmental disorders, period: 2010-2023, type of study: systematic reviews, meta-analyses, and load Studies. The literature search was performed in EMBASE, PubMed (MEDLINE), PubMed Health, DARE Database, and Cochrane Library databases.

Results: Fifteen research articles were found, with three specifics to Colombia. No specific study evaluated the burden of child malnutrition in Colombia; however, a 2019 epidemiological analysis reported disability-adjusted life years (DALYs) due to malnutrition. Of the studies, 46.7% were published after 2020, 33.3% between 2016 and 2019, and 20% between 2010 and 2015, showing increasing interest in the topic.

Conclusions: Two studies in the review assessed the burden of child malnutrition in Colombia. In 2010, low birth weight was the primary cause (134 total DALYs in men and 144 in women), with protein-caloric malnutrition accounting for 4 DALYs in men and 5 in women per 1,000 children under 5. In 2022, DALYs ranged from 2,402 in 2016 to 8,668 in 2019. More research is needed for precise measurement, and more detailed information sources are necessary. SISPRO data might underestimate malnutrition cases due to underreporting.

Conflicts of Interest: Research funded by the Éxito Foundation; authors declare no conflicts of interest.

Keywords: protein-calorie malnutrition; malnutrition; growth retardation; burden of disease; child development

O21

Nutrition Status and Food Feeding Practices in Children of Indigenous Migrant Field Workers in Social Vulnerability

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Introduction: Since 2016 the University of Guanajuato through the nutrition bachelor program started to work with the Centro de Desarrollo Indígena Loyola (CDIL) to assess the nutrition status of the children at the Campamentos Na´Vali ("children's camp" in *Tu'un Savi* language). The parents, older brothers, and sisters of these children are Indigenous people who travel from the south of Mexico to work in the fields in Guanajuato (the center of Mexico) from April to July every year. The conditions they live in make them a highly vulnerable and poverty population.

Objective: To assess the nutrition status and food feeding practices in children of indigenous migrant field workers in social vulnerability.

Methods: Weight, height, arm, and head circumferences were measured in children from 0 to 6 years old in an improvised space beside the fields where the parents are working where the camp *Na´Vali* was installed and were evaluated following the WHO recommendations. A food questionnaire was applied to the mothers and observers verified food feeding practices during mealtime.

Results: In the last assessment, 136 children were evaluated. With z-score BMI/age 22.4% presented some degree of malnutrition but with z-score height/age 53.7% presented low stature and with z-score weight/height 25% presented some degree of malnutrition. Nevertheless, obesity risk was observed in 14% of them and 6.2% were already obese. This is the first time that obesity has been observed.

High intakes of processed food, soft drinks, and instant noodles were observed. Their diet is based on beans, tortillas, coffee, and on some special occasions chicken, which is poor in quality and quantity.

Conclusions: Malnutrition and poor feeding practices are observed in children of indigenous migrant field workers in social vulnerability. *Campamentos Na´Vali* gives good support to the children and families but is not enough. It is necessary to develop strategies that improve the nutritional status of children.

Conflicts of Interest: none

Keywords: childhood malnutrition; migrant; nutrition status

O22

Nutritional Actions in the *Na´Vali* Camps to Reduce Food Insecurity in Children from Families' Indigenous Migrants Field Workers in Guanajuato Mexico

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Introduction: In Guanajuato, the Loyola Indigenous Development Center established the *Na'Valí* camps ("children's camp", *Tu'un Savi* language), to provide education, health, and nutrition support to the children from families of Indigenous migrant field workers, a population with high marginalization. The University of Guanajuato Campus León through the bachelor's degree in nutrition supports the *Na'Valí* camps by developing research about different nutritional issues including food insecurity assessment, previously had been identified that 100% of the 42 surveyed families experienced some degree of food insecurity (FI), 19% mild, 57% moderate and 24% severe; after to know these outcomes, different actions should be established.

Objective: Design nutritional actions to reduce food insecurity in children who participate in the *Na'Valí* camps.

Methods: Using qualitative methods, we identified the feasibility of adding to the children's diet two higher nutritional quality products designed for the research group, those products would include an improved hot drink (atole) and wheat and chickpea pancake (*gordita*). For the drink, the ingredients that enrich the original recipe for the base drink were analyzed, chickpea, lentil, corn, sunflower, peanut, and flaxseed flour were tested; organoleptic tests were carried out to determine the best combination of ingredients; the drink was taken to camps to test its acceptability. About the pancake, chickpea flour, rapeseed oil, and butter were added to the traditional wheat recipe; it is important to clarify that the enriched drink was offered to substitute another traditional hot drink, and the wheat and chickpea pancake, is a substitute for a regular Mexican sweet bread, that used to be included in the breakfast offered.

Results: An enriched drink was obtained that provides more than double the protein, B complex vitamins, zinc, magnesium, iron, potassium, omega-3, and omega-6 fatty acids compared to the conventional drink; the pancake provides high-quality protein, and both were well received by the boys and girls at the camp.

Conclusions: The developed products are simple to prepare and low cost, with known and available ingredients, with adequate organoleptic characteristics, and with a better nutritional contribution.

Conflicts of Interest: none

Keywords: food insecurity; enriched drink; chickpea pancake

Safe, Healthy, Sustainable, and Social Food

O23

Extruded Snacks Made from Corn Starch/Melon Peel/Soy Protein Isolate Blends: Effect on Texture and Expansion

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Introduction: Extrusion has been used to produce a wide variety of food products such as snacks and these have become an important part of the eating habits of various countries worldwide. Snacks with higher nutritional content have been developed by incorporating plant sources such as legumes, vegetables, and fruits, as well as the use of agro-industrial waste rich in bioactive compounds and dietary fiber. Currently, the search for raw materials that present a greater benefit to consumer health, which is key to the design and development of new food products, has been increasing. Melon (*Cucumis melo* L.) belongs to the *Cucurbitaceae* family and is one of the most popular fruits grown in tropical countries.

Objective: Evaluate the effect of a corn starch/melon peel/soy protein isolate blend on texture and expansion in the production of an extruded snack.

Methods: A composite central experimental design was used with four variables: temperature (T) (120-170 °C), moisture content (MC) (16-25%), soy protein isolate/corn starch (SPI/CS) content (25-40%) and melon peel (MP) content (10-25%). The texture and expansion index of the obtained products were evaluated. The results were analyzed by multiple linear regression.

Results: Increasing MP decreased extrudate expansion. Increasing T decreased ($p<0.05$) texture and expansion. Increasing MC decreased ($p<0.05$) expansion. Increasing SPI/CS increased ($p<0.05$) texture. T-MC, T- SPI/CS, MC-SPI/CS, and SPI/CS-MP interactions decreased ($p<0.05$) extrudate texture, while MC-SPI/CS and MC-MP interactions increased ($p<0.05$) extrudate expansion.

Conclusions: The use of higher concentrations than 10% of melon peel decreases expansion and increases texture, however, more research is needed on the effect on the fiber and protein content of the extruded product obtained and consumer acceptance.

Conflicts of Interest: none

Keywords: *Cucumis melo* L.; corn; soy; byproducts; texture

O24

Preparation of Corn Chips with Watermelon (*Citrullus Lanatus*) Rind Flour Using Microwave Oven Baking

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Introduction: In the current context, where there is greater global awareness of environmental sustainability and food challenges, the revalorization of "agro-industrial waste" emerges as an innovative and environmentally friendly strategy. At the same time, concerns about trans fats and acrylamide formation affect public health. Processed foods are the main source of 80% of trans fats in the diet, driving the need for strategies to reduce them.

Objective: Develop and characterize corn chips added with watermelon rind flours using emerging technologies (microwave oven).

Methods: Commercial nixtamalized corn flour was used as a base for the manufacture of chips, combined with watermelon rind flour obtained according to the methodology of Rangel Guimarães et al. (2010). Four treatments were designed with varying proportions of corn flour and watermelon rind flour. They were subsequently baked in a microwave oven for 1 minute and 10 seconds at a power of 90. Proximal chemical determination and physical properties of the chips were analyzed according to AOAC (2012) methodologies, respectively. The results were subjected to statistical analysis using the multiple range test at a 95% confidence level.

Results: In general terms, it was possible to develop a low-fat snack with a high fiber content, standing out as a product that could offer significant benefits for the organism. A distinctive feature is its ability to be processed in a conventional microwave oven. In addition, a sensory analysis was carried out with an untrained panel, revealing a positive acceptance by the evaluators. This achievement highlights the viability and potential of this snack as a healthy and sustainable option.

Conclusions: This research not only seeks to propose a healthy and sustainable alternative to conventional snacks but also to address the dual issues of agro-industrial waste management and the need to reduce the presence of toxic compounds in our daily diet.

Conflict of Interest: none

Keywords: reduced fat snack; emerging technologies; microwaves

O25

Technofunctional Properties of Mixtures of Wheat Flour and Nightshade Leaf Powder

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Introduction: In recent years, research has increased on the development of new food products with better quality nutritional value on the market, using legumes. In this sense, nightshade is a herbaceous and edible plant, which presents nutrients such as protein, vitamins and minerals, flavonoids, and saponins, as well as high levels of β-carotene, vitamin E, and polyphenol. It also has several healing properties due to its diuretic and antipyretic effect; It is used as an antiseptic, cardiotonic expectorant, digestive diaphoretic, and sedative.

Objective: The techno-functional properties of mixtures of wheat flour and nightshade powder were evaluated for their possible use in the food industry.

Methods: The nightshade was purchased at the local market in San Juan Bautista Tuxtepec, Oaxaca, Mexico, washed and dried at 65 °C for 2 h. They were ground and sieved to 0.520 mm (No. 35 mesh). Wheat flour was purchased from the supplier. The proportions (%) of the mixtures of wheat flour (HT) and nightshade powder (PH) were: HT100, HT81/PH19, HT74/PH26, HT85/PH15, HT78/PH22, HT96/PH04, HT92/PH08, HT70/PH30. The water absorption capacity (CAA), oil absorption capacity (CAC), emulsifier (EC), and apparent density (AD) were evaluated according to the methodology described by Rodríguez-Miranda *et al.*

Results: The mixtures with nightshade flour were characterized by presenting a high CAA, CAC, and EC with respect to HT; these differences are due to their relationship with the presence of proteins, starch, and fiber. Referring to the fact that PH has a high protein content in its composition, which is why PH presents this behavior.

Conclusions: Mixtures of HT and PH can be used in compound flour formulations, in bakery and pastry products. As well as a main ingredient in the formulation of new products such as puddings, sauces, and pasta.

Conflicts of Interest: none

Keywords: *Solanum nigrescens;* wheat semolina; mixture; functional foods

O26

Influence of Food Assistance on the Dietary Pattern of Two Communities in the Sierra Tarahumara, Chihuahua, Mexico

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Introduction: Today we are well aware that food and eating are used socially to send messages about status, gender, and belonging to a group (Mintz, S. 2003:59). In the same way, the use and application of power are often involved in changing a societies' food consumption habits (Mintz, S. 2003:39). The nutritional food process of the native peoples of northern Mexico, in this case the Rarámuri people, has suffered the application of power influencing their eating habits; chronicles of the year 1813 show the scrutiny and intervention that the Catholic Church promoted and promotes in relation to the food it offers and qualifies as better than what the people obtain from their immediate environment.

Objective: To know which foods, persist in the dietary pattern and which have been added to the preferences of people in two communities of the high Tarahumara.

Methods: Through 24-hour recalls, food frequency questionnaires, and interviews with key actors from different age groups, we characterize the dietary pattern and the origin of foods that have been incorporated into daily consumption.

Results: We found that one community has more frequent contact with civil society organizations, the church, and government institutions, and has access to more industrialized foods; the other community consumes more foods from its environment and native corn; however, the amount of calories consumed and the distribution of macronutrients is very similar in both communities.

Conclusions: The consumption of foods that institutions and associations bring to the communities only confer status and become mechanisms of power over the community and do not represent a substantial improvement in caloric intake and nutritional quality for the population.

Conflicts of Interest: none

Keywords: food pattern; status; Indigenous peoples; food aid

O27

Knowledge, Attitudes, and Practices on Allergen Management, Specifically Gluten, in Food Services in the Hospital Setting

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Introduction: The increasing global prevalence of gluten-related disorders and food allergies presents a critical challenge for hospital food services due to their impact on public health. Understanding the knowledge, attitudes, and practices of the personnel involved in food preparation is key to managing allergens.

Objective: To understand the necessary conditions and implications for hospital food services to provide gluten-free food that ensures safety and consumption for patients with gluten-related disorders.

Methods: The methodology adopted for this research integrated a qualitative approach and the hermeneutic paradigm; through the combination of case studies and ethnographic techniques, a holistic understanding of the dynamics and interactions between food service personnel and food processes in allergen management, specifically gluten, was achieved. The hazard analysis matrix described the probability of gluten cross-contact.

Results: Limited knowledge of hospital food service personnel on allergen handling and insufficient management of these, particularly gluten, was observed, which could compromise food safety. However, participant testimonies showed a favorable attitude toward learning and improving allergen management. The review of Good Manufacturing Practices and the HACCP system revealed practices that promote allergen cross-contact.

Conclusions: A favorable attitude towards learning and improvement among personnel seems insufficient for effective allergen management in food services. According to the findings, the organization needs to define pertinent processes that provide its collaborators with the necessary knowledge, ensuring they adopt and apply it in their work routines. The need to adopt evidence-based practices and guidelines is emphasized.

Conflicts of Interest: none

Keywords: knowledge; attitudes, and practices; allergen management; food safety; gluten; hospital food service

O28

Mitigating Nutrition Insecurity in the Face of Global Warming: Insights for Potential Strategies

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Introduction: Global warming and extreme meteorological events have a direct impact on people's health and the achievements of the Sustainable Development Goals (SDGs). The SDGs aim to address a range of social needs, including ending all forms of malnutrition in populations experiencing low-income. It is crucial to understand these populations´ health values and consumption habits, so nutrition interventions can be successful.

Objective: This study investigated the food consumption profile and health concerns of populations experiencing low-income in Brazil to suggest insights for sustainable solutions.

Methods: A multicentric field study was conducted using combined quantitative and qualitative techniques, where trained interviewers applied structured questionnaires to perform a systematic collection of data about behavior, perception, attitudes, consumption habits and health concerns. The study engaged a total of 452 people equally distributed in 3 state capitals of Brazil: São Paulo

(33%), Fortaleza (33%) and Salvador (34%). As inclusion criteria, only women and women with kids participated.

Results: The most prevalent items that made up the composition of meals were rice (93%), bread (86%), chicken/beef/fish (89%), beans (82%), fruits (79%), pasta (75%), legumes (75%), milk (73%), butter (68%), juice (62%), cookies (58%), couscous (58%) and yogurt (52%). Common health concerns were tiredness (25%), overweight (24%), headache (23%), vision impairment (21%), hypertension (19%) and diabetes (15%). From a socioeconomic perspective, 76% of the women were 25 years-old or older, only 6% had no children, and 69% mentioned that the main source of income depended on their partners' contribution.

Conclusions: The participants declared that rice was the most prevalent item in their meals, indicating a potential risk in case of rising sea level and consequent low rice production and price increase. It can represent an opportunity, as rice could be an excellent vehicle for enrichment with vitamins and minerals to enhance the nutritional density of meals and address some of the women´s main health concerns. Both scenarios need to be evaluated aiming to take strategic actions to secure food and nutritional security, and the achievement of the SDGs in the country.

Conflicts of Interest: supported by dsm-firmenich
Keywords: global warming; nutrition intervention

O29

Determination of the Antioxidant Activity of the Edible Mushroom *Agaricus bisporus* (j.e. Lange) Imbach; Cultivated in the Andean Zone of the Cusco Region

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Introduction: Oxidative stress generated by free radicals is a predisposing factor for the development of different chronic and infectious diseases and the acceleration of aging. The consumption of antioxidants is essential to achieve a balance between the production of free radicals and their neutralization. Edible mushrooms have a high nutritional and nutraceutical value.

Objective: To determine the content of antioxidant substances and the antioxidant activity of the edible mushroom *Agaricus bisporus* cultivated in the Andean zone of Anta, Cusco Region.

Methods: Samples of the species *Agaricus bisporus* (J.E. Lange) Imbach. cultivated in the Andean Region of Cusco, Conchacalla community, province of Anta (altitude of 3345 m.a.s.l.) were collected and freeze-dried. Proximal analysis was performed by AOAC methods. To determine the antioxidant activity, methanol extraction of the dry sample was performed and determined by the DPPH method, working with concentrations of 2; 3.25, and 6.25 mg/mL of sample, and then the IC50% that inhibits the DPPH radical was determined. The content of polyphenols and flavonoids was determined by the spectrophotometric method.

Results: In the proximate analysis, a high content of protein (26.6%), fat (1.6%), and fiber (10.7%) was determined. The flavonoid content was 182.15 mg of quercetin/100 g.m.s and the total polyphenol content was 663.4 mg of gallic acid equivalents/ 100 g.m.s. The antioxidant activity by the DPPH method showed an IC of 50% of the free radical of 6.25 mg/ mL.

Conclusions: The edible mushroom of *Agaricus bisporus* cultivated in the Andean zone of Cusco, has high protein content, low-fat content, and high fiber content. Its content of polyphenols and flavonoids contributes to its high antioxidant capacity.

Conflicts of Interest: none
Keywords: antioxidant; DPPH; Agaricus; cultivated

O30

Andean Regional Foods as Ingredients in the Formulation of a Prototype Ready-to-Use Therapeutic Food (RUTF)

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Introduction: In the principle of sustainability, regional raw materials are considered of greater relevance in the local food industry. RUTF foods, Ready-to-use-therapeutic-foods, constitute an alternative to overcome nutritional gaps.

Objective: Investigate the use of flours obtained from plant materials from the Andean region and its potential for the formulation of a RUTF Food prototype with reference to the 12 requirements of the Codex Guide CXG 95 2022-2023.

Methods: Flours obtained from green banana (*Musa paradisiaca L.*), Oyster mushroom (*Pleurotus ostreatus sp.*), pineapple bark (*Ananas comosus*), chickpea (*Cicer arietinum*), and white quinoa (*Chenopodium quinoa*) were used as primary ingredients, in mixture with other food grade additives, without addition of fortifiers.

From previous studies, a formulation and process for this type of food were selected, characterized with methods recognized by food and nutritional regulation entities: quantification of minerals and aminoacids, bromatological analysis, physicochemical properties of pH, aW and humidity, estimation of osmolarity with mathematical basis and modified *in vitro* study of Digestibility Corrected by Amino Acid Score –PDCAAs from the FAO Expert Report -Food and Agriculture Organization of the United Nations, 2017.

Results: The findings show a non-fortified RUTF prototype, with high potential, meeting the parameters, calories of 528.24±7.2 kcal/100g, energy density of 5.28±0.7 kcal/g, lipids of 52± 2.2 g/100kcal, aW of 0.3±0.01, humidity of 1.5±0.2%. The PDCAAs were found to be 71±9% with sulfur aminoacids as the limit, compared to the required 90%, lysine, tryptophan, and threonine contents, in mg/g of protein, were found to be 77.59±3.7, 8,

20±0.65 and 40.98±4.2, respectively, showing higher digestibility in these aminoacids. The estimated osmolarity was 799.59±18.5 mOsm/L, hypertonic, in contrast to an isotonic mixture of less than 370 mOsm/L, which is recommended.

Conclusions: The study shows a prototype with a horizon, even so, it is evident that it is necessary to continue its study and development stage, making adjustments with fortifiers, in accordance with the Codex and FAO regulations of reference for this type of product, which have a relevant purpose in Child malnutrition, a global scourge.

Conflict of interest: none

Keywords: flours; fortifying additives; RUTF; PDCAAs; osmolarity

O31

Neglected and Underutilized Plant Species (NUS) to Improve Diets in the Yucatan Peninsula, Mexico: Barriers and Facilitators for Behavior Change in the Supply and Demand Sides

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Introduction: Neglected and underutilized plant species (NUS) are widely recognized for their potential to reduce hunger, promote healthier diets, and contribute to food security while offering agricultural diversity, resilience, and sustainable food systems. Inclusion of NUS in agriculture and diets is a challenge that requires changing behaviors from actors in the food system. Social and behavior change communication (SBCC) can be an effective approach to promoting the wider consumption of NUS.

Objectives: To identify the barriers and facilitators for behavior change, of both agricultural producers and customers of 5 short food supply chain (SFSC) initiatives, related to increasing the production and consumption of NUS in the Yucatan Peninsula, Mexico.

Methods: We based our study on the capability, opportunity, and motivation for behavior change (COM-B) model. We conducted semi-structured interviews, site visits, and an online survey, including both agricultural producers and customers of five SFSC initiatives in Yucatan, Mexico. For agricultural producers, we focused on 2 behaviors: producing and commercializing NUS. For consumers, we focused on 2 behaviors: buying NUS and cooking them at home.

Results: Barriers to behavior change for agricultural producers and consumers include psychological capabilities (knowledge and skills), social influences, and motivation. Producers face additional challenges related to physical capability and opportunity. SFSC initiatives can help by improving access to neglected and underutilized species (NUS), enhancing social opportunity, and motivating behavior change through social influences and information sharing.

Conclusions: Increasing NUS consumption requires communication and social change strategies that consider the barriers and facilitators for behavior change on the supply and demand sides.

Conflict of interests: none

Keywords: food systems; neglected and underutilized plant species; social and behavior change communication; Yucatan Peninsula; Mexico

O32

Nutritional Interventions within the Community: Innovative, Transcendent and Binding. The Challenge of Practical Nutrition.

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Introduction: The community has been considered a learning space for future Nutrition professionals. The groups assisted in the localities are mostly vulnerable to malnutrition; therefore, respecting their ideology and customs, two programs were designed to address a nutritional issue in the Municipality of *Banderilla*, focused on both adults and senior citizens. Both programs were innovative, transcendent, and binding.

Objective: To promote within the students the design, implementation, and evaluation of a community program with innovation and transcendence based on the cultural identity of the community, looking to encourage the population to ingest healthy meals.

Methods: Two programs were designed focused on adults and senior citizens, which were crafted in the classroom, and subsequently, they were applied and evaluated in the locality. The adults' program was held in the '*La Haciendita*' locality. This program was designed to train adults on the elaboration of healthy products such as yogurt, salads, and soy ceviche, looking as well to improve their financial situation. The other program was held in *Banderilla*, and it was focused on senior citizens, using buttermilk as a substratum to elaborate products low in carbohydrates, rich in fiber, and with a suitable texture to meet senior citizens' needs.

Results: One hundred adults were trained, and the programs were widely accepted by the community. The program regarding healthy meals training was subsequently replicated by one of the attendees, who was a health aide, and who, afterward, was able to incorporate yogurt into her daily sales. Both programs were evaluated through satisfaction surveys which consisted of 'faces' in the responses because, due to their situation, most of the adults and senior citizens were not able to write or read. Satisfactory percentages were obtained in the implementation of these programs.

Conclusions: The interaction with the community by designing a program based on their identity and needs enabled students to engage in researching suitable, viable, and nutritive alternatives. These alternatives were also envisioned as financial support through collaboration with authorities to ensure their transcendence.

Conflict of Interest: none

Keywords: program; transcendent; community; binding

Methods and Tools in Nutrition

O33

Nutrimetry is a useful clinical and epidemiological tool to complete anthropometric studies and intervene to prevent malnutrition in the life cycle

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Introduction: The weight and height survey carried out in children under 6 years of age in the municipality of *Calkiní*, Campeche (1992) carried out by Community Nutrition of the National Institute of Nutrition Dr. Salvador Zubirán was selected.

Objective: Present Nutrimetry as a useful tool to complete clinical, epidemiological, and anthropometric studies.

Methods: 1,629 children under 6 years of age from 17 locations in the municipality of *Calkiní*, Campeche included in the anthropometric survey of weight and height were reviewed, the variables Height/age and Weight/Height/age were analyzed in Z score units, the model was applied Nutrimetry mathematician and the 9 nutritional risk groups were constructed for each location. The prevalence of the risk groups analyzed was compared with non-parametric Mantel-Haenszel Chi Square X2 tests.

Results: The prevalence for risk group 6 (normal height/normal weight) was the highest for *Isla Arena* at 45.83% and the lowest for *Santa María* at 8%, showing statistically significant differences with all other locations in the municipality. Concerning risk groups 1,4,7 (Short height/Low weight, normal, high) the lowest prevalence was for *Isla Arena* at 20.83%, and the highest for Santa Cruz town with 67.22% showing statistically significant differences in a favorable direction for the town of *Isla Arena*. In risk groups 5,8,11 (High height/Low, normal, and high weight) *Isla Arena* stands out with 6.25%, in several locations we find 0%.

Conclusions: The town of *Isla Arena* stands out for showing a more balanced distribution in the nutritional status of its children, with the lowest prevalence of stunting and the highest prevalence of normal height and weight, and an acceptable proportion of tall stature. Fresh fish is bioavailable for this locality, this leads us to propose interventions with recipes that favor the consumption of fish oil, promoting 9 to 11 hours of sleep and improving the linear development of children, preventing malnutrition.

Conflicts of interest: none

Keywords: nutrimetry; nutritional risk groups; fish oil; hours of sleep; linear development; anthropometric studies

O34

Dietary Intake Assessment Using 24-Hour Dietary Recalls (R24h) Assisted by Digital Photographs: The Importance of the Conversion Database to Increase the Accuracy

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Introduction: Dietary intake assessments are susceptible to bias in nutrient estimation. One approach to mitigate this is by assisting the R24h with photographs of the ingested food. While this technological update shortens the time of R24h, data accuracy remains dependent on the database to convert foods into measurement units and nutrient values. In regions like Colombia, where local foods may not be included in these databases, the quality of the dietary assessment can be compromised.

Objective: Determine the accuracy of the photograph-assisted R24h either with an international database and tool with predefined portion sizes (ASA24®), or an expanded database enriched with local foods and measurement units (DbF).

Methods: Twenty participants photographed and weighed their food for two days. A certified dietitian received the photographs and applied the multiple-pass method to estimate portion sizes and weights. Data were analyzed using ASA24® and DbF. Food weights served to estimate accuracy. Misreporting of energy intake followed Huang et al. (2005). Spearman correlations and Bland-Altman graphs served to analyze the correlations and concordance. This study was registered on ClinicalTrials.gov (NCT05610137)

Results: ASA24® and DbF underestimated 15% of the energy intake. DbF showed correlations >0.90 with the actual food weights for calories, protein, carbohydrates, fat, sugar, and fiber. Energy intake with DbF showed better concordance with the actual food weight than ASA24® (-364 to 256 vs. -771 to 909 kcal, respectively). Carbohydrates were the nutrient with the greatest estimation error in both methodologies (ASA24®: - 102 to 127 g; DbF: -50 to 33 g). DbF had an estimation error in the intake of protein, fat, sugar, and fiber around 20 g, while ASA24® was twice for these nutrients.

Conclusions: The use of a conversion database enriched with local foods increased the accuracy of R24h energy and nutrient intake in the adult Colombian population compared with an international tool (ASA24®). Combining DbF with photograph-assisted R24h significantly improves the dietary assessment and may help harmonize intake analysis in Latin American countries.

Conflicts of Interest: vidarium is a research center funded by companies of Grupo Empresarial Nutresa.

Keywords: Dietary recalls; food intake; nutrient estimation.

O35

Assessing Body Composition in Adults with Excess Weight: a Comparison of Multi-segment Bioelectrical Impedance Analysis and Dual-Energy X-ray Absorptiometry

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Introduction: While Dual-energy X-ray absorptiometry (DEXA) provides accurate body composition measurements, limitations in availability and cost may restrict its use. Multi-segment bioelectrical impedance analysis (BIA) offers a practical and cost-effective alternative. Both estimate visceral fat.

Objective: To determine the concordance between DEXA and BIA estimates of body composition and evaluate the accuracy of simpler indicators of fat body like relative fat mass, and of the visceral fat such as waist circumference, and metabolic score for visceral fat (METS-VF), in an overweight population.

Methods: Forty volunteers aged 20-50 years with a BMI ≥27 and <35 kg/m^2 underwent body composition assessments using DEXA and BIA. Lean and fat indices served to calculate the correlation and concordance between the two methodologies. In addition, relative fat mass, waist circumference, METS-VF, and visceral fat mass (VFM) were calculated. This clinical trial was registered on the International Clinical Trials Registry Platform, WHO primary registry (RPCEC00000406).

Results: BIA showed a strong correlation with DEXA in the evaluation of body fat mass (correlation coefficient, **ρ**=0.95; high concordance: -3.93 to 6.70 kg), and lean and fat indices (**ρ**=0.95). However, BIA's accuracy for visceral fat (VAT) was limited (**ρ**=0.28). Relative fat mass showed moderate correlations with both BIA and DEXA fat mass (**ρ**=0.75). Interestingly, METS-VF displayed a moderate correlation with DEXA-VAT (**ρ**=0.72); waist circumference was correlated with VAT by DEXA and METS-VF (**ρ**=0.62 and 0.85, respectively). VFM showed a good correlation with DEXA-VAT values (**ρ**=0.72).

Conclusion: BIA demonstrates strong agreement with DEXA in assessing body composition for overweight individuals, making both valuable tools in clinical practice. However, BIA offers a more readily available alternative for estimating body fat percentage when DEXA is inaccessible. While BIA may be less accurate for VAT assessment, simpler measures like waist circumference and metabolic score for visceral fat (METS-VF) can provide moderately accurate estimates of VAT when DEXA is unavailable.

Conflicts of interests: Vidarium is a research center funded by companies of Grupo Empresarial Nutresa

Keywords: DEXA; bioelectric impedance; intra-abdominal fat; body composition, overweight.

O36

Breastfeeding Knowledge and Skills of Health Professionals Involved in Maternal and Childcare in the City of Ambato. Ecuador, 2023

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Introduction: Breastfeeding is one of the most effective ways to ensure the health and survival of children. The World Health Organization recommends early initiation of breastfeeding, exclusive breastfeeding until 6 months of age, and continued breastfeeding until at least two years of age. One of the barriers to increasing the rate of exclusive breastfeeding in Ecuador is the lack of knowledge and breastfeeding counseling skills of health professionals who are in continuous contact with the mother and child.

Objective: To evaluate the knowledge and skills in breastfeeding counseling of health professionals involved in maternal and childcare in the city of Ambato.

Methods: Cross-sectional study. A non-probabilistic sampling was carried out, 78 professionals who provide maternal and childcare in public and private hospitals (resident physicians, nurses, gynecologists, dietitians, pediatricians) were included. An online questionnaire was used, which included demographic data of the participants and the Breastfeeding Knowledge Survey (ECoLa), a validated tool to assess breastfeeding knowledge and skills, giving a maximum score of 25 points. Means and standard deviations were obtained according to the characteristics of the participants, and the level of knowledge was classified into 3 categories (Good, Fair, and Poor). Chi-square was applied for comparison between groups.

Results: Of the total number of participants, only 5.1% achieved a good score, 38.5% obtained a fair score and 56.4% a poor score. Significant differences were found in the level of knowledge according to sex, years of experience, and profession, with nutritionists obtaining the highest score, and gynecologists obtaining the lowest score. Of the total number of participants, only 33% had specific training in breastfeeding.

Conclusions: Health professionals lack the breastfeeding knowledge and skills to adequately provide breastfeeding counseling, which is an obstacle to the implementation of programs aimed at breastfeeding promotion. Efficient training programs are needed, and the inclusion of breastfeeding specialists in the health team is crucial to ensure timely and evidence-based breastfeeding counseling.

Conflict of Interest: none

Keywords: breastfeeding knowledge; breastfeeding education; healthcare professionals

O37

Capacity of the Malnutrition Screening Tool to Identify Malnutrition in Chronic Patients with Home Care

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Introduction: The Malnutrition Screening Tool (MST) is a simple and quick tool used to identify malnutrition risk in various healthcare settings, including home hospitalization.

Objective: To evaluate the diagnostic accuracy of the MST in detecting malnutrition among patients receiving home care.

Methods: A diagnostic test study was conducted, collecting sociodemographic data, MST results, and malnutrition diagnosis based on GLIM criteria. A positive MST score was defined as 2 or above. Data were summarized using proportions for categorical variables and measures of central tendency for quantitative variables. Sensitivity, specificity, area under the receiver operating characteristic curve, positive likelihood ratio (LR+), and negative likelihood ratio (LR-) were estimated along with their respective 95% confidence intervals.

Results: Among 676 patients, with a median age of 82 years (interquartile range: 68-89 years) and predominantly female (57.3%), 59.8% met the criteria for malnutrition according to GLIM. MST classified patients into low risk (62.4%), medium risk (30.8%), and high risk (6.8%). The sensitivity of MST was 11.4% (95% CI: 8.5-14.9%), specificity was 100% (95% CI: 98.7-100%), LR+ was 1.75, and LR- was 0.0. The area under the curve was 0.71 (95% CI: 0.69-0.73).

Conclusions: While the MST demonstrates high specificity, its low sensitivity limits its effectiveness in identifying malnourished patients in the context of home care.

Conflicts of Interest: the authors state that the Centro Latinoamericano de Nutrición (CELAN) has received payments from Boydorr SAS and Alpina Productos Alimenticios SA for consultancy, preparation of technical documents, and conferences. Additionally, Patricia Savino acts as a scientific advisor to Boydorr SAS. However, the authors indicate that they do not present any type of conflict with the content of this article.

Keywords: Colombia; diagnosis; protein-energy malnutrition; nutrition assessment; sensitivity; specificity

O38

Association of SNPs of Carbohydrate Metabolism Genes with Insulin Resistance Indicators in the Mexican Population

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Introduction: The efficiency of carbohydrate metabolism significantly influences insulin resistance, determined by the HOMA-IR index. This condition arises when the cellular responsiveness to insulin is not adequate, therefore impairing glucose metabolism, consequently leading to hyperglycemia and hyperinsulinemia, both antecedents for insulin resistance and diabetes.

Objective: The objective of this study was to identify significant polymorphisms present in the Mexican population that would represent risk or protective factors against insulin resistance.

Methods: A genome-wide association analysis was conducted on 430 carbohydrate-metabolism- related polymorphisms. This evaluation compared the genotypical variations of each selected polymorphism against waist circumference, body fat, body mass index, glucose and insulin levels, and HOMA-IR index obtained from 450 young Mexican individuals. Also, the average values of each of the clinical variants were calculated and analyzed for the general population, men, and women, through an unpaired two-sample t-test to determine statistical significance between the male and female subpopulations. Finally, the prevalences of suffering from increased values of all clinical markers were compared in men, women, and the complete sample.

Results: The risk prevalence of developing cardiovascular disease was positioned at 34.51%, while overweight and obesity stood at 34.95%; however, the insulin resistance prevalence resulted in 13.85% of the sample. The homozygous recessive genotype (TT) of rs6037255 emerged as the polymorphism with the highest risk factor for hyperglycemia. On the contrary, rs847693 was identified to be the best protection marker to maintain low body fat levels when expressing the genotype AA. It was also confirmed that SNP rs1799884, associated with the *GCK* gene, is a risk factor that causes blood glucose levels to increase. Finally, rs13129697 exhibited a Bonferroni-significant association with an elevated risk of developing insulin resistance.

Conclusions: This study represents, for the first time, an extensive association between Mexican polymorphism and insulin resistance, which highlights the genetic predisposition of this population to suffer from carbohydrate-related metabolic alterations.

Conflicts of interest: none

Key words: carbohydrates; metabolism; single nucleotide polymorphisms; insulin resistance; HOMA-IR

O39

Dietary Diversity in Women of Childbearing Age: Development and Validation of a Paper and Digital Form and a Software for Its Analysis

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Introduction: Currently, the academic environment and those responsible for developing public health policies are demanding new methods of evaluating dietary intake that are fast, less expensive, and with digital collection to reduce the use of paper and optimize the analyses.

Objective: To develop a dietary diversity software that identifies the prevalence of the risk of deficiency in the intake of eleven micronutrients.

Methods: The Dietary Diversity (DD) paper form was designed and validated with the 24-hour recall (24HR) as the reference method. The validation was performed on 186 women of childbearing age, who worked for the *Buen Comienzo* (Good Start) program of the city of Medellín, Colombia, in 2019. A dietary diversity software was developed for the collection of the DD digitally and for obtaining reports. A descriptive analysis, and comparisons between prevalence, concordance, and reproducibility analysis were performed. Software Dietary Intake Evaluation (EVINDI) v5, Personal Computer Software for Intake Distribution Estimation (PC-SIDE) v1, dietary diversity software, Stata 16 and Jamovi 1.6.23 were used.

Results: When comparing the methods (R24H-DD) there were no statistically significant differences in the prevalence of risk of deficiency in the intake of calcium, iron, zinc, vitamins A, B1, B2, B3, B6, B9, B12, and C, so the DD was useful at the population level. At the individual level, a good ability to detect deficiency was only observed in vitamin A (100.0 %), calcium (98.7 %), iron (92.8 %), vitamin B9 (91.6 %), and B6 (81.8 %).

Conclusions: The dietary diversity software, for its digital collection and analysis, is useful and faster at evaluating population-level data at risk of deficiency in the intake of calcium, iron, zinc, vitamins A, B1, B2, B3, B6, B9, B12, and C. Based on individual-level data, it has a good ability to detect deficiencies in the intake of calcium, iron, vitamins A, B9 and B6.

Conflict of Interest: none

Keywords: dietary diversity; software; validation; 24-hour recall; women

O40

MNA-SG: A Version that Completes the Nutritional Assessment with the Clinical Risk of Geriatric Syndromes

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Introduction: The Mini Nutritional Assessment (MNA) is probably the most widely used nutritional assessment instrument for the elderly. Its relationship with geriatric syndromes (GS) has not been studied, nor has special importance been given to dietary components.

Objective: To propose an MNA model that associates the risk of developing GS with the modification of 4 variables of the MNA and to compare it with the latest version of the same.

Methods: Description of the modification of 4 variables, 1 screening variable: variable F (BMI), including obesity, and 3 assessment variables and proposal for their modification, linking them to knowledge of GS and chronic diseases of high prevalence. Variable H: do you take more than 5 drugs a day? Variable K: select protein foods of high nutritional value: do you consume 2 or more servings of dairy products per day?; do you consume legumes 3 or more times a week?; do you consume eggs 3 or more times a week?; do you consume fish 3 times a week?; and, do you consume white meat instead of red meat or meat derivatives? Variable L: do you consume at least 5 portions of vegetables and fruit per day? Descriptive and correlation analyses were performed (R-Commander software).

Results: Ninety-nine subjects were evaluated, a median of 87 years (74% female). The main strong correlations were found between total MNA and MNA-SF, rho=0.88; screening MNA-SG and MNA-total, rho=0.86; total MNA and MNA-SG, rho=0.90. Moderate correlations were observed between Barthel index with MNA-total and MNA-SG, 0.67 and 0.64, respectively. All correlations were statistically significant ($p<0.005$).

Conclusions: A novelty is the approach to 14 GS that are related: malnutrition, frailty, dysphagia, anorexia, sarcopenia, immobility, constipation, pain, depression, dementia, functional impairment, polypharmacy, pressure ulcers, and dehydration. This version does not involve modification in the total score and has an added advantage, such as a good correlation with the original version.

Conflict of interests: none

Keywords: nutritional assessment; geriatric syndromes; nursing homes

O41

Correlation of Handgrip Strength with Body Composition in School Children

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Introduction: The determination of manual handgrip strength (HGS) by means of dynamometry is a non-invasive, portable, and low-cost clinical method that has been used as a marker of nutritional status that correlates inversely with protein loss and can identify early changes of nutritional deprivation associated with body composition variables.

Objective: To evaluate the correlation between handgrip strength and body composition variables in children aged 9 to 12 years.

Methods: A cross-sectional descriptive study was carried out on 219 healthy schoolchildren between 9 and 12 years of age of both sexes. The measurement of manual grip strength was performed by means of a Camry digital dynamometer with a precision of 100 g. To measure height A SECA 214 portable stadiometer and an Inbody model 120 electrical bioimpedance scale were used to obtain body composition data. For data analysis, SPSS Statistics 21 was used to obtain the correlation of the anthropometric variables together with Spearman's test.

Results: A total of 111 boys and 108 girls were evaluated, with a mean HGS of 14.89±4.83 kg and a mean of 7.37±0.99 kg/m2 fat-free mass index (FFMI). Correlating the variables showed a moderate positive relationship (rho= 0.520) between FFMI and HGS in the total sample, although when analyzed by sex, it was evident that girls had a greater relationship (rho= 0.613) between HGS and FFMI than boys (rho= 0.408). The correlation of body mass index (BMI) z-score with HGS showed a low positive relationship (rho= 0.331) in the total sample, although when separating the analysis by sex, girls showed a higher correlation (rho= 0.424) than boys (rho=0.226).

Conclusions: The FFMI correlates positively with HGS in schoolchildren between 9 and 12 years of age, with a greater effect observed in girls than in boys. The determination of HGS by dynamometry is a useful tool that should be considered as part of the comprehensive nutritional assessment in this age group, although more studies are needed to elucidate in greater detail its relationship with body composition.

Conflicts of Interest: none

Keywords: dynamometry; electrical bioimpedance; handgrip strength; fat-free mass index

Poster Communications

Healthy Nutrition in the Life Cycle and Clinical Nutrition

P1.01

Effect of Green Tea Kombucha Consumption on Oxidative Stress and Endothelial Health in Individuals with Excess Weight: A Randomized Clinical Trial

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Introduction: *In vitro* and experimental animal studies indicate that green tea kombucha has high antioxidant potential. However, to date, no clinical study has evaluated its effect on oxidative stress and endothelial health.

Objective: The present study was designed and aimed to evaluate the effect of consuming green tea kombucha (200 mL/day) on antioxidant markers (GPx, GR, SOD, and FRAP), pro-oxidants (ox-LDL, NO, H2O2, and MDA) and of endothelial health (ICAM, VCAM, and CD36) in individuals with excess weight.

Methods: This is a randomized clinical trial, with two parallel experimental groups that followed a healthy diet with calorie restriction (-500kcal/day), without the consumption of fermented foods and beverages (control group), or associated with daily consumption of green tea kombucha (group kombucha), for ten weeks. At the beginning and end of the study, participants came to the laboratory for blood collection. Statistical analyses were performed using SPSS software (version 25.0), considering a significance level of 5%.

Results: In total, 59 individuals completed the study, 29 from the control group and 30 from the kombucha group. At the beginning of the study, anthropometric variables and inflammatory profile did not differ between the groups ($p>0.05$). During the study, the groups also showed similarity ($p>0.05$) in the consumption of macronutrients and micronutrients with antioxidant potential, as well as in relation to the level of physical activity practiced. At the end of the study, the kombucha group reduced the H2O2 marker significantly more than the control group (-3.44 *vs.* -1.42 µmol/mL, $p=0.006$). The other markers evaluated did not differ between the groups.

Conclusion: Daily consumption of 200 mL of green tea kombucha for ten weeks promoted the reduction of the pro-oxidant marker hydrogen peroxide. The other markers of oxidative stress and endothelial health were not affected by the consumption of the beverage.

Conflict of interest: none

Keywords: fermented beverages; hydrogen peroxide; atherosclerosis

P1.02

Guidelines to Improve the Nutritional Approach for Adolescents, Importance of Assessment, Monitoring and Follow-Up

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Introduction: This work reflects a critical analysis of infant and adolescent nutrition, approaching the adolescent population in a timely manner and accompanying them with adequate nutrition that favors growth and development, avoiding nutritional deficiencies that interfere with the life cycle processes.

Objective: To identify adolescents' dietary habits and nutritional status (aged 12 to 19 years) seen in a private nutrition clinic.

To identify the dietary habits and nutritional status of adolescents (aged 12 to 19 years) seen in a private nutrition clinic in the city of Durazno, Uruguay, and to generate a proposal to help improve the nutritional approach and intervention in this population.

Methods: The methodology used in this study is based on a quantitative approach. A form of questions and anthropometric evaluation during consultation with the pediatrician was designed and validated. Inclusion criteria were adolescents (12 to 19 years), BMI 15-85p and exclusion criteria were adolescents with metabolic diseases, excess and/or deficit malnutrition.

Results: The sample consisted of 50 adolescents between 12 and 19 years of age, who attended a nutritional consultation referred by a pediatrician, an adolescent physician, and a general practitioner to evaluate their diet. They were invited to participate in the study and agreed to do so voluntarily. Of the adolescents who participated, those who consumed more fruits and vegetables showed a higher consumption of fruits and vegetables and a higher frequency among females than among males. Adolescents who attended the consultation with their representatives showed healthy eating habits in relation to those who attended alone. Males were the ones who presented a higher consumption of fast food.

Conclusions: During adolescence, there is intense growth and development in a short period, which influences adolescent nutrition and often leads to changes in attitude and social behavior that directly influence eating habits. Nutrition professionals are the best reference to play a key role in educating adolescents, addressing myths and beliefs and providing information on specific nutrient sources, and monitoring normal parameters of critical nutrients that are fundamental to ensure proper adolescent growth and development.

Conflict of Interest: none

Keywords: critical nutrients; adolescence; food and nutrition; growth and development; nutritionist

P1.03

Incidence of Diet Quality and Nutritional Status in Hearing Loss in the Chilean Population

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Introduction: Age-related hearing loss is a chronic sensory deficit that affects older people, which can occur at early ages such as 50 years. Hearing loss can be associated with various risk factors, however, recently the scientific literature has begun to indicate that diet quality or nutrition may be one of them. However, this association has not been evaluated in Chile.

Objective: This study aims to determine the degree of association between diet quality, nutritional status, and hearing loss in adults.

Methods: Adults aged 50 to 80 years from the city of Santiago de Chile underwent the Montreal Cognitive Assessment (MoCA) (exclusion criterion), a nutritional survey of quantified consumption trends (ETCC) to determine the quality of the diet, anthropometric evaluations (weight, height, waist circumference, and skinfolds) and auditory evaluations (gold standard audiometry and tympanometry). The ANOVA or Kolmogorov-Smirnov test (statistical significance $p<0.05$) and Pearson's correlation coefficient were used for statistical analysis.

Results: There were participants with normal hearing status and others with hearing loss to varying degrees. Among the latter, differences in hearing performance were observed between the right and left ear. In nutritional terms, diet quality also varied, with participants with good, average, and poor diet quality, which were significantly related to nutritional status ($p<0.05$). However, the sample was generally homogeneous (the result of the participants), i.e., no participants with severe hearing loss or obese nutritional status participated.

Conclusion: In conclusion, our goal is to generate data that will help us determine the association within the city of Santiago. Additionally, we aspire to extend our evaluation to other geographic regions of Chile in the near future, with the potential to make a significant impact on public health.

Conflict of Interest: none

Keywords: hearing loss; diet quality; nutritional status; nutritional survey

P1.04

Sociodemographic Characteristics, Feeding Variety, Food Refusal, and Feeding Difficulties Presented by Children Between 2 and 11 Years Old with Autism Spectrum Disorder in Panama, 2023

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Introduction: Children with autism sometimes have feeding difficulties, which is a challenge for management and a concern for parents and caregivers to avoid nutritional deficiencies. Early management tools provide a healthy life, and a stable and nutritionally adequate environment according to their individuality.

Objective: To identify sociodemographic characteristics, feeding variety, food refusal, and feeding difficulties presented by children with Autism Spectrum Disorder between two and eleven years of age in Panama, January to March 2023.

Methods: We used the Brief Questionnaire of Eating Behavior of the Patient with Autism Spectrum Disorder rated with the Likert scale; 3 factors were identified (limited variety, food refusal, and characteristics of autism). Descriptive statistics and absolute frequency were used in SPSS V 26.0.

Results: Seventy n=70 children with autism in Panama between 2 and 11 years of age were recruited; the most frequent ages were 4 years (24.3%; n=17) and 5 years (20.0%; n=14). A limited variety was present in 77.1% (n=54) of the children, and 22.9% (n=16) had no factor found. 82.9% (n=58) did not present food refusal and 17.1% (n=12) did. In the characteristics of autism, 90.0% (n=63) did not present these characteristics compared to 10.0% (n=7) who did.

Conclusions: Feeding difficulties in autism are complex and require multidisciplinary intervention. Age and schooling are important factors in determining feeding difficulties. This study did not find a strong basis for associating characteristics of autism spectrum disorder with feeding difficulties. It did reflect that the eating difficulties of the evaluated group were more related to behavioral problems, rather than to symptoms of autism severity.

Conflict of Interest: none

Keywords: autism; nutrition; feeding difficulty; feeding disorder; behavior

P1.05

Effect of *Lactobacillus reuteri DSM 17938* on the Gastrointestinal Function and Behavioral Severity in Patients Aged 5 to 11 Years with Autism in Nutrition Consultation, Bioalimentación Panamá

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Introduction: Growing evidence establishes that both the presence of gastrointestinal and neurobehavioral symptoms, typical in children with autism, may be related to microbiota alterations, which probiotics such as *Lactobacillus reuteri* can modulate.

Objective: To analyze the effect of *Lactobacillus reuteri DSM 17938* on the gastrointestinal function and behavioral severity in children with autism.

Methods: A single-group pre-experimental study with a pre-test and post-test was conducted, with a non-probabilistic convenience sampling. A sample of 21 participants was collected (81% male, 19% female, with a mean age of 8.7±1.7 years), evaluated with a nutritional interview, the Bristol Stool Chart (BSC), and the Autism Treatment Evaluation Checklist (ATEC), and supplemented with 10^8 colony-forming units (CFUs) of *Lactobacillus reuteri DSM 17938* for 50 days. Participants were reevaluated at the end of treatment.

Results: This intervention showed a significant decrease in symptoms of anxiety (p=0.03), indigestion (p=0.0000), bloating (p=0.0000), and gas and foul-smelling stools (p=0.0000), a significant reduction in stool with abnormal color or texture (p=0.04), and a significant increase in the consistency of type 4 stool of the BSC (p=0.0003). It showed no significant changes in the frequency of fecal evacuations. It did demonstrate significant improvements in the severity of behavior on the total ATEC scale (p=0.0001) and on the subscales of speech (p=0.0005), sociability (p=0.0002), sensory and cognitive awareness (p=0.0001), and physical health and behavior (p=0.0002).

Conclusions: Supplementation with *Lactobacillus reuteri DSM 17938* significantly decreased symptoms of anxiety, indigestion, bloating, gas, and foul-smelling stools. Also, abnormal color or texture in stools. In addition, it provided significant improvements in the severity of the behavior of these patients. This may be a great treatment to help improve the function of the gut-brain axis in patients with autism, attenuating gastrointestinal and neurobehavioral symptoms through the vagus nerve, but requires further investigation.

Conflict of interest: none

Keywords: autism spectrum disorder; gut-brain axis; gastrointestinal microbiome; probiotic; *Limosylactobacillus reuteri*

P1.06

Personalized Nutrition Intervention with Physical Activity Improves Body Composition and Lowers LDL in Overweight and Obese Adults: a Randomized, Controlled Clinical Trial

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Introduction: A healthy lifestyle holds an immense impact in preventing cardiometabolic diseases, a leading cause of death worldwide. Personalized nutrition, tailored to individual needs can be effective in promoting long-term dietary changes for cardiometabolic health.

Objective: To examine the effects of personalized nutrition intervention, with either a soluble konjac glucomannans (KG) or a placebo, on body composition and lipid profile in overweight and obese adults.

Methods: Adults with excess weight (N=40) were randomly assigned to consume either: KG supplement (3 g/day) or a placebo for 12 weeks. Body composition (DEXA) and blood biochemistry were measured at baseline and end of the intervention. In both groups, participants received a personalized nutrition intervention with an individualized diet with a programmed caloric intake, combined with remote and in-person nutritional monitoring. Food intake and adherence were assessed using 24-hour recalls, and personalized recommendations were given to improve dietary behavior and physical activity (PA) during the study (WHO primary registry: RPCEC00000406).

Results: Calorie and nutrient intake were similar between the placebo group (1413±117 kcal/day) and the KG group (1365±116 kcal/day). Both groups saw significant reductions from baseline to post-intervention in body weight (-2.23±055 and -2.73 ± 0.69 kg), BMI (-0.76 ± 0.19; -1.03 ± 0.21 kg/m^2), waist circumference (-2.45 ± 0.56; -3.05 ± 0.73 cm), visceral fat area (-12.7 ± 4.44; -20.4 ± 3.75 cm^2), and fat mass index. However, the KG group experienced significantly greater reductions in body fat percentage (-2.19 ± 0.37% vs. -0.84 ± 0.43%) and LDL cholesterol (-14.20 ± 3.54 mg/dL vs. -1.46 ± 4.91 mg/dL) compared to the placebo group.

Conclusion: Combining personalized nutrition recommendations with PA is a successful strategy for managing excess weight and improving body composition. Moreover, KG intake further enhances these benefits by positively impacting body fat and blood lipids.

Conflict of Interest: Vidarium is a research center funded by companies of Grupo Empresarial Nutresa.

Keywords: overweight; obesity; weight loss; personalized nutrition; konjac glucomannans

P1.07

Anxiety, Intake Disinhibition, and Eating Self-Regulation: Relationship to Fat Percentage in College Students

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Introduction: The anxiety generated by an unpleasant situation can be avoided and masked with a dysfunctional coping mechanism, triggering disinhibition of food intake and resulting in an increase in body weight; therefore, self-regulation has been proposed as the most consistent predictor of weight control.

Objective: To analyze the relationship between fat percentage and anxiety, disinhibition of intake, and eating self-regulation in university students.

Methods: Descriptive cross-sectional study. A virtual questionnaire was carried out with students from a university in Colombia. The Beck anxiety inventory (21 items), the disinhibition subscale of the three-factor eating questionnaire (TFEQ-R18), and the eating self-regulation of eating habits scale were used. Fat percentage was obtained subjectively through body images according to biological sex. Subsequently, the population was classified into the fat percentage categories of low (female: <21% and male: <8%), normal (female: 21-32.9% and male: 8-19.9%) and high (female: > 33% and male >20%). The confidence level was set at 95%. The analysis was performed in the GraphPad Prism 8® statistical program.

Results: One thousand sixty-seven (n=1067) university students participated, with a mean age of 21 ± 4 years. Females were represented by 66.4% and men by 33.6%%. A positive correlation was evidenced between anxiety and intake disinhibition (r=0.27, p< 0.0001) and a negative correlation trend between intake disinhibition and food self-regulation because the difference was marginal (r= - 0.049, p=0.05). It was evident that students classified with a high-fat percentage compared to the group with low and normal fat percentage presented higher intake disinhibition (p=0.021) and anxiety (p=0.039); as for food self-regulation, no differences were found as a function of fat percentage.

Conclusions: University students with a high fat percentage had a higher score of anxiety and disinhibition of intake; eating self-regulation tends to be inversely proportional to disinhibition of intake.

Conflict of interest: none

Keywords: anxiety; disinhibition; self-regulation; intake

P1.08

Self-Regulation of Physical Activity is Related to the Restriction of Food Intake in University Students from Colombia, Chile, and Mexico

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Introduction: While individuals with greater self-regulation in physical activity may have better control over their body weight and habits, our study also highlights a potential risk. It has been observed that those who exercise routinely often impose stricter restrictions on their food intake, a behavior that can be dysfunctional and even pose a risk for eating disorders.

Objective: The objective was to analyze the self-regulation of physical activity related to the restriction of food intake in university students from Colombia, Chile, and Mexico.

Methods: Cross-sectional exploratory study. A virtual questionnaire was conducted with university students from Colombia, Chile, and Mexico. The cognitive restraint subscale of the three-factor eating questionnaire (TFEQ-R18) and the self-regulation of physical activity scale were used. The analyses will be carried out with a significance level of 95% and in the GraphPad Prism® statistical program.

Results: Two hundred eighty-five university students participated, of which 45% were from Colombia, 35% from Mexico and 20% from Chile. The average age was 22 ± 3 years. A positive correlation was found between intake restriction and dietary self-regulation ($r=0.49$, $p<0.0001$). Students classified with intake restriction (>12 points) presented greater self-regulation of food intake (average 36.8 points) compared to the group without intake restriction (average 19.1 points) ($p<0.0001$). Mexican students presented greater dietary self-regulation (average 33.4 points) compared to Colombian students (average 26.4 points) ($p=0.02$). No statistically significant difference was evident for intake restriction when comparing the three countries ($p=0.33$).

Conclusions: It is concluded that university students who self-regulated their physical activity habits presented more significant restrictions on food intake, which is considered a dysfunctional behavior and a common characteristic of eating disorders. Therefore, it is a paradox that must continue to be investigated.

Conflict of interest: none

Keywords: self-regulation; physical activity; restriction; intake

P1.09

Description of eating habits in children aged 0 to 2 years residing in Spain and Ecuador

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Introduction: Healthy eating habits from the early months of life enable optimal development of the newborn and predict good nutritional status in the future.

Objective: To describe the dietary habits of a sample of children aged 0–2 years residing in Spain and Ecuador.

Methods: Cross-sectional observational study conducted on two subsamples of children aged 0–2y residing in Spain (n=92) and Ecuador (n=81) through surveys conducted on the online platform 'EUSurvey' distributed in daycare-centers, health-centers, pharmacies, and social media in urban and rural areas. Subsamples were from a larger project carried out with face-to-face and online surveys (n=250 per country). The survey consists of 63 questions on dietary habits, sociodemographic, socioeconomic, prenatal, and pathological backgrounds. Recruitment was conducted between 26/03/22-15/04/2024 in Spain and 26/03/22-22/05/23 in Ecuador. The study was approved by the ethics committee of the Complutense University of Madrid (CE_20210715-4_SAL). We analyzed the type of breastfeeding, age, and method of introducing complementary feeding (CF) (Excel 2021).

Results: In the analyzed subsamples, the prevalences of Spain vs Ecuador in different domains were as follows: 74 vs 75 had never changed country of residence 2 vs 1 had lived 1-5y in current residence country 4 vs 0 from 5.1-10y and 12 vs 5 for >10y. Regarding type of breastfeeding 52 vs 41 reported exclusive breastfeeding, 7 vs 8 exclusive artificial feeding, and 33 vs 32 mixed feeding (breastfeed+artificial formula. 58 vs 57 had started complementary feeding, while 4 vs 7 did it at ≤4mo, 47 vs 31 at 5-6mo, and 7 vs 19 at ≥7 months. Finally, regarding the complementary feeding method 16 vs 8 used the baby-led-weaning method (BLW), 11 vs 25 traditional porridge method (TP) and 31 vs 24 used the mixed method (BLW+TP)

Conclusions: The results from this subsample reveal different patterns of breastfeeding and the introduction of complementary feeding (CF) in Spain and Ecuador. Further investigation into the possible causes of these differences will be conducted when working with the total sample from both countries.

Conflict of Interest: none

Keywords: breastfeeding; complementary feeding; infant nutrition

P1.10

Health risk factors associated with Down syndrome in young people

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Introduction: Down syndrome (DS), a genetic condition caused by an extra copy of chromosome 21 or a portion thereof, affects multiple body systems, including the cardiovascular and metabolic systems. Individuals with DS are at an increased risk of developing alterations in lipid profiles and blood biochemistry, which may contribute to long-term health complications. However, it remains controversial whether these alterations correlate with higher mortality rates from cardiovascular disease in this population. Additionally, anatomical alterations in the kidneys have been observed in individuals with DS. Therefore, assessing the health status of individuals with DS is crucial, focusing on risk indicators of metabolic syndrome and renal function from early stages and determining whether these conditions are attributable to the underlying genetic condition.

Objective: To identify health risk factors associated with Down syndrome in young people.

Methods: A cross-sectional cohort study was conducted on individuals with Down syndrome, aged between 3 and 18 years of both genders and compared with a control group. Weight and height measurements were taken for each participant, and a blood sample was collected for biochemical evaluation. Values were categorized according to the NCEP-ATPIII criteria for metabolic syndrome.

Results: Individuals with DS exhibited a shorter height compared to the control group, and although their weight was also significantly lower, their BMI was higher. Regarding blood biochemistry, the DS group showed a higher prevalence of hypertriglyceridemia and low HDL cholesterol than the controls. Additionally, the atherogenic index was significantly elevated in the DS group. However, no differences were noted in total cholesterol and LDL cholesterol concentrations between the two groups. Furthermore, concentrations of uric acid, urea, and creatinine were higher in the DS group.

Conclusions: Individuals with Down syndrome exhibit a higher prevalence of metabolic alterations suggestive of heightened cardiovascular risk and renal impairment. Establishing routine lipid profile and renal function monitoring is crucial in the healthcare surveillance of individuals with DS.

Conflict of interest: none

Keywords: Down syndrome; lipid profile; renal function; body mass index

P1.11

Nutrient Intake and Anthropometric Status of Centenarians from the *Nicoya Peninsula*, Costa Rica: a Comparative Study with their Offspring

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Introduction: Longevity is determined by factors such as social relationships, physical activity, and diet. In recent decades, there have been drastic changes in dietary habits, which could influence both the quality of life and life expectancy. The consumption of a diverse diet, rich in fruits and vegetables, allows the supply of different nutrients essential for the preservation of functionality and the prevention of chronic diseases; aspects that could explain a long and healthy life from a nutritional perspective.

Objective: To evaluate nutrient intake and anthropometric status in centenarians and their descendants.

Methods: The sample consisted of 120 adult volunteers, inhabitants of the *Nicoya Peninsula*, including centenarians (n= 51), their children (n= 36), and grandchildren (n=33), the latter over 30 years of age. During 2019 and 2020, visits were made to the home of each participant to take anthropometric measurements and conduct interviews on sociodemographic data and food consumption (24-hour recall). Statistical analysis was performed using descriptive and inferential statistics. Values of $p < 0.05$ were considered statistically significant.

Results: The anthropometric analysis showed that centenarians present a better anthropometric condition than their descendants since they present less excess weight and visceral fat. In addition, they consume significantly fewer calories than their children and grandchildren ($p= 0.009$). No significant differences were found in the percentage of energy consumed from protein, carbohydrates, or lipids. Centenarians consume more calcium and vitamin A per 1000 calories ($p< 0.05$), and a tendency is seen for them to consume more iron, copper, and cobalamin, and less sodium than the other generations.

Conclusions: Centenarians of the *Nicoya Peninsula* have a better anthropometric status a lower caloric diet and a higher intake of critical micronutrients, such as iron and calcium, compared to their descendants.

Conflict of Interest: none

Keywords: centenarians; nutrients; nutritional status

P1.12

Indirect Methods of Insulin Resistance for Early Detection of Cardiometabolic Risks in Apparently Healthy Adults: Gemm Study

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Introduction: Indirect methods are available for detecting insulin resistance (IR) in clinical settings (HOMA-IR, the triglyceride-glucose ratio (TGR), and adiponectin/leptin ratio (Adpn/Lep).

Objective: To investigate the relationship between indirect measures of IR and markers of adiposity in apparently healthy adults.

Methods: This study involved 124 asymptomatic adults enrolled in the GEMM multicenter study, excluding those with chronic or acute metabolic diseases. The indices used included HOMA-IR (≥2.6), Triglyceride-to-Glucose Ratio (TGR >8.8), and Adpn/Lep ratio (≥1.0 normal, ≥0.5 to <1.0 moderate-medium risk, <0.5 severe risk). Adiposity markers comprised body mass index (BMI), waist circumference (WC), body fat percentage (%), waist-to-height ratio (WHtR), total fat mass, and muscle mass (kg). Descriptive analysis and Pearson correlation were conducted using SPSS V22 ($p < 0.05$).

Results: Among 43 men, aged 36.7 years (±14.2), and 81 women, aged 38.3 years (±13.5), significant correlations were found in men between TGR and WC ($r = .416$, $p = .006$), BMI ($r = .400$, $p = .008$), and WHtR ($r = .435$, $p = .004$). Adpn/Lep also showed significant correlations with WC ($r = -.420$, $p = .005$), fat mass ($r = -.497$, $p < .001$), and % body fat ($r = -.561$, $p < .001$). Similarly, in women, significant correlations were observed between TGR and BMI ($r = .581$, $p < .001$), WC ($r = .526$, $p < .001$), WHtR ($r = .532$, $p < .001$), % body fat ($r = .415$, $p < .001$), and fat mass ($r = .538$, $p < .001$). HOMA-IR was correlated with BMI ($r = .409$, $p < .001$) and WC ($r = .401$, $p < .001$). Adpn/Lep showed correlations with % body fat ($r = -.478$, $p < .001$) and fat mass ($r = .470$, $p < .001$). Furthermore, significant correlations were found between muscle mass and TGR ($r = .365$, $p < .001$) and HOMA-IR ($r = .301$, $p < .006$) in women.

Conclusions: Detecting individuals at high risk of IR-associated diseases is crucial for implementing preventive and early management interventions, even among those with normal weight and overweight.

Conflict of interest: none

Keywords: insulin resistance; cardiometabolic risk factors; adult

P1.13

Sources of Sugar and *Panela* Consumption in Colombian Children Under 3 Years Old

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Introduction: The main types of sugar used in the Colombian population's diet are cane sugar and *panela*. According to the WHO (2015), high sugar consumption in children is associated with obesity and probably cavities, so it is recommended not to exceed its consumption by 5% of the daily energy intake. Studies on the intake of these ingredients are limited and even non-existent in children under 1-year-old.

Objective: This work aims to describe the sources of added natural sugars and assess their consumption.

Methods: An estimation of dietary sugar and *panela* intake was made using data obtained from the National Nutritional Situation Survey-ENSIN, 2015 of Colombia, based on a 24-hour recall. The population under 36 months old was selected (N=5,392). Sociodemographic characteristics were collected, and intakes were described using descriptive statistics and compared between age groups and other variables using t-student and ANOVA tests. Consumption frequencies and the average amount of sugars added to preparations were estimated.

Results: The addition of sugars to food in the diet was frequent (93.8% of children consume sugar, *panela*, or both). At the household level, beverages were the main source of sugar intake (69.1%), while *panela* was used as a sweetener for *panela* water and porridge (87%). The mean intakes of sugar and *panela* in the overall study population were 8.5 g and 16 g, respectively, reaching values of 17.5 g and 45.5 g for children aged 25–35 months respectively. Statistically significant differences were observed according to ethnicity, rural or urban habitat, wealth level, and region (p-values<0.05).

Conclusion: Most of the studied population exceeds the 5% energy recommendation referred by the WHO. Children consuming added sugars exceeded it widely (35% of energy for those under 6 months and between 28.3-31.8% for those over 7 months).

Conflict of interest: none

Keywords: added sugars; culinary preparations; infants; toddlers

P1.14

Factors that Influence the Initiation of Breastfeeding in the First Hour of Life at Kennedy Hospital in the West, Bogotá, 2023

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Introduction: The Women's and Children's Friendly Institutions Integral strategy (in Spanish *Instituciones Amigas de la Mujer y la Infancia Integral or* IAMII) favors skin-to-skin contact and the early initiation of breastfeeding in the first hour of life. Factors that facilitate early initiation include vaginal birth, skin-to-skin contact after birth, the accompaniment of a nurse in the delivery room, adequate weight of the newborn, adequate support from health personnel, and knowledge about breastfeeding of staff and mothers

Objective: Determine the factors that facilitate or hinder the initiation of breastfeeding during the first hour of life, at the Kennedy Hospital of Bogotá, 2023

Methods: Study with a qualitative phenomenological approach. A semi-structured interview was applied to 26 members of the health staff in the delivery room and immediate postpartum period, and to 49 mothers with full-term delivery at the Kennedy Hospital-Southwestern Subnet of Bogotá, Colombia certified as IAMII. The sample was selected for convenience. The analysis was performed with Nvivo 12

Results: The majority of the personnel who participated were professionals and medical students. They mentioned as factors that influence early onset, the health conditions of the mother and the newborn, socioeconomic, cultural, and psychological aspects of the mother, and institutional factors. Most mothers had a vaginal birth, breastfed during the first hour of life (59.2%), had skin-to-skin contact (69.4%), and 53.1% had skin-to-skin contact and started breastfeeding early. They know the benefits of breastfeeding for the baby, the mother, and the family, and they mentioned as difficulties with early initiation, the health problems of the newborn, and the mother's complications during labor and delivery. They received emotional support and breastfeeding training

Conclusions: Breastfeeding in the first hour of life at Kennedy Hospital requires strengthening training in counseling and a greater number of nursing staff to support the mother.

Conflict of Interest: none

Keywords: infant; newborn; breastfeeding; delivery rooms; health personnel

P1.15

Atherogenic Lipoprotein Phenotype is Present in Adolescents with Obesity Even When Plasma LDL-C Levels are Normal

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Introduction: Obesity in childhood and adolescence is a key element in the development of cardiovascular disease. The atherogenic lipoprotein phenotype, characterized by a reduction in high-density lipoprotein (HDL) levels and an increase in triglyceride (TG) and low-density lipoprotein (LDL) levels, is an important marker in these conditions due to its strong relationship with atherosclerosis. However, characteristics of the size and density of lipoprotein particles can define this risk even under conditions of normal lipoprotein concentration. Thus, LDL-c subfractions allow the identification of a normal lipoprotein profile with predominantly large LDL (phenotype A) or a more atherogenic profile with small, dense LDL (phenotype B).

Objective: To identify the prevalence of atherogenic lipoprotein phenotype based on LDL subfractions in adolescents with obesity.

Methods: This was an epidemiological, cross-sectional study of 80 obese adolescents aged between 10 and 16 years. After 12 hours of fasting, plasma samples were used for analysis of LDL particle size in nanometers (nm), carried out in linear tubes of 3% polyacrylamide, using the Lipoprint® LDL system (Quantimetrix®). The phenotypes were classified as A (≥26.8 nm) and B (<26.8 nm) based on the average LDL size. The plasma concentration of LDL-c was calculated using the Friedewald equation and classified as normal when < 110 mg/dL, according to the recommendations of the Brazilian Society of Cardiology. Data were presented as means and standard deviation (SD), frequencies, and percentages.

Results: The adolescents had a mean age of 12.34 (SD 1.32) years and were mostly male (55.6%). The prevalence of phenotype B in the total number of adolescents assessed was 28.7%. Of the 62 (77.5%) adolescents classified as having normal LDL-c concentrations, 27.4% had the atherogenic lipoprotein phenotype (B).

Conclusion: Our findings indicate a worrying prevalence of atherogenic lipoprotein phenotype among obese adolescents, even with normal plasma LDL-c concentrations. Identifying phenotype B in this population could contribute to the early detection of atherogenic risk.

Conflict of interest: none

Keywords: adolescents; atherosclerosis; low-density lipoprotein

P1.16

Association Between Excess Weight and Abdominal Adiposity and Atherogenic Risk Indices in Adolescents

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Introduction: Anthropometric measurements are important indicators for monitoring cardiovascular health, since they reflect, besides nutritional status, the distribution of body fat in individuals. Given that abdominal adiposity is associated with atherogenic risk among adolescents, monitoring variables related to this outcome can enable early detection and the development of strategies to prevent cardiovascular diseases in adulthood.

Objective: To evaluate the association between excess weight and abdominal adiposity and atherogenic indices in adolescents.

Methods: This was a cross-sectional study of adolescents aged 10 to 18 from municipal schools in the city of Fortaleza-CE, Brazil. Weight and height were measured to calculate BMI. Waist circumference (WC) was measured to calculate the waist-to-height ratio (WHtR). Total cholesterol (TC), HDL cholesterol (HDL), and triglycerides (TG) were analyzed in plasma using commercial kits (Roche Diagnosis®). LDL cholesterol (LDL) was calculated using the Friedwald equation. The Castelli I (TC/HDL) and II (LDL/HDL) indices were calculated, as well as the plasma atherogenic index (PAI) using the formula: Log^{10}(TG/HDL); and atherogenic coefficient (AC) by the formula: (TC-HDL)/HDL. The outcome variables with asymmetric distribution were log-transformed and the student's t-test was used to verify the difference between the means of the atherogenic indices between the categorical exposure variables: presence and absence of excess weight by BMI/age; high abdominal adiposity by WHtR. Data were presented as mean and standard deviation (SD) considering statistical significance at $p<0.05$.

Results: A total of 823 adolescents were assessed, with a mean age of 13.08 (SD 1.35) years and the majority being female (56.6%). All the indices showed higher means in adolescents with excess weight ($p<0.001$ in all indices). The same happened with adolescents who had greater abdominal adiposity by WHtR ($p<0.001$ for all indices).

Conclusions: Adolescents with excess weight and high abdominal adiposity had a higher atherogenic risk in the population evaluated.

Conflict of interest: none

Keywords: adolescent; atherosclerosis; obesity; abdominal; excess weight

P1.17

Educational Intervention for the Improvement of Handling, Collection, Extraction, Transportation, and Use of Human Milk in the Nursing Staff of a Public Hospital in Guadalajara, Jalisco

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Introduction: Educational interventions are a fundamental pillar in healthcare, encompassing activities such as self-evaluation, informative communication, and media-based idea exchange.

Objective: Evaluate the level of knowledge on handling, collection, extraction, transportation, and use of human milk in the female nursing staff of the neonatology service, who have received educational intervention during November 2022 and November 2023.

Methods: Quasi-experimental, longitudinal, prospective design, with a non-probabilistic convenience sampling. The intervention was divided into three phases: I. Baseline pre-test; II Training; and III. Post-test, in both periods. A custom-made questionnaire was used to assess knowledge about human milk, defined as: deficient <2 points, good 3–5 points, adequate 6–8 points, excellent 9–10 points. Descriptive statistics and Student t-tests were used for data analysis.

Results: n25, distribution by work shift: morning 36%, evening 8%, night 20%, weekend 36%. Regarding the level of knowledge, means were reported comparing the interventions of 2022 vs 2023: PRE 6.64 points ± 2.01 SD vs 7.04 points ± 1.30 SD, POST 7.92 points ±1.15 SD vs 8.52 points ± 0.96 SD. Regarding the level of knowledge in 2022 vs 2023 before the intervention, the participants with a deficient level decreased from 4% to 0%, those with a good level remained the same at 16%, while those with an adequate/excellent level increased from 80% to 84%. After the intervention, an increase from 32% to 44% was observed in the excellent level. No differences were observed based on the shift, with a global analysis conducted. The educational intervention showed a statistically significant improvement in the knowledge during 2022 vs. 2023 period. Pre-test scores ($t=16.450$ vs $t=26.944$, $p<.001$) were lower than post-test scores ($t=36.381$ vs $t=44.244$, $p<.001$).

Conclusions: Educational intervention as part of continuing education programs for healthcare personnel is efficient in raising their level of competence and the quality of patient care. This strategy contributes to reducing costs and hospital stays.

Conflict of Interest: none

Keywords: human milk; nursing; nutrition; educational intervention

P1.18

Relationship between Nutritional Status, Eating Habits and Frequency of Use of Nutritional Labeling in Home Delivery Food Delivery Workers, Heredia, Costa Rica, 2023

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Introduction: The majority of delivery workers have a normal nutritional status, consume a variety of food groups, and are deficient in the use of nutritional labeling; no relationship between nutritional status and the use of nutritional labeling; However, there is a relationship between nutritional status with mealtime and frequency of sausage consumption.

Objective: To relate nutritional status, eating habits, and frequency of use of nutritional labeling, in food delivery partners, Costa Rica, 2023.

Method: Quantitative approach, descriptive. A questionnaire was used to recall data on eating habits, frequency of consumption, and use of nutritional labeling, as well as anthropometry.

Results: A study was conducted on 96 people, according to age, sex, education, and marital status. Considering that the majority have a normal nutritional status, where 85% buy snacks outside the home, 61% prefer water as their main drink, while 38% opt for soft drinks or sugary juices. They consume weekly foods such as dairy products, cheese, beef, chicken, pork, fish, eggs, sausages, fruits, salads, tubers, sweets, and alcoholic beverages weekly. Eighty-four percent know what a nutrition label is and men are the least likely to read it, 52% rarely understand the information, and 52% are not influenced by it in their purchasing decision. Label use is not related to nutritional status. However, there is a relationship between Body Mass Index time spent at lunch/dinner and the frequency of sausage consumption.

Conclusions: The study population consists mostly of men with normal nutritional status. Snacks are generally obtained outside the home, and this is where the consumption of energy-dense foods increases. In addition, they consume a variety of food groups every week. Less than half make use of nutrition labeling. Nutritional status is not related to the use of nutrition labeling and is related to eating habits, time spent at lunch or dinner, and frequency of consumption of sausages.

Conflict of interest: none

Keyword: nutritional status; eating habits; delivery workers; nutritional labeling

P1.19

Preliminary Diagnosis of Gaps in the Training of Medical and Nutrition Students Regarding Breastfeeding Knowledge, Skills, Beliefs, and Other Constructs

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Introduction: Challenges related to exclusive and continuous breastfeeding (BF) rates persist in Mexico. Health sciences students are key to promoting, supporting, and protecting BF. Theoretical and practical content provided regarding BF was insufficient at this university.

Objective: To analyze knowledge, skills, beliefs, and other performance constructs regarding BF in students (medicine and nutrition) of a Mexican public university, and to associate students' responses with other variables such as breastfeeding experiences.

Methods: Cross-sectional study, applied to medical and nutrition students an online questionnaire to assess knowledge, skills, subjective beliefs and norms, behavioral intentions, and self-perceived capabilities related to BF. Results were compared using Mann Whitney U and Chi-Square tests.

Results: A total of 72 students participated (medicine: 33; nutrition: 39), 80, 6% were in their fifth semester or more. Median

knowledge score in medicine and nutrition were 50/100; for skills was 37.5/100 in medicine and 50/100 in nutrition (p=0.039). In 10 out of 24 knowledge questions and 6 of 8 skills questions, correct answers were <50%. Subjective beliefs-norms score was greater than 70/100, while behavioral intention and self-perception of BF abilities, was less than 50/100.

Conclusions: Knowledge and skills in students should be strengthened. There is a need to strengthen BF behavioral intentions and self-perception of BF capabilities to improve support to pregnant and breastfeeding families.

Conflict of Interest: none

Keywords: breastfeeding; health education; medical students; nutrition students; knowledge

P1.20

Why Wait for Nutritional Monitoring? Results in Patients with Neurological Disease with Monthly Evaluations

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Introduction: Continuous nutritional monitoring is essential for evaluating and adjusting nutritional interventions to achieve objectives. Currently, there is a lack of data regarding nutritional changes in patients with neurological diseases undergoing monthly follow-ups.

Objective: To describe the nutritional status changes in patients with neurological diseases during monthly follow-ups.

Methods: A historical cohort study was conducted, collecting clinical information and assessing nutritional status at four different time points (baseline and three follow-up visits) following a nutritional care protocol (including dietary counseling and oral nutritional supplement adjusted to disease). Data were summarized using proportions for categorical variables and medians for quantitative variables. Changes in nutritional status between the final and initial evaluations were estimated.

Results: A total of 171 patients were identified, with a median of 83 years (interquartile range 69 to 89y), predominantly female (62.6%). The most common pathologies included Alzheimer's disease (28.7%), cerebrovascular disease (21.1%), and dementia (18.7%). The median time between follow-up visits was 44, 36, and 32 days for the first, second, and third evaluations, respectively. Significant improvements were observed at the end of follow-up, including increases in median weight (+1kg p=0.00), body mass index (+0.4kg/m2 p=0.00), arm circumference (+1.2cm p=0.00) and calf circumference (+0.6cm p=0.00). Additionally, there was a reduction in the frequency of severe muscle mass depletion based on physical examination (16.9% p=0.04) and malnutrition (21.9% p=0.00).

Conclusions: Monthly follow-up visits allow for timely interventions and adjustments, leading to favorable clinical nutritional outcomes in patients with neurological diseases.

Conflict of Interest: The authors state that the Centro Latinoamericano de Nutrición (CELAN) has received payments from Boydorr SAS and Alpina Productos Alimenticios SA for consultancy, preparation of technical documents, and conferences. Additionally, Patricia Savino acts as a scientific advisor to Boydorr SAS. However, the authors indicate that they do not present any type of conflict with the content of this article.

Keywords: Colombia; nutrition therapy; nutrition assessment; nutritional support; neurodegenerative diseases

P1.21

Nutrimetry and the Virtuous Circle of Malnutrition Prevention as Nutri-evidence in Child Development

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Introduction: A clinical case was selected with evidence from prenatal control and monthly controls during the breastfeeding and preschool stages. A 4.9-year-old male patient was evaluated with Nutrimetry from prenatal control to the present.

Objective: Present the evidence of clinical control from the prenatal stage and its behavior during chapters 1,2 and 3 of the virtuous circle of malnutrition prevention with Nutrimetry. Present the nutri-evidence in child development (NEDI) with Nutrimetry.

Methods: The Epi info Nutri software was used to capture, analyze, and cross-reference anthropometric variables. The variables used were Height/age, Weight/Height/age, BMI/age, and PB/age in z-score units. The variables were crossed with the mathematical model of Nutrimetry reaching the number corresponding to the nutritional risk group that is considered the Nutri-evidence for child development (NEDI).

Results: Chapter 1 (pregnancy) of the virtuous circle was developed as a very high-risk pregnancy with data on high weight of the product to which preventive measures were applied, concluding in a full-term delivery with a weight of 3,500kg and a height of 50cm, generating evidence of a risk group 6 (Weight/Height/normal). He received breast milk for 8 months, continuing in risk group 6 (Weight/Height/normal). At one year of age he is overweight, which places him in risk group 9 (High weight/normal Height), achieving his return to group 6 at 18 months, closing chapter 2 of the virtuous circle in risk group 6 in the first 1000 days of life. After 1000 days of life, he becomes overweight at 3 years old, returning to risk group 6 at 3.5 years, maintaining group 6 of the virtuous circle until the present moment.

Conclusions: Nutrimetry and the virtuous circle of malnutrition prevention generate Nutri-evidence for child development.

Conflict of Interest: none

Keywords: nutrimetry; mathematical model; virtuous circle; nutri-evidence; child development

P1.22

Association of NLRP3 and ASC Gene Expression with Nutritional and Physical Activity Variables in Subjects with Obesity

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Introduction: The NLRP3 inflammasome is a macromolecular complex that includes caspase-1, NLRP3, and ASC, which is activated by different damage response mechanisms, mainly inflammatory. Obesity is a metabolic condition characterized by an increase in the production of pro-inflammatory cytokines. Recently, it has been reported that lifestyle changes in subjects with obesity favor the reduction of comorbidities, which can be explained by the downregulation of NLRP3 inflammasome expression.

Objective: To associate the changes in expression of the NLRP3 and ASC genes in subjects with obesity who received a structured progressive functional exercise and nutritional plan.

Methods: Forty-two subjects were randomly divided into two groups: one group received a hypocaloric diet plan with a 20% energy restriction (Diet group), while the second group received, in addition, a progressive functional exercise plan for three months of follow-up (Diet + Exercise group). Peripheral blood samples were taken to extract RNA at the beginning and at the end of three months of intervention. Subsequently, the expression of the NLRP3 and ASC genes was performed using real-time PCR with TaqMan probes and the relative quantification method. Nutritional data were obtained through a 24-hour recall and a three-day dietary diary that includes two weekdays and one weekend day in each month of follow-up.

Results: A positive correlation was found between changes in NLRP3 gene expression and dietary consumption of riboflavin (r= 0.883, p= 0.004) and niacin (r= 0.782, p= 0.022), as well as a positive correlation between the change in ASC gene expression and riboflavin (r= 0.869, p=0.005), fiber (r=0.785, p=0.021) and polyunsaturated fatty acids (r=0.722, p=0.043) in the Diet + Exercise group.

Conclusions: Subjects with obesity who received a nutritional intervention and progressive functional exercise showed a positive correlation between the consumption of specific nutrients from the diet and changes in gene expression of the NLRP3 inflammasome.

Conflict of Interest: none

Keywords: NLRP3 inflammasome; obesity; nutrition; exercise

P1.23

Polyamine Content in Traditional Foods of the Mexican Diet

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Introduction: The *milpa*-diet is a food model of Mesoamerican origin that has as its central axis products from the *milpa*, as well as other foods of Mesoamerican origin; on which traditional Mexican cuisine is based. These foods, in addition to their nutritional content, also possess different bioactive compounds (e.g., polyphenols, phytosterols, and carotenoids) that confer different health benefits. Although polyamines are bioactive compounds that are present in a wide range of foods; there is a lack of information regarding their presence in foods commonly consumed in Mexico.

Objective: The objective of this work was to evaluate the polyamine content in traditional foods of the Mexican diet.

Methods: Sixteen food products commonly consumed in the Mexican diet were studied: corn- tortilla, flour-tortilla, *bolillo*, salty-*birote*, amaranth, chia, coconut, chayote, green- tomato, *nopal,* and six varieties of chili (*poblano, serrano, mirasol, ancho, arbol,* and *mulatto*). The determination of polyamines was carried out in duplicate by ion-pair ultra-high performance liquid chromatography coupled to fluorometric-detection (UHPLC-FL) as described by Latorre-Moratalla (2009).

Results: Polyamines were detected in all foods, with values that ranged between 2.81-120.64 mg/kg. The *poblano-chili, serrano-chili, nopal, arbol-chili*, amaranth, and chia were the foods that stood out for the highest polyamine content, with values above 12.55mg/kg. Spermidine was the predominant polyamine in most foods (0.63-24mg/kg), especially in amaranth, chia, and green-chili. Putrescine was the predominant polyamine in *nopal*, coconut, and some types of chilis (*poblano* and *ancho*), with values that ranged between 1.44-77.13mg/kg.

Conclusions: Polyamines were detected in all analyzed foods consumed in the Mexican diet, being spermidine the predominant compound. Due to the antioxidant and anti-inflammatory effects of polyamines and their crucial role in the prevention of chronic diseases, it will be interesting to estimate the intake of polyamines in the Mexican population and associated with the prevalence of chronic disorders. In this sense, further efforts need to be focused on the characterization of the polyamine content in a larger number of foods of Mesoamerican origin.

Conflict of Interest: none

Keywords: milpa-diet; bioactive-compounds; polyamines, mexican foods; spermidine; putrescine

P1.24

Nutritional Status in Older Adults in Centro Habana City, Havana, Cuba

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Introduction: Aging is a process associated with various changes, all of which can impact the nutritional status of humans, causing nutritional disorders due to depletion of lean body tissues, or due to excessive accumulation of body fat. The nutritional vulnerability of the elderly, and the high prevalence of chronic diseases in this life stage, require periodic studies to report on the nutritional status of the individual.

Objective: To evaluate the nutritional status of older adults from the Centro Habana municipality, Havana.

Methods: A cross-sectional descriptive study was carried out on 204 older adults selected in two health areas of the Centro Habana municipality, Havana. Nutritional status was evaluated by determining hemoglobin (Hb) levels, which was measured by an automated hematology counter (ABX Micros60) and by determinations of total cholesterol, triglycerides, and glycemia, which were performed using colorimetric-enzymatic techniques. Additionally, BMI was estimated by measurements of weight and knee-height length. A sociodemographic survey was applied to determine variables of interest. The data were analyzed using frequency distribution using the SPSS20 software system.

Results: The distribution of older adults according to age groups was 32% (60–69 years), 38% (70–79 years) and 30% (80 and over). The majority were female (73%), widowed/separated/single adults (60.3%), retired/pensioners (74.9%), and middle and higher educational levels (64.7%). The prevalence of anemia was 38.2%. A moderate frequency of older adults with altered concentrations of lipid levels was observed: TC (39.2%) and TG (30.9%) and glycemia (25.0%). Chronic energy deficiency was only (6.9%), however, overall overweight was found (60.3%).

Conclusions: The nutritional status of older adults was inadequate, given the moderate prevalence of anemia, dyslipidemia, and hyperglycemia and the high global overweight, which could increase the risk of suffering from chronic diseases.

Conflict of interest: none

Keywords: nutritional status; BMI; lipid levels; hemoglobin; older adult

P1.25

Body Compartments and Body Composition of Elderly Living at High Altitude, in La Paz City, Bolivia

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Introduction: Elderly people are susceptible more frequently to chronic diseases associated with physiological variations in body composition at sea level. In high-altitude inhabitants, hypobaric hypoxia of the environment in which they live is added to this, leading to a decrease in quality of life and an increased risk of mortality.

Objective: The objective of this research is to determine the compartments and body composition of adults over 60 years of age residing in La Paz city at 3600 meters above sea level.

Methods: This research is a descriptive observational study, which evaluated the compartments and body composition through electrical bioimpedanciometry analysis using a QuadScan 4000 device (BodyStat, UK), anthropometry was performed according to standardized norms for weight, height, skin folds: tricipital, subscapular and suprailíac; in addition to waist and hip circumferences.

Results: A total of 59 subjects were evaluated, 41 women and 18 men. Regarding weight, waist circumference, subscapular fold, and body mass index (BMI), there was no significant difference according to sex, and height was greater in men. Hip circumference and tricipital and suprailiac folds show higher values in women. The BMI classifies 28.8% as normal, 42.4% as overweight, 25.4% as Obesity I, and 3.4% of the study subjects as Obesity III. Body composition showed differences according to sex in total bodywater (TBW) Female TBW=46.4±4.7%, Male TBW=55.4±3.6% (p=0.000), intracellular fluid (ICF) Female ICF=24.5±1.7%, Male ICF=31.6±9.5% (p=0.000), fat mass (FM) Female FM=48±4.4%, Male FM=33±4% (p=0.000) and fat-free mass (FFM) Female FFM=32.6±5.7%, Male FFM=46.6±6.5% (p=0.000); and there was no difference in the extracellular fluid (ECF) Female ECF=22±1.9%, Male ECF=23.2±2% (p=0.043).

Conclusions: There are significant differences according to sex, with women having a greater fat mass and men having a greater fat-free mass at high altitudes; fat mass values are similar to studies carried out in Mexico and Chile.

Conflict of Interest: none

Keywords: body compartments; body composition; elderly; high altitude

P1.26

Effects of Ultra-processed Food Intake on Diet Quality of Adolescents from Medellín and Antioquia

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Introduction: Ultra-processed food (UP) consumption has been associated with diet quality (DQ) deterioration. A high UP intake in adolescents from Antioquia has been reported. Information about adolescents from Medellín has not been analyzed.

Objective: To compare UP intake and its association with DQ in adolescents from Medellín and Antioquia.

Methods: A cross-sectional study (276 teenagers included in the Food and Nutrition Security Profile of Medellin 2015, developed by Medellín´s City Hall and the School of Nutrition and Dietetics of University of Antioquia (UdeA); and 126 teenagers of Food and Nutritional Profile of Antioquia 2019, conducted by Government of Antioquia´s Food and Nutritional Security Management and the School of Nutrition and Dietetics, UdeA. Dietary recalls (24-hours) were analyzed and foods were sorted according to NOVA classification.

Results: The adolescent's mean age was 14 years (52% male). Sixty-four percent from Medellín and 65% in Antioquia had an adequate BMI. Excessive body weight was present in 18% of adolescents from Medellín and 23% from Antioquia. The median calorie intake percentage from UP was similar in adolescents from Medellín [17.9% (IQR:9.2-29.1)] and Antioquia [16.3% (IQR:5.6-31.5)]. When comparing rural areas, the median caloric intake from UP was greater in Medellín than in Antioquia [16.9% (IQR:7.9-29.7) vs 8.1% (IQR:0.1-16.9); $p<0.05$]. In both populations, with the augment in UP consumption: total calorie intake, total fat, and saturated fat increased ($p<0.05$) and total carbohydrates and fiber density decreased ($p<0.05$). With an increase in UP consumption, the free sugar intake tended to increase.

Conclusions: Although UP consumption was similar in adolescents from Medellín and Antioquia, the UP-calorie intake was over the 10% limit of total diet calories, proposed by Antioquia´s decennial Food and Nutrition Plan 2020-2031. An increase in UP consumption was associated with higher total and saturated fat intake, and lower fiber density, deteriorating diet quality. Public health strategies should aim to reduce UP intake in adolescents from Medellín and Antioquia.

Conflict of Interest: none

Keywords: ultra-processed food; diet quality; adolescents

P1.27

Oropharyngeal Colostrum in Very Low Birth Weight Preterm Infants to Reduce Morbidity

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Introduction: The Hospital Universitario Departmental de Nariño (HUDN) implemented the oropharyngeal colostrum therapy strategy in very low birth weight preterm infants (VLBW) in order to reduce morbidities in premature infants.

Objective: To evaluate morbidities in preterm infants with VLBW, before and after the implementation of oropharyngeal colostrum therapy in HUDN.

Method: Quasi-experimental retrospective cohort study with historical controls, before and after the introduction of oropharyngeal colostrum therapy. A total of 57 preterm patients with VLBW in 2019 without oropharyngeal colostrum therapy and 54 in 2022 with oropharyngeal colostrum therapy were included. Oropharyngeal colostrum therapy consists of extracting colostrum from mothers in the first hours postpartum. The extracted colostrum was administered 0.2 ml in ≤ 1000 grams, and 0.4 ml in premature infants from 1001 to 1500 grams, distilling drop by drop in the cheeks every 3 hours for 15 days. Multidisciplinary follow-up was carried out during their stay and upon discharge from the kangaroo program.

Results: With the oropharyngeal colostrum therapy strategy, a reduction in morbidity was achieved in preterm infants with VLBW. In 2019, there were 11 cases of enterocolitis, and in 2022 there were no cases of enterocolitis in the colostrum therapy group, a statistically significant finding ($p=0.000$). In the colostrum therapy group, there was a decrease in cases of: bronchopulmonary dysplasia (70% vs 63.3%), intraventricular hemorrhage (21.6% vs 16.7%), ductus (29.4% vs 22.9%) and retinopathy of prematurity (26% vs 16%). A decrease in mortality was observed, with a reduction of 21% in 2019 and 18% in 2022.

Conclusions: The implementation of oropharyngeal colostrum therapy in preterm infants with VLBW was associated with a statistically significant decrease in necrotizing enterocolitis, and a reduction in retinopathy of prematurity, bronchodysplasia, ductus, and intraventricular hemorrhage. The strategy of oropharyngeal colostrum therapy in preterm infants with WLBW is novel and innovative, with a social impact in the short, medium, and long term, reduces neonatal morbidity, strengthens, protects, and supports breastfeeding, in order to meet the goals of sustainable development.

Conflict of interest: none

Keywords: colostrum; orogapharyngeal; morbidity; preterm infants

P1.28

Foods with Special Medical Purposes in Patients in Home Care in Colombia

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Introduction: In Colombia, the utilization of Foods for Special Medical Purposes (FSMP) among patients undergoing home hospitalization has not been characterized.

Objective: To delineate the usage patterns and prevalence of FSMP among individuals receiving care under the home hospitalization modality.

Methods: A cross-sectional observational study was conducted involving 676 patients. Data encompassed the type and quantity of FSMP utilized, prescription origins, administration routes, and consumption duration. Findings were summarized using proportions for categorical variables and measures of central tendency for quantitative variables.

Results: Seventy percent of the sampled population utilized FSMP. Among FSMP users, 94.7% consumed a single formula, while 5.3% used two formulas, primarily protein modules. Regarding classification, 51% employed standard formulas, 19.5% were designated for diabetics, 12.3% for hypercaloric needs, 5.1% for renal conditions, and 5.1% for pulmonary diseases, with the remaining 7% comprising other formula types. Health professionals prescribed 44.6% of FSMP, while 4.3% were self-prescribed, and 51.2% lacked identified prescription origins. Consumption routes for FSMP were oral in 74.4% of cases, enteral in 23.7%, and mixed in 1.9%. The median duration of formula consumption was 12 months (interquartile range: 6 to 36 months).

Conclusions: A substantial proportion of the investigated population relies on FSMP, showcasing diverse types and consumption modalities. Advocating for the significance of FSMP usage by both healthcare providers and patients is imperative.

Conflict of Interest: the authors state that the Centro Latinoamericano de Nutrición (CELAN) has received payments from Boydorr SAS and Alpina Productos Alimenticios SA for consultancy, preparation of technical documents, and conferences. Additionally, Patricia Savino acts as a scientific advisor to Boydorr SAS. However, the authors indicate that they do not present any type of conflict with the content of this article.

Keywords: home care services; hospital-based; dietary supplements; Colombia

P1.29

Characterization of APME Focused on Pediatrics in Colombia

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Introduction: Foods for special medical purposes (FSMP) are products used to meet the nutritional needs of patients when they are not met through the oral route. In Colombia, the nutritional and general characteristics of FSMP used in pediatrics have not been described.

Objective: Describe the nutritional characteristics, indications, and general information of the FSMP available in Colombia aimed at the pediatric population.

Methods: Cross-sectional study carried out on the website of the National Institute of Food and Drug Surveillance (in Spanish *Instituto Nacional de Vigilancia de Medicamentos y Alimentos)* to identify current FSMP in Colombia. Once identified, the technical sheets and physical products were consulted to extract information on the nutritional content, indications for use, type, and presentation characteristics of the FSMP. Categorical and quantitative variables were summarized in proportions and measures of central tendency, respectively.

Results: Forty-eight FSMP from 10 manufacturers were identified. In total, 56.3% have a polymeric composition, 18.8% are modular, 14.6% designed for specific diseases, 8.3% oligomeric and 2.1% monomeric. The median energy density was 1.3kcal/ml (range 0.67 to 2.45kcal/ml). The median energy intake from protein, fat, and carbohydrate was 16% (range 11.2 to 20.6%), 15.6% (range 13.6 to 19.6%), and 43.7% (range 34.4 to 52.7%), respectively. Powder is the most common form of presentation (54.2%). 22.9% of the formulas are indicated for children between 1 and 13 years old, and 20.8% for adolescents from 14 years old, especially polymeric formulas.

Conclusions: The FSMP available in Colombia for pediatrics are diverse, and it is necessary to consider the individual characteristics of the patients when selecting the FSMP.

Conflict of Interest: The authors state that the Centro Latinoamericano de Nutrición (CELAN) has received payments from Boydorr SAS and Alpina Productos Alimenticios SA for consultancy, preparation of technical documents, and conferences. Additionally, Patricia Savino acts as a scientific advisor to Boydorr SAS. However, the authors indicate that they do not present any type of conflict with the content of this article.

Keywords: Colombia; diagnosis; protein-energy malnutrition; nutrition assessment; sensitivity and specificity

P1.30

Randomized, Double-blind, Placebo-controlled Clinical Trial to Evaluate the Effect on the Glycemic Variability of a Greek-type Yogurt in Patients with Type 2 Diabetes

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Introduction: Consumption of a Greek yogurt at brunch-time is an alternative for people with type 2 diabetes (T2D).

Objective: To evaluate the glycemic variability during 14 days by continuous monitoring of glucose in early-onset T2D patients by the consumption of Greek yogurt, compared to other types of yogurts and placebo.

Methods: Early-onset T2D patients with diabetic nephropathy were recruited at the MDRU, a blood sample was obtained, and a continuous-monitoring glucose device (Abbot FreeStyle Libre) was applied. The experimental yogurt named "*Nutri-Yogur*" was manufactured at the Pilot Plant according to protocol CTA-256-18/19-1 of the DFST. Each participant received 9 individual-size 125g (3 of each) the experimental yogurt, commercial yogurt, or placebo, and were asked to consume them randomly during 3 consecutive days followed by a 1-day wash-out until all the yogurt samples were consumed. Satiety was evaluated with a 5-point scale at 3 times: before (t0), and after 1 h (t1) and 2:30h (t2) of consumption. The liking of the yogurt was determined with a 9-point hedonic scale.

Results: Twenty T2D patients (14 women, 6 men; 21 to 81 years, HbA1c less than 9.0%), agreed to participate in this study, all were regular yogurt consumers and none had digestive problems. Glucose variability was analyzed via a one-way ANOVA with a 5% tolerance. Significant differences (p <0.05) in glucose were observed between 1) days when yogurts were consumed *vs.* days without consumption; 2) Satiety to all yogurts before (t 0) and after (t 1) described as "I'm satisfied", and only with *Nutri-Yogur* at t2 when compared to commercial brands, and described as "I'm satisfied" and "I am a little hungry". The highest liking was for the commercial yogurt (Yoplait) with added sugar.

Conclusions: Consumption of "*Nutri-Yogur*" at brunch, resulted in less glycemic variability compared to a commercial yogurt.

Conflict of interests: none

Keywords: Greek yogurt; glycemia; satiety; T2D

P1.31

Application of Nutritional Gastronomy in the Design of Balanced Meal Plans for Adolescents in Search of a Healthy Weight

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Introduction: Nutritional gastronomy is an innovative approach that combines principles of nutrition and gastronomy to address health problems such as obesity. This approach is based on evidence-based recommendations and promotes dietary diversity to improve health and well-being.

Objective: The aim of the study is to analyze how nutritional gastronomy can effectively contribute to addressing clinical problems such as obesity and promoting healthy eating habits in adolescents.

Methods: This study introduces a practical approach to integrating principles of nutritional gastronomy into the development of balanced diets. Variables such as body mass index (BMI), resting metabolic rate, exercise intensity, and personal tastes in food were taken into account to formulate diets that are nutritionally complete while meeting taste expectations. An example of a menu specifically designed to address obesity in adolescents is also included.

Results: The right combination of ingredients and culinary techniques allows for the creation of balanced and nutritious dishes that comply with the principles of healthy eating. The inclusion of gastronomic nutrition in dietary planning promotes enjoyment and long-term adherence to a healthy lifestyle.

Conclusions: Nutritional gastronomy is presented as an effective tool to address health problems such as obesity and promote healthy eating habits. The application of this discipline in the creation of balanced meal plans can improve the quality of life of adolescents in pursuit of a healthy weight.

Conflict of Interest: none

Keywords: healthy diet; obesity; gastronomic nutrition; adolescents; dietary planning

P1.32

Obesogenic Intestinal Microbiota: Relationship with Inflammation and Non-communicable Chronic Diseases in Adults

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Introduction: Obesity is a multifactorial chronic disease characterized by an excessive accumulation of adipose tissue and a risk factor for the development of chronic non-communicable diseases. The intestinal microbiota suffers an alteration in its composition in the presence of obesity, altering the functionality of the intestinal barrier, homeostasis, and immunological and inflammatory response.

Objective: Describe the relationship of the intestinal microbiota with nutritional status, inflammation, and the development of non-communicable chronic diseases in adults with obesity.

Methods: Articles were identified using the PubMed, Scielo, and Hinari databases, yielding 310 publications from 2018 to 2022. Of these, 50 articles met the inclusion criteria and were selected for analysis. The Oxford scale was employed to assess the level of evidence.

Results: Most studies report the presence of *Firmicutes, Prevotella,* and *Firmicutes/Bacteroidetes* species related to a greater amount of body fat, high BMI, and chronic diseases. A lower presence of *Bacteroidetes, Bifidobacterium,* and *Akkermansia* associated with potential health biomarkers was also identified. The presence of circulating lipopolysaccharides is described as a triggering factor of low-grade inflammation, the metabolite "succinate" increased in plasma, and the gene count and butyrate producers decreased related to DM2 and cerebrovascular diseases. These alterations were associated with an increase in triglycerides, cholesterol, liver enzymes, IL6, uric acid, fibrinogen, glucose, and HOMA index.

Conclusions: The composition of the intestinal microbiota changes when the host is obese, triggering inflammation and metabolic alterations that increase the risk of developing NCDs. The use of probiotics and a diet high in fiber and antioxidants could positively contribute to the composition of the intestinal microbiota and biomarkers for health.

Conflict of Interest: none

Keywords: intestinal microbiota; obesity; inflammation; non-communicable chronic diseases

P1.33
Effects of Dietary Fiber in the Prevention and Treatment of Cardiovascular Disease and Diabetes Mellitus

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Introduction: Dietary fiber is the edible part of plants, which resists digestion and absorption in the small intestine; It is essential for a healthy diet, reducing the risk of chronic non-communicable diseases such as cardiovascular diseases, cancer, and diabetes that cause more than 40 million deaths annually worldwide. Among the benefits of its consumption is the increase in HDL cholesterol, the decrease in the absorption of intestinal fat, and the reduction of total cholesterol and blood glucose. In Latin America, between 10 and 20 grams of fiber are consumed per day, less than the 25 to 35 grams per day recommended by WHO.

Objective: Identify the effects of dietary fiber consumption on the prevention and treatment of cardiovascular disease and diabetes mellitus.

Methods: A systematic review of the literature was carried out on the bases: Google Scholar, PubMed, Cochrane, and BVS. Fifty articles published between 2016 and 2022 were included, and the Oxford scale was used to evaluate the level of evidence.

Results: It was identified that an average daily intake of 25 to 33.5 g of dietary fiber, especially soluble, showed positive effects in the prevention of risk factors for cardiovascular disease and type 2 diabetes mellitus such as HbA1c, total and LDL cholesterol, triglycerides, glucose fasting, insulin, systolic and diastolic blood pressure. Greater benefits are reported with daily consumption and longer periods of consumption, as well as a beneficial effect in both preventive and therapeutic interventions with greater benefits in healthy people.

Conclusions: The greatest benefits of dietary fiber in metabolic markers were the decrease in glucose, insulin, and glycated hemoglobin, with greater benefits in prevention.

Conflict of Interest: none

Keywords: dietary fiber; cardiovascular diseases; diabetes mellitus

P1.34
Evaluation of the Effect of Extra Virgin Olive Oil Bioactive Compounds on Biomarkers of Oxidative Stress and Inflammatory Status in Children and Adolescents with Obesity and Hypertension

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Introduction: Obesity among children is a risk factor for cardiovascular disease and hypertension. Bioactive compounds of extra virgin olive oil (EVOO) have demonstrated antioxidant, anti-inflammatory, and cardioprotective effects.

Objective: To evaluate the effect of three different EVOOs with different contents of bioactive compounds on oxidative stress and inflammatory biomarkers in children and adolescents with obesity and primary hypertension.

Methods: A controlled, parallel, randomized, double-blind clinical intervention with three olive oils with similar fatty acid profiles and different amounts of bioactive compounds was performed in 41 children (7-17 years) with obesity and hypertension. Participants consumed 30 g/day of either an optimized EVOO, a control EVOO, or a functional olive oil for six months without changing their diets. Samples were collected at baseline, three months, and six months to assess erythrocyte fatty acid profiles, plasma inflammatory biomarkers, and urinary oxidative stress markers. Data were analyzed using repeated measures and Pearson correlation in SPSS ($p < 0.05$).

Results: Oleic acid increased in erythrocyte membranes over time. No differences were observed in oxidative or inflammatory biomarkers. Erythrocyte oleic acid percentages were negatively correlated with plasma levels of 8-hydroxy-2'-deoxyguanosine (after optimized-EVOO intake) and positively correlated with the anti-inflammatory interleukin-4 (after functional oil intake).

Conclusions: Erythrocyte oleic enrichment after supplementation with different EVOO differing in the amounts of bioactive compounds for 6 months may improve oxidative and inflammatory status in children with obesity and hypertension. More studies are needed to understand the amounts of bioactive compounds responsible for the beneficial effects of EVOO.

Conflict of Interest: none

Keywords: EVOO; children; obesity; hypertension; oxidative stress; inflammation

P1.35
Questionnaire on Breastfeeding Experiences in Migrant Shelters (QBEMS)

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Introduction: Despite the fact that the phenomenon of migration has become a global humanitarian crisis, with an increasing number of women and babies in migratory flows, few studies have explored breastfeeding practices in women living in shelters. One obstacle to this is the scarcity of valid and reliable measuring instruments. In addition, migrant mothers belong to a sector that is difficult to access due to their constant mobility and precarious living conditions.

Objective: Design a questionnaire and measure its internal consistency to assess breastfeeding experiences in migrant shelters.

Methods: The modified version translated and validated into Spanish of BEIRS (Breastfeeding Experiences in Informal and Refugee Shelters) (Robledo, 2022) was taken as a reference. Questions were developed around socio-demographic data; breastfeeding practices; and, experiences inside the hostel. First, it was submitted for content validity through expert consultation; and then pilot tests were conducted in three stages. Migrant women with children up to 24 months of age were included. Cronbach's alpha coefficient (α) was calculated using the SPSS program.

Results: During 2023, the Questionnaire on Breastfeeding Experiences in Migrant Shelters (QEBMS) was developed, which consists of 3 sections; the first one records general and socio-demographic data (13 items); then evaluates breastfeeding practices (28 items); and, the third section addresses the experience inside the migrant shelter (7 items). A Cronbach's alpha of 0.83 was obtained. A total of 142 women from Venezuela (44.4%), Honduras (38.7%), Guatemala (4.2%), Ecuador (3.5%), Haiti (2.8%), Colombia (2.8%), El Salvador (2.1%), Costa Rica (0.7%) y Cuba (0.7%) participated.

Conclusions: The QEBMS is a questionnaire with a very good degree of internal consistency.

Conflict of Interest: none

Keywords: migrant women; breastfeeding; hostels; refugees; experiences

P1.36
Determination of Sucrose Content in Beverages for School-age Children

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Introduction: The prevalence of overweight and obesity has increased in recent decades worldwide. The negative health effects of this condition on children have been widely documented and include, among other things, joint, sleep, and psychological problems, as well as the increased risk of some types of cancer, type 2 diabetes, and heart problems in the medium and long term. The World Health Organization-WHO- recommends reducing the intake of free sugars to less than 10% of total caloric intake, as well as reducing the intake of sugars added to foods.

Objective: Quantify the concentration of sugar present in a cola drink, industrial apple juice, and grape hydrating drink.

Methods: The materials used to prepare the samples were cola drink, grape hydrating drink, and apple juice box. A digital refractometer, oven, degasser, semi-analytical balance, reagents (distilled water), and bomb calorimeter were used. Instruments and glassware provided by the I2QB3 Laboratory were used. The refractive index was used, and the analysis was carried out in duplicate for each sample.

Results: Grape soda was the beverage with the highest content of sugars and calories, followed by carbonated beverages, while peach nectar had the lowest. In addition, it was observed that the consumption of these beverages can contribute significantly to the daily caloric intake recommended by the WHO, especially in the case of grape soda and carbonated beverages.

Conclusions: The three drinks analyzed exceed the WHO daily free sugar intake recommendations by consuming 1 glass of 250 ml. It is recommended to promote compliance with the WHO guidelines for sugar content in industrial foods, the reformulation of these products, and information to the population about the implications it has for health.

Conflict of Interest: none

Keywords: sucrose; industrial drinks; school drinks

P1.37

Adherence to the Mediterranean Diet and its Appropriateness to the Recommended Daily Intakes of Nutrients in Older Adults

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Introduction: The Mediterranean diet is widely recognized for its benefits in preventing cardiovascular diseases and promoting longevity, noted for its rich composition of fruits, vegetables, legumes, whole grains, olive oil, and fish. Despite its well-known positive impact on quality of life, questions remain about its direct influence on levels of essential micronutrients, crucial for preventing nutritional deficiencies and maintaining optimal health.

Objective: To assess adherence to the Mediterranean diet (MD) in the older adult population and determine whether higher adherence is associated with better compliance with Dietary Reference Intakes (DRIs) for nutrients.

Methods: A cross-sectional study was conducted on adults over 65 years of age residing in León, selected by convenience. A frequency of consumption questionnaire and 24-hour dietary records were used to evaluate intake. Nutrient adequacy was verified according to the DRIs for the Spanish population, adjusted for age and gender, using the EvalFINUT nutritional analysis software. Adherence to the Mediterranean diet was classified based on the PREDIMED scale and analyzed using ANOVA to identify significant differences in micronutrient intake among different levels of adherence.

Results: The sample consisted of 39 women and 37 men, with adherence to the MD of 77% and 68% respectively, achieving scores of 9 or more on the PREDIMED scale. The analysis showed that greater adherence is linked to adequate intake of protein, calcium, vitamin B6, and phosphorus. However, no significant differences were found in the intake of vitamins A and E, magnesium, and iodine.

Conclusions: Adherence to the MD is associated with greater nutritional adequacy in calcium, vitamin B6, and phosphorus, with higher adherence rates in women. Promoting this diet could

Conflict of Interest: none

Keywords: mediterranean diet; micronutrients; diet adherence; healthy aging; nutritional assessment

P1.38

Reduction in Potassium Concentration in Tamarind Drink and Broad Bean *Atol* Due to the Use of Calcium Resin

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Introduction: During the development of the Analytical Chemistry Applied to Nutrition course, a research project on nutrient content in foods was carried out. The present study was carried out with the purpose of providing pediatric patients with Chronic Kidney Disease (CKD) with an alternative to consuming tamarind and broad bean *atol* drink through an ion exchange method using a calcium resin that allows a decrease in potassium content and in this way the patient can take advantage of the contribution of other nutrients contained in these drinks.

Objective: To quantify the potassium content in samples of broad bean *atol* and tamarind drink with and without calcium resin (Resincalcio®) by means of atomic absorption spectroscopy.

Methods: An experimental analytical study was carried out to determine the potassium content in duplicate samples of tamarind drink and bean atol to which 15 grams of Resincalcio® was added to one of the samples, the drink was allowed to rest for 1 hour. tamarind and broad bean *atol* for 2 hours, and the microwave digestion technique was applied for subsequent measurement of potassium content through atomic absorption spectroscopy.

Results: The potassium content in a 250 ml glass of tamarind drink was 142.42 mg. By adding calcium resin, a potassium reduction of 98% was obtained (3.23 mg of potassium). In the broad bean *atol*, the potassium content was 7.58 mg, and a reduction of 84% was obtained (0.64 mg of potassium).

Conclusions: The results showed that the use of Resincalcio® is effective in reducing the potassium concentration in tamarind and broad bean *atol* drinks, contributing to increasing beverage options for patients with kidney disease.

Conflict of Interest: none

Keywords: potassium; resincalcio®; spectroscopy; kidney disease; drinks

P1.39

Effects of an Intervention on the Eating Behaviours of Preschool Children: The MELIPOP Study

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Introduction: Changes in eating behaviours over time can provide valuable insights into the development of dietary patterns, which in turn affect overall food consumption and nutritional status. These changes are key in children, as they may influence the risk of becoming overweight or obese.

Objective: This study aimed to evaluate the 1-year follow-up effects of an intervention on the eating behaviours of preschool children.

Methods: MELIPOP is a randomized clinical trial carried out in three Spanish cities involving 240 children (4.9 ± 1.1 years) at risk of being overweight or obese. After a run-in period, the children were assigned to the control group or the intervention group, which followed a Mediterranean lifestyle. Eight subscales of eating behaviours were assessed using the Child Eating Behaviour Questionnaire. Linear repeated measures models were used to assess changes in the different eating behaviours subscales after one year of participation. All analyses were performed using SPSS statistical software.

Results: This analysis included 185 Spanish preschool children (53% boys), 102 in the intervention group and 83 in the control group. After one year of intervention, no significant changes were found in the eating behaviours. Descriptive statistics indicated slight changes in certain behaviours. Specifically, there was a decrease in the mean scores for 'desire to drink' and 'slowness in eating', and an increase in 'food responsiveness' and 'emotional overeating' subscales. These changes were seen in both groups. All results were compared between the intervention and control groups.

Conclusion: Despite the implementation of an intervention based on a Mediterranean dietary pattern and regular physical activity, no significant changes were observed in the dietary behaviour subscales after one year. These results indicate the complexity of modifying dietary behaviour and patterns in this population. They also highlight the need for further research to develop more effective interventions that focus on preschool children's eating behaviour.

Conflict of Interest: none

Keywords: eating behaviours; child; preschool children; Mediterranean diet; dietary patterns

P1.40

ACTA Study on the Application and Monitoring of New Dietary Trends among Spanish Paediatricians

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Objective: ACTA study aimed to analyse the application and monitoring of new dietary trends among Spanish paediatricians.

Methods: A multicentre cross-sectional study was conducted among 245 Spanish paediatricians, who completed an online survey about their daily clinical practice and knowledge of children's nutrition. The studied topics were dietary diversification through baby-led-weaning, vegetarian diets, organic foods, and plant-based drinks consumption.

Results: Most participants indicated that they warn families about the risk of choking associated with baby-led weaning, and more than 60% consider that infants may receive an insufficient variety and amount of nutrients with this practice. Only 15% of paediatricians admitted to actively recommending its application. There is general agreement that organic foods do not have a better nutritional profile than non-organic foods and the limitations of vegetarian diets, especially because of the possible insufficient intake of vitamins B12, D., and iron. Paediatricians agreed that plant-based beverages should be avoided during the first two years of life and that in the first 12 months of age, the best alternative is breast milk, or the use of infant formulas when necessary.

Conclusions: In general, there is adequate knowledge of the new trends, about which many questions are received from parents and about which professionals are interested in obtaining more information. Their application and concern about obtaining additional knowledge, seem statistically higher in younger paediatricians.

Conflict of interest: JDO and ASO are employees of Laboratorios Ordesa

Keywords: child nutrition; complementary feeding; vegetarian diet; organic food

P1.41

Decrease in Potassium Concentration in Natural Drinks with the Use of Calcium Resin as Food Alternatives for Pediatric Population with Chronic Kidney Disease

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Introduction: In kidney disease, one of the nutritional risk factors is excess potassium in the body or "hyperkalemia." There are many treatments or compounds to treat hyperkalemia, among which is calcium resin which acts by reducing the concentrations of potassium ions in the blood.

Objective: Quantify the potassium content in natural pineapple drink and lemonade, with and without Resincalcio® to offer more options for natural drinks to patients with chronic kidney disease.

Methods: The materials used to prepare the samples were 20 lemons and 1 large pineapple, adding the components contained in the respective drinks (water and sugar). Likewise, instruments and glassware provided by the I2QB3 Laboratory were used. To study the samples, 15 grams of Resincalcio® were added, and the microwave oven digestion method was also used to completely digest the samples; the second method was the Atomic Absorption Spectrophotometry to have a more precise reading and with exact data on the amount of potassium that the addition of Resincalcio® could reduce.

Results: A potassium reduction was obtained by the addition of Resincalcio® of 87% (7.83 mg/100ml) in a sample of pineapple juice, and 55% (35.2 mg/100ml) in a sample of lemonade, having a greater effectiveness in the first mentioned sample.

Conclusions: Based on the results of this study, the use of Resincalcio® could be recommended to reduce the potassium content in lemonade and pineapple juice. Additionally, it is useful to know this percentage reduction when calculating the meal plan for patients with kidney disease.

Conflict of Interest: none

Keywords: Resincalcio®; potassium; spectrophotometry; kidney disease; natural drinks

P1.42

Effect of Nutritional Educational Interventions on Glycemic Control in Adults with Type 2 Diabetes

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Introduction: Diabetes is a chronic non-communicable disease that can cause complications mainly derived from inadequate glycemic control. The nutritional educational intervention was designed based on the social model that considers intrapersonal, community, and public policy processes, to educate the person based on nutrition, healthy lifestyle, and health orientation. Some studies mention that nutritional educational intervention is a preventive and promotional tool in which programs can be implemented to adopt healthy habits in a group of people.

Objective: Determine the effect of a nutritional educational intervention on glycemic control in adult patients with type 2 diabetes.

Methods: A systematic literature review was carried out that included 50 articles identified in Google Scholar, Scielo, Medigraphic, ScienceDirect, and Elsevier, and evaluated its level of evidence using the Oxford grading scale.

Results: A total of 25,018 patients underwent nutritional educational intervention. The intervention was structured by modules in which they were combined with two or more nutritional interventions that were taught to the patients and included a solid structure of the educational plan. It was demonstrated that it is necessary to complete an intervention period of more than 3 months to achieve the effects on glycemic control in adult patients with type 2 diabetes.

Conclusions: Eighty-four percent of the studies demonstrate that nutritional educational interventions in combination with two or more nutritional interventions have a positive effect on glycemic control in adult patients with type 2 diabetes.

Conflict of Interest: none

Keywords: type 2 diabetes; glycemic control; nutritional education

P1.43

Evaluation of the Acceptance and Tolerance of a Yogurt Rich in DHA from Microalgae in a Group of Lactating Women from Medellín, Colombia

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Introduction: The docosahexaenoic fatty acid (DHA) is essential for the development of the brain and retina of children. If the breastfeeding woman receives a diet with a good supply of DHA, she will be able to provide her child with the necessary requirements

through breast milk. Therefore, incorporating DHA into commonly consumed foods becomes a highly effective nutritional strategy. One option to obtain it is microalgae oil, which provides high concentrations of the fatty acid, has no contaminating traces, and has better organoleptic characteristics

Objective: This study aimed to describe the acceptance and tolerance of a yogurt rich in DHA from microalgae, in addition to evaluating the concentrations of the fatty acid in human milk in a group of lactating women who received the food for a period of time.

Methods: For the acceptance test, 71 women were evaluated, who were offered 30 milliliters of yogurt and were asked to fill out a five-category hedonic scale, that ranged from *"hated it"* to *"loved it"*. For the tolerance test, a group of eight lactating women consumed yogurt daily for five days and completed a symptom survey that inquired about abdominal pain, bowel movements, bowel sounds, gas, bloating, and vomiting after each intake

Results: In the acceptance test, no mother classified the product in the *"I hated"* category and 97% (n= 69) reported that they liked the product: 63% in the *"I loved it"* category and 34% in the *"I liked it"* category. For 3% (n=2) it was indifferent. Regarding the tolerance evaluation, 100% of the women denied symptoms such as emesis, nausea, flatulence, and abdominal distension and none presented alterations in the consistency and number of stools after ingesting the yogurt.

Conclusions: Yogurt was well accepted and tolerated, which allowed us to advance to the next phase of the project which determined the change in DHA concentrations in human milk after the intervention.

Conflict of Interest: none

Keywords: docosahexaenoic acid; human milk; lactating woman; fortification; yogurt

P1.44

Factors Associated with Food Insecurity of Older Adults in Chile

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Introduction: Despite the rapid process of population aging and the high socioeconomic inequality that affects Chile, little is known about the factors associated with food insecurity in older people (≥65 years).

Objective: To examine the factors associated with food insecurity among older adults in Chile during the year 2024, focusing the analysis on demographic, socioeconomic, and health factors.

Methods: The data come from the Food Security, Quality of Life and Health Survey (ESCAVIS in Spanish) conducted on a nationally representative sample of 1,174 elderly people. Food insecurity is a dichotomous variable (Yes and No) created from the FIES-FAO scale where moderate and severe insecurity were grouped. Demographic (sex, age, ethnicity, number of household members, and geographic area), socioeconomic (status, occupation), and health (loneliness and life satisfaction) variables were included. A series of 4 logistic regression models were run.

Results: The results show that there are no statistically significant differences in food insecurity according to sex, urban-rural area, number of household members, or occupation. However, being Indigenous (OR = 2.21; CI 95% 1.22-3.98), living in a poor household (OR = 2.89; CI 95% 1.13-7.38), being lonely (OR = 2.86; CI 95% 1.94-4.21) or being dissatisfied with life (OR = 4.55; CI 95% 1.75-11-84) are significantly (p-values < 0.05) associated with higher degrees of food insecurity.

Conclusions: Food insecurity in Chile is associated with socioeconomic and health factors. Therefore, it is relevant to generate actions that seek to link the promotion of the well-being of the elderly with sustainable development goals, of which food security is a crucial factor. Undoubtedly, promoting food security in the elderly will positively influence their health and well-being in Chile (The results are preliminary).

Conflict of Interest: study financed by AB-Chile. However, there is no influence on the part of the company in data processing or analysis that could be considered a conflict of interest.

Keywords: food insecurity; associated factors; older adult

P1.45

Physical and Neuromotor Development in Wistar Rat Pups with Prenatal and/or Postnatal Exposure to Sucralose

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Introduction: In Mexico, more than 80% of the population, including women of reproductive age, consume sweetened beverages. Sucralose is a non-caloric sweetener (NCS) widely used by the beverage industry. There are no restrictions on the consumption of NCS during pregnancy, so they may even be recommended to avoid excessive weight gain during pregnancy. Studies in rodents have shown that prenatal or infancy exposure to sucralose could cause metabolic and intestinal microbiota alterations in offspring. However, the effect of this exposure has not been evaluated on the physical and neuromotor development of the offspring.

Objective: Evaluate the physical and neuromotor development of Wistar rat offspring with maternal exposure to sucralose, during pregnancy and/or lactation.

Methods: Before and during pregnancy, 6 female rats received a daily intragastric (i.g.) solution containing 4.6 mg of sucralose (S), while 6 females received water (A). During lactation, females were randomly divided into 2 groups, resulting in 4 experimental groups of offspring AA, AS, SS, and SA. The physical and neuromotor development of the offspring was evaluated using a battery of tests.

Results: The groups exposed to sucralose during pregnancy and/or lactation showed differences compared to the group exposed to water, on the day of appearance of the surface righting and grasping reflexes, negative geotaxis, and eye-opening (p < 0.05, ANOVA, Duncan).

Conclusions: Regarding physical development, on postnatal day 21, the SA offspring presented significantly lower length and

body weight compared to the other groups, mainly with the AS ($p<0.05$, ANOVA, Duncan). The consumption of sucralose during pregnancy and lactation has varying effects on the physical and neuromotor development of Wistar rat pups, whose future implications need further experimental research.

Conflict of interest: none

Keywords: neurodevelopment; sucralose; lactation; pregnancy

P1.46

Inadequate Dietary Intake in Older Adults in Centro Habana City, Havana, Cuba

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Introduction: Inadequate nutrition is a main contributing factor, which can cause older people to suffer a series of disabilities that lead to a deterioration in their quality of life. Preventing risk factors linked to diet can contribute not only to increasing life expectancy but also to quality of life. There are no recent data available from studies carried out on dietary intake in older adults in Havana,

Objective: To evaluate dietary intake in a group of older adults from the Centro Habana municipality, Havana.

Methods: A cross-sectional descriptive study was carried out on 133 older adults selected in two health areas of the Centro Habana municipality, Havana. Diet was assessed through the application of a semi-quantitative food recording survey from the previous month; energy and nutrient content was determined using Ceres software. Energy and nutrient content were calculated using Ceres software. A sociodemographic survey was applied to determine variables of interest. The data were analyzed using frequency distribution using the SPSS20 software system.

Results: The sample was made up of 72% female and according to the age groups, it was 31% (60-69 years), 43% (70-79 years) and 26% (80 and over). The average intake of energy, proteins, fats, carbohydrates, and main micronutrients were below the nutritional recommendation for this age group. More than 50% of older adults in the three age groups ingested less than 70% of the nutritional recommendations for dietary energy and the main nutrients and micronutrients.

Conclusions: Dietary intake is inadequate in older adults since the established dietary recommendations for energy, proteins, fats, carbohydrates, and most micronutrients were not met.

Conflict of interest: none

Keywords: dietary intake; older adult; consumption energy; nutrients

P1.47

Polyphenol-Enriched-Extra-Virgin-Olive-Oil Supplementation Improves Vascular Dysfunction and Oxidative Stress in a Mice Model of Hypercholesterolemia in Pregnancy

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Introduction: Maternal supraphysiological hypercholesterolemia (HC) occurs in ~25% of human pregnancies. This condition is associated with increased pro-atherogenic LDL, fetoplacental endothelial dysfunction, oxidative stress, fetal atherosclerosis, and cardiovascular disease later in life. Nevertheless, HC in pregnancy is not clinically determined and there are no interventions to improve its harmful effects. Extra virgin olive oil (EVOO) reduces oxidative stress in cardiovascular patients and is secure in pregnancy; however, its effects on maternal HC are unknown.

Objective: To determine the effect of EVOO on endothelial function and oxidative stress in a model of maternal HC.

Methods: Pregnant C57/BL/6 mice were randomly distributed to control (chow diet, n=10), HC (diet 2% cholesterol + 0,5% cholate, from gestational (GD) day 13 to 18, n=9) or HC+EVOO groups (diet 2% cholesterol + 0,5% cholate + 12% EVOO from GD 13 to 18, n=9). After euthanasia, plasma and hepatic total cholesterol (TCh), endothelial function (vascular reactivity), hepatic oxidative status (DHE staining), and NADPH activity were evaluated. In the fetus, TCh and soluble markers of endothelial dysfunction (VACAM, ICAM) were determined. Only significant differences are shown ($p<0,05$).

Results: HC and HC+EVOO dams presented increased plasma and hepatic TCh, higher liver/weight ratio, and increased hepatic lipid droplets compared to the control group. In HC dams, hepatic DHE staining, and NADPH activity were increased compared to C and HC+EVOO groups meanwhile methacholine-mediated aortic relaxation was reduced indicating endothelial dysfunction only in the HC group. In the fetus, placental efficiency was similar between the groups. Remarkably, TCh, VCAM, and ICAM levels were higher in HC compared to HC+EVOO offspring.

Conclusions: EVOO supplementation at the end of pregnancy improves vascular dysfunction and oxidative stress in a mice model of pregnancy-HC.

Conflict of Interest: none

Keywords: hypercholesterolemia; pregnancy; olive oil

P1.48

A Preclinical Approach to the Beneficial Effects of Intravitreal Administration of Wild Olive Oil-Related Extracellular Vesicles in Counteracting Hypertensive Retinal Damage

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Introduction: Previous studies have reported oxidative damage in the retina of mice with arterial hypertension (AH) induced by the administration of L-NAME (an inhibitor of nitric oxide synthesis). This damage was alleviated following the intake of wild olive oil (referred to as ACE, after *acebuche* oil). Additionally, we have demonstrated that circulating extracellular vesicles (EVs) isolated from animals fed with ACE are effective in reducing reactive oxygen species (ROS) production in cultures of retinal pigment epithelial cells incubated with angiotensin II.

Objective: To demonstrate the mediating effect of circulating EVs isolated from mice fed with ACE on ocular oxidative damage associated with AH.

Methods: Male C57BL/6J mice, aged 10-12 weeks, were used in this study. EVs were isolated from mice subjected to either an ACE-enriched diet for 6 weeks or a standard (oil-free) chow. Intravitreal (IV) injections of EVs (equivalent to ~ 60 µg of protein) were administered on days 1, 3, and 5 to both normotensive and hypertensive mice. All animals were euthanized on day 7. Where appropriate, AH was induced by administering 45 mg of L- NAME per kg body weight per day for 6 weeks. Intraocular pressure (IOP) was monitored, and reactive oxygen species (ROS) levels, as well as the activity/expression of NADPH oxidase and glial fibrillary acidic protein (GFAP, a marker of gliosis), were examined at the retinal level.

Results: Circulating EVs from normotensive animals and those fed with ACE displayed a similar appearance and size, averaging 150-200 nm. An increase in IOP was observed in hypertensive animals, which was reduced following IV injection of EVs from mice fed with ACE. Comparable outcomes were noted in the assessment of ROS levels and the activity and expression of NADPH oxidase and GFAP.

Conclusions: These preclinical studies highlight two key findings: 1) the significance of EVs in mediating oxidative damage in the retinas of hypertensive animals; and 2) the potential role of EVs in the prevention and/or treatment of ocular diseases.

Conflict of Interest: none

Keywords: extracellular vesicles; hypertension; retina; wild olive oil

P1.49

Evaluation of the Drug-mediated Inhibition of DAO Enzyme: A Multidisciplinary Approach

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Introduction: Histamine intolerance is a disorder that arises from a failure in the catabolism of dietary histamine regulated by the diamine oxidase (DAO) enzyme at the intestinal level. The accumulation of histamine in the blood can lead to the onset of a wide range of gastrointestinal and extraintestinal symptoms. Among the different causes described for this food intolerance, the transient and reversible inhibition of DAO enzyme by different drugs remains the least studied. Although a considerable number of drugs with the capacity to block the enzyme have been described over the years, scientific studies providing robust data on this topic are outdated and not supported by multiple experimental studies.

Objective: The aim of this study was to evaluate the inhibitory effect exerted by different widely used drugs on the intestinal metabolism of histamine by DAO enzyme through a combination of *in silico* and *in vitro* approaches.

Methods: To elucidate the structure-activity relationship between porcine DAO and the selected drugs, a 3D model was obtained through the homology modeling technique. DAO pharmacophore was identified by an *in silico* screening approach. Subsequently, a molecular docking virtual screening of the selected ligands was run to assess drug binding affinity to the enzyme.

In vitro, enzymatic DAO activity (porcine kidney protein extract) was determined in the presence of several widely used drugs at three different concentrations (100, 50, and 10 µM) using the UHLPC-Fl method. Aminoguanidine, a specific DAO inhibitor, was used as a positive control.

Results: The computational study allowed us to predict the interaction of the active ingredient with the DAO enzyme. Among all the ligands docked *in silico*, only n-acetylcysteine and clavulanic acid were able to enter the binding pocket. In-vitro, only clavulanic acid exhibited a significant inhibition of the DAO enzyme at all concentrations tested. The percentage of enzyme activity inhibition was higher than 50% at the highest concentrations.

Conclusions: The treatment with clavulanic acid could be a cause or enhancement factor of histamine intolerance, increasing the number of people susceptible to the adverse effects of dietary histamine.

Conflict of Interest: none

Keywords: histamine intolerance; diamine oxidase; clavulanic acid; pharmacological inhibition

P1.50

Evolution of Diamine Oxidase Activity and Symptoms Associated with Histamine Intolerance in Pregnant Women

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Introduction: Diamine oxidase (DAO) enzyme activity increases during pregnancy, suggesting its role as a barrier to prevent excessive entry of histamine into the fetal circulation. Nevertheless, limited studies exist on the evaluation between pregnancy and DAO activity, particularly in women with symptoms associated with histamine intolerance due to DAO deficiency.

Objective: This study aimed to assess the serum DAO activity in pregnant women diagnosed with histamine intolerance due to DAO deficiency, and whether this activity and symptoms improve during this period.

Methods: A retrospective observational study was carried out with 31 women with symptoms of histamine intolerance, who became pregnant during their clinical monitoring at the International Institute of DAO deficiency (Barcelona). The study assessed the evolution of DAO enzyme activity and symptomatology pre-pregnancy, during the 12–14 weeks of gestation, and postpartum (2 months after birth).

Results: One hundred percent of the participating women improved their DAO activity during pregnancy, reaching an average activity level of 79.91 ± 34.25 U/ml, which represents an increase of 90.1% compared to the average activity observed before pregnancy. Furthermore, this increase was related to an improvement in their associated symptoms, especially at the gastrointestinal, neurological, and dermatological levels, which persisted throughout the pregnancy. Notably, a low histamine diet was unnecessary during this period and did not influence the symptoms. However, during the postpartum period, DAO activity levels decreased in all participants, reaching an average of 14.93 ± 9.97 U/ml, coinciding with the re-emergence of symptoms.

Conclusions: These results confirm that DAO enzyme activity increases during pregnancy in women with symptoms associated with histamine intolerance due to DAO deficiency. In addition, it seems that this increase could be related to an improvement in symptoms, which remains stable throughout the pregnancy. Therefore, it looks like adopting a less restrictive diet during pregnancy may not adversely affect the clinical manifestations of histamine intolerance.

Conflict of Interest: none

Keywords: histamine; diamine oxidase (DAO); pregnancy; placenta; histamine intolerance

P1.51

Prevalence of Anemia in Hospitalized Patients in the Internal Medicine Department of a General Hospital in Southern Mexico

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Introduction: Anemia is characterized by a reduction in the number of red blood cells and/or hemoglobin concentration, falling below the second standard deviation in relation to the mean established for age and gender. Worldwide, about 1.92 billion people suffer from it. Frequent and often underestimated condition at in-hospital and out-of-hospital level, which plays a key role in morbidity and mortality.

Objective: To determine the prevalence of anemia in patients hospitalized in the internal medicine department of a general hospital in southern Mexico.

Methods: The study was quantitative, descriptive, cross-sectional, non-probabilistic. The sample consisted of 36 individuals, 58.3% male and 41.7% female, who were hospitalized on the day of data collection. The instruments used included nursing charts, and medical records, as well as Microsoft Excel and Jamovi for data organization and analysis.

Results: Anemia was present in 89.9% of the population. The prevalence was 90.5% in men and 86.7% in women. In relation to age, there was a Spearman coefficient of 0.136 and a p-value of 0.428. Regarding morphological characteristics, 83.3% had normocytic cells and 55.6% had normochromic cells. In the case of BMI, there was a Spearman value of 0.076 and a p-value of 0.658, with no cases of severe anemia in patients with obesity.

Conclusion: Hospital anemia is prevalent, without relevant fluctuations between both sexes and normal morphological characteristics in a large part of the population. With weak and statistically insignificant correlations with respect to age and BMI and a lack of cases of severe anemia in patients with obesity. It is recommended that future research take serum ferritin into account when assessing hematologic health in patients with inflammatory diseases and chronic infections.

Conflict of Interest: none

Keywords: anemia; hemoglobin; hospitalized patients; internal medicine; body mass index

P1.52

Determination of Sugar Content in Commercial Beverages for Children by Means of the Refractometry Method and Its Comparison with Nutritional Labeling

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Introduction: Scientific and technological advancement has brought forth numerous studies dedicated to analyzing foods and beverages that we commonly consume. Among them, studies on carbonated beverages, juices, and other types of drinks stand out, aimed at obtaining updated and reliable information on their sale and consumption. It has been observed that in recent years, the consumption of sugary drinks, sodas, and flavored milks has significantly increased among children. Therefore, through this research, the sugar content in sugary drinks frequently consumed by children will be analyzed.

Objective: Determine the sugar content in *Big Cola*, *Kerns* peach nectar, and grape *Sipi* drinks, comparing it with the nutritional labeling.

Methods: A refractometer was used to analyze the percentage of humidity and degrees Brix. Likewise, semi-analytical balance, degasser, oven, instruments, and glassware provided by the I2QB3 laboratory of the Mariano Gálvez University of Guatemala were used.

Results: The grape soda was the drink with the highest sugar and calorie content, followed by the carbonated drink, while peach nectar had the lowest. In addition, it was observed that the consumption of these drinks can contribute significantly to the daily caloric intake recommended by the WHO, especially in the case of grape soda and carbonated drinks.

Conclusion: The results of this study highlight the need to carefully evaluate the sugar content in beverages aimed at children and its impact on the daily diet. The data collected provide a solid basis for future research in the field of child nutrition, to promote healthy eating habits and prevent health problems associated with excessive sugar consumption during childhood.

Conflict of Interest: none

Keywords: brix degrees; refractometer, percentage of sugars; calories, sugar-sweetened beverages

P1.53

Do Food Allergies in Children Under 18 Affect Nutritional Status?

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Introduction: Food allergies (FA) have increased, affecting approximately 6-8% of children under 18 years of age. The clinical presentation of the disease and prolonged symptoms can affect nutrition.

Objective: To associate the type of FA with the nutritional status of children and adolescents.

Methods: Cross-sectional-analytical study conducted on 709 patients under 18 years of age with a diagnosis of FA were included. Descriptive analysis of variables was performed; for the association between type of FA and nutritional status, Yuen's test was used for quarters and was complemented with the effect size measure of the Algina-Keselman- Penfield standardized difference coefficient with their respective 95% confidence intervals. Multivariate dependence analysis was performed with quantile regression of the median (0.5) and the Stepwise Estimation technique was used for the selection of predictor variables.

Results: In under-fives, a significant relationship was observed between cow's milk protein allergy and a decrease in height-for-age z-score (p=0.001/ME -3.48); an association was found between cow's milk, nuts, and seeds restriction and the risk of low weight-for-height (p<0.010/ME >-2.60). In the age group of 5–18 years, egg allergy was associated with a greater magnitude of effect on the decrease in height-for-age deviations (p=0.016/ME -2.44). Vegetable allergy was associated with increased height-for-age and with risk of excess weight classified by BMI-for-age (p=0.014/ME 2.48).

Conclusion: The study showed high rates of malnutrition in children with FA. Restrictive diets, especially for FA to high biological value proteins, negatively affect nutritional status. Protocols are required to strengthen nutritional care and prevent malnutrition in these patients.

Conflict of interest: none

Keywords: food allergy; nutritional status; child malnutrition

P1.54

Degree of Food Processing and its Relationship to the Breast Milk Microbiota

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Introduction: The role of the degree of processing of foods consumed in the lactation period and the milk microbiota has not been explored, and understanding this interaction contributes to the design of dietary recommendations at this stage.

Objective: To relate food consumption according to the degree of processing to the milk microbiota.

Methods: An observational, descriptive study was conducted on 30 women in their first trimester of exclusive breastfeeding, with a Body Mass Index between ≥ 18.5 and 29.9 kg/m2. The microbiota was analyzed by 16S ribosomal RNA (rRNA) sequencing using the Illumina platform. Two 24-hour recalls were applied on non-consecutive days. Foods were classified based on the NOVA classification. Correlations between bacterial genera and calories consumed by each of the food groups were explored using Spearman's correlation coefficient.

Results: Of all women evaluated, 70% had adequate Pregestational Body Mass Index, 40% had excessive gestational weight gain and 40% were overweight at the time of evaluation. Intake of the unprocessed food group was negatively correlated with *Ruminococcus* spp. (rho=-0.46 p= 0.010), *Escherichia- Shigella* spp. (rho=-0.48 $p \leq 0.01$); intake of minimally processed foods was negatively correlated with *Clostridium sensu stricto* 13. (rho=-0.38 p=0.036), *Prevotellaceae UCG-001* (rho=-0.44 p=0.013), while consumption of processed food was positively correlated with *Prevotellaceae UCG-004* (rho=0.43 p=0.016), *Ruminococcaceae UCG-009* (rho=0.39 p=0.031) and ultra-processed with *Clostridium innocuum group* (rho=0.37 p=0.042) *Ruminococcus* spp. (rho=0.52 $p \leq 0.01$) and *Romboutsia* spp. (rho=0.42 p=0.020).

Conclusions: The degree of processing of foods consumed by women during breastfeeding is related to bacterial genera of interest to infant health, such as those that may be precursors of intestinal infections for the infant. Nutritional support at this stage should be considered. Further research is needed to investigate these relationships.

Conflict of Interest: none

Keywords: microbiota; breast milk; foods

P1.55

Factors Associated with the Cessation of Exclusive Breastfeeding among Breastfeeding Mothers in a Town of Cartagena, 2023

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Introduction: There are factors that determine compliance with breastfeeding; the absence or deficiency of these factors leads to the cessation of this practice, among them are the economic situation, education level, environment, and family and partner support. It is essential to accompany and inform each woman during the gestation process to adhere to the practice. Several studies have shown that socio-demographic factors such as age, multiparity, family support, and work, among others, are significantly associated with the cessation of breastfeeding before 6 months postpartum.

Objective: To determine the factors associated with the cessation of exclusive breastfeeding in nursing mothers in a locality of Cartagena, during the year 2023.

Methods: Cross-sectional study. A sample of 98 randomly selected breastfeeding mothers, assigned to 8 ICBF Family Child Development Centers where there are 5-27 breastfeeding mothers with children up to 6 months of age, located in locality 3 of the district of Cartagena. To assess the cessation of the practice, a feeding questionnaire was implemented in the last 24 hours, based on WHO indicators, for the infant and child, it was possible to identify whether they maintained exclusive breastfeeding or not; supported by the personal data form, it was possible to characterize the mothers, according to socioeconomic, family, educational and sociodemographic level.

Results: Ninety-one percent of the mothers were aged between 20–35 years, most were multiparous, planned their pregnancy, and received family and partner support. The variable associated with the cessation of breastfeeding was parity, being primiparous a reported an OR 3.4 (1.29-8.43) p= 0.008.

Conclusions: Being multiparous favors the practice of EB.

Interest conflicting: none

Keywords: breastfeeding; cessation; social factors; parity

P1.56

Gene Expression of *CASPASE-1* and *NLRP3*: Implications for Metabolic Response in Obese Adults on a Progressive Functional Exercise Program

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Introduction: Caspase-1 is a key enzyme in the activation of the NLRP3 inflammasome, which in turn plays a fundamental role in the pathogenesis of various inflammatory and metabolic diseases, such as obesity and cardiovascular diseases. Progressive functional exercise may exert beneficial effects on metabolic health and chronic inflammation by modulating factors that regulate the activation of the NLRP3 inflammasome.

Objective: To associate the expression of *CASPASE-1* and *NLRP3* genes with markers of metabolic response in obese adults who participated in a progressive functional exercise program.

Methods: Forty-two obese subjects were enrolled in a three-month follow-up study. Participants were randomly assigned to either the control group or the exercise group. The control group continued with their usual physical activities, while the exercise group received a progressive functional exercise program. Body composition and exercise intensity were assessed, and peripheral blood samples were collected at the beginning and end of the study. Serum samples were used to determine total cholesterol and HDL using dry chemistry with the COVAS system. The atherogenic index was calculated based on the Castelli index. RNA was extracted and gene expression of CASPASE-1 and NLRP3 was measured using real-time PCR with TaqMan probes and relative quantification. Statistical analysis was performed using SPSS v.22 software, with significance set at $p < 0.05$.

Results: A significant association ($p < 0.05$) was found between levels of total cholesterol, HDL cholesterol, atherogenic index, and the expression of *CASPASE-1* and *NLRP3* genes in obese subjects participating in a progressive functional exercise program. Specifically, a decrease in the expression of these genes was associated with a significant reduction in markers of metabolic response related to cardiovascular diseases.

Conclusions: Progressive functional exercise in obese subjects influences the reduction of CASPASE-1 and NLRP3 gene expression, thereby affecting markers of metabolic response related to cardiovascular diseases.

Conflict of Interest: none

Keywords: CASPASE-1; NLRP3; obesity; functional progressive exercise

P1.57

Relationship of Body Image and Nutritional Status with the Risk of Orthorexia Nervosa in Young Users of Five Fitness Training Centers in Iquitos-Perú

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Introduction: The social environment defines an ideal physique as slim and flawless, indicative of success, happiness, and beauty. However, exercise or extreme dieting can be dangerous and lead to failure to meet goals, resulting in body dissatisfaction and ongoing concerns about weight or appearance. Misdirected healthy living involves factors that are detrimental to human health, such as the perception that healthy eating can be viewed as perfectionistic and proper, i.e. nutritionally recommended. However, the act of eating healthy does not require restrictions, as well as naming foods as good or bad. Eating disorders impact the nutritional status and health of the individual by modifying eating habits, disorders such as orthorexia nervosa interfere with people's lives and increase the likelihood of self-harm, becoming a growing public health problem.

Objective: To determine the relationship between body image, nutritional status, and the risk of orthorexia nervosa.

Methods: Non-experimental, descriptive, correlational, and cross-sectional study. The sample consisted of 397 users of five fitness training centers in the city of Iquitos-Peru. The Stunkard scale, body satisfaction questionnaire, ORTO-15 questionnaire, and anthropometric nutritional evaluation card were the data collection instruments. Descriptive and inferential statistics were used to process the information.

Results: Ninety-nine percent of those evaluated were satisfied with their body image. Thirty-six percent had normal nutritional status, 54.9% were overweight, 8.1% had grade I obesity and 1% had grade II obesity. 4.3% are at high risk, 61.5% are not at risk and 34.3% have a low risk of orthorexia nervosa.

Conclusions: Body image and nutritional status have no statistically significant relationship with the risk of orthorexia nervosa.

Conflict of interest: none

Keywords: orthorexia nervosa; body image; nutritional status; body satisfaction

P1.58

Adequacy of Energy, Carbohydrates, Proteins, Fats, Folic Acid, Vitamin D, Iron, and Zinc, in Women Attending the Pregna Fertility Center in Buenos Aires, Argentina

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Introduction: According to the World Health Organization, infertility is the inability to achieve a pregnancy, without the use of contraceptive measures, for a period of one year. This situation affects 15% of the population of reproductive age in Western countries Research focuses its interest on assisted fertility treatments of low and high complexity, but underestimates the importance of diet, as a contributing factor in the preservation of fertility

Objective: To evaluate the adequate percentages of energy, carbohydrates, proteins, fats, folic acid, vitamin D, iron, and zinc, of women between 35 and 49 years old, who attended the Pregna Fertility Center of the City of Buenos Aires in October 2020.

Methods: Descriptive cross-sectional observational study. Sample: 30 women between 35 and 49 years old, with a diagnosis of infertility, patients from the Pregna center, who agreed to answer the self-administered surveys online.

Results: Only 57% of the women (n = 17) had a normal BMI (body mass index) and 86.7% of the women (n = 26) did not reach the total energy value (TEV). With reference to macro and micronutrients, we found that 56.7% of surveyed consume more than 30% of their TEV in fats. Among women studied, 10% consume more than 60% of their total energy value (TEV) from carbohydrates, and 63.3% consume more than 20% of their TEV from protein. Additionally, 30% had a folic acid intake below the recommended levels, while vitamin D intake was 96.7% lower than the recommended dietary allowance. Iron intake was also concerning, with 70% consuming less than the daily dietary recommendation, and 63% had zinc intake below the recommended levels

Conclusions: The total energy value of these women with infertility was less than adequate, with excess protein intake and total fat. Furthermore, poor intake of total carbohydrates, iron, vitamin D, folic acid, and extremely low levels of intake of zinc.

Conflict of Interest: none

Keywords: infertility; energy; carbohydrates; proteins; fats; folic acid; vitamin D; iron; zinc

P1.59

Nutritional Status of Pregnant Women and Newborns Treated in an I-4 Health Centre in Iquitos-Perú

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Introduction: Anabolic activity during pregnancy increases maternal nutritional demands for almost all nutrients compared to pre-conception needs, as the fetus is nourished at the expense of the mother. The World Health Organisation (WHO) points out that poor nutritional status in pregnancy negatively affects the health of the mother, leading to the development of various risks, such as inadequate weight gain and anaemia. On the other hand, problems in the child have also been demonstrated, such as low birth weight, prematurity, anaemia, as well as decreased growth and cognitive performance in the first months and years of life.

Objective: To determine the relationship between the nutritional status of pregnant women and newborns, treated in an I-4 health centre in Iquitos-Peru.

Methods: Non-experimental, descriptive, correlational, cross-sectional research was conducted on 235 pregnant women aged 18 to 40 years and newborns. A nutritional assessment form for the pregnant woman, a nutritional assessment form for the newborn, and the Clinical Assessment of Nutritional Status score -CANS SCORE- were used as data collection instruments.

Results: Fifty percent of the pregnant women evaluated had a nutritional status according to normal pregestational BMI, and 34.90% were overweight. With regard to haemoglobin level, 85.10% of pregnant women reported a haemoglobin level without anaemia, 13.60% mild anaemia, 0.90% moderate anaemia, and 0.40% severe anaemia. The results of the CAN SCORE showed that 66.8% had normal nutritional status and 33.2% fetal malnutrition; all newborns had a haemoglobin level without anaemia.

Conclusions: A correlation was demonstrated between the variables pregestational BMI, haemoglobin of the pregnant woman, haemoglobin of the newborn, birth weight, weight for gestational age, head circumference, and nutritional status according to the CAN SCORE.

Conflict of interest: none

Keywords: pregestational BMI; newborn; birth weight; nutritional status

P1.60

Oropharyngeal Colostrotherapy in Very Low Weight Premature Infants to Strengthen Breastfeeding

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Introduction: The Departmental University Hospital of Nariño, in 2022, implemented the oropharyngeal colostrotherapy strategy in very low birth weight (VLBW) premature infants to strengthen breastfeeding.

Objective: Strengthen breastfeeding in VLBW premature infants with the oropharyngeal colostrotherapy strategy.

Methods: Retrospective quasi-experimental cohort study with historical controls, before and after the introduction of oropharyngeal colostrotherapy. 57 VLBW premature infants from 2019 without oropharyngeal colostrotherapy and 54 from 2022 with oropharyngeal colostrotherapy were included. Identification of VLBW premature infants and their mothers. Subsequently, colostrum extraction from hospitalized postpartum mothers. The extracted colostrum was administered 0.2 ml in ≤ 1000 grams, and 0.4 ml in premature infants weighing 1001 to 1500 grams, directly into the cheeks, every 3 hours for 15 days. The information was recorded in databases and daily interdisciplinary monitoring was carried out during their stay and upon discharge from the outpatient kangaroo program.

Results: In 2022, 96% of VLBW premature infants received oropharyngeal colostrotherapy, 47% of VLBW premature infants with colostrotherapy started enteral feeding with their own mother's milk, and in 2019 without colostrotherapy, 100% of premature infants started with human milk donated, evidencing with the strategy, the early start with her own mother's milk. 90% of VLBW premature infants with oropharyngeal colostrotherapy were discharged with exclusive or predominant breast milk, of which 74% continued breastfeeding during the first year of life, evidence of the effectiveness of the strategy.

Conclusions: The early extraction and administration of one's own mother's milk is a practice that increases the availability of breast milk during hospitalization and upon discharge. With the implementation of oropharyngeal colostrotherapy, it was possible to start enteral feeding with their own mother's milk in VLBW premature infants. The oropharyngeal colostrotherapy strategy strengthens, protects, and supports breastfeeding during hospitalization and during the first years of life, contributing to meeting the objectives of sustainable development.

Conflict of Interest: none

Keywords: colostrotherapy; oropharyngeal; breastfeeding; premature infants

Nutritional Epidemiology and Challenges of Public Health in Latina America

P2.01

Nutritional Inadequacy of Water-soluble Vitamins According to Nutritional Status in Adolescents from Highly Marginalized Communities of Chiapas, Mexico

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Introduction: The nutrition transition has shifted the Mexican population's eating habits. The consumption of high-calorie and nutrient-limited foods has led to inadequate micronutrient intakes even in subjects with overweight and obesity.

Objective: This study aimed to evaluate the nutritional inadequacy of water-soluble vitamins according to nutritional status in adolescents from highly marginalized communities of Chiapas, México.

Methods: This cross-sectional study included 240 adolescents from the *Tzotzil-Tzeltal* and *Selva* regions of Chiapas. Food intake was assessed using 24-hour dietary recalls. Total energy and nutrient intake were estimated using the Mexican Food Composition Tables. Nutrient inadequacy of vitamins was obtained by comparing the dietary intake with the age and sex-specific estimated average requirement (EAR) available for vitamins, in accordance with the guidelines of the Institute of Medicine. The Body Mass Index Z-score was calculated and categorized into normal weight and overweight or obesity. Differences between groups were analyzed using Chi-squared and Fisher's exact tests.

Results: Two hundred forty adolescents were evaluated, 47.5% were women and the mean age was 14.1 years. In subjects with overweight or obesity, a significantly higher prevalence of inadequate intake of thiamine (11.8%) was found when compared to the prevalence of inadequacy in adolescents with normal weight (2.3%). The same trend was observed for niacin and vitamin B6, although the differences did not reach statistical significance.

Conclusions: In highly marginalized communities of Chiapas, adolescents with overweight or obesity had a higher prevalence of nutritional inadequacy of thiamine than adolescents with normal weight.

Conflicts of Interest: none

Keywords: nutritional adequacy; water-soluble vitamins; overweight; obesity; adolescents; Chiapas-Mexico

P2.02

Development of a School Food and Nutrition Surveillance System for Obesity Prevention: Experience at the *Monseñor Gerardo Valencia Cano* Educational Institution

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Introduction: Countries like Chile and Brazil have implemented Food and Nutrition Surveillance Systems to collect information regarding the nutritional status of the population served by primary healthcare services. During the implementation of the Colon Cancer Prevention Project at the Monseñor Gerardo Valencia Cano Educational Institution (IEMGVC), the School Food and Nutrition Surveillance System (SISVANE) was developed, gathering data on students' nutritional and oral health.

Objective: The objective was to design a SISVANE that allows for the collection and analysis of data related to factors affecting nutritional health.

Methods: The information for consolidating SISVANE was collected from 2019 to 2022, including two components: nutritional health and oral health. The nutritional health component was evaluated through anthropometric measurements and the Healthy Eating Index. For oral health, the Simplified Oral Hygiene Index and caries risk assessment were used. The information was managed using the Power Bi application.

Results: A tool for collecting and analyzing data related to the nutritional status and food consumption of IEMGV students was developed. Variables can be cross-referenced to evaluate the relationship between the Healthy Eating Index and the nutritional and oral health status and filtered by age groups, gender, or evaluation period to compare progress over time.

Conclusions: The development of SISVANE has been fundamental in providing the Educational Institution with a tool that allows for self-management in monitoring changes in students' nutritional status. This process has involved and empowered students to become aware of their health situation, allowing them to prioritize matters they consider truly relevant. Additionally, SISVANE has enabled the periodic analysis of key variables for obesity prevention and visualizing the direction and trend of the nutritional status of the student population, facilitating informed decision-making.

Conflict of Interest: none

Keywords: obesity; prevention; nutritional surveillance

P2.03

What Role Do Critical Pedagogies Play in Food and Nutrition Education to Combat Childhood Obesity in the School Context?

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Introduction: In society nowadays, Food and Nutrition Education (FNE) emerges as an opportunity and possibility for promoting healthy eating habits and preventing health issues related to diet and nutrition. However, to ensure that this education is relevant and has real effects and/or results on the nutritional health of populations, it is imperative to approach it from a critical perspective and ensure that those in the role of educators (teachers, counselors) are adequately prepared and trained.

Objective: The objective of this work is to analyze how pedagogical practices of food education in school settings, from critical approaches, can combat obesity.

Methods: A review of the literature on FNE, critical pedagogies, and childhood obesity was conducted. Pedagogical theories such as those of Paulo Freire and Basil Bernstein were analyzed. Pedagogical practices in school settings were examined from critical approaches.

Results: Critical pedagogies in FNE question power structures, promote equity in access to food and address childhood obesity as a social phenomenon beyond individual factors. FNE from critical pedagogies empowers and mobilizes individuals/collectives and questions the structures that perpetuate childhood obesity in the school environment.

Conclusions: Pedagogical practices in FNE from critical approaches are consolidated as an opportunity and enabler, as they promote critical ways of understanding the phenomenon of malnutrition and empower/mobilize/promote (from cultural negotiation) the building of capacities in students and advocate for justice towards and for healthy and sustainable food in the environment in which they live and coexist, as well as perceiving the possibilities of transforming it critically.

Conflict of Interest: none

Keywords: pedagogy; education; obesity

P2.04

Sedentary Behaviors and Consumption of Ultra-processed Products in Uruguayan School-age Children

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Introduction: Lack of physical activity and high screen time have been associated with greater consumption of ultra-processed products (UP).

Objective: Analyze the association between physical activity, screen time, and UP consumption in children.

Methods: Data were obtained from the Third Round of the 2013 Cohort of the Uruguay Nutrition, Child Development, and Health Survey, which included 2474 girls and boys 5 to 11 years old. The survey included the number of days that the child watches TV, cell phone, tablet, or video games, and that attends a sports club. UP consumption during the last week (NOVA classification) was assessed qualitatively and analyzed for the present work as a dichotomy variable (YES: consumed one or more UP; NO: did not consume any UP). Nutritional status was evaluated according to WHO Growth Standards. For the statistical analysis, a weighted sample was used due to the sample complexity. Logistic regression models were tested with SPSS Version 25 software.

Results: Almost a quarter of the children presented excess malnutrition, with 17% overweight and 6% obese. Approximately 57% reported eating meals while watching screens and 75% daily screen exposure; 89% attended a club, with only 17% more than 3 times per week. Only 4% declared not consuming UP in the last week. Children who watched TV, tablet, or cell phone during meals had higher UP consumption (OR: 2.4). Those who regularly watched TV, cell phones, and video games reported greater frequency of UP consumption compared to those who did not watch any screens (p=0.000). With a longer time of daily exposure to screens, there was a greater probability of UP consumption (OR: 1.6 with ≥2, and OR: 3.6 with ≥4 hours), compared to those not exposed. No significant association was found between club attendance and UP consumption.

Conclusions: Exposure to screens constitutes a risk factor for UP consumption in Uruguayan children 5 to 11 years of age.

Conflict of Interest: none

Keywords: ultra-processed products; screen time; sedentary lifestyle; children

P2.05
Dietary Intake and Food Patterns of Indigenous Colombian Women During Pregnancy and Lactation: an Urgent Problem

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Introduction: Indigenous communities in Colombia face economic, political, and health disparities, particularly affecting women who experience significant challenges in nutrition and health. To address these needs, the Colombian Institute of Family Welfare (*Instituto Colombiano de Bienestar Familia - ICBF*) has been leading the National Study on the Food and Nutritional Situation of Indigenous Peoples of Colombia (*Estudio Nacional de la Situación Alimentaria y Nutricional de los Pueblos Indígenas de Colombia - ENSANI*) since 2013, due the lack of comprehensive data on their food and nutritional status.

Objective: To evaluate the dietary intake of Colombian indigenous women during pregnancy and lactation.

Methods: A cross-sectional descriptive study was conducted using secondary data from the dietary intake and nutrient component of the ENSANI, carried out between 2013 and 2019. Data from 1,028 pregnant and lactating women from 24 indigenous groups were collected using a 24-hour recall (24HR) adjusted dietary assessment system. Energy and nutrient intake were estimated using the Diet Analysis Plus (PC-Side®) software. Additionally, dietary patterns were determined using the Consumption Ratio Index (CRI). Statistical analysis included non-parametric tests and normality and homoscedasticity criteria, with a p-value < 0.05 considered significant.

Results: The study revealed that over 90% of Indigenous women during pregnancy and lactation had insufficient calorie and fat intake. Protein, iron, and calcium deficiencies affected more than 50% of these women, and consumption of dairy products, fruits, and vegetables was below 70% in both groups.

Conclusions: The gap between actual dietary intake and recommendations is alarmingly wide, underscoring the urgent need for effective interventions to improve the quality of diet in these vulnerable groups. Interventions should be adapted to regional and cultural particularities to enhance the health of both women and their children.

Conflicts of Interest: none

Keywords: breastfeeding; diet, nutrition, and food; indigenous women; nutrition for pregnant women

P2.06
Warning Labels on Foods: Are They Effective? A Systematic Review

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Introduction: Lifestyle changes have led to an increase in the consumption of ultra-processed foods, which are linked to the onset of chronic diseases. Several countries have implemented strategies such as front-of-package warning labels to address this issue. Different types of warning labels have been developed and studied, but there is no summary of the characteristics that might be most effective for behavior change.

Objective: To describe the characteristics of nutritional warnings (NW) and health warnings (HW) that are most effective in motivating behavior change.

Methods: The PRISMA methodology was used, searching four databases. Studies that addressed the use of NW and HW in front-of-package labeling were included, employing specific inclusion and exclusion criteria. Study selection was performed through the review of titles, abstracts, and keywords. Relevant information was extracted, including demographic data, characteristics of experiments, and results related to behavior change. A total of 15 articles were included in the systematic review.

Results: Key characteristics for the effectiveness of NW included geometric shapes associated with STOP signs, black color, the word "excess," and placement in the top left corner. For HW, effective features included white background, black text, borders, images/icons, attribution to health agencies, and the

inclusion of the word "Warning." The review highlights the lack of HW evidence in Latin America and the need to investigate their effects on younger and adolescent populations. It also emphasizes the importance of considering factors such as brand influence, price, and other marketing strategies, as well as the need for studies in real-world shopping scenarios.

Conclusions: This review contributes to the growing evidence regarding the effectiveness of warning labels on ultra-processed products, summarizing the characteristics that are relevant in designing such labels to induce behavior change. It exposes gaps related to conditions that may mediate this effectiveness.

Conflicts of Interest: none

Keywords: front-of-package labeling; behavior change; obesity

P2.07
The Ability of Adolescents to Identify Vegetables and Fruits as an Important Skill for Making Healthy Dietary Decisions

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Introduction: Low consumption of fruits and vegetables in young people is a long-standing global problem, whose chronicity may be so widespread that it currently impacts their ability to recognize and identify these foods. It poses an enormous challenge for nutrition education since identifying fruits and vegetables represents an important skill for adolescents to make healthy dietary choices.

Objective: Identify the ability to recognize local foods, fruits, and vegetables in *Puerto La Cruz*, Venezuela.

Methods: A cross-sectional study was conducted in 1322 adolescents of both sexes from the city of Puerto La Cruz, Venezuela. Direct and individual interviews, where each participant was asked to verbally identify the 20 foods presented in a photographic laminar. The images were displayed on a laptop computer, with 60 seconds to identify the food before the next image appeared. A dietitian-nutritionist recorded whether the foods were correctly identified or not. To check the distribution of the data, the Shapiro-Wilk test of the Stata software was used. To test for statistically significant differences, Pearson's chi-square test and Fisher's exact test were used. In addition, we ran Poisson regression and negative binomial regression models to examine sex- and age-adjusted predictions of the number of correctly recognized foods.

Results: With only 7 foods correctly identified (median; IQR:6) the performance in this sample was alarmingly poor; finding substantial and significant differences according to sex, with even worse performance in male adolescents.

Conclusions: The low ability to correctly identify vegetables and fruits suggests that nutrition education in Venezuelan adolescents deserves urgent attention as a public health problem. This problem has implications for the nutritional food situation of the country and constitutes a major obstacle to national dietary strategies and guidelines, which aim to improve nutrient intake in this particularly vulnerable population group. The level of nutritional literacy of the participants should always be a premise to be considered before any nutrition education intervention.

Conflicts of Interest: none.

Keywords: adolescents; fruits; vegetables; diet; nutrition education

P2.08
Nutritional Status According to BMI and Eating Behavior in Chilean Adults

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Introduction: Excessive malnutrition in Chile is one of the biggest public health problems affecting different age groups and socioeconomic levels. One of the factors responsible for this situation is the modification of dietary patterns due to eating behavior that can be affected by emotions of anxiety, boredom, and loneliness.

Objective: The objective of the study is to characterize the nutritional status and eating behavior of adults in the Metropolitan Region of Chile.

Methods: Descriptive, non-experimental study. The sample consisted of 383 Chilean adults between 18 and 60 years old (288 were women and 95 were men). Nutritional status was determined by calculating BMI from weight and height. To evaluate eating behavior, the food questionnaire (TFEQ) validated for the Chilean adult population was applied. The participants signed an informed consent. A descriptive analysis of the study variables was performed.

Results: The average age of the participants was 30.3 years, the average weight was 72.5 kg, the average height was 163.5 and the average BMI was 27.1. 34.5% of those evaluated were overweight and 24.8% were classified as obese. 18.7% say that when they smell or see a delicious meal, they find it very difficult to stop themselves from eating, even if they have just finished eating; 14.8% say that sometimes they start eating and can't seem to stop; 14.3% of respondents say that when they see some delicious food, they feel hungry and have to eat immediately; 14.1% said they are always so hungry that it is difficult to leave food on the plate and 14.3% say they are always hungry enough to eat at any time.

Conclusions: Eating behaviors affect self-control of food intake, representing a significant dietary risk, as people prefer the intake of ultra-processed foods, which favors an increase in the prevalence of obesity and overweight.

Conflict of interest: none

Keywords: nutritional status; eating behavior; obesity; BMI

P2.09

Prevalence of the Double Burden of Malnutrition and Associated Sociodemographic Factors in Women of Childbearing Age 15–49 Years in Panama 2019

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Introduction: The double burden of malnutrition (DBM) is the co-occurrence of problems of overweight (OW) and nutritional deficiencies, such as anaemia. The global nutrition targets and Sustainable Development Goals seek the reduction of anaemia in women of childbearing age (WCBA) and an end to all forms of malnutrition.

Objective: The objective of the study was to estimate the DBM and its associated socio-demographic factors in WCBA in Panama for the year 2019.

Methods: Using data collected from the National Health Survey of Panama (ENSPA) (n=17,997) with a random, tri-stage, cluster sampling design. The ENSPA included 8,608 WCBA aged 15-49 years. For the present analysis, 2,212 WCBA who participated in the biomarker subsample, with a Body Mass Index (BMI) ≥ 18.5 kg/m2 and complete anthropometric information, were included. Anaemia was defined as haemoglobin (Hb) < 12 g/dL. DBM was defined as the co-occurrence of BMI ≥ 25 kg/m2 and anaemia (OW&A) or central obesity (CO) (waist/height ≥ 0.5) and anaemia (CO&A). Logistic regressions were used to assess the association between age, area, monthly household income, employment status, and DBM.

Results: The prevalence of anaemia was estimated at 24.3%, falling mainly in the mild (Hb 11.9-11.0 g/dL) and moderate (Hb <8 g/dL) anaemia categories. The OW was 75.5% and the CO was 80.6%. DBM defined as OW&A was 18.7%, while CO&A was 20.8%. Compared to women aged 15-19 years, age 40-49 years was associated with DBM (OR 2.88 (95%CI 1.22-6.79); OR 2.90 (95%CI 1.16-7.25) defined as OW&A and CO&A respectively.

Conclusions: This nationally representative study indicated that a quarter of WCBA suffer from anaemia, and more than 70% suffer from central or peripheral obesity. One in five women have DBM, with differences according to age.

Conflicts of Interest: none

Keywords: double burden of malnutrition; overweight; central obesity; anaemia; Panama; ENSPA

P2.10

Nutritional Status and Food Consumption Patterns of Older Adults Attending the Day Center Program in the Municipality of *Sibaté*

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Introduction: Colombian older adults are 62.9% overweight (overweight and obese) and present a state of vulnerability due to their low income and educational level (SABE, 2015), which influences the consumption pattern. To ensure that they do not suffer from hunger in *Sibaté* and improve their quality of life, there is the *Centro Día* Program, in which the elderly are provided with between 1–3 meals per 1-2 days/week.

Objective: Describe the nutritional status and food consumption habits of older adults who attend the Day Center Program of the municipality of *Sibaté* during the year 2023.

Methods: Descriptive observational study, with the participation of 368 older adults out of a total of 581 enrolled in the *Centro Día* program in the municipality of *Sibaté*, Cundinamarca (Colombia). All those present in the field operation were censused; those identified with mental illness were excluded, given the impossibility of understanding informed consent. A survey on consumption habits was applied, and anthropometric measurements were taken (weight, height/average wingspan, waist, and calf circumference) to evaluate nutritional status. The analysis was performed in Excel.

Results: 66% of the participants were women with an average age of 71.5 SD ±8.1 years, 66% had non-communicable diseases. In relation to nutritional status by BMI, 46% were overweight (overweight/obese), higher in women (34%) than in men (12%), and 4% were underweight. The cardiovascular risk was 60%, the risk of sarcopenia was 10%. Concerning the recommended daily consumption, 40% met the consumption of whole fruit, 39% of vegetables, 36% of milk and dairy products, 32% of eggs, and 72% of water. 46% consumed legumes 2 or more times/week. 24.2% ate two or fewer main meals a day.

Conclusions: The *Centro Día* program requires affecting the nutritional status and inadequate eating habits to improve the quality of life and ensure the human right to food of older adults.

Conflict of Interest: none

Keywords: nutritional status; healthy lifestyle; nutrition assessment; aged; diet, healthy

P2.11

Let-7c MiRNA Expression and its Relationship with AGEs/sRAGE in People with Down Syndrome

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Introduction: Down syndrome (DS) is one of the most prevalent genetic disorders, with an increased risk of cardiovascular disease, diabetes, dyslipidemia, metabolic syndrome, and Alzheimer's disease, attributable to the presence of extra genetic material from chromosome 21. Within chromosome 21 lies the miRNA gene let-7c, which has essential functions in neuronal development. *In silico* analysis of this gene shows its significant potential to regulate the advanced glycation end products (AGEs)/AGE receptor (RAGE) signaling pathway, implicated in multiple pathological processes and triggered by oxidative stress, a frequent process in DS. However, the soluble RAGE (sRAGE) concentration may mitigate this deleterious response. Therefore, studying the molecules associated with the AGEs/sRAGE pathway in DS could help to elucidate potential biomarkers of disease risk and identify viable therapeutic targets.

Objective: To determine let-7c expression and its relationship with AGEs/sRAGE levels and health risk indicators in individuals with DS.

Methods: Individuals with DS were compared to eugenics using anthropometric assessments and blood biochemical profiles. The Let-7c-5p expression was quantified from plasma by qPCR, while AGEs and sRAGE were measured using fluorescence and ELISA, respectively.

Results: Individuals with DS showed an unfavorable lipid profile compared to the control group, characterized by high triglyceride and low C-HDL levels. Moreover, children and adolescents with DS presented significantly elevated AGEs and lower sRAGE concentrations ($p < 0.001$).

Conclusions: The DS population has a higher risk of developing dyslipidemias, mainly hypertriglyceridemia and low C-HDL. In addition, there is a higher AGEs/sRAGE relationship associated with DS, potentially diminishing the protective role of sRAGE and exacerbating the development of chronic degenerative diseases.

Conflicts of Interest: none

Keywords: down syndrome; let-7c; AGEs/sRAGE; lipid profile

P2.12

Reading of Nutritional and Frontal Labeling, Its Relationship with Pathologies and Perception of Health

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Introduction: Countries have been implementing several front-of-package food labeling models for the general population. In order to evaluate whether the information received is understood by consumers with various pathologies, a series of bachelor's theses were developed that constitute a line of research on the subject and research work to do by the Barceló Foundation (FB).

Objective: Analyze consumer food choices and their relationship with previous pathologies and health concepts.

Methods: Analysis of works related to the subject published in the FB repository. 2020/23, with a total sample of 2602 respondents over the age of 18.

Results: The analysis of the studies showed positive correlations between the reading of labels and metabolic diseases, food allergies, and kidney diseases with the reading of labels, while negative correlations were indicated for cardiovascular pathologies, overweight, and obesity. Sugar is the most frequently read and the least read is gluten-free. Regarding the concept of healthy, a segmentation was found with respect to age and level of education, favorable to older people with a higher level of education and this perception could be modified with the information on the warning label. Dairy products were the healthiest. Well-being was associated with healthy.

Conclusions: The need for access to nutritional information is detected, and they accept that it was with a QR code, and the importance of specific labeling linked to food-related pathologies is warned. The term healthy was linked to well-being, and it is relevant to know that word in consumers to communicate.

Conflict of Interest: none

Keywords: pathologies; labeling; healthy; food; information; perception

P2.13

Pattern of Food and Nutrient Consumption in Paraguay According to Availability Year 2021

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Introduction: The present research work was based on the study of the Food Balance Sheets, pertaining to Paraguay in 2021, published by the FAO on its website. The study was developed by students of the nutrition career (Faculty of Health Sciences, Catholic University).

Objective: To determine the pattern of food and nutrient consumption in Paraguay according to availability in the year 2021.

Methods: Observational, descriptive study, based on the study of the Food Balance Sheet, pertaining to Paraguay, corresponding to the year 2021, published by FAO. Some of the variables considered are: Percentage of daily calorie intake per capita; contribution by each of the food groups; Percentage of calories contributed by carbohydrates, proteins, fats, and alcohol; Percentage of daily protein and fat intake per inhabitant, according to food groups.

Results: In 2021 the total caloric intake per capita was 3091 kcal/day; carbohydrates accounted for 64.3%, proteins 9.5%, and fats 26.2%. Among the food groups, cereals accounted for 39%, tubers 17%, vegetable oils 12.4%, meats 6.3%, alcohol 4.4%, dairy products 4.3%, sugar 4.2%, legumes 3%, fruits 2.9%, animal fats 2.6%, eggs 1.8%, vegetables 1.4%, and nuts and seeds 0.4%. Regarding carbohydrates, cereals contributed 50.9%, tubers 25.7%, alcohol 6.5%, fruits 3.7%, and legumes 3.1%. Dairy products and vegetables made lesser contributions. For proteins, cereals contributed 37.8%, meats 25.6%, legumes 8.8%, dairy products 8.6%, and eggs 6.9%, with tubers, vegetables, and fruits contributing less significantly. Regarding lipid intake, vegetable oils contributed 47.6%, meats 14.4%, cereals 10.6%, animal fats 9.8%, and dairy products 8.6%, with eggs, fruits, and nuts contributing to a lesser extent.

Conclusions: Cereals and tubers are the main sources of calories, while vegetable oils are the main caloric source of lipids. Red meat and dairy products significantly contribute to protein intake, fish consumption is scarce. Fruits and vegetables contribute minimally to caloric intake compared to other food groups.

Conflicts of Interest: none

Keywords: consumption pattern; food; nutrients, FAO; balance sheets

P2.14

Prevalence of Celiac Disease and Risk Haplotypes in People with Down Syndrome in Mexico

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Introduction: Celiac disease (CD) is an autoimmune condition triggered by gluten consumption, a composite of proteins in wheat, rye, and barley. It exerts its effects on the mucosa of the small intestine, inducing gastrointestinal and extraintestinal symptoms. Notably, individuals with Down syndrome (DS) exhibit a higher incidence of CD compared to the general population (5% vs. 1%, respectively). Furthermore, the presence of HLA-DQ2 and DQ8 haplotypes associated with CD susceptibility is particularly relevant in individuals with DS. An in-depth comprehension of CD prevalence and associated factors, including the HLA-DQ2 and DQ8 haplotypes in the context of DS, is crucial to understanding its health implications and improving the nutritional and clinical management of this population.

Objective: To identify the clinical prevalence and risk haplotype of celiac disease in individuals with Down syndrome.

Methods: Eighty-six participants diagnosed cytogenetically with DS were enrolled, and anthropometric measurements, clinical history, and biochemical analyses were performed. IgA- and IgG- antigliadin, as well as IgA-antitransglutaminase autoantibodies, were quantified by ELISA for CD diagnosis. Additionally, real-time PCR was utilized to identify the HLA-DQ2 and HLA-DQ8 haplotypes.

Results: Among the 86 participants, 4.6% tested positive for autoantibodies associated with CD. Within this subset, 50% had the DQ2 and DQ8 haplotypes, whereas the remaining had at least two risk alleles; one participant presented gastrointestinal symptoms and obesity. Of all participants, 98.8% had at least one risk allele, with 26.7% testing positive for both DQ2 and DQ8 haplotypes and 44.1% possessing at least one haplotype. Only one participant lacked any risk allele.

Conclusions: 4.6% of the participants were diagnosed with CD, all of whom had risk alleles, and at least half possessed the HLA-DQ2 and DQ8 haplotypes. Notably, 98.8% have risk alleles for CD, with the DQ2 haplotype being the most prevalent. These findings suggest that DS is characterized by genetic variations and heightened autoimmune susceptibility, leading to an increased risk of CD.

Conflict of Interest: none

Keywords: celiac disease; down syndrome; IgA-antitransglutaminase; IgA-antigliadin

P2.15

Expression of MiR-33, ApoE Gene Variants, and HDL Cholesterol as Risk Factors for Alzheimer's in Down Syndrome

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Introduction: Down syndrome (DS), characterized by the presence of an extra copy of chromosome 21, stands as the most prevalent chromosomopathy. It has an estimated incidence of 12 cases per 10,000 individuals. Over recent decades, there has been a notable increase in the life expectancy of this population, escalating from 5 years in 1950 to around 60 years at present. This longevity extension has contributed to the rise in the incidence of associated diseases in this population. At the same time, it has facilitated the possibility of carrying out more disease risk studies in adult patients. Recent investigations have shown the role of

apolipoprotein E (APOE) in lipid transport and its potential implications in diseases such as Alzheimer's. Furthermore, research has extended to microRNA miR-33, which influences the biogenesis of high-density lipoprotein (HDL) cholesterol by regulating the expression of ABCA1. Notably, HDL has been implicated in higher cognitive impairment risk, which can lead to Alzheimer's disease.

Objective: Establish the expression of miR-33, APOE isoforms, and HDL cholesterol as risk factors in Down syndrome.

Methods: A cross-sectional cohort study was carried out on people with Down syndrome, aged between 3 and 18 years of both sexes and compared with a control group. Blood samples were collected for biochemical analyzes. Quantification of miR-33 was performed by real-time PCR from plasma. Genotyping of APOE isoforms was performed using TaqMan Applied Biosystems probes.

Results: Short stature was observed in the DS group compared to the control group, in addition to significantly lower levels of HDL-C. miR-33 was found to be decreased in the SD group. However, the risk-related APOE ε4 allele was associated with lower HDL-C concentrations in the DS group.

Conclusions: An association was observed between APOEε4, a known risk factor, and low HDL-c concentrations in this population. This finding suggests that the risk genotype may be associated with low HDL concentration, which in turn could perhaps be considered a risk factor for the early onset of Alzheimer's disease.

Conflicts of Interest: none

Keywords: down syndrome; apolipoprotein E; miR-33; HDL cholesterol

P2.16

Fruit and Vegetable Carotenoids Intake in Eight Latin American Countries, Results from the ELANS Study

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Introduction: Carotenoids are hydrophobic phytochemicals synthesized by plants. Dietary sources are colorful fruits and vegetables and although they are not considered essential nutrients, important benefits are associated with their intake. Three carotenoids (beta and alpha- and beta-cryptoxanthin) can convert to vitamin A and represent a significant source of retinol, especially in Latin American countries.

Objective: To determine carotenoid intake from fruit and vegetable sources in the ELANS participating countries.

Methods: Data were obtained from the Latin American Health and Nutrition Study (ELANS), a multicenter study developed in urban areas of 8 countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Peru, and Venezuela. Dietary intake among 9218 participants (15- 65 y) was assessed using two 24-hour recalls and processed by Nutritional Data System for Research (NDS-R). Usual intake was estimated using the Multiple Source Method. Fruits and vegetables were classified according to the 2002-2007 FAO Supply Utilization Accounts Data. Major food sources of carotenoids were assessed using weighed-proportions formula developed by Block (1985).

Results: Ecuador reported the highest intake of alpha and beta carotene and lycopene, while Venezuela showed the highest consumption of beta-cryptoxanthin. The lowest intakes were reported in Brazil (carotenes and beta-cryptoxanthin) and Peru (lycopene). Carotenoid main dietary sources were root vegetables (carrots and beets), fruity vegetables (tomatoes and peppers), and fruit juices.

Conclusions: Despite having sources available all year round, most countries did not meet the recommended daily intakes for

any carotenoids. Further studies are needed to assess bioavailability and serum concentrations in order to establish dietary recommendations regarding both pro-vitamin and non-pro-vitamin A carotenoids.

Conflict of Interest: The ELANS was supported by a scientific grant from the Coca-Cola Company and support from the authors' institutions and universities. The funders had no role in study design, data collection, and analysis, the decision to publish, or the preparation of this abstract.

Keywords: carotenoids; fruits; vegetables; Latin America

P2.17

Misperception of Nutritional Status and Associated Factors among Latin-American University Students

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Introduction: The phenomenon of body image distortion is prevalent among adolescents and young adults, largely influenced by external factors that shape their perceptions of physical appearance, lifestyle choices, and dietary habits.

Objective: This study aimed to examine the prevalence of body weight misperception and its relationship with diet quality in Latin American university students.

Methods: Cross-sectional study. Data were obtained from 4884 university students from 11 countries who answered a survey through Google Forms® were analyzed. Participants were asked about their perception of their nutritional status, current weight and height, eating habits, and lifestyles. Diet quality was assessed using a scoring system with their frequency of food consumption.

Results: 24.9% of the total sample (22.5% of women and 31.7% of men) reported an erroneous perception of their nutritional status. This percentage was higher among Guatemalan participants (36.2%) and lower among Colombians (17.8%). Some 12.3% of the women and 8.2% of the men perceive themselves to be heavier than they really are. In the case of those who perceive themselves to be lighter than they really are, the percentage was higher in men than in women (23.5% vs. 10.2%). Those who perceived their weight correctly also reported a higher diet quality score (64.5 vs 61.9 points, $p<0.001$), and a lower BMI (23.5 vs 25.1 m/kg^2, $p<0.001$).

Conclusions: A quarter of the participants did not perceive their body weight correctly. Men were more likely to underestimate weight, and women were more likely to overestimate weight. Participants who perceived their weight correctly also reported better diet quality and lower BMI. Understanding these results and their association with sociodemographic and dietary factors is essential for the development of programs to promote self-awareness of nutritional status.

Conflicts of Interest: none

Keywords: body weight; body weight perception; Latin America

P2.18

Food Security, Nutritional Status and Anemia in Children, Adolescents, and Young People Living in Mexican Penitentiaries

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Introduction: Upbringing in conditions of deprivation of liberty is a complex situation little studied that directly affects health and nutritional status (NS) in children, adolescents and young people in developing countries. Food security (FS) as an inalienable right is limited in children raised in prison, favoring nutritional disorders and the presence of anemia (A).

Objective: To assess the association between SA, FS, and A in infants and young people living in Mexican penitentiaries.

Methods: Cross-sectional study in 43 minors living in prison. Of the total number of participants, 18 children under three years of age lived with their mothers inside the prison, and 25 adolescents and youths were deprived of liberty for having had conflicts with the law. The FS was identified by means of a questionnaire. Anthropometric measurements were obtained to calculate the indicators: weight/age, height/age, weight/height, and body mass index (BMI), A was identified by capillary hemoglobin. Fisher's exact or chi-square tests were used to compare the proportions of NS and A by FS. The level of statistical significance in all analyses was considered when $p \leq 0.05$.

Results: Ninety percent under-threes, 6.0% presented low weight/age, 11.0% high weight/age, and 6.0% low height/age. Thirty-three percent had low weight/height, and 17.0% were overweight or obese. Regarding BMI, 39.0% were undernourished. The combined prevalence of overweight-obesity was found in 54.0% of adolescents and young people. Low hemoglobin was identified in 13.0% of children under three years of age.

Conclusions: In this population deprived of liberty, food insecurity predominates. Acute malnutrition, anemia in children under three years of age, and overweight-obesity in adolescents and young people are the most prevalent NS disorders. This situation should be addressed in a multidisciplinary manner, prioritizing the right to health in children raised in prison.

Conflicts of Interest: none

Keywords: food security; nutritional status; children; youth; prison

P2.19

Characterization of Dietary Patterns in Colombia

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Introduction: Identifying dietary characteristics and recognizing components that may suppose health risk are necessary actions to promote the adoption of practices aimed at mitigation.

Objective: This study aimed to analyze, in the Colombian dietary pattern, homemade culinary preparations and treatments associated with acrylamide.

Methods: Dietary pattern and culinary treatment identification were conducted using consumption information from two 24-hour recalls applied to the adult population (18–64 years old), N = 1464 subjects, from the country's representative sample of the National Survey of Nutritional Situation of Colombia, ENSIN 2015. Variables such as sex, age, ethnicity, type of population, wealth index, geographic regions, weight, and height were considered. Consumption estimation considered variables such as food groups, categories, consumed portions, and consumer rates. Consumption frequencies of foods and preparations under specific processing techniques were estimated. Pattern derivation was performed using Principal Component Analysis (PCA). Components were rotated using orthogonal transformation (Varimax). Kaiser- Meyer-Olkin sampling adequacy measure (KMO) and Bartlett's test of sphericity values were >0.7, and factor loadings >0.3 were considered. Regional and consumption differences were assessed using descriptive statistics.

Results: Estimated rates show that high percentages of the analyzed population reported consuming energy sources such as cereals and derivatives; tubers, roots, and bananas; fats and oils; sweets, sugar, and/or *panela*. Two dietary patterns were identified: the "traditional pattern" and the "Westernized pattern." Regarding culinary treatment patterns, the "traditional pattern" (boiled, fried, untreated) and "alternative patterns" (grilled, grilled on a flat metal plate, baked, and microwaved) were found.

Conclusions: The identified dietary patterns resemble those of populations in the process of nutritional transition. This condition, coupled with the frequent consumption of preparations with starchy foods and fried foods, could suppose a risk factor for the formation of thermal contaminants such as acrylamide.

Conflicts of Interest: none

Keywords: dietary patterns; eating behavior; food preparation

P2.20

Application of Linear Programming to Model a Healthy Diet of Minimum Cost for Schoolchildren in the Eastern Region of Honduras

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Introduction: The use of linear programming is a tool that can help in modeling diet-related problems. It can be used to formulate minimum-cost menus while ensuring that it meets all dietary criteria. Therefore, it can become key to formulating appropriate diets and identifying the most economical possible combination of food ingredients that meets nutritional requirements.

Objective: To apply linear programming to model a healthy minimum-cost diet for children aged 6 to 12 years in the eastern region of Honduras.

Methods: The study is a cross-sectional, descriptive study. Linear programming was used to estimate the cost of diet using the Solver add-in in Excel. The objective function of the diet cost was minimized using two elements: 1) the food prices of the eastern region taken from the database of the Honduran Agricultural Products Market Information System for 2022 and 2023, 2) food composition tables from INCAP 2018. The function was subject to restrictions based on nutritional requirements for children aged 6 to 12 years.

Results: The average minimum cost of a healthy diet for a schoolchild was HNL 1083.62 (USD 43.94) per month. This diet comprised a total of 16 foods that cover the nutritional requirements of macronutrients and micronutrients in schoolchildren, among those with the highest contribution were green cabbage, orange juice, *pipian*, white cassava, fresh fish and small cucumber, foods that are locally accessible.

Conclusions: The use of linear programming had significant implications for estimating the minimum cost of a healthy diet for children from low-income households. Its potential for designing school feeding programs where the aim is to work on the formulation of menus with low-cost local foods, but with a high nutritional value, is highlighted.

Conflicts of Interest: none

Keywords: nutritional deficiencies; healthy diet; dietary intake; linear programming

P2.21

Dietary Intake and Physical Activity of Schoolchildren in Rural Honduras: Their Contribution to SDG 2

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Introduction: Malnutrition is a substantial problem in the world population, characterized by nutritional imbalances. This problem affects the physical and mental health of human beings, especially children, compromising their ability to learn and develop as a whole. In addition, the lack of access to nutritious food and adequate health services further aggravates the situation of school-age children. Addressing this issue allows promoting equity and ensuring a good nutritional status through school feeding programs and policies.

Objective: To identify the food consumption and nutritional status of school children in rural Honduras.

Methods: This was a descriptive cross-sectional study of 64 schoolchildren aged 8 to 12 years in the eastern valley of Honduras. Physical activity questionnaires and food consumption records in the last 24 hours were applied. Anthropometric and biochemical measurements were also taken. Dietary intake data were analyzed in Food Processor® and the databases in JASP 0.16.3.0®.

Results: The results show that 77.1% were moderately physically active. Deficits in calories, macronutrients, and fiber, and deficiencies in micronutrients (calcium, iron, zinc, vitamin A, and vitamin C) were identified. The schoolchildren had a high consumption of ultra-processed foods, mainly soft drinks and juices. The 96.9% were estimated to have normal height for age. The average body mass index was 17.47 kg/m2; 4.7% were undernourished, 15.6% were at risk of being overweight, and 7.8% were overweight. Anemia was present in 7.7% of schoolchildren.

Conclusions: There was a deficit in the dietary intake of key nutrients for their development and a tendency towards being overweight. Interventions are required to promote optimal health in schoolchildren.

Conflicts of Interest: none

Keywords: nutritional status; dietary habits; malnutrition

P2.22

Intervention with Cashew Nuts and Nutritional Guidance Based on Regional Food Helps Reduce the Double Burden of Malnutrition in Adolescents with Obesity: A Randomized Clinical Trial

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Introduction: The double burden of malnutrition (DBMN) is the simultaneous presence of malnutrition and overweight/obesity, a condition favored by the nutritional and epidemiological transition, which mainly affects the pediatric population. A diet based on regional fresh and minimally processed foods may help to improve dietary deficiencies and reduce obesity in this population.

Objective: To determine the prevalence of DBMN in adolescents with obesity before and after intervention with natural cashew nuts and nutritional guidance based on regional food.

Methods: This was a randomized clinical trial with adolescents diagnosed with obesity from the Fortaleza-CE municipal school system. The participants were allocated into two groups: intervention (IG) (n=71) who received daily supplementation of 30g of fresh cashew nuts for 12 weeks; and control (CG) (n=65). Both groups received nutritional guidance based on the Dietary Guidelines for the Brazilian population, focusing on regional food. After 12 weeks, 57 participants completed the study in the IG and 25 in the CG. Serum iron and plasma zinc concentrations were obtained before and after the intervention. DBMN was considered when one of the markers of malnutrition - anemia or risk of zinc deficiency - coexisted with obesity, which was present in all the participants in the sample. The data was presented in percentages.

Results: Considering the two periods evaluated, the prevalence of anemia in the CG went from 29.2% to 20%, while in the IG it fell from 35.7% to 20.8%. Regarding the risk of zinc deficiency, there was a reduction in prevalence from 47.7% to 28% in the CG and from 71.4% to 37.5% in the IG. As for DBMN, the prevalence was similar in the CG at both times (47.7% and 48.0%, respectively), while in the IG there was a reduction from 82.9% to 50.0%.

Conclusions: Cashew nut consumption combined with nutritional guidance seems to help reduce anemia and zinc deficiency and, consequently, reduce DBMN in adolescents with obesity.

Conflict of interest: none

Keywords: malnutrition; obesity; adolescents; cashew nuts

P2.23

Longitudinal Study on the Effect of the COVID-19 Pandemic on Economic Income and Access to Food in Families in Oaxaca, Mexico

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Introduction: Mexico is a country with great diversity. Even before the COVID-19 pandemic, this heterogeneity was already observed between the different states of the country. The state of Oaxaca is recognized for its cultural wealth; however, until a few years ago, it has also been recognized as one of the most disadvantaged in terms of its indicators of social deprivation, in addition to presenting high malnutrition rates. There is uncertainty due to the impact of the COVID-19 pandemic on indicators of social deprivation in the most vulnerable areas of Mexico such as Oaxaca.

Objective: Compare the socioeconomic level and access to food at the beginning of the COVID-19 pandemic and 18 months later in the adult population of Oaxaca, Mexico.

Methods: Longitudinal study with adult residents of Oaxaca. Families responded to a survey on LimeSurvey (March 2020 and September 2021). Age, gender, education, and income/month were asked and access to food was measured with the ELCSA Scale.

Results: Of 500 participating families, 62.2% lost their food security status during the pandemic. Families surviving on less than $4,000 a month went from 8.6% to 74.6%. After 18 months of living in isolation, 74.4% of this population moved to a low-low SES and 53.4% of them suffered from a reduction in the quality and quantity of food due to lack of access, even finding that 7.2% of the population lived at least one experience of hunger due to lack of access to food.

Conclusions: This is the first longitudinal study in the state of Oaxaca that analyzes the effect of the COVID-19 pandemic on indicators of social deprivation. It is a great challenge to ensure that the entire Oaxacan population can consume sufficient, nutritious, and quality food, therefore, it must be faced by different sectors, not only the government but also the social and family sectors. This study will lay the foundations for implementing strategies to consolidate sustainable, quality agriculture that permanently improves indicators of social deprivation.

Conflicts of Interest: none

Keywords: food security; Oaxaca; economic income; access to food

P2.24

Food and Nutrition Literacy: Application of an Assessment Instrument in Adult Women in the Coquimbo Region, Chile 2024

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Introduction: In Chile, the 2016-17 national health survey shows that more than 75% of the Chilean population suffers from malnutrition due to excess, present in greater proportion in women, groups with lower educational and socioeconomic levels. Food and nutrition literacy are key concepts associated with nutritional status that describe, in different dimensions, the knowledge and ability to obtain, interpret, and understand basic food and nutrition information and services, as well as the competence to use this information and services to improve health. Both concepts are modifiable through educational strategies specially designed according to the needs and characteristics of the population.

Objective: To evaluate and characterize nutrition and food literacy in adult women in the Coquimbo region, Chile 2024.

Methods: Quantitative, observational, descriptive, and cross-sectional study to evaluate nutrition and food literacy with the application of a validated instrument for Chilean women, through a Google form to adult women in the Coquimbo region, Chile 2024.

Results: To identify the dimensions with greater and lesser strengths of nutrition and food literacy in adult women in the Coquimbo region and their correlation with the sociodemographic characteristics of the participants.

Conclusions: The results of this research, which is currently in development, will allow the design of educational strategies to improve decision-making regarding food and nutrition and reduce the social impact and gender gap of overweight and obesity. This research is part of the research project to obtain the degree of Doctor in Public Health from the International Iberoamerican University - UNINI Mexico and under the "Doctoral Support" of ANID from the InES Gender Project "University in Equality", INGE code 210022.

Conflicts of Interest: none

Keywords: literacy; nutrition; food; diet

P2.25

Child Abuse and Parental Monitoring to Eat

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Introduction: Violence against children (VAC) is a serious public health problem with short- and long-term consequences. However, to date, limited research has shown the relationship between VAC and detrimental parental child-feeding practices (PFP).

Objective: The aim of this study was to investigate the association between VAC and parental feeding monitoring (PFM) in children aged 2 and 5 years attending Basic Health Units in the city of Rio de Janeiro.

Methods: We conducted a cross-sectional study with 180 mothers between 2015 and 2017. VAC and PFM were measured using the Brazilian versions of the Parent-Child Conflict Tactics Scales (CTS-PC) and the Child Feeding Questionnaire (CFQ), respectively. VAC was classified as non-violent discipline, psychological aggression or physical violence, and both (psychological aggression and physical violence). PFM practices were categorized as dichotomous (≤ 4.0 and >4.0 mean score). Associations were examined using logistic regression analysis and adjusted odds ratio and 95% confidence intervals were calculated. The analysis was adjusted: child's age, maternal age, maternal schooling, and social support.

Results: The adjusted analyses showed that guardians who perpetrate psychological aggression or physical violence against their children are approximately four times more likely to monitor their children's diet in the first years of life (OR=3.95; 95% CI=1.30-11.99; p=0.015).

Conclusions: Findings revealed that VAC was associated with high levels of parental monitoring of feeding. These findings emphasize the importance of understanding the relationship between VAC and PFP in order to build actions, to prevent VAC and promote positive PFP.

Conflicts of Interest: none

Keywords: child abuse; parental feeding practice; monitoring to eat

P2.26
Front-of-Package Labeling: Knowledge of Front-of-Package Warning Seals and Their Relationship to Food-Related Pathologies

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Introduction: In Latin America, seals have been placed for the critical content of sugars, fats, saturated fats, trans fats, calories, sodium, sweeteners, and caffeine, with calls for attention such as "high in" or "excess in" as a warning to the community.

Objective: Analyze the perception and understanding of front seals on packaged foods and find out the knowledge of the pathologies that are associated with these seals.

Methods: A total of 288 people were surveyed in Argentina, 72% of women, 27% of men, and 0.35% did not indicate gender, the age range was 25 to 34 years old with 58%, from 35 to 44 years old 66% and from 45 to 54 years old 71%. 47% of the sample have an independent occupation and 38% are teachers. 81% had studied up to university. A survey was used from Google Forms that was distributed on social networks and WhatsApp.

Results: 60.8% of the sample believes that seals can help in making healthier choices. When asked about the label and the relationship with pathologies, it was found that only 1 person associated "excess sugar" with overweight/obesity and hypertriglyceridemia, 8 acknowledged not knowing the relationship and the rest gave incorrect or partially correct answers. The pathology most associated with sugar was diabetes. In "excess sodium" and the associated pathology, 19.7% related it to hypertension and cardiovascular diseases, 6.5% did not know, 5% did not associate the seal with hypertension, and 11% recognized the association. In excess fats, 78.8% were correctly associated with pathologies and saturated fats could not be linked with associated diseases. With excess calories, a disorientation was found as to what to consider.

Conclusions: It is recommended to design consumer education campaigns because the responses do not recognize the function of excess calories and saturated fats and there is confusion with excess sodium.

Conflicts of Interest: none

Keywords: labeling; pathologies; excess; healthy; fats; sodium; sugar; calories

P2.27
Child Abuse and Childhood Overweight

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Introduction: The family environment significantly shapes children's nutrition, growth, and overall health. Childhood exposure to violence can lead to profound physical and psychosocial consequences.

Objective: This study aims to investigate the association between violence against children (VAC) and childhood overweight among children aged 2 to 5 receiving care at Basic Health Units in Rio de Janeiro.

Methods: This cross-sectional study, conducted between 2015 and 2017, involved 180 children. VAC was assessed using the Brazilian version of the Parent-Child Conflict Tactics Scales, while overweight status was determined using anthropometric measurements of weight and length. VAC was dichotomously classified based on parental responses to corporal punishment or physical abuse scales. Excess weight was categorized using the BMI-for-age indicator, with children ≤ +2 z-score classified as eutrophic or at risk of excess weight, and those >+2 z-score classified as excess weight (overweight and obese) (WHO, 2007). Logistic regression analysis (odds ratio (OR) estimates and 95% confidence intervals) was used adjusting for variables such as the child's age, mother's age, mother's schooling, and social support, based on existing literature.

Results: Adjusted analyses showed that guardians who perpetrate physical violence against their children are approximately twice as likely to have overweight children (OR=2.25; 95%CI=1.01–5.05; p=0.049).

Conclusions: VAC is associated with excess weight in childhood. These findings highlight the importance of raising awareness among health professionals about the role of violence against children in the childhood growth processes.

Conflicts of Interest: none

Keywords: child abuse; overweight; child weight status

P2.28

Snacking Patterns and Associated Factors in Mexican University Students

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Introduction: The frequency and amount of snacking (eating between main meals) have been studied in different contexts, but the analysis of consumption of food combinations (not individual foods) or "snacking patterns" (SP) is limited.

Objective: Analyze the factors associated with SP consumption in students of a public university in Mexico.

Methods: Analytical cross-sectional study (macroproject on food insecurity; CI-02322). We evaluated online: 21-snack consumption frequency (last month), sociodemographic characteristics, chronotype (Horne-Östberg Test), emotional eating (Garaulet, 2012), food insecurity (ELCSA), sleep quality (Pittsburgh), sedentary lifestyle (IPAQ), stress- anxiety-depression symptoms (DASS-21), and consumption schedule (snacks and main meals). In-person, we measured waist circumference. SP was generated by principal component analysis; associations were analyzed with linear regression.

Results: A total of 459 participants were included (72.8% women, 23.3% nutrition students). Four SP were identified: SP-1: "Ultra-processed drinks and salty snacks"; SP-2: "Sweet snacks"; SP-3: "Healthy snacks"; and SP-4: "Perceived healthy snacks". Being an emotional/very emotional eater was positively associated with SP-2 (β:4.74; 95% CI:1.47, 8.01). Having anxiety symptoms was positively associated with SP-1 (β:0.63; 95% CI:0.32, 0.95), SP-2 (β:0.44; 95% CI:0.13, 0.76) and SP-4 (β:0.43; 95% CI:0.12, 0.74). Performing nighttime snacking was positively associated with SP-1 and SP-2. Waist circumference was positively associated with SP-1. Being a nutrition student was negatively associated with SP-1, SP-2, and SP-4. Having mild food insecurity was negatively associated with SP-3. Performing morning snacking was positively associated with SP-3 and SP-4. Sleep quality, sedentary lifestyle, and chronotype were not associated with these SPs.

Conclusions: Three unhealthy SPs were identified. Anxiety symptoms, emotional eating, and nighttime snacking favored adherence to unhealthy SP. Those who skip breakfast or present food insecurity adhere less to the healthy SP.

Conflicts of Interest: none

Keywords: snacking patterns; college students; young adults

P2.29

Development and Measurement of the Validity of a Food Frequency Questionnaire for Uruguayan Pregnant Women

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Introduction: Food Frequency Questionnaires (FFQ) are used in epidemiological studies to evaluate the relationship between dietary intake and non-communicable diseases and their risk factors, as well as to identify dietary patterns. Uruguay does not have a validated FFQ for the adult pregnant population.

Objective: The objective of this study is to develop and validate a culturally adapted FFQ for the Uruguayan pregnant population.

Methodology: For the construction of the FFQ, 24-hour recalls (24hR) were carried out, two on weekdays and one on weekends, on a convenience sample of 137 pregnant women from the capital and the departments bordering Argentina and Brazil, to ensure the cultural diversity of border food. From the data about the foods and preparations ingested by pregnant women, the food list of the FFQ was constructed, which included the 63 most consumed foods and food groups by pregnant women. The frequency categories were the nine proposed by Willett and the response period covered the last six months. The FFQ was validated with a population of 40 pregnant women who responded to three 24hR. The average intake of the three 24hR was used as the reference method. To evaluate the distribution of the population, the Kolmogorov-Smirnov test was used and the correlations of nutrient intake with the Pearson and Spearman coefficients were sought.

Results: The validation of the FFQ for Uruguayan pregnant women was good for energy (0.59) and CHO (0.50) to medium for Vitamin B12 (0.32).

Conclusions: The results showed that the 63 foods and food groups proposed in the FFQ provided a good to medium estimate for nutrient intake in pregnant women, in relation to the average of the three 24hR.

Conflict of Interest: none

Keywords: pregnant women; food intake measurement; food frequency questionnaire; nutritional epidemiology

P2.30

Disarticulation in the Approach to Food and Nutrition Policy and Its Implications in the Situation of Food and Nutrition Insecurity in the Municipality of Puerto Berrio-Antioquia, Colombia

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Introduction: *Puerto Berrio* is located in the so-called Magdalena Medio sub-region in the department of Antioquia, Colombia, and is considered the economic hub of the sub-region. Its history has been shaped around livestock, fishing, and mining. Despite its importance, the municipality has perpetuated conditions of inequality, unemployment, unmet basic needs, and deficient access to health services. According to the 2019 Antioquia Food and Nutrition Profile, 17.5% of households in the Magdalena Medio sub-region had a severe food insecurity prevalence, one of the highest percentages at the departmental level. Additionally, the municipality lacks a public policy on food and nutrition security, which has resulted in disarticulated actions and detached from the contextual reality.

Objective: To interpret the relationships among public policy actors in food and nutrition and their relation to the food and nutrition insecurity situation in the municipality of *Puerto Berrio*-Antioquia.

Methods: A qualitative methodological design was developed, incorporating stakeholder mapping, social network analysis, and grounded theory through semi-structured interviews with 14 public policy actors.

Results: The approach to actions in food and nutrition is developed in a disjointed and sectoral manner, with short-term interaction exercises predominating without a common objective and with little direction. Actors tend to work in favor of their mission-oriented interests, and the Food and Nutrition Security approach is reduced to the delivery of food packages and actions for comprehensive early childhood care and primary health care.

Conclusions: The lack of adequate direction and understanding of the complexity of Food and Nutrition Security has impacted the development of effective actions that favor the guarantee of food security in the *Puerto Berrio* municipality.

Conflicts of Interest: none

Keywords: food security; nutrition policy; public administration; social determinants of health

P2.31

Burnout and Binge Eating Behaviors in Peruvian Young Women

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Introduction: In the last few decades, Binge eating disorder (BED) and burnout have become increasingly important for researchers and healthcare professionals. Emotional exhaustion, one of the characteristics of burnout, can lead the individual to situations of anxiety, depression, anger, and behavioral changes, among others. These situations can also happen in individuals with BED. In addition, BED is one of the most frequent forms of eating disorder presentation and is related to obesity and other clinical conditions.

Objective: To estimate the prevalence and the association between binge-eating behaviors and burnout in Peruvian young women.

Methods: A cross-sectional descriptive and correlational study was carried out between June and July 2023 on a non-probabilistic sample of 411 young women who were recruited through online recruitment strategies. The study instruments used for this study were divided into two: Binge eating behavior was assessed by the Binge Eating Disorder Scale (BEDS), which was developed and validated in the Peruvian population. Burnout was assessed by modifying the single-item academic burnout questionnaire (IUBA). The data was analyzed in SPSS v29. Descriptive statistics were performed, and the Odds Ratio was used for associations with a 95% confidence interval and a p-value <0.05. This study was approved by *the Universidad de Ciencias y Humanidades* Ethics Committee (reference number 034-23).

Results: The average age was 22.97 ± 6.27 years. A prevalence of 46.5% binge-eating behavior and 53.5% burnout were found. Furthermore, binge-eating behavior was significantly associated with the presence of burnout (OR=2.21).

Conclusions: The prevalence of burnout and binge-eating behavior is high in young Peruvian women, and there is an association between them. It is necessary to create health policies focused on the mental health of women and nutrition to improve their quality of life and well-being.

Conflicts of Interest: none

Keywords: binge-eating behavior; burnout; obesity

P2.32

Determination of Breastfeeding and Complementary Feeding in the Municipality of *Cota*-Cundinamarca, 2023

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Introduction: The World Health Organization recommends exclusive breastfeeding (EB) for the first 6 months of life, and to continue it together with complementary feeding (CF) up to

2 years of age, as correct nutrition is essential for the growth and development of the baby.

Objective: To describe breastfeeding and complementary feeding practices in children aged 0 to 24 months in the municipality of *Cota*.

Methods: Descriptive, cross-sectional study. The sample consisted of 361 children aged 0 to 23 months living in the municipality of *Cota*-Cundinamarca. Mothers with contraindications to breastfeeding due to medical conditions such as HIV/AIDS, chemotherapy, and/or breast surgeries were excluded, as well as those mothers who had some type of disability that prevented them from answering the questionnaire.

Results: 49.5% of the children did not receive breastfeeding in the first hour of life; a risk factor was established as cesarean delivery, not having an early initiation of breastfeeding, and not having SCI in the first two days of life. Nearly 40% of breastfed children aged 6 to 8 months and non-breastfed children aged 6 to 23 months did not receive a minimum acceptable diet. Also, 60% of children aged 6 to 23 months consumed sweet drinks and/ or unhealthy foods (processed or ultra-processed) the day before the survey was taken.

Conclusions: Strengthening food education programs aimed at parents of children under 2 years of age can contribute to the improvement of feeding practices during the first 1000 days of life.

Conflicts of Interest: none

Keywords: breastfeeding; complementary feeding; infant nutritional physiological; phenomena; community health

P2.33

Relationship between Poverty, Food Insecurity, and Anthropometric Nutritional Status in Children Under 60 Months in Peru

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Introduction: Adequate nutrition is essential for good health, especially in the first years of life. Nutritional status is determined by the balance between intake and nutrient requirements, and anthropometric evaluation in children is an easily accessible value and is used at an epidemiological level as part of health indicators. Likewise, socioeconomic conditions are a determining factor in nutrition.

Objective: The objective was to evaluate the relationship between poverty and food security before and during the pandemic with the change in anthropometric nutritional status in children under 5 years of age between 2019 and 2021 in Peru.

Methods: Quantitative descriptive study. The absolute values were taken as a percentage of the prevalence of all forms of malnutrition, the index levels of vulnerability to food insecurity in 2018, and the percentages of the population in total monetary poverty in 2018. Pearson correlation and multiple linear regression were performed.

Results: The percentage of chronic malnutrition decreased by 0.93%, although the risk of chronic malnutrition increased by 3.66%, that of global malnutrition increased by 0.26% and that of acute malnutrition by 0.39%. On the opposite side, malnutrition due to excess, the percentage of overweight increased by 0.15% and that of obesity by 0.32%. When analyzing the correlation between the 3 variables, a positive correlation (moderate and strong) was found between chronic malnutrition, risk of chronic malnutrition, and global malnutrition with vulnerability and poverty for each year; Likewise, a negative correlation (moderate and strong) between overweight and obesity with vulnerability and poverty for each year. Although the multiple linear regression model is accepted with a probability $F<0.001$ explaining 56% of the changes, only vulnerability was significant ($p=0.005$) with a regression coefficient of -9.75 (95% CI: -16.97, -3.23).

Conclusions: Food insecurity and poverty have a strong and significant correlation with each other and a direct and significant correlation with nutritional anthropometric status deficient, which was maintained in the 3 years studied.

Conflicts of Interest: none

Keywords: malnutrition; food insecurity; poverty

P2.34

The Food Consumption Frequency of Health Sciences University Students from a Public Institution in *Tepatitlán de Morelos*, Jalisco

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Introduction: The food consumption frequency is an accessible and cost-effective tool that facilitates the assessment of diet, and the detection of patterns and trends in food choices, among other aspects. Furthermore, it serves as a fundamental indicator for understanding the dietary habits of university students, their nutritional and health status, as well as the factors influencing their consumption patterns.

Objective: Determine the food consumption frequency of health sciences university students, particularly those studying medicine, from a public institution.

Methods: Descriptive-cross-sectional study. Non-probabilistic convenience sampling was employed. A validated questionnaire on food consumption frequency (FCF), based on the NOVA classification (Monteiro, 2016), was utilized: Group 1. Fresh or minimally processed foods, Group 2. Processed culinary ingredients, Group 3. Processed foods, and Group 4. Ultra-processed foods, categorizing them as: excessive, above recommended, recommended, below recommended, insufficient, and non-consumption (Bourges, 2009). Descriptive statistics were applied.

Results: A sample of 202 students, 70% female, 30% male; average water consumption of 1.89 liters/day ±0.6399 SD were studied. Food consumption frequency (FCF) by groups: Group 2 with 59% and Group 3 with 12% in excessive consumption, group 4 with 26% in consumption above recommended, while Group 1 with 95%, group 4 with 51%, and water with 54% in recommended consumption. Upon gender analysis of FCF, no significant differences

were found for groups 2, 3, 4 for excessive consumption, while in group 1 and water consumption is recommended; highlighting that in males, consumption in group 3 is within recommended levels or below, whereas, in females, it is presented in group 4.

Conclusions: A large portion of the population is aware of what they should consume; however, the consumption of foods from groups 2, 3, and 4 is high, which is concerning as these foods are known to be harmful to health. Therefore, implementing nutritional education programs in the university community is recommended.

Conflicts of Interest: none

Keywords: consumption frequency; NOVA classification; health sciences students

P2.35

Comprehensive Educational Intervention Project for Oral and Dental Health, with Respect to the Body Mass Index of Schoolchildren at the *Monseñor Gerardo Valencia Cano* Educational Institution, Medellín-Antioquia

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Introduction: Obesity is the most common Chronic Non-Communicable Disease (NCD) and its root causes are social, derived from environments that promote inappropriate eating habits and lifestyles. This condition carries an increased risk of developing other NCDs and certain forms of cancer (colon cancer). This article evaluates the effect of a comprehensive educational intervention project for oral health, regarding the BMI of schoolchildren of the *Monseñor Gerardo Valencia Cano* Educational Institution, IEMGVC, Comuna 7 Robledo, San Germán neighborhood, Medellín-Antioquia.

Objective: To evaluate the effect of a comprehensive educational intervention project for oral health, related to the BMI of IEMGVC schoolchildren.

Methods: Longitudinal cohort study that included a sample of 83 schoolchildren, who were evaluated through dental and nutritional assessments at various times between 2019-2022. Data were collected on three occasions to analyze pre- and post-implementation changes of a health education intervention project.

Results: At the first moment or baseline, overweight schoolchildren had a better condition in the oral hygiene index, compared to schoolchildren in a thin state, who presented a deficient condition. Post-educational intervention, the percentage of schoolchildren with adequate weight increased and their oral hygiene index improved. In general, the indicator of risk of dental caries presented a decrease, increased the use of dental floss and the application of different brushing techniques, topics addressed during the educational intervention on healthy lifestyles.

Conclusions: The risk of dental caries decreases when the Healthy Eating Index is impacted, revealing that diet and oral health have a directly proportional relationship, which leads us to conclude that health promotion emerges as a primary action that encourages the adoption of healthy habits and lifestyles, with positive repercussions in the medium and long term on oral and general health.

Conflicts of Interest: the authors state that they do not present any conflict of interest.

Keywords: health education, body mass index, oral hygiene index, caries risk.

P2.36

Situation of Accessibility and Adequacy of Food for Vulnerable Families in the Departments of Atlántico and Magdalena (Colombia) in the Period 2022-2023

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Introduction: The instruments of international law state that every human being has the right to adequate food (DHAA) and to not suffer from hunger; This is exercised when the human being as an individual or community has physical and economic access, at all times, to adequate food or the means to obtain it. Vulnerable families in the Caribbean Region in Colombia do not enjoy DHAA Therefore, it is relevant to demonstrate its magnitude.

Objective: Characterize the accessibility and adequacy of food from the perspective of DHAA in vulnerable families in the Colombian Caribbean Region.

Methods: The sample was 1,169 heads of vulnerable households of legal age, in six municipalities in the departments of Atlántico and Magdalena. A survey was applied to identify sociodemographic variables, the level of food security, and the dimensions of accessibility and adequacy, research ethical standards were applied, and statistical analysis was performed in SPSS.

Results: Sixty-five percent of the sample are Colombians, 34.7% are migrants. 76.5% are in food insecurity: and 61.7% moderate or severe; The greatest severity of INSAN is observed in migrants, with a statistically significant relationship. 94.7% reside in socioeconomic stratum one; 84.8% of families are made up of children and young people, 56% are households headed by women. 55.4% reach high school and 24.4% primary school. 55.1% were unemployed, 19.6% were employed and 24.4% were self-employed; 19% declared themselves without income, and 60% with income up to a minimum wage. 39.2% do not consume any of the three main meals. The foods with the least access are: fruits 26.7%, dairy products 27.6%, meats 36.6%, and milk 40.1%, they are the highest priced. 6% were thin, and 40% were overweight. 24.2% do not have drinking water in their homes.

Conclusions: Families find themselves in a situation of violation of the DHAA due to limitations in access to food, the low level of family income, and high prices, added to the migration situation and adverse socioeconomic contexts.

Conflict of Interest: none

Keywords: adequacy; access; right to food; vulnerability

P2.37

Dietary Pattern of Colombian Breastfeeding Women

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Introduction: Breastfeeding women have high energy and nutrient requirements, which in contexts of social and economic vulnerability contribute to the risk of micronutrient deficiency and thus to the intergenerational cycle of malnutrition, affecting women's nutritional status and limiting the concentration of some nutrients in breastmilk.

Objective: Therefore, this study sought to identify the dietary pattern of lactating women and compare it with the Dietary Guidelines for Colombia (GABAS), according to the household food security level.

Methodology: A cross-sectional-descriptive study was conducted with 554 lactating women (14-49 years). Sociodemographic, anthropometric, and dietary variables were assessed by 24-hour recall. Calories consumed by the food group were compared with the GABAS recommendations, using the consumption ratio index (CRI) according to the household food security level.

Results: Among the findings, breastfeeding women did not reach the recommended intake of fruits, vegetables (CRI 0.4 MAD 0.3), dairy (CRI 0.4 MAD 0.2), protein (CRI 0.5 MAD 0.2), and fats (CRI 0.5 MAD 0.3) and exceeded the recommended intake of cereals (CRI 1.3 MAD 0.4). Intake of most food groups was lower in breastfeeding women with household food and nutrition insecurity and worsened proportionally with the level of household food insecurity.

Conclusion: This pattern was severely restricted in households with higher levels of food insecurity, which has implications for the nutritional and health status of the mother-child binomial and successful breastfeeding. It was evident that after childbirth there is no programme to monitor the health, food, and nutritional status of women beyond the breastfeeding woman.

Conflict of Interest: none

Keywords: dietary pattern; breastfeeding women and food security

P2.38

Complexion, Body Perception, and Eating Habits in Adolescent Women in Xalapa, Veracruz. México

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Introduction: During adolescence, body image is a reflection of the construction of physical changes and subjective evaluations of the social environment, which can lead to body dissatisfaction, configured as a potential risk factor for developing eating disorders.

Objective: To analyze the relationship between body perception, complexion, and eating habits of adolescent girls at the secondary and high school levels of a private school in the city of Xalapa, Veracruz, Mexico.

Methods: Cross-sectional study was conducted from August 2022 to January 2023 in 81 women. They were weighed and measured to obtain the Body Mass Index, and the wrist diameter for the complexion, and validated surveys were applied for the Eating habits of the Mexican population, Body Shape Questionnaire, and the Figurative Method Survey. The analysis of the data was carried out through descriptive statistics and the use of the $\chi 2$ independence test, a supervised machine learning technique was applied: decision trees. The independence test showed no association between the body perception of the individual and complexion, but the decision trees showed that BMI, height, weight, eating habits, or body shape influence the body perception of the population.

Results: The complexion obtained was: 60% medium, 27% small, and 12% large. 51% said they had no concern about body shape, 26% had a mild concern, 7% had a moderate concern, and 6% expressed marked distress. 16% of the adolescents had inadequate eating habits, 73% partially adequate, and only 9% considered themselves adequate. One in three adolescents (30%) perceived themselves correctly with respect to their BMI, however, 70% reported an incorrect perception.

Conclusions: Adolescent girls at the high school level expressed greater dissatisfaction with their body image and a minority had adequate eating habits. Half expressed concern about their body shape, which is a determining factor in the development of other diseases such as eating disorders.

Conflicts of Interest: none

Keywords: body complexion; body perception; eating habits; adolescents

P2.39

Comparison of Two Scales of Self-perception of Body Image in Schoolchildren

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Introduction: Mexico is one of the countries with the highest rates of childhood obesity worldwide, with this issue being more prevalent in the northern states of the country and in urban communities. Body weight perception is a predictor of body management and behaviors related to body mass index.

Objective: To compare the self-perception of body image in school-aged children using two different scales.

Methods: A cross-sectional quantitative study involving 533 school-aged children (6 to 12 years old) was conducted. Body mass index (BMI) and percentile were obtained using CDC growth charts. Body image perception was assessed using Truby and Paxton's Children's Body Image Scale and Eckstein et al.'s Body

Rating Scale, both of which contain 7 figures ranging from thin to obese. Agreement between nutritional status and self-perception was evaluated using Cohen's Kappa test.

Results: Nutritional status varied by gender, with overweight (15.2% girls, 19.8% boys) and obesity (18.8% girls, 30.4% boys) being more prevalent in boys. In Truby and Paxton's scale (2002), 47.1% underestimated their weight, and 6.6% overestimated it, while with Eckstein's scale (2006), 50.7% underestimated their weight, and 7.7% overestimated it. Cohen's Kappa agreement was 0.040 with Truby and Paxton and 0.030 with Eckstein.

Conclusions: Men presented higher percentages of overweight and obesity. More than half of the schoolchildren exhibit distortion in the perception of their body image on both scales, whether they underestimate or overestimate their weight; the Eckstein scale shows higher percentages. The degree of agreement with Cohen's Kappa test between the nutritional status and self-perception of the image on the scales is considered poor according to the normative levels for this index.

Conflicts of Interest: none

Keywords: perception; body image; schoolchildren

P2.40

The Market Logic in Food Policy in Medellín, a Crossroads for Effectively Addressing the Food and Nutritional Situation

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Introduction: In Colombia, food public policies have been permeated by characteristics of neoliberalism and market logic, leading to their implementation under paternalistic models. These models are guided by the vision of multilateral organizations through a top-down approach, shaping a beneficiary that becomes instrumentalized for the purposes of paternalism and lacking participation strategies.

Objective: With the aim of contributing to the analysis of public policies from the perspectives of the stakeholders, this study sets out to analyze the implementation approaches of the Public Policy on Food & Nutrition Security and Food Sovereignty in Medellín from the perceptions and meanings of the actors.

Methodology: The research was conducted within a historical-hermeneutic paradigm, where interpretations and meanings of social life form the foundation of the study. The analysis of public policy was based on an integrative approach. The methods implemented included a documentary review of governmental texts and constructivist grounded theory, based on content analysis and semi-structured interviews with technicians and policy beneficiary participants.

Results: In the implementation of the Public Policy on Food & Security and Food Sovereignty in Medellín, the food supplementation approach is predominant, which not only is evident in the instruments and current regulations as the main approach but is also recognized by the actors as the flagship approach of Medellín's food policy. It aligns with government interests aimed at achieving goals through quantitative indicators. The subjects identify the absence of approaches related to the Human Right to Food, Food Sovereignty, and food systems, with a lack of a comprehensive perspective in care, and with an emphasis on Social Risk Management, diverging from principles conceived during policy formulation.

Conclusions: The voices of the actors recognize the need to incorporate other principles in the implementation of public policy and construct narratives with recommendations on policy formulation and implementation.

Conflict of Interest: none

Keywords: food security and nutrition policy; public administration; nutrition and food programs and policies; state

P2.41

Consumption of Dairy Products and Its Relationship with Anthropometric Status and Adequacy of Micronutrients in the Diet of the Urban Costa Rican Population

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Introduction: More than 60% of the urban Costa Rican population is overweight, one of the main risk factors for developing comorbidities. Several studies have shown that dairy consumption might promote a healthy weight and better compliance with micronutrient recommendations.

Objective: To analyze the relationship between dairy consumption and anthropometric variables and micronutrient adequacy in the urban Costa Rican population.

Methods: The data come from the Latin American Study of Nutrition and Health (ELANS), a cross-sectional study with a representative sample of 798 people living in urban areas, aged 15 to 65 years (2014-2015). Using an international methodology, trained personnel obtained anthropometric measurements (body weight, body mass index (BMI), waist circumference (WC), hip, and neck circumferences). Two 24-hour recalls were applied on non-consecutive days, and dairy consumption (milk, yogurt, and cheese) and micronutrients were recorded. Usual intake was obtained using the Multiple Source Method (MSM). The data were analyzed by gender, age group, and socioeconomic level (SES).

Results: The average consumption was 244.3 g/day, significantly higher in men (269.6 g/day, $p<0.001$), in people aged 50–65 years (266.7 g/day; $p<0.001$), and higher SES (292.7 g/ day, $p<0.001$). 7.9% reported consuming ≥3 servings/day (s/day), 10.4% (<3-2 s/day), 20.7% (<2-1 s/day), and 61% (<1-0 s/day). Consumption of ≥3 s/day was not associated with higher BMI ($p<0.729$), WC ($p<0.592$), hip circumference ($p<0.876$), and neck

circumference (p<0.764), and no significant differences were found by consumption quartile. It was found that consumption of ≥3 s/day was associated with significantly higher intakes of micronutrients such as calcium, iron, vitamins B2, B6, D, A, C, and E, phosphorus, and zinc (p<0.05). Higher dairy consumption was associated with a more diverse diet (p<0.001).

Conclusions: These findings suggest that higher dairy consumption is not associated with an increase in body weight but rather with more adequate micronutrient diets and better diet quality.

Conflict of Interest: none

Keywords: dairy products; milk; yogurt; body mass index

P2.42

Diet Quality of Adolescents at the *Don Bosco* Salesian School in *Arequipa* 2022

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Introduction: Currently, overweight and obesity are public health problems that increasingly occur in the entire world population and are associated with other comorbidities, according to the PAHO (Pan American Health Organization), the age group from 5 to 19 years, 33.6% of children and adolescents are affected by overweight or obesity, constituting a population at risk.

Objective: The objective of the research was to determine the quality of the diet of adolescents in Arequipa in 2022.

Methods: The study was a quantitative, descriptive, cross-sectional study that allowed the quality of the adolescents' diet to be identified. The sample was made up of 783 students. To evaluate the quality of the diet, the KIDMED Test was used, a validated instrument for children and young people aged between 2 to 25 years to evaluate adherence to the Mediterranean diet (MD), which was self-administered after informed consent.

Results: The results showed high adhesion at 48.40%, followed by medium adhesion at 45.90%, while the lowest frequency presented low adhesion at 5.7% in adolescents, the response frequencies of the Kidmed test, regarding questions with positive connotations, The highest percentages corresponded to 92.50% who reported having fresh or cooked vegetables regularly once a day, 89.60% consumed whole grains (pasta or rice) almost every day or ≥5 times/week, 88.50% consumed a fruit or fruit juice every day and 80.30% have a low-fat dairy product for breakfast (yogurt, milk, and cheese.). Regarding the questions with negative connotations, 84.40% eat sweets and treats several times a day, 80.50% skip breakfast, 79.60% have baked goods or commercial cakes for breakfast, and 74.30% go > 1/week to a restaurant fast (burger restaurants).

Conclusions: Based on these results, it is important to develop food education programs in schools that allow maintaining a healthy diet and adequate weight growth within the framework of the comprehensive health care model.

Conflict of Interest: none

Keywords: diet quality; healthy eating; adolescents

P2.43

Comparison of Sweeteners in Soft Drinks in Quito (Ecuador) and Bogotá (Colombia)

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Introduction: Soft Drinks (SDs) are a widely consumed option in Ecuador and Colombia, with shared and exclusive brands in each country. The main ingredients of these beverages are water, sweeteners (natural or synthetic, caloric, or non-caloric), and additives. The analysis of the sweeteners present in these beverages is useful to make informed dietary decisions and to evaluate the impact of labeling regulations on the reformulation of these products.

Objective: To compare the sweeteners used and the caloric content of the most common soft drinks in Quito (Ecuador) and Bogotá (Colombia) by analyzing the labels of these products.

Methods: A visit was made to some supermarkets in Quito and Bogotá to identify SDs common in Ecuador and Colombia, as well as those different but recognized in these cities. The nutritional information and the labeling system of each SD were compared between the two countries, focusing on the sweeteners used.

Results: 80% of carbonated soft drinks use blends of artificial sweeteners instead of traditional sugar. Combinations of aspartame and acesulfame K, as well as sucralose and acesulfame K each represent 40%. The use of sugar alone is infrequent, representing 5% of the beverages evaluated. Sucralose has a moderate presence, both in combination with sugar (10%) and alone (5%). 75% of the beverages in Colombia and 37.5% of the beverages in Ecuador contain sugar and therefore calories.

Conclusions: In Ecuador, most beverages declare: "sugar-free" in the nutritional traffic light and have replaced this ingredient with artificial sweeteners, which shows the effect of the implementation of this labeling system 10 years ago, none of the beverages analyzed contain only sucrose, this one is mixed with artificial sweeteners. While in Colombia, where the implementation of warning nutritional labels began in 2021, there are still beverages sweetened only with sucrose, as well as others with a mixture of sucrose and artificial sweeteners, in general, Colombian beverages have more calories than in Ecuador.

Conflicts of Interest: none

Keywords: carbonated beverages; sweeteners; Ecuador; Colombia; labeling; traffic light nutrition labels

P2.44

Comparison of Saturated and Unsaturated Fat Intake according to Sociodemographic Characteristics in the Urban Population of Ecuador between 2015 and 2019

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Introduction: Lifestyles are undergoing significant changes, including dietary habits, where excessive consumption of fats, especially saturated and trans fats, is associated with various negative health effects.

Objective: To compare fat intake according to sociodemographic characteristics in an urban Ecuadorian population between 2015 and 2019.

Methodology: This is a comparative cross-sectional study analyzing dietary intake, based on data from the Latin American Nutrition and Health Survey - Ecuador (ELANS-Ecuador) in 2014. ELANS studied a sample of 800 subjects in 2014, and in 2019, 400 participants were studied with the following characteristics: Ecuadorians of both sexes aged between 15 and 65 years, residing in urban areas of the Coast and Sierra regions. Two 24-hour dietary recall surveys were conducted using the multiple-pass method on non-consecutive days, and fat intake (saturated fats (SFA), monounsaturated fats (MUFA), polyunsaturated fats (PUFA), and TRANS fats) was compared according to sociodemographic characteristics (sex, age). Means, standard deviations, and 95% confidence intervals were analyzed, accompanied by comparative diagrams of the distribution of these variables in subpopulations defined by sociodemographic variables' categories.

Results: Between 2015 and 2019, there was a significant decrease in PUFA consumption (p=0.000) and a marked increase in TRANS fats (p=0.000). Both SFA and PUFA were within the recommended range for both sexes. MUFA was below the recommendations, and TRANS fats were above them. MUFA increased in women between 2015 and 2019. Men decreased PUFA consumption, while women maintained it but increased SFA consumption.

Conclusion: Sociodemographic characteristics showed a change in fat consumption, especially a decrease in PUFA and an increase in TRANS fats, which could lead to health problems such as obesity, metabolic syndrome, and cardiovascular diseases in the Ecuadorian population.

Conflict of Interest: none

Keywords: urban population; sociodemographic characteristics; total fats; saturated fats; monounsaturated fats; polyunsaturated fats

P2.45

Measuring Food and Nutritional Insecurity: Beyond Socioeconomic Indicators

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Introduction: The growing concern about a state of malnutrition due to deficiency or undernutrition in developing countries leads to the formulation of food and nutritional security programs. For this, it is a priority to measure the level of food and nutritional insecurity - FNI - and identify the socioeconomic determinants of the beneficiary population. In recent years, research has been conducted on the situation of FNI in populations living in poverty in Latin American countries through different methodologies. However, there is little information about this situation in middle- and high-income populations.

Objective: Determine the level of food and nutritional insecurity and socioeconomic determinants in the beneficiary population of a Food and Nutritional Security program -FNS- in a non-governmental organization in Guatemala.

Methods: A stratified random sample of 180 families from 48 beneficiary communities was included. A survey was designed including questions from the Latin American Food Security Scale -ELCSA-, as well as sociodemographic and socioeconomic information.

Results: The results of the application of the ELCSA scale show that the total population has 87.1% FNI, 40.2% mild FNI, and 13.4% severe FNI. FNI was identified in the population with university studies: 57.1% mild FNI and 14% with moderate and severe FNI. In the illiterate population, everyone has some level of FNI. It was found that 8.7% of the unemployed population had a level of food and nutritional security and 33.7% had INSAN, while in families with formal employment, there was mild FNI in 37.5%.

Conclusions: The analysis of the food security situation requires the incorporation of other elements such as local food culture, use of economic resources, and prioritization of health, food, and nutrition issues. This would allow decision-makers to have a broader view of the situation from a comprehensive and multidimensional perspective.

Conflicts of Interest: none

Keywords: food and nutritional insecurity; socioeconomic determinants; ELCSA

P2.46

E-Cigarette Knowledge and Use in Undergraduate Nutrition Students: a Pilot Study

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Introduction: Tobacco is considered to be the main risk factor for cardiovascular diseases, respiratory diseases, and cancer (particularly lung cancer). According to the World Health Organization (WHO), 1250 million adults smoke tobacco. The Electronic cigarette (E-cigarette or EC) is a device that heats and vaporizes a liquid containing nicotine and other substances (propylene glycol, glycerin, flavorings, and some metals) that could be potentially toxic. It began to be marketed as an alternative to quitting smoking, and its presentation and flavors make it a more attractive product for adolescents; the WHO estimates that 20% of adolescents have smoked E-cigarettes. However, there is more evidence of the harm associated with its use to the extent that the Pan American Health Organization (PAHO) recommended its regulation, in Mexico they were banned in 2020. There are no studies on the prevalence of electronic cigarette use in students of the Bachelor's Degree in Nutrition.

Objective: To determine the prevalence of electronic cigarette, use among undergraduate nutrition students at a public university.

Methods: An exploratory, descriptive, cross-sectional pilot study was conducted to estimate the prevalence of E-cigarette use among undergraduate nutrition students. A self-drafted questionnaire was applied electronically using Microsoft Forms and anonymously; Microsoft Excel was used for data descriptive analysis.

Results: Twenty-one students responded to the pilot survey, with an average age of 22 years, 57% female, 10% male, and 33% transgender; they are in their sixth and seventh semesters. Seventy-nine percent stated that they had not smoked tobacco, and of those who did smoke (21%) did so occasionally. Forty-eight percent (n=10) have used E-cigarette, with the main motivation being curiosity (63.63% of those who have used it). Having received an E-cigarette as a gift from a friend (54.54%) was how they got their first electronic cigarette.

Conclusions: This would be the first study to analyze the prevalence of E-cigarette use in nutrition students. Unlike other reports, where EC use is used to try to substitute tobacco use, in the case of nutrition students it did not occur.

Conflicts of interest: none

Keywords: Nutrition student; E-cigarette

P2.47

Comparison of Protein Consumption Patterns in the Urban Population of Ecuador between 2015 and 2019

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Introduction: Adequate protein intake is essential for growth, as it is part of the tissue structure and has a metabolic and regulatory function. On the other hand, protein deficiency leads to compromised health such as anemia, physical weakness, vascular dysfunction, and impaired immunity among other conditions.

Objective: To compare protein intake patterns in the urban population of Ecuador between 2015 and 2019.

Methods: The present study used 800 subjects from the Latin American Nutrition and Health Study (ELANS - Ecuador 2015) and in 2019 with similar procedures and definitions, a comparable sample of 400 participants was taken, aged 15–65 years, stratified by gender, age, region of residence and socioeconomic status. Protein intake was assessed by two 24-hour recalls reported on non-consecutive days. Descriptive comparison statistics to demonstrate differences were employed.

Results: Between 2015 and 2019, the average intake of total protein in the Ecuadorian population decreased, where animal protein for 2019 decreased significantly (p=0.002) while vegetable protein presented a small but significant increase (p=0.011). In relation to sex, the consumption of animal protein decreased in men, while it increased in women, except in the group between 20 and 34 years old, which presented a lower average level of intake. Vegetable protein intake was higher in men than in women in both periods, although the differences were less marked in 2019. Thus, between the two periods studied, both in men and women, vegetable protein consumption increased for all age groups except for men between 35 and 49 years of age.

Conclusions: In Ecuador comparing between 2015 and 2019 protein intake decreased, this decrease being higher in men than in women. Animal protein consumption decreased in men and increased in women, and vegetable protein consumption in general increased.

Conflict of interest: none

Keywords: protein intake; animal protein; vegetable protein; Ecuador; ELANS

P2.48

Challenges of the True Magnitude of Overweight and Obesity in Schoolchildren: Simple Measurements vs. Body Composition

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Introduction: Body mass index (BMI) is the most used measurement to diagnose pediatric obesity at individual and population levels, but it has limitations because it does not assess body fat.

Objective: To determine the frequency of obesity based on BMI z-scores (BMIz) and abdominal obesity compared to total body fat percentage (BF%) in Mexican schoolchildren and discuss their diagnostic value.

Methods: Descriptive and validation study in urban Mexican schoolchildren. The frequency of overweight (OW) and obesity (OB) was determined using BMIz, abdominal obesity with waist circumference (WC), and excess body fat and obesity with BF%. Comparisons were made using the Mann-Whitney U test and Chi^2, and Spearman correlations were explored. Sensitivity (s) and specificity (e) were calculated using the area under the curve (AUC) ROC. Analysis was performed using Stata 14, with significance set at $p<0.05$.

Results: Of a total of 1960 schoolchildren were evaluated ($\tilde{x}$ = 9 years), 62.5% had normal nutritional status based on BMIz, but only 52.6% matched when using BF%, with 41.7% classified as having excess body fat and obesity. BMIz and BF% were strongly correlated (r=0.86), as were waist circumference (WC) and BF% (r=0.78). For boys, OB diagnosis using BMIz and BF%, the AUC was 0.79 with s=9.4% and e=60.1%. For OW the AUC was 0.44 with s=8.1% and e=81.4%. For girls, the AUC for OB was 0.85; s=100% and e=70%; while the AUC for OW was 0.49; s=15.6% and e=83.8%.

Conclusions: The BMIz is an unreliable indicator for diagnosing OW and is more reliable for diagnosing OB. A high and very high correlation between zBMI, WC, and %BF should be taken with caution, as simple measures to diagnose OW and OB through BMIz and WC underestimate the magnitude of excess weight in Mexican schoolchildren.

Conflicts of Interest: none; the project was funded by the Mexico-Chile Joint Cooperation Fund.

Keywords: schoolchildren; sensitivity; specificity; body mass index; body composition; pediatric obesity

P2.49

Lipid and Glucose Metabolism Imbalances Suggest a General Presence of Insulin Resistance in Elders from Urban Locations in Havana

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Introduction: Lipidic and glucidic metabolic features may be markers for chronic disease risk and nutritional status, whereas common unbalances may reflect insulin resistance which is generally more prevalent in urban scenarios. Their assessment during old age allows detection of harmful levels and to set preventive interventions.

Objective: To evaluate the prevalence of derangements from main lipidic and glycemic metabolism markers and indexes in elders at an urban municipality in Havana.

Methods: A cross-sectional study was performed on 204 elders (mean age: 74,3 ± 8,2) from several neighborhoods in Centro Habana municipality. After fasting, they were evaluated for anthropometric (weight, height, and BMI) and biochemical (serum glucose, triglycerides, total cholesterol, and triglyceride-glucose index) measurements using conventional methods. Participants were classified according to BMI, glucose, and lipid values using respective reference criteria. Results were analyzed as a whole and for each gender by descriptive statistical methods.

Results: Of the total participants, 60.3% were overweight and 52.5% had hyperlipidemia. Normal-weight and underweight subjects account for 32.8% and 6.9% of all individuals, respectively. The majority (58.5%) of those with overweight corresponded to the pre-obese class. Serum glucose and total cholesterol shared the higher frequency of elders with risk values (39.2%). Unlike the other indicators, glucose mean concentration (5.93 mmol/L) reached the risk interval. Of all subjects, 33.8% showed glucose values consistent with a Diabetes diagnosis. The mean triglyceride-glucose index was 8.66 ± 0.41, but men had a higher value than women (8.7 vs 8.6), respectively.

Conclusions: Our study revealed in this urban subpopulation of elders an elevated prevalence of lipid and glycemic metabolism derangements through high prevalences of overweight, hyperlipidemia, and Diabetes Mellitus. Detected mean values of the triglyceride-glucose index in males and females were close to those reported for Metabolic Syndrome and reflect a common trend toward insulin resistance. Nutritional and integral interventions are necessary for reducing the presence and impact of these metabolic alterations in this elderly group.

Conflicts of Interest: none

Keywords: lipid metabolism unbalances; glucid metabolism derangements; insulin resistance; Diabetes; BMI; cholesterol; triglyceride-glucose index; elder; urban

P2.50

Long-term Dietary Behaviors and Self-reported Changes in Taste Perception associated to COVID-19 Dysgeusia

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Introduction: Dysgeusia is a set of alterations in taste perception, associated with COVID-19. Recovery time is uncertain and although it is not life-threatening, it can cause changes in taste perception and changes in food preferences with possible health effects.

Objective: Identify long-term changes in eating behavior and taste perception in patients with dysgeusia recovered from COVID-19.

Methods: A partial retrospective study, using an online questionnaire, was applied to characterize eating behaviors, changes in food preference, and flavor perception in 106 Mexican adults. A subsample of participants (n=30) with self-reported persistent dysgeusia (2 years post-pandemic) participated in a cross-sectional study, to evaluate detection and recognition thresholds in sodium chloride and sucrose solutions, determined by test methods of limits.

Results: Of the average age of 30±10 years, 75.5% were women. 86.8% reported less enjoyment when eating and implemented compensatory behaviors such as: remembering its flavor, enhancing it, or prioritizing other senses, with women implementing more behaviors for enjoyment (p= 0.02). The perception of sweet taste was associated with BMI: overweight and obese individuals reported more changes in the perception of this flavor compared to individuals with normal weight (p=0.05). Participants self-reported a significant change in sensitivity to perceive all taste qualities (p<0.01), especially sweet and salty. There is persistence of dysgeusia in 25.9% of the participants 2 years post-COVID-19. Participants with persistent dysgeusia more frequently detected and recognized sodium chloride solutions compared to the group who never had dysgeusia during COVID-19, while an opposite trend was observed for sucrose solutions (p=0.06).

Conclusions: Dysgeusia can last more than 2 years post-COVID-19, affecting sensory perception, especially salty and sweet according to self-report and sensory analysis. 86.8% of participants reported less enjoyment when eating and implemented compensatory behaviors, being women who implemented more behavioral alternatives to enjoy food during dysgeusia.

Conflict of interest: none

Keywords: COVID-19; food preferences; taste perception; dysgeusia.

P2.51

Emotional Eating, Malnutrition due to Excess, Lifestyle in Adult Women with Teleworking at the University of Bío-Bío

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Introduction: The emotional eater has been described as an individual who uses food as a dysfunctional mechanism to cope with negative emotions. It is like this; during teleworking, women are faced with physical and mental overload, accumulating negative emotions, which could influence eating behavior and lead to the intake of unhealthy diets of low nutritional quality, worsening the current problem of obesity

Objective: Determine the relationship between bio-sociodemographic characteristics, weight difference, presence of malnutrition due to excess and lifestyle, according to the type of emotional eating, during the teleworking period in women at the University of Bio-Bío

Methods: Cross-sectional quantitative analytical approach, 425 women between 18 and 64 years old were evaluated. A consolidated questionnaire was applied on the Google Forms platform, which was enabled for one month and included informed consent, bio-sociodemographic background, Garaulet emotional eating questionnaire, and lifestyle questionnaire

Results: Seventy-three percent of the participants were students, 11.8% were administrative and 15.3% were academics. 53.8% of the administrative staff and 50% of the students present malnutrition due to excess. 64.7% gained an average of 1.9 kg in weight during teleworking. There was statistical significance between lifestyle according to age (p=<0.001), type of emotional eating according to age (p=0.046), location (p=0.022), weight difference (p=<0.001), presence of malnutrition due to excess (p=0.001) and lifestyle (p=<0.001)

Conclusions: Confinement and teleworking have impacted the population, mainly women. Emotionally influenced food intake has led to eating to cope with negative emotions.

Conflicts of Interest: none

Keywords: emotional eater; malnutrition due to excess; lifestyle; weight gain; women- teleworking

P2.52

Comparison of the Caloric Intake of the Most Consumed Lunch Menus in Restaurants of Different Socioeconomic Levels, Lima-Callao, 2013

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Introduction: The consumption of food prepared away from home has significantly increased worldwide. Peru ranks second in the percentage of people who have lunch several times a month outside the home. Most restaurants serve portions that exceed the ideal size for the consumer, resulting in high caloric intake and deficiencies in essential nutrients, which are directly linked to cardiometabolic diseases.

Objective: To compare the total caloric intake, derived from macronutrients, and portion size per food group of the most consumed menus in restaurants of different socioeconomic status (SES: SESA=high; SESC =middle; SESD=low-middle; SESE=low) in Lima and Callao.

Methods: This is a secondary analysis of the "Survey to Measure the Nutritional Composition of the Main Foods Consumed Outside the Home (ECONUT)". The research was observational, analytical, and cross-sectional. The sample consisted of 1646 menus. Databases were merged to obtain the net weight per serving, resulting from mathematical equations, using the Atwater conversion factors and food group equivalencies in SPSS software v.26.

Results: There were significant differences between caloric intake and SES: SESA and SESE (p=<0.001); SESA and SESD (p=<0.001); and SESA and SESC (p=<0.001). The highest energy contribution came from Carbohydrates Macronutrient adequacy showed that Carbohydrates exceeded with a higher proportion in SESE; Protein, in SESA; and Lipids were deficient for SESE. The portion size offered per food group in SESE exceeded in cereals and sugars, while meats were greater in higher strata. Nevertheless, vegetables, fruits, and oils covered less than three-quarters of the recommended portion in all socioeconomic statuses. Comparing by SES, there were significant differences for the groups of cereals (p=<0.001), vegetables (p=0.005), fruits (p=<0.001) and oils (p=0.015).

Conclusion: The menus of lower socioeconomic strata exceeded in greater proportion; the total caloric intake, was mainly attributable to inadequate portion sizes of carbohydrate-rich foods.

Conflicts of Interest: none

Keywords: energy intake; menus; food groups; macronutrient energy intake; socioeconomic level

P2.53

Acceptability, Use, and Consumption of Small Quantity Lipid-Based Nutrient Supplement (SQ-LNS) for Children under 2 Years of Age for 14 Continuous Days in *Pasto*, Nariño Department, Colombia

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Introduction: The Small Quantity Lipid-Based Nutrient Supplement (SQ-LNS) is formulated to complement diets of children aged 6 months and older. Provides a food-based source of energy, protein, and essential fatty acids alongside multiple micronutrients. This addresses micronutrient deficiencies, such as iron deficiency anemia, which affects 59.7% of children aged 6 to 11 months and 29% of children aged 12 to 23 months—a significant public health issue in Colombia.

Objective: To explore the acceptability, use, and consumption strategies of a lipid-based nutritional supplement in children aged 6 to 23 months in *Pasto*, Colombia.

Methods: Mixed-method study, Phase I: focused ethnographic base, *'Design Thinking'* and in-depth interviews with health professionals, from whom information was obtained to be applied in Phase II in mothers and caregivers, to explore the acceptability and use of the supplement, through the implementation of recipes and organoleptic tests in workshops (n=23 mothers/caregivers) and children's homes (n=15) for 14 days. Qualitative data were analyzed with NVivo and quantitative data with SPSS. The study was approved by the Ethics Committee of Universidad CES.

Results: During the food workshops, mothers/caregivers selected mainly: *colada* (instant cereal), soups, *purée*, yogurt, and banana. The supplement was offered with one of these foods: yogurt (35%) or *colada* (22%); selected *"because their children are used to eating them"* and *"they like them"*. From the 14-day trial, adherence to consumption was 47%, the main reason for not consuming the daily ration of the supplement was that *"they did not like the supplement"* or *"food was mixed with…"*. Other reasons were: that the child eats too little, has eaten other foods before, or mixed with too much food. If the child is not hungry, has been breastfed before giving the supplement, or it is offered at a time when the child does not usually eat well, the supplement is rejected.

Conclusions: Knowing the behavior of mothers and caregivers when providing SQ-LNS was key to understanding the reasons for preferences and rejections in the use of the supplement, which helps to better implement public nutrition programs.

Conflicts of Interest: none

Keywords: SQ-LNS; infant feeding; Colombia

P2.54

Children's Menus from Fast Food Restaurants on the Uber Eats Delivery Application

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Objective: To evaluate the offer of children's menus offered in fast food restaurants present in the Uber Eats delivery application through the Kids Menu Healthy Score "KIMEHS" in Greater Santiago.

Methods: Observational, descriptive, cross-sectional study in fast food restaurants present in the Uber Eats delivery application in different communes of greater Santiago classified according to the Social Priority Index (IPS). The Kids Menu Healthy Score "KIMEHS" was used to evaluate the quality of the menus.

Results: 858 restaurants were selected, of which 57 offered children's menu, obtaining 114 children's menu options from 18 different communes. The common offer was based on fried and/or processed lean meat (Nuggets or breaded chicken fillets) accompanied by french fries in 71%. Most menus do not offer legumes or soups in their children's options, nor do they display nutritional information. Only 8% of menus include an offer of collectible toys. Asian and Peruvian restaurants are the only ones that offer fish on their menus (14%), which is usually fried. 99% of the menus evaluated scored the minimum score on the KIMEHS, falling into the "not healthy at all" category.

Conclusions: Most restaurants offer a children's menu of low nutritional quality and poor balance, where their dishes are commonly based on fried and processed products pointing to the urgent need for legislation on guidelines

Conflicts of interest: none

Keywords: Fast-food restaurants, Uber Eats, nutritional quality, children menu offering

P2.55

A Call for the Recognition of Breastfeeding Women as Subjects of Rights in Food and Nutrition

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Introduction: Globally, the importance of Breastfeeding (BF) during the first thousand days of life is recognized. However, in promoting it, the nutritional and dietary situation of the woman is often overlooked. This leads to instrumentalizing her, violating her rights, and negatively affecting BF.

Objective: To interpret the perception of a group of breastfeeding women regarding their recognition as subjects of rights in food and nutrition.

Methods: A descriptive-interpretative perspective was used. Sampling was intentional and conditioned by theoretical saturation. Semi-structured interviews, which were recorded and transcribed, were used as the data collection technique. According to Braun and Clarke's thematic analysis model, the information was analyzed simultaneously with its collection.

Results: Eleven interviews were conducted. The narratives revealed that healthcare attention changes drastically from pregnancy to breastfeeding. In the latter, attention focuses on the Newborn (NB), their care, and breastfeeding, neglecting the recognition of the health, nutritional, and emotional needs of the breastfeeding woman. Consequently, it was identified that they have limited awareness of their own needs, always prioritizing the care of other household members and the NB before themselves. Since nutrition is not considered a priority to enhance their well-being, the women who described adjustments in their dietary patterns did so under the guidance of family members and social networks that focused on food as a potential enhancer of breast milk production.

Conclusions: The tendency to minimize the breastfeeding woman to her biological function of breastfeeding contributes to the lack of recognition and protection of her rights, reducing her autonomy and well-being. This view affects how women perceive their needs and rights and, consequently, their ability to recognize and demand them. A more comprehensive vision should be promoted, recognizing women based on their needs and context.

Conflicts of Interest: the results are part of a macro project funded by the Éxito Foundation

Keywords: breastfeeding; women's rights; perception

P2.56

Risk Factors for the Development of Metabolic Dysfunction-Associated Fatty Liver Disease in Mexico

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Introduction: During the year 2020, the term metabolic dysfunction-associated fatty liver disease (FLD) (MAFLD) was coined, in response to the need to encompass the known information in the field of non-alcoholic FLD, which spans from steatosis to steatohepatitis, liver cirrhosis, and hepatocellular carcinoma; with risk factors including overweight or obesity, insulin resistance, T2-DM, and sedentary lifestyle. No studies have yet been conducted on the prevalence of these factors in the Mexican population.

Objective: To determine the frequency of risk factors in patients with MAFLD at a national center for hepatic diseases: CEIHET, Mexico.

Methods: A cross-sectional study was conducted. Patient records with NAFLD were selected from January 2020 to October 2024. Statistical analysis was performed using measures of central tendency, dispersion, and correlation.

Results: A total of 587 records were analyzed, with 56% (n=329) female and 44% (n=258) male patients, with a mean age of 51.4 years. The mean age for simple steatosis was 38 years, whereas for liver cirrhosis it was 63 years. Regarding education level, basic education was observed in 73.12% (n=215) of cirrhosis patients, while in earlier stages of this spectrum, it was 21.84% (n=64), indicating that lower education levels correlate with diagnoses at more advanced stages. In family history and personal history, type 2 Diabetes was the main risk factor with 65.92% (n=387) and 58.77% (n=345) respectively, and 6 out of 10 patients had 2 or more risk factors in these categories. It was shown that 77.3% (n=454) of MAFLD patients did not meet the standards for adequate physical activity, with 53.2% being sedentary. Regarding body mass index, 73% of patients with simple steatosis were overweight or obese, while it was present in 98% of patients with liver cirrhosis without ascites or edema.

Conclusions: Sedentary lifestyle, overweight, obesity, and T2-DM are determining factors for the presence of this pathology in the Mexican population, highlighting the importance of nutritional management to prevent its progression and improve patients' quality of life.

Conflicts of Interest: none

Keywords: metabolic dysfunction-associated fatty-liver disease; epidemiology; fatty-liver

Safe, Healthy, Sustainable and Social Food

P3.01

Physicochemical and Microbiological Evaluation of a Traditional *Téjate* Beverage with *Malanga* Flour Addition Using Sterilization as a Pasteurization Medium

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Introduction: *Tejate* is a typical beverage from the Zapotec region of the Central Valleys of Oaxaca, Mexico. It is traditionally produced in an artisanal manner and served in decorated *jícaras*. In the absence of a formal standardized protocol, consumer food safety could be compromised. In artisanal beverage production, several factors can cause microbial contamination and spoilage.

Objective: The objective of this research was to develop a pasteurized beverage, added with *malanga* flour, and to analyze the stability of its physicochemical and microbiological properties for 60 days.

Methods: The raw material was obtained locally. The beverage was prepared by mixing tea powder and *malanga* flour (80:20) with sugar and water. The ingredients were mixed and packaged in 450-ml bottles, then autoclaved at 121°C for 15 minutes in three batches of 15 bottles (45 total). Refrigerated at 8°C, physicochemical and microbiological properties were analyzed at 15, 30, 45, and 60 days, compared to the control (day of processing). The following were determined: moisture content, total solids and ash; total soluble solids; titratable acidity; and density. Microbiologically: aerobic plate count, *Salmonella, Shigella; fungi* and yeasts. Results (mean ± standard deviation, three replicates) were analyzed by ANDEVA and Tukey's test (95% confidence) with Minitab 21.

Results: The physicochemical and microbiological properties of the beverage were obtained after 60 days. In general terms, it was found that the beverage maintained an acceptable microbiological and physicochemical stability up to 45 days after brewing.

Conclusions: Despite challenges, sterilization offers safety and durability, being a superior option to traditional methods. This innovative, potentially marketable, and healthy beverage is a culturally important alternative in the region. It addresses the food safety of tea with comprehensive strategies, protecting its authenticity through modern practices in the face of risks such as mycotoxins in corn and cocoa.

Conflicts of Interests: none

Keywords: Mexican traditional beverage; mycotoxins; sterilization

P3.02

Impact of Using Nightshade in the Production of an Extruded Snack Based on Purple Corn

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Introduction: The current challenge for industries that produce snack foods is to reformulate these products to make them more nutritious without affecting the taste or smell of the products. Therefore, the extrusion process is one of the most common processes for obtaining snacks. Purple corn is a pigmented variety of *Zea mays*, normally grown in Latin America, rich in starch and gluten, but has a low protein content and that is why it is sought to increase its nutritional content, by adding flours from unconventional sources, such as nightshade (*Solanum nigrescens*) which is a herbaceous plant that grows as a weed in wild areas and is adaptable to different types of climate and has a high protein value and antioxidant capacity.

Objective: Evaluate some physicochemical properties of an extruded snack made from mixtures of nightshade (*Solanum nigrescens*) in purple corn (*Zea mays* L).

Methods: Three independent variables were evaluated (temperature: 125-175 ºC, moisture content: 18-25%, and concentration of nightshade flour (CNF) in purple corn flour (PCF): 0-50%). The response variables were texture (hardness), expansion radius (ER), and apparent density (AD). The results were analyzed by standardized effects analysis (Pareto analysis).

Results: CNF concentration in PCF had the most significant impact among all the response variables studied, followed by moisture on Er and temperature on AD. The results showed a range of texture: 13.79 to 104.54 N, RE: 85 to 156%, and AA: 0.60 to 1.18 g/cm^3.

Conclusions: The use and concentration of nightshade flour plays a very important role, as it is the factor that had the greatest significant effect on the physicochemical properties evaluated, probably due to the high protein content. However, further research is needed on the chemical composition, antioxidant capacity, as well as consumer acceptability tests.

Conflicts of Interest: none

Keywords: corn; *Solanum nigrescens*; byproducts; hardness

P3.03
Microencapsulation by Spray Drying of *Rorippa Nastartium Aquaticum* Extracts

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Introduction: In Mexico and at the national level, diseases such as cancer, and cardiovascular diseases, among others, are suffered, which is why alternatives are sought in natural foods with beneficial substances to counteract them. Watercress is a wild plant that contains vitamins and minerals, as well as bioactive compounds responsible for antioxidant activity. However, care must be taken when extracting them, as they tend to degrade during processing. In this sense, microencapsulation by spray drying is used to convert liquids into solids, add functionality, improve oxidative stability, mask flavors, and odors, protect bioactive compounds, and extend the shelf life of foods.

Objective: The objective was to evaluate microencapsulation by spray drying of watercress leaf extracts to protect their bioactive compounds for possible use in the food industry.

Methods: *Rorippa* leaves were purchased at the local market in San Juan Bautista Tuxtepec, Oaxaca, Mexico. Maltodextrin and gum Arabic were purchased from the supplier. It was microencapsulated using a Buchi B-191 laboratory scale spray dryer, the mixtures were made according to a rotatable composite central experimental design with two independent variables: temperature (100-150 °C) and mixtures of wall materials: maltodextrin and gum. Arabica (0-100%) and the response variables were evaluated: efficiency, retention, yield, morphology, and moisture content.

Results: It was observed that increasing the microencapsulation temperature increased the microencapsulation yield (34-79%), efficiency (71-92%), and flavonoid retention (85-100%). The increase in maltodextrin concentration decreased the retention of flavonoids (64.29%), and humidity (3.33%). The microcapsules had sizes of 2.82-29.87 μm, with dents on the surface of the capsules, and were spherical in shape.

Conclusions: High values were obtained in the retention and efficiency of bioactive compounds in microencapsulation, so it can be suggested that the microcapsules obtained from the different mixtures of wall material are feasible for inclusion in the food industry.

Conflicts of Interest: none

Keywords: *Rorippa nastartium aquaticu;* maltodextrin; microcapsules; spray drying

P3.04
Promoting the Circular Economy: Transforming Agro-Food Surpluses into Healthy and Sustainable Food

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Introduction: 1.3 billion tons of food produced for human consumption are lost or wasted worldwide each year, and between 40% and 50% of fruits and vegetables are lost or wasted annually. This is why the circular economy proposes a model of prioritization of priorities in the management of food waste, one of which is the valorization of agro-food surpluses.

Objective: The objective of this study was to transform agro-food surpluses into healthy and sustainable foods.

Methods: Five experimental formulations of salted concentrates were developed from surplus broccoli, celery, and beetroot at different concentrations. The formulations were heat-treated with pasteurization at 85°C for 25 minutes. Microbiological analyses were carried out on the raw materials to be used after the sanitization process and once the formulations were pasteurized. Sensory analysis was performed on the 5 formulations, using a 7-point hedonic scale, to evaluate product acceptance under general appearance, aroma, color, and texture. Finally, proximal analyses were carried out.

Results: Formulation n° 5 was selected due to the availability of raw materials, consisting of 30% agro-food surpluses of broccoli, 60% celery, and 10% beetroot leaves, without salt or additives. In the subjective sensory analysis of formulation No. 5, the following

general appearance scores were obtained: 3.7±2.0; aroma: 3.8±1.9; color: 3.9±1.6; texture: 4.5±1.8. Regarding the nutritional characterization in 100 grams of food was: humidity: 93%; calories: 12 kcal, carbohydrates: 0.8 grams; dietary fiber: 2.7 grams; proteins: 1.5 grams; lipids: not available.

Conclusions: The composition of formulation n°5 is given from the agro-food surpluses available in the wholesale market and the unusual intake of agro-food surpluses could explain the values obtained in the sensory analysis. This experience poses a series of challenges when it comes to valorising food waste to create new foods that are not only healthy but also sustainable.

Conflict of interest: none

Keywords: valorization; agro-food surpluses; circular economy; sustainability

P3.05
Roles and Food Practices of *Girardotas'* Female Coffee Farmers

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Introduction: Gender roles have been established by the local culture: Women commit to home chores and caretaking; Men play the role of providers. In the last decades, this has changed with many women who due to socioeconomic factors now play both roles. This applies to coffee farmers in *Girardota*, Antioquia.

Objective: Describing *Girardota's* female coffee farmers' caretaking and coffee farming practices.

Method: Qualitative methodological approach. Focused ethnography, which recognizes shared experiences among subjects in a specific thematic. Techniques used were deep interviews and observations. The analysis began with a codification and categorization process, grouping related ideas followed by theoretical bodies, and defining the study's categories and subcategories.

Results: Although women do several coffee production processes, some of them do not perceive themselves as coffee farmers and are ignored in this area. They have no coffee farmer ID nor lands of their own. They do caretaking activities, home chores, supervise animals and gardens, and activities related to coffee farming. They must wake up early in the morning, and go to bed late, without receiving any help or salary. They do coffee-related activities like washing, shaking, selecting, drying, and delivering to the canopy. They do home chores like cleaning the house, clothes, and pottery. Moreover, caretaking activities, and cooking daily meals, which is very traditional. They would appreciate having more time for coffee farming and making a brand of their own.

Conclusions: Food prepared by women is traditional and healthy. At home, they play the role of caretakers and providers without receiving a salary or credit in the coffee-growing industry.

Conflict of interest: none. Funded by the University of Antioquia.

Keywords: municipality of *Girardota*; women; coffee; care practices; coffee work

P3.06
'GOODFOOD' – A European Educational Project to Promote Healthy and Sustainable Consumption in Adolescents: Results and Considerations for the Future

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Introduction: Diseases associated with an unhealthy and unsustainable diet continue to rise in Europe, especially in the younger population. Teenagers seem to know the importance of healthy eating, but this does not translate into their daily habits. School is an environment where young people acquire many of their habits and where education is a powerful tool to improve their diet and future health.

Objectives: The main objectives of *GOODFOOD* are i) to increase adolescents' understanding of the impact of our food system on the planet and human health, ii) to support teachers towards an interdisciplinary teaching model that promotes research-based learning projects.

Methods: Participants: secondary education students and teachers from Greece, Italy, and Spain. Materials: 1) Questionnaires to attain opinions and experience of teachers and students; 2) methodology and learning units; 3) workshops for teachers and students; 4) digital resources, websites, and social networks; 5) school projects and sustainable and healthy recipes.

Results: The participants expressed a high interest in the topic, although their knowledge about it was very general and limited. The methodology is based on research projects and the combination of different school subjects. A total of 9 learning units have been developed on the themes: production, distribution & sustainable management of food and food waste, and on nutritious and healthy eating. The students' activities focused on the preparation of healthy and sustainable recipes investigated through the application of digital tools, laboratory tests, surveys to professionals, and visits to centers of the agri-food sector. All results, methodology, resources, and information are available on the website: https://goodfoodeplus.cebas.csic.es/.

Conclusions: The GOODFOOD project has constituted an important push to promote among teachers and adolescent students the need to change our eating habits to improve future human and planet health. This working model must continue to evolve and be applied in school systems.

Conflicts of Interest: none

Keywords: education; teenagers; feeding; sustainability; healthy

P3.07

Effect of Technological Treatment in the Composition of Andean Maize Native Whole-Grain Flour Used to Make Bread

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Introduction: Andean maize grown in Jujuy-Argentina derives from family farming, the main form of agricultural production in Quebrada and Puna regions. Transforming the grain into higher value-added products such as gluten-free breads will allow producers to generate economic benefits while conserving the biodiversity of this ancient grain.

Objective: The work aimed to evaluate two races of Andean maize in order to produce gluten-free flours with baking aptitude through extrusion processing.

Methods: The Andean maize (races *Capia* and *Bolita*) was provided by producers from Ocumazo- Humahuaca, Jujuy Province, Argentina. Native whole-grain flours were extruded at 120°C, 20% humidity, and 120 rpm in a Brabender single-screw extruder. These samples were ground and fermented with lactic bacteria until pH 4. The proximal composition and dietary fiber were determined for the native flour and those treated by extrusion and extrusion-fermentation. Mold bread was made with mixtures of native (80) and treated (20) whole-grain flours and its textural properties and specific volume were determined.

Results: The application of extrusion and extrusion-fermentation in Andean maize whole-grain flours reduced the content of free lipids compared to the native flours, especially in the *Capia* race maize (6.00±00 to 1.39±0.02 g/100 g db). The dietary fiber content was higher in the extruded sample of *Bolita* maize. Although the replacement of native- whole-grain flours with extruded and extruded-fermented whole-grain flour reduced the specific volume of bread (between 1.73±0.02 to 1.51±0.01 cm3/g), also increasing the hardness, gumminess, and chewiness of the gluten-free bread made with both maize, they also contributed to improving the springiness, cohesiveness, and resilience of bread. *Capia* maize bread made with native and extruded whole-grain flour presented a significant ($p<0.0001$) improvement in its textural properties.

Conclusions: The replacement of extruded Andean maize whole-grain flour contributes to improving the textural characteristics of gluten-free bread. The volume of the loaves seems not to be associated with the Andean maize races. *Capia* and *Bolita* maize are suitable for formulating gluten-free bread products.

Conflicts of interest: none

Keywords: Andean maize; whole-grain; gluten-free bread; fermentation; extrusion

P3.08

Incident Management System and role of the Dietitian Nutritionist professional

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Introduction: The Incident Management System - IMS requires trained nutritionists- dietitians with competencies that can incorporate differential gender and rights-based approaches, ensuring equitable participation of men and women in the conception, implementation, and leadership of sustainable Food Security programs to address in a timely way anthropic and natural situations, recognizing ancestral knowledge and practices, and aiming to guarantee life, reduce risks, and promote the recovery of the environment towards sustainable and resilient development in Colombia. This territory has historically been impacted by forced displacement, pandemics, natural disasters, and climate change, among other factors.

Objective: To evaluate the comprehensive educational competencies of nutrition and dietetics professionals and students in the design, formulation, implementation, and evaluation of plans and strategies that enable emergency risk management, in alignment with Human Rights and ensure food security, sovereignty, and sustainability during emergency and disaster situations.

Methods: This is a multicenter, descriptive cross-sectional study conducted over three different periods, with independent samples across different time points. A survey was conducted to assess perceptions, knowledge, and attitudes regarding risk management in emergency and disaster situations. The sample size was 114.

Results: Overall, 85% were women; 63% were students, 20%; were academics; and 7% were administrative professionals. All participants expressed their intention to receive training in the IMS. 91% were unfamiliar with the theoretical foundations of the IMS, while 9% had experience in emergency and disaster intervention. 18% believed they could be integral actors in IMS intervention if they had specific academic competencies, and 73% considered themselves lacking the skills to be field actors in IMS intervention.

Conclusions: The Incident Management System requires specialized and expert nutritionists and dietitians trained in risk management, who demonstrate proactivity, timeliness, and empathy skills in teamwork within the territorial COE for intervention in Food Security and Nutrition during emergency and disaster events.

Conflicts of Interest: none

Keywords: emergencies and disasters; food and nutrition security; incident management system; human rights; differential approach

P3.09

Food Loss and Waste in *The Potrerillo* Market Square in *San Juan de Pasto*

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Introduction: To achieve sustainable food systems, a great challenge at the global level is the reduction of food losses and waste. According to estimates made by FAO (2012), this problem reaches figures that are close to a third of the world's food production. At the national level, it constitutes a problem that contributes to high levels of food and nutritional insecurity, conditions of inequality, and environmental deterioration.

Objective: Characterize the loss and waste of food generated at the *Potrerillo* market center in the municipality of *Pasto*.

Methodology: This study was developed under a concurrent mixed methodology. The quantitative component included direct weighing of food losses and waste of the prioritized groups (Fruits, vegetables, roots, tubers, and bananas), subsequently, the nutritional and economic loss was estimated. For the qualitative component, semi-structured interviews were applied to different actors, which were digitized and analyzed.

Results: The determining factors of the context that contribute to food loss and waste are the inefficient organization and infrastructure, which lacks spaces for storage and marketing, low government interest, and weaknesses in the social cohesion of vendors. The physical quantification included 12 weighings, estimating a total of 2,616 tons of losses and waste, with greater representation of the group of fruits, later, vegetables, roots, tubers, and bananas. For nutritional loss, a total of 1,656,155 calories was estimated, with a greater proportion of nutritional loss of carbohydrates followed by lipids and proteins. The above represents an economic loss of 11, 177, 236 COP.

Conclusions: The study identified that food loss and waste are generated by serious administrative, organizational, and social problems. Food loss and waste are problems in the Potrerillo market square, with a negative impact on the environment. They also contribute to food and nutritional insecurity due to the economic and nutritional loss it represents.

Conflicts of interest: none

Keywords: food loss; food waste; food and nutrition security

P3.10

Use of Ultrasound as a Separation Technique in Cryoconcentration of Mint Infusions to Increase Bioactive Compounds and Antioxidant Capacity

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Introduction: Medicinal plants are considered a valuable source of natural bioactive ingredients that can be utilized to enhance food products or develop drugs. Among them is Mint (*Mentha piperita*), whose leaves are commonly used for tea infusions. However, little research has been done on the use of concentrated infusions in the development of syrups or to be added to other matrices.

Objective: This study aimed to explore the use of ultrasound technology as an assisted technique in cryoconcentration and to assess its impact on process parameters and physicochemical properties of the resulting concentrate.

Methods: The infusion underwent a freezing process and was cryo-concentrated in three consecutive stages at a temperature of -20°C for 12 hours. The separation of the concentrate was done using an ultrasonic bath. A 3Ù2 factorial design was employed, assessing ultrasound frequency at 45, 80, and 100 kHz, and time at 3, 5, and 10 minutes, while maintaining the bath temperature at 15°C. The process parameters and antioxidant properties of the concentrates and obtained ice were analyzed.

Results: The study found that the optimal conditions for cryoconcentration of Mint infusion were 80 kHz and 3 minutes. The concentration efficiency was 70%, with a solute yield of 25 g concentrate/g infusion and a concentration index 45 times higher than the initial infusion value. The polyphenol and flavonoid levels increased 14 times, and antioxidant activity increased 12 times in the liquid fraction after the process. The highest percentage of bioactive compounds were retained in the concentrate with ice losses of less than 7%.

Conclusions: The results demonstrated that the use of ultrasound in the separation stage allows for improving the content of bioactive compounds and the functional properties of Mint infusion. This technique can help obtain concentrated fractions with high biological values, which could be used to create natural products for medicinal syrups or supplements to enrich food matrices.

Conflict of Interest: none

Palabras clave: ultrasound; cryoconcentration; mint, infusion

P3.11

Acrylamide Determinación in Traditional Colombian Foods

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Introduction: Acrylamide is a potentially carcinogenic substance produced in starchy foods treated at temperatures above 120°C. In Colombia, fried, grilled, or baked preparations based on cereals, plantains, roots, and tubers are important staples of the diet.

Objective: This study aimed to determine and assess the acrylamide content in traditional Colombian homemade foods and preparations.

Methods: Selected samples for the determination of acrylamide precursors, acrylamide, and browning indicators were defined based on consumption patterns and the characterization of traditional preparations. Twenty preparations based on cereals and on potatoes, yucca, and plantains, processed at the household level with different intensities of heat treatment, were analyzed. The content of reducing sugars, asparagine, total amino acids, and the intensity of color, measured indirectly, were analyzed to study the generation of acrylamide. Acrylamide was determined using UPLC-MS/MS in raw materials, foods, and preparations commonly consumed in Colombia processed at the household level with different intensities of heat treatment.

Results: The highest acrylamide values were obtained in fried potatoes of different varieties (748 μg/kg) and green plantains (806 μg/kg), generally exceeding those established in European Regulation (ER) when the intensity of heat treatment is the highest. In the processing of *arepas*, *arepuelas, churros*, rice croquettes, and yucca, very low acrylamide values can be achieved, lower than 20 μg/kg.

Conclusions: High browning intensity is necessary to produce acrylamide values higher than those established by the ER. Very different acrylamide values can be obtained depending on the variety and ripeness of the food. Pre-cooking may limit the final acrylamide level in the food.

Conflicts of Interest: none

Keywords: acrylamide; Colombian foods; starchy foods

P3.12

Comparison of Anxiety and Depression Levels and Their Relationship with Food Insecurity in University Students of Health Sciences at the University of Guadalajara, Mexico

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Introduction: University students in the health field are more likely to experience anxiety and depression; moreover, food insecurity (FI) may occur in vulnerable populations, negatively impacting the health and academic performance of students.

Objective: To compare the level of anxiety and depression and their relationship with food insecurity among health sciences students of the Centro Universitario del Norte versus the Centro Universitario de Tonalá of the University of Guadalajara.

Methods: Cross-sectional-analytic study conducted during the school cycle 2023-A; including active students of Health Sciences (HS) of the Centro Universitario del Norte (CN) and Tonalá (CT) of the University of Guadalajara (UDG), of both sexes, aged 18-24 years. Exclusion criteria included parents, chronic diseases, economic support, and previous diagnoses of anxiety and depression. Non-probabilistic convenience sampling was employed with a sample calculation of 265 students. Instruments used include FIES-SM, AMAI, and Beck's depression and anxiety inventory. Ethics Committee approval and informed consent were obtained. Frequencies, percentages, and Chi-square test; means and standard deviations or median (min-max) and T-test or Mann-Whitney U test were analyzed and performed with SPSS-21; statistical significance was set as $p < 0.05$.

Results: A total of 327 students were included (CN= 56 and CT= 271); >95% were single, >62% came from nuclear families, and had 2 to 4 siblings (>58%). Statistical differences were observed between centers in the distribution by sex and semester, parental education, and parental occupation only ($p < 0.05$); these differences were not observed within centers. The FI rate was 23.8% (CN) and 29.4% (CT), with mild FI being the most common, without SS by sex and center. Depression was not present in men in CN, but it was in 48.6% of women; and 16.7% and 29.4% in CT respectively ($p < 0.001$) between genders within centers but not between centers. This trend was also observed in anxiety, with the same statistical results.

Conclusions: Food insecurity is lower than state and national statistics despite being vulnerable populations. Anxiety and depression were significantly higher in women.

Conflicts of Interest: none

Keywords: food security; anxiety; depression; university students

P3.13

High-Fiber Foods and Their Impact on Nutrient Digestibility

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Introduction: Proper nutrition is essential for human health and dietary fiber is important for the digestive system. For a complete assessment of the nutritional value of foods, in addition to their chemical composition, it is necessary to consider the nutrient digestibility processes available for absorption.

Objective: This work aimed to analyze the chemical composition of three fiber-rich food sources and evaluate digestibility by an *in vitro* gastrointestinal digestion method.

Methods: Three fiber-rich foods were used: flaxseed, chia, and prickly pear cactus. Proximal analysis was performed according to AOAC's official methodologies: protein (Dumas, 992.23), fat (Goldfish, 7.056), ash (923.03), and total dietary fiber using the Sigma- Aldrich Total Dietary Fiber Kit, Supelco® (AOAC, 991.43). For *in vitro* gastrointestinal digestion (INFOGEST), saline buffers and enzymes (pepsin, pancreatin, and bile) were used for the different digestive phases.

Results: Dried and ground samples from flaxseed, chia, and prickly pear cactus had a high content of dietary fiber (24±0.05, 27±0.48, and 35±0.73%, respectively). Flaxseed and chia samples had a high lipid content (41±0.45 and 37±0.64%, respectively); also, a high ash content was observed in prickly pear cactus (20±0.58%). On the other hand, the analysis of the *in vitro* digestibility of nutrients in food sources showed that the highest percentage of protein was present in flaxseed (66±4.60%) followed by prickly pear cactus and chia (41±4.29 and 42±3.89%, respectively). In terms of lipid content, prickly pear cactus had the highest percentage (52±6.84%), compared to chia and flaxseed (45±5.37 and 38±1.51%, respectively). However, the availability of ashes in flaxseed and chia (67.46±0.58 and 71.99±0.57%, respectively) was higher than in prickly pear cactus (35.66±2.10%).

Conclusions: Factors such as the chemical composition, origin, and processing of food can influence the digestibility and availability of nutrients. In this study, it was observed that samples with high fiber content are influenced by reducing the availability of proteins. More research is required in this field.

Conflicts of Interest: none

Keywords: proximal composition; *in vitro* digestibility; dietetic fiber

P3.14

Design a High-Quality Hot Drink that is Nutritious and Culturally Acceptable for Children of Indigenous Migrant Day Laborers in Social Vulnerability

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Introduction: In Mexico, agricultural workers who migrate taking their families with them are a population with high marginalization and poverty, which affects their nutrition and health, especially in childhood. In Guanajuato, the Loyola Indigenous Development Center established the *Na'Valí* camps ("children's camp", *Tu'un Savi* language), to provide education, health, and nutrition support to the children of day laborers who come to harvest in agricultural fields. The University of Guanajuato Campus León through the Bachelor's Degree in Nutrition supports the *Na'Valí* camps by developing research on nutritional status, child neurodevelopment, and food insecurity.

Objective: Design a nutritious drink aimed at children who participate in the *Na'Valí* camps that would have higher nutritional quality than the drink originally offered.

Methods: The ingredients that could enrich the recipe for the base drink were analyzed. Chickpea, lentil, corn, sunflower, peanut, and flaxseed flour were tested. Organoleptic tests were carried out to evaluate smell, color, texture, and flavor. The nutritional content was subsequently evaluated to determine the best combination of ingredients. The drink was taken to camps to test its acceptability.

Results: An enriched drink was obtained that provides more than double the protein, B complex vitamins, zinc, magnesium, iron, potassium, omega 3, and omega 6 fatty acids compared to the conventional drink. With one portion of this drink, it was possible to cover 70% of the average energy requirements and 100% of the proteins that an infant requires per day and it was offered from Monday to Friday at the beginning of the camp day. It is considered that it was well received by the boys and girls at the camp.

Conclusions: The drink developed is simple to prepare and low cost, with known and available ingredients, with adequate organoleptic characteristics, and with a better nutritional contribution. Due to the contribution of energy, proteins, polyunsaturated fatty acids, calcium, iron, and zinc, it is an ideal drink that we hope in the medium term will have an impact on the growth and neurological and immunological development of the children who consume it.

Conflicts of interest: none

Keywords: childhood malnutrition; drink; migrants

P3.15

Network Pharmacology is a Tool for Exploring the Therapeutic Mechanism of *Opuntia Ficus-Indica* (Nopal) in Type 2 Diabetes and Colorectal Cancer

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Introduction: Type 2 diabetes (T2D) is one of the most prevalent diseases in the world and has been associated with the risk of colorectal cancer (CRC). Several studies demonstrate the beneficial effect of Nopal on T2D and CRC. However, the mechanism by which this plant acts on these two diseases has not been adequately described.

Objective: To investigate the pharmacological mechanism of Nopal in treating T2D and CRC.

Methods: Bioactive compounds of Nopal were identified in the IMPPAT database, and their molecular targets were inferred using the SWISS TARGET PREDICTION tool and PharmMapper Server. Using the DisGeNET, MalaCards, and CTD base websites, genes associated with T2D, and CRC were identified. Subsequently, common molecules between these two groups were identified. Gene ontology enrichment was performed with the ShyniGO 0.80 database to determine the function of these shared genes, and the protein-protein interaction network was constructed with the Cytoscape tool to identify hub genes. Finally, the binding of hub genes with bioactive compounds from Nopal was verified by molecular docking using PyRx and BIOVIA studio tools.

Results: Seventeen bioactive compounds were identified in Nopal, which presented 430 molecular targets. We obtained 923 genes associated with T2D and 1896 with CRC, of which 55 were shared with the molecular targets. Nopal bioactive compounds are involved in biological processes related to apoptosis in T2D and CRC; they act mainly on the cell membrane and mitochondria; they participate in the molecular function of kinases and cytokine metabolic pathways. In addition, they act primarily on five key proteins: AKT1, SRC, MAPK14, MAPK8, and HSP90AA1, which spontaneously bind to Nopal bioactive compounds.

Conclusions: Nopal has 13 bioactive compounds that participate in metabolic pathways related to cytokines, apoptosis processes, and molecular functions of kinases and act on the cell membrane and mitochondria.

Conflicts of Interest: none

Keywords: bioinformatics; cancer; diabetes; colorectal; nopal

P3.16

Bromatological Analysis and Nutritional Composition of the Most Consumed Soups in San Juan de Pasto According to Cooking Time

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Introduction: The nutrient content in foods, as well as the quantity, quality, and characteristics of these, can vary depending on the preparation method and cooking temperature. Therefore, it is important to consider the culinary technique and cooking method when choosing foods for preparation; these factors can affect their nutritional value. The loss of nutrients in foods during their preparation is a complex phenomenon that depends on multiple factors, including time, temperature, type of food, initial state, and cooking method. Understanding how the method influences the final nutritional content of soups is central to dietary and food culture.

Objective: Determining the nutritional value based on exposure time in the most consumed soups in the municipality of San Juan de Pasto.

Methods: The study was conducted under a quantitative approach with an empirical positivist paradigm, employing a quasi-experimental design. Data were collected from 464 consumption diary records, identifying the 23 most consumed soups, of which 6 were selected for the study. These soups were standardized and adjusted according to the desired number of servings.

Results: The results showed a uniform distribution among the selected soups, with significant differences in calorie content according to multivariate analysis. A direct influence of ingredients on the nutritional content of soups was observed. Overall, the calorie, carbohydrate, and protein content increased with cooking time. The fat content, on the other hand, showed inconsistency as it increased with cooking time in some soups while decreasing in others.

Conclusions: From the statistical tests, subsets of soup groups with similar contributions of calories, carbohydrates, lipids, and proteins are very useful for classifying them according to their macronutrient content. This classification can have various practical applications such as controlling food exchanges, managing different pathologies, and offering options according to needs and preferences.

Conflicts of Interest: none

Keywords: soups; nutritional contribution; standardization; cooking time

P3.17

Perception of Purchase and Consumption of Food Acquired in Supermarkets and Agroecological Fairs in the City of *Cuenca* 2023

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Introduction: In the city of *Cuenca*, Ecuador, due to people's growing concern about the impact of food consumption on their health, there is an interest in studying their knowledge and purchasing behavior at agroecological fairs and supermarkets. A study carried out there identified that only 48% of respondents buy in agroecological fairs even though they offer healthy products, provide fair treatment and welfare to farmers, and are the best place to buy the basic food basket.

Objective: To analyze and understand the perceptions of adults about the purchase and consumption of food acquired in supermarkets and agroecological fairs in the city of *Cuenca*.

Methods: A sample of 28 adults was recruited, 14 supermarket shoppers and 14 agroecological fair shoppers, aged between 30 and 55 years. Focus groups, semi-structured interviews, and audio recording techniques were used for data collection, audio transcription was manual, and ATLAS.ti 23 software was used for data analysis.

Results: Shoppers at the agroecological fair prioritize the purchase of fresh, organic foods and trust in their origin and quality, but supermarket shoppers prioritize the review of labeling, specifically expiration dates and content of salt, sugar, fat, sweeteners, and colorings. The most purchased and consumed foods at the agroecological fair were vegetables and fruits, but in the supermarket were dry foods, oils, meats, dairy products, and canned goods. In both places, people prefer to buy food in good condition, well preserved, and stored in clean spaces, and they do not know the ingredients and production processes of most of the food.

Conclusions: Between the agroecological fairs and supermarkets, there are clear differences in the most important factors that their customers consider when buying and in the most purchased and consumed foods, but there are clear similarities in terms of lack of knowledge about ingredients and food production processes and in that they demonstrate that they are very conscious of their health by the way they buy.

Conflicts of Interest: none

Keywords: perception; purchase; consumption; food; agroecological fair; supermarket

P3.18

Breads With a Health Horizon: Without Excess Nutrient Stamps, High in Fiber, and With Sensory Acceptability

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Introduction: Recovering the nutritional status of bread is imperative for the baking industry; it must be rethought and supported by scientific activity to be in harmony with food trends and demands.

Objective: To formulate a baked product with nutritional properties as a proposal for demands in nutrition and health, expressed in the milling and bakery sector.

Materials and Methods: HF formulation selected for bread enriched with fruit fiber, whole-grain, gums, and cereal flakes, with flour, preferment wheat, and secondary ingredients typical of bread, without the addition of synthetic sweeteners and standardized bread-making process. A control sample was also prepared and analyzed: bromatological, critical nutrient (sodium, sugar, saturated, and trans-fat) quantification, and allergen for egg, milk, and gluten. Physical tests were applied according to AACC methods, and acceptability tests by sensory perception. *In vitro* methodology was applied to estimate starch digestibility and glycemic index (eIG). All experimental data were expressed as mean ± standard deviation, with ANOVA and Duncan's multiple range test with $p< 0.05$ using Statgraphics Centurion XVII software.

Results: The most relevant results show that HF fiber bread does not require front labels on its packaging, with sugars at 8.96±0.8%, saturated fat at 3.97±0.1%, trans fat at 0.023±0.00, and sodium at 0.64±0.00, calculated according to current regulations in Colombia, with soluble fiber content of 1.93±0.2 and insoluble fiber of 6.5±0.5. The estimated eIG of HF fiber bread was 62.87±6.8 compared to white bread at 89.6±4.2, all with significant differences according to Duncan ($p<0.05$). The presence of allergens allows expressing that the bread is free of egg and casein proteins with 2.9±0.1 ppm and 0.12±0.0, respectively. The acceptability test on a scale of 1 to 5 shows results of 4 and 5 for flavor, texture, and smell.

Conclusions: It is possible to make bread with healthy properties that contribute to health and are in line with nutritional trends in the bakery and milling sector.

Conflict of interest: none

Keywords: glycemic index; front labels; dietary fiber

P3.19

Comparison between Two Biointensive Production Methods to Achieve Food Sovereignty in the *Mazahua* Region of the State of Mexico

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Introduction: In Mexico, the situation of food insecurity and the nutritional status of the rural population reflects a reality of deficiencies and difficulties in accessing an adequate diet; the availability of food is insufficient to meet the demands of the most vulnerable populations. Therefore, it is necessary to develop intensive agricultural interventions to increase the availability and accessibility of nutritious foods at low cost.

Objective: Compare two biointensive production methods to increase access and availability of food that contributes to better food and nutrition in 10 homes of Mazahua families in the State of Mexico.

Method: Ten commissioners were trained in 2 biointensive production methods: Vertical Membranes (VM) and Double Excavation Beds (DEB), 3 replicas of VM and 2 of DEB were carried out in each home of the commissioners, production records were completed, and destination of vegetables.

Results: Vegetable production was higher in DEB compared to VM (1,807.4 Kg and 1,119.4 Kg respectively), in the dry season, production in VM remained constant while the DEB showed a considerable decrease, the main vegetables produced were kale (VM 866.6 Kg, DEB 704 Kg), chard (VM 268.9 Kg, DEB 601.4 Kg) and romaine lettuce (VM 162.3 Kg, DEB 317 Kg), 57.6% of the total production by both methods was destined for self-consumption (VM 56.2 % and DEB 56.2%) and the remaining 42.4% for local sale.

Conclusions: The results obtained show that both VM and DEB can be considered as potential strategies to achieve food sovereignty in households in high and very high marginalization environments, not only can they contribute to facilitating the availability and access to more nutritious foods, if not also, they can generate extra economic income for households through the local sale of production surpluses, thus increasing the quality of life of families.

Conflicts of interest: none

Keywords: food insecurity; food sovereignty; nutrition; biointensive production

P3.20

Comparison of the Inflammatory Metabolic State Between Offspring and Mothers with Gestational Diabetes Mellitus and High Sucrose Consumption

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Introduction: Gestational Diabetes Mellitus (GDM) occurs in pregnancy with elevated blood glucose and metabolic alterations in the mother and the child. It is diagnosed in 30% of pregnancies and is influenced by the type of diet, particularly sucrose consumption. The effects of high sucrose consumption have been little studied.

Objective: To compare the inflammatory metabolic state between offspring and mothers with Gestational Diabetes Mellitus and high sucrose consumption.

Methods: Twenty-four females of the CD1 strain (10 weeks old) and their offspring were used. The females were placed in mating, the gestational status was confirmed, and 4 groups were formed (n= 6): Group 1, without GDM, without sucrose; Group 2, without GDM with sucrose; Group 3, with DMG, without sucrose; Group 4, with DMG, with sucrose. GDM was induced with a single subcutaneous dose of *streptozotocin* (230 mg/kg body weight). Sucrose was supplemented (Groups 2 and 4) with 500 µL of concentrated solution at 41.66 mg/mL, by oral deposition daily (8:00 am) throughout the gestational period. At the end of pregnancy, the females and offspring were sacrificed. In females and newborns, serum was obtained to quantify: insulin, Adiponectin, leptin, IL-1β, IL-6, INF-γ y TNF-α, IgA, and IgG.

Results: Females and their offspring with GDM and sucrose consumption maintained high blood glucose levels ($p < 0.001$). Adiponectin and leptin increased in offspring with sucrose consumption without GDM ($p < 0.001$), decreasing in females with GDM independent of sucrose consumption ($p < 0.001$). In mothers with GDM, inflammatory parameters, IgA, and IgG increased with or without sucrose consumption. In contrast, the offspring of group 2 and 4 mothers increased: IL-1β, IL-6, INF-γ y TNF-α. In the offspring, IgA decreased, and IgG increased with sucrose consumption.

Conclusions: High sucrose consumption alters metabolic parameters and IgA and IgG concentrations in mothers. The above is modified in the offspring. It is necessary to recommend the moderate use of sucrose during the gestational period.

Conflicts of Interest: none

Keywords: gestational diabetes mellitus; sucrose; metabolic state; cytokines

P3.21

Promotion of the Consumption of Vegetables in a Marginal Locality of Mexico

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Introduction: Food security represents physical-economic access to safe, nutritious, and sufficient food to satisfy nutritional needs and food preferences. The ENSANUT 2020 revealed that between 2018-2020, mild food insecurity (FI) increased by 5.8%. In rural areas, the consumption of nutritious foods is affected, among other factors, by poverty. It is necessary to influence food literacy in households in marginal locations.

Objective: Evaluate an educational intervention based on the dietary guidelines for the Mexican population in 2023.

Methods: A social-cognitive learning model was applied. From a survey of households in a town in Morelos, volunteers with FI were invited, who did not know about crops of vegetables and greens (V&G). In 5 weeks, 10 socio-cognitive learning sessions about the V&G were developed, including forms of cultivation and management; combination food; recommended V&G servings/day; hygienic handling; effects on health, conservation, physical activity, and culinary practice. At the end of the workshop, the following were evaluated: 1) acquired knowledge and 2) presentation of a menu or familiar dish, 3) daily food consumption.

Results: Of 106 homes visited, 59 people met the defined criteria and were invited by telephone, 16 started and 11 completed the workshop. Attendees of up to 7 sessions obtained a lower knowledge score than those attending 8 sessions or more (3.2 ± 3.5 points vs 7.3 ± 2.1 respectively, p [t]< 0.05). The prepared dishes were rated by judges with 9.1 ± 0.76 points. V&G consumption went from 3.5 ± 1.7 to 6.3 ± 1.2 servings/day, p[t] <0.05.

Conclusions: Food orientation based on socio-cognitive learning experiences is revealed in a higher level of knowledge, preparation of dishes, and the frequency of consumption of V&G.

Conflicts of Interest: none

Keywords: guides; food; survey; workshop

P3.22

Importance of Menu Labeling when Selecting a Restaurant by Colombian and American Consumers Considering their Health Concern

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Introduction: Restaurants may offer food that promotes obesogenic environments, but consumers may react differently based on their health concerns. Some governments have implemented menu labeling (ML) to intervene in such environments. However, it is unknown whether ML is important for consumers when they select a restaurant, even more so when comparing consumers who are familiar with ML to those who are not.

Objective: To determine whether there are differences in the importance that Colombian consumers (unfamiliar with ML) and American consumers (familiar with it) attribute to menu labeling when they select a restaurant based on their health concern.

Methods: This was a secondary analysis using data from the study "Nutritional Nudges at Restaurants: Establishments Adoption and Perceptions by Consumers." The subsample included 150 Americans and 121 Colombians (N = 271). Consumers responded to a 7- 7-point Likert scale that asked them to indicate the importance that they attributed to menu labeling (IML) when selecting a restaurant. A regression analysis was conducted. Explanatory variables considered were country, demographics (sex, age, education level, body mass index), and psychographics (hunger level and health concern).

Results: Differences in IML were found between consumers based on their country ($p < 0.01$). Age, level of hunger, and health concerns were identified as explanatory variables of IML. The variation in IML, according to the health concern level, was different between Colombians and Americans. Colombian consumers, even having a high health concern, assign significantly lower importance to IML compared to Americans ($p < 0.01$).

Conclusions: When selecting a restaurant, Colombian and American consumers showed significant differences in the importance they attribute to menu labeling. If ML were to be implemented in Colombia, it would be necessary to convince even those segments of the population with high health concerns of its importance.

Conflicts of Interest: none

Keywords: restaurants; menu labeling; health concern; food environments

P3.23

Neglected and Underutilized Plant Species in the *Yucatán* Peninsula, Mexico: Understanding their Nutritional Value and Potential to Improve Diets

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Introduction: There is a global call to promote the consumption of neglected and underutilized plant species (NUS) due to their potential to improve diets and food security. The actual global food crisis makes NUS particularly relevant as well. Some NUS, such as leafy greens and legumes are rich sources of proteins and essential amino acids, while others are rich in essential micronutrients or provide complex carbohydrates with low glycemic index. However, sustainable use of NUS requires a better understanding of their nutritional potential, particularly in biodiverse regions such as the *Yucatán* Peninsula, Mexico.

Objectives: To characterize NUS from the *Yucatán* Peninsula as food sources, according to their nutritional value and their potential for healthier dietary patterns.

Methods: We gathered samples of 20 priority species, out of 75 neglected and underutilized plant species (NUS) from the *Yucatán* Peninsula we searched for in the scientific literature to examine their nutritional content and functional properties. We conducted nutritional and functional analysis on these 20 species to assess their potential to promote healthier diets. Our analysis included an estimation of their functional properties, such as their antioxidant and anti-inflammatory components.

Results: Bromatological and bioactivity data from a total of 20 NUS indicate variability within and between food groups (i.e. fruits, vegetables, tubers, seeds, and legumes). Compared to widely commercialized species, some NUS are outstanding for their nutritional and bioactive contribution, in addition to being considered biocultural resources.

Conclusions: While not all NUS from the *Yucatán* Peninsula stand out nutritionally, consuming them comprehensively can help develop healthier and more diverse diets while contributing to food security. Furthermore, the presence of bioactive compounds and the nutritional composition of some NUS point to new potential uses in the pharmacological and food industries. However, harnessing the potential of NUS in the *Yucatán* Peninsula and incorporating them into local diets requires a comprehensive approach involving all key players in the local food system to ensure sustainable production and consumption.

Conflict of interests: none

Keywords: agrobiodiversity; food systems; neglected and underutilized plant species (NUS); nutritional value; bioactive components; *Yucatán*; Mexico

P3.24

Availability, Accessibility, and Food Consumption in Public Secondary School Adolescents

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Introduction: The adolescent's diet must be correct to achieve optimal growth and development, as well as create healthy habits and prevent diseases. Food transculturation in this stage of life leads to excessive consumption of bottled soft drinks, fast foods high in fat, sugar, and salt, and low consumption of fruits and vegetables, making adolescence a stage of high nutritional risk.

Objective: Determine the availability, accessibility, and food consumption of public high school students in *Tuxtla Gutiérrez* to issue a timely diagnosis of the study population.

Methods: Descriptive, quantitative, cross-sectional study, applied to students from 12 to 15 years of age, from three public secondary schools in *Tuxtla Gutiérrez*, *Chiapas*, Mexico. Selection criteria: students enrolled in second and third grade, morning shift, who consented to participate, the institution had a cafeteria, mixed population. Sampling at the convenience of the researcher. A questionnaire on food consumption in adolescent students was used, with 29 questions and 4 sections, consisting of: letter of informed consent and authorization, Identification, data of the respondent, Food consumed at school; individual economic fee for school expenses, and use of mass media. The information was analyzed using frequency and percentage.

Results: The highest consumption occurred in school cafeterias, both foods prepared in the kitchen and industrialized, it was observed that 43% consumed canned juices, 35% fresh water, 59% plain water, 30% fruits, 39.8% vegetables; 56% sweets, 51% cookies; 71% *tacos*, 65% *quesadillas*, 56% cakes, 55% hamburgers. 36% of the students stated that they spend daily $5.00-$20.00/M.N., 38% $21.00-$40.00, and 20% more than $40.00. 96% watch television 30 to 60 minutes a day.

Conclusions: There is a wide availability of foods for adolescents, high in calories, fats, and sugars, both industrialized and cooked at school, coupled with the low consumption of fruits and vegetables, economic accessibility, and influence of mass media, increases the possibility of creating bad eating habits.

Conflicts of Interest: none

Keywords: adolescents; food; food availability

P3.25

The Effect of Innovative Pre-Treatments: Ultrasound and High Hydrostatic Pressures, on Drying Parameters, Proximate Composition, and Quality of Dehydrated Chilean Edible Mushrooms *Morchella Conica*

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Introduction: Chilean edible mushrooms are increasingly consumed as functional foods. However, their commercialization is affected by their perishable nature. To mitigate this, combined pre-treatments with drying methods have been applied to improve their quality as dehydrated products, without compromising their nutritional properties.

Objective: To investigate the effect of ultrasound and high hydrostatic pressure pre-treatments on drying parameters, proximate composition, and quality of dehydrated Chilean edible mushrooms *Morchella conica.*

Methods: Samples were divided into five groups: ultrasound, high hydrostatic pressure, ultrasound-high hydrostatic pressure, and two untreated groups, followed by freeze-drying and hot air drying. Ultrasound was applied at 40 kHz and 960 W, and high hydrostatic pressure at 600 MPa for 20 and 10 minutes, respectively. Subsequently, the samples were dried and moisture ratio, drying rate, rehydration, moisture content, proteins, lipids, ash, fiber, carbohydrates, water activity, color, and degree of browning were evaluated.

Results: Compared to untreated dehydrated samples, those treated with high hydrostatic pressure showed better results, regardless of the drying method. Their drying times were reduced by 2 and 7 hours for hot air drying and freeze-drying, respectively. The contents of moisture, proteins, lipids, ash, fiber, and carbohydrates were: 6.32±0.05, 31.25±0.05, 5.39±0.09, 8.59±0.05, 22.38±0.21, and 32.38±0.14 mg/g, respectively. The water activity was 0.1051±0.006, which will allow for extending their shelf life. Additionally, color (ΔE=6.02±0.12) was preserved, and the degree of browning was reduced.

Conclusions: The high hydrostatic pressure pre-treatment was the most effective, regardless of the drying method used. It significantly reduced drying times and maintained the nutritional properties and quality of these edible mushrooms, suggesting that this pre-treatment could be a promising strategy to improve the quality and commercialization of Chilean edible mushrooms *Morchella conica* as dehydrated products.

Conflicts of Interest: none

Keywords: edible mushrooms; ultrasound; high hydrostatic pressure; quality; proximate composition; drying parameters

P3.26

Consumption, Health, and Nutrition in Quinoa-Producing Families in *San Isidro- Carchi*

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Introduction: In *Carchi*, the marginality and poverty of the population is around 68%, becoming a vulnerable group with limited development opportunities. According to INEC, 66% of children consume a diet of low nutritional value, causing chronic malnutrition of 38% at the rural level and 17% in the urban sector.

Objective: Determine the degree of nutritional food insecurity faced by quinoa-producing families, in the community of *San Isidro - Espejo*, province of *Carchi*-Ecuador; and establish the relationship of public health diseases with food consumption.

Methods: Quantitative research and descriptive study. Universe: 78 families from the communities of the *San Isidro* parish. Primary sources: personal interview, Living Conditions Survey, Food Consumption Frequency Survey, and observation. Instruments: anthropometric and hemoglobin measurement in children under 5 years of age.

Results: The results showed based on the consumption, health, and nutrition axis, that the population has low access to safe water, there is a low influx to health centers, the self-consumption of quinoa is low, and the presence of low birth weight in children under 5 years old.

Conclusions: Children under 5 years old have low birth weight: 10.5% in *Chitacaspi* and 6.3% in *San Isidro*. Anthropometric indicators show that low height affects 23.1% of *Carlisamá's* children. Overweight and obesity affect 53.8% of children in *Carlisamá* and 18.8% in *San Isidro*. Iron insufficiency has a high prevalence in children in *San Isidro*. Children under one year and over 4 years old are the least affected by anemia. The self-consumption of quinoa is low in *San Isidro*, with its sales prevailing to improve income. Diseases: diabetes mellitus (57.1% in *Puchués* and 35% in *Chitacaspi*) and arterial hypertension (65% in *Chitacaspi* and 47.8% in *Carlisamá*).

Conflicts of Interest: none

Keywords: food safety; diseases

P3.27

Effect of High-Pressure Homogenization (HPH) and Pulsed Electric Field (PEF) Treatment on the Bioaccessibility of Bioactive Compounds in Cryoconcentrated Extracts of Maqui (*Aristotelia chilensis*) and Calafate (*Berberis microphylla*)

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Introduction: Maqui (*Aristotelia chilensis* (Mol.) Stuntz) and calafate (*Berberis microphylla*) are edible berries endemic to Chilean and Argentinean Patagonia, abundant in phenolic compounds, hydroxycinnamic acid derivatives (HCAD) and flavonoids with proven antioxidant capacity and bioactivity. The processing of these berries, particularly the application of high temperatures, can affect these valuable phytochemicals and also modify their bioaccessibility.

Objective: Evaluated the effect of HPH and PEF pretreatment, and subsequent cryoconcentration of maqui and calafate aqueous extracts on the bioaccessibility of their bioactive compounds.

Methods: Maqui and calafate berries were sanitized and pulped, and subjected to an aqueous extraction process by mechanical agitation at a 1:1.5 w/v ratio. Then, they were treated by HPH (200 MPa / 1 pass), PEF (10 KV/cm, 70 Hz and 10 μs pulse width), PAST (90°C for 30 s) and untreated control (CONT). Pretreated and untreated extracts were concentrated by cryoconcentration-assisted filtration-centrifugation at 4000 rpm for 10 min. *In vitro* digestion (gastric and intestinal phase) was simulated in a semi-dynamic system of two bioreactors. The percentage bioaccessibility (%B) of total polyphenols (TP), total anthocyanins (TA), total flavonoids (TF), and antioxidant capacity (AOXC) were evaluated.

Results: When the pretreatments (HPH, PAST, PEF, and CONT) and subsequent cryoconcentration of maqui and calafate extracts were applied, it was observed that %B of TP, TF, TA, and AOXC in the gastric digestion stage were higher ($p<0.05$) than those obtained in the intestinal stage. Particularly, in ileum the %B of TA was the one that presented lower values compared to TP and TF, in maqui depending on the treatment (HPH, PAST, PEF, and CONT) it fluctuated between 8-11%, and in calafate between 5.5-6.7%. The %B of AOXC ranged between 17-21% in maqui and 18-23% in calafate.

Conclusions: The percentage bioaccessibility of TA was low compared to TP, TF, and AOXC and there was a significant decrease during the intestinal phase compared to the gastric phase. These results should be considered when recommending the amount of consumption of the product obtained from the berries.

Conflicts of Interest: none

Keywords: bioactive compounds; maqui; calafate; bioaccessibility

P3.28

Effect of Dietary Fiber Supplementation on Chronic Low-Grade Inflammation in Children: A Meta-Analysis of Randomized Controlled Trials

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Introduction: Chronic low-grade inflammation (CLGI), characterised by increased inflammatory markers including C-reactive protein (CRP), is a common factor in several chronic non-communicable diseases. Higher intake of dietary fiber has been suggested to reduce the concentration of inflammatory markers and prevent the progression of chronic diseases.

Objective: The aim is to assess the effect of dietary fiber intake on CRP in children and adolescents.

Methodology: This meta-analysis was conducted based on the Cochrane *Handbook for Systematic Reviews and Interventions* methodology and following the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA). A systematic search was performed in the databases PubMed, Web of Science, Scopus, and the Cochrane Central Register of Controlled Trials (CENTRAL). There was no restriction on publication language and date up to March 2024. Study screening, selection process, and data extraction were conducted in duplicated by two reviewers. Quality and risk of bias were assessed. The overall treatment effect of fiber on CLGI was calculated as the difference between the net changes in CRP after the intervention and comparator groups.

Results: Of the 2030 studies identified, 25 were included in the systematic review. Six randomized controlled trials met the criteria for inclusion in the meta-analysis of CRP changes after intervention with fiber supplementation. Supplemented fibers in these studies were oligofructose-enriched inulin, fructans, galacto-oligosaccharides, and/or fructo-oligosaccharides. Meta-analysis showed that intervention with dietary fiber supplementation compared with control, produced a significant reduction of 0.64 mg/L (95% CI _1.13, 0.16) in circulating CRP concentration among children and adolescents. The subgroup analysis by age demonstrated that in participants below one year of age, the reduction of CRP was slighter but still significant (0.61 mg/L 95% CI_1.21, 0.01), and in those RCTs studying subjects with a mean age of 10 years, serum CRP decreased 0.7 mg/L (95% CI_1,09, 0.31).

Conclusions: Supplementation with dietary fiber has beneficial effects on circulating CRP in children and adolescents, probably through its prebiotic action in gut microbiota, among other mechanisms.

Conflict of interest: none

Keywords: chronic low-grade inflammation; c-reactive protein; dietary fiber; children; adolescents; meta-analysis; prebiotics

P3.29

Exposure to Television Advertising of Food and Non-Alcoholic Beverages and its Impact Before and After the COVID-19 Pandemic

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Introduction: The population's health and nutritional status are influenced by numerous factors that determine dietary choices, with television advertising of food and non-alcoholic beverages (ABNA) being one of them.

Objective: To describe the exposure and impact of television advertising in children and adolescents under 18 years old in the Department of Antioquia in the years 2019 (pre-pandemic) and 2023 (post-pandemic).

Methods: Using data from the Antioquia Food and Nutritional Profile (AFNP) for 2019 and 2023, exposure to TV and the impact of television advertising are described. The study population consisted of children and adolescents under 18 years old. TV exposure was measured in hours/day. The impact was assessed as the request or effective purchase of ABNA associated with TV advertising.

Results: The 2019 AFNP showed that 86.4% of Antioquia's children and adolescents, excluding Medellín, were exposed to TV, with 83.5% of them watching more than one hour/day. 64.5% of children and 40.6% of adolescents requested or purchased advertised foods on TV, mainly sodas, sweets, chocolates, and packaged products. The 2023 AFNP revealed that 82.9% of Antioquia's children and adolescents, including Medellín, were exposed to TV, with 79.3% watching more than one hour/day. Regarding the impact, 41.1% of subjects requested ABNA advertised on TV, especially sweets, chocolates, fast food, packaged snacks, sodas, and sugary beverages.

Conclusions: Children and adolescents in Antioquia have high TV exposure, which favors exposure to television advertising. Consequently, ABNA advertising manages to impact the effective request or purchase, especially of ABNA with a high content of risky nutrients, which when consumed in excess can pose a risk to health and nutritional status. This suggests relative stability in the exposure and impact of television advertising of ABNA on children and adolescents in Antioquia, regardless of the pandemic context.

Conflicts of Interest: none

Keywords: food advertising; food marketing; COVID-19 pandemic; ultra-processed foods

P3.30

Effect of Freeze-Drying, Convection, and Microwave-Assisted Vacuum Drying Treatments on the Phenolic Compounds and Antioxidant Potential of the Wild Mushroom Digüeñe (*Cyttaria espinosae*).

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Introduction: Wild edible mushrooms, rich in bioactive compounds such as polyphenols, phenolic acids, antioxidants, and β-glucans, are a potential source of healthy components. *Cyttaria espinosae*, an ascomycete parasite of *Nothofagus* trees endemic to southern Chile, stands out for its nutritional properties. However, due to its perishability, its consumption is limited to certain areas and collection seasons, highlighting the need for preservation processes.

Objective: Evaluate the effect of freeze-drying, convection, and microwave-assisted vacuum drying treatments on the phenolic compound content and antioxidant potential of the *Cyttaria espinosae* mushroom.

Methods: A response surface model was developed to maximize the extraction of total polyphenols from fresh mushrooms using the Folin-Ciocalteu method. The mushrooms were then subjected to freeze-drying, convection, and microwave-assisted vacuum drying. Total polyphenol content and antioxidant potential were determined using DPPH and ORAC assays. Phenolic acid and erg "Total polyphenols, phenolic acids, antioxidant potential, *Cyttaria espinosae*, digueñe, drying methods." othioneine content were analyzed via HPLC-DAD and UV-Vis, respectively. Additionally, the internal microstructure and surface were evaluated using scanning electron microscopy. These assessments were complemented by drying kinetics, rehydration, and color evaluations for each drying condition.

Results: The *Cyttaria espinosae* mushroom dried by microwave-assisted vacuum at 210 W and by convection, at 80°C retains the highest levels of compounds and antioxidant potential. However, convective drying does not exhibit good rehydration, color, and microstructural characteristics compared to microwave-assisted vacuum drying.

Conclusions: Microwave-assisted vacuum drying is an ideal alternative compared to convection drying and even freeze-drying for the *Cyttaria espinosae* mushroom. This research is pioneering in applying microwave-assisted vacuum drying to this wild mushroom.

Conflicts of Interest: none

Keywords: total polyphenols; phenolic acids; antioxidant potential; *Cyttaria espinosae*; digueñe; drying menthods

P3.31

Effect of Freeze-Drying, Convection, and Microwave-Assisted Vacuum Drying Treatments on Phenolic Compounds and Antioxidant Capacity of *Pleurotus ostreatus* Mushroom

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Introduction: Oxidative stress, caused by an imbalance between reactive oxygen species and antioxidants, promotes metabolic diseases. Research into natural antioxidant alternatives has identified edible mushrooms as a promising source, particularly *Pleurotus ostreatus*, known for its high antioxidant potential and widespread cultivation worldwide.

Objective: Evaluate the effect of freeze-drying, convection, and microwave-assisted vacuum drying treatments on the phenolic compound content and antioxidant potential of the *Pleurotus ostreatus* mushroom.

Methods: To maximize the extraction of total polyphenols from fresh mushrooms, a response surface model was developed using the Folin-Ciocalteu method. Subsequently, the mushroom was subjected to freeze-drying, convection, and microwave-assisted vacuum drying, and optimized extraction conditions were applied to determine total polyphenol contents. The antioxidant potential was evaluated using DPPH and ORAC assays, and the phenolic acid and ergothioneine contents were determined through HPLC-DAD and UV-Vis, respectively. Additionally, internal structure and surface were evaluated using scanning electron microscopy, complemented by drying kinetics, rehydration, and color assessment for each drying condition.

Results: The *Pleurotus ostreatus* mushrooms dried by convection at 40°C and 80°C mostly preserve their compounds and antioxidant potential. However, drying at 80°C does not exhibit good rehydration, color, and microstructural characteristics compared to 40°C

Conclusions: Convection drying at 40°C of *Pleurotus ostreatus* mushrooms is an ideal alternative in terms of polyphenol content, antioxidant potential, drying rate, rehydration, color, and microstructure, compared to the microwave-assisted vacuum drying method.

Conflicts of Interest: none

Keywords: total polyphenols; phenolic acids; antioxidant potential; *Pleurotus ostreatus*; oyster mushroom; drying methods

P3.32

Phenolic Compounds in Mexican Wine Pomace and Their Potential Anti-Adipogenic Effect

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Introduction: In recent years, the prevalence of obesity has increased worldwide, with Mexico ranking first in childhood obesity and second in adult obesity. Meanwhile, the revalorization of by-products from the food industry has gained relevance due to the sustainability and sustainability of food systems. Therefore, there is a focus on obtaining high-value-added products from by-products to combat public health issues. It is known that the common grape (*Vitis vinifera*) contains bioactive compounds related to obesity, but 1) most reports come from Europe, the USA, and Chile, and 2) most compounds end up in the pomace, pressed and fermented from red wine production. This creates a need to analyze this by-product, which has high biological potential against metabolic diseases like obesity.

Objective: To determine the bioactive compounds, present in two varieties of grape pomace and their in-silico molecular docking with PPARγ.

Methods: Two samples of pomace, Cabernet and Tempranillo, from wines produced in Chihuahua, Mexico, were used. Hydroalcoholic extraction (acidified water:ethanol) was performed, followed by lyophilization and storage at -80°C for analysis. Total polyphenols and flavonoids were determined using the Folin-Ciocalteu and Shinoda methods, respectively. Antioxidant activity was measured using ABTS, DPPH, and FRAP assays. A database search was conducted to identify previously reported bioactive compounds, and their molecular docking with the PPARγ receptor, a specific receptor in obesity, was determined in silico.

Results: Notable values were obtained for Tempranillo with TP: 255.67 mg GAE/g, exhibiting above-average antioxidant activities. Molecular docking identified over 10 compounds with binding energies below -6 kcal/mol, with δ-viniferin being the most efficient ligand in modulating PPARγ.

Conclusions: These findings can provide valuable information for designing more targeted *in vitro* and *in vivo* studies for obesity control and the revalorization of this by-product.

Conflicts of Interest: none

Keywords: grape pomace; in silico; food by-products; sustainable food

P3.33

Effect of drying methods on color and sugar content of edible wild mushrooms from southern Chile: Digüeñe (*Cyttaria espinosae*) and Gargal (*Grifola gargal*)

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Introduction: Edible wild mushrooms, such as Digüeñe (*Cyttaria espinosae*) and Gargal (*Grifola gargal*), are rich in bioactive compounds such as β-glucans and polyphenols and have outstanding nutritional properties. These mushrooms, endemic to southern Chile, are highly perishable, which limits their consumption to certain areas and harvesting seasons. Therefore, it is necessary to investigate drying methods for their preservation.

Objective: The study aimed to determine the drying characteristics of mushroom samples using different methods, to select the drying condition according to Page's model, to determine the color differences between fresh and dried mushrooms, and to analyze the effects of drying on the mushroom sugar profile by HPLC.

Methods: Convective Drying (CD) and Microwave-assisted Vacuum Dryer (MAVD) were used, following Kurozawa's procedure. Temperatures and microwave powers were varied to find the best drying condition using Page's thin layer model and mathematical adjustment. Color (L*, a*, b*) was evaluated with a HunterLab colorimeter at different drying conditions. In addition, the sugar profile of the fresh and dried samples was analyzed using a liquid chromatograph with an ELSD detector.

Results: The results indicate that the MAVD method significantly reduced drying times compared to convective drying (CD). The drying speed increased with the temperature or power of MAVD. Page's model fitted the drying process well, with a minimum value of $R^2 = 0.9828$. Color parameters and simple sugar contents were significantly affected ($p \leq 0.01$) by the drying methods. The MAVD method allowed better quantification of sugar contents in mushrooms compared to the fresh state and the SC method.

Conclusions: Drying methods and conditions significantly affect the physicochemical characteristics of mushrooms. It is recommended to continue with the study of mushroom carbohydrates, specifically glucans as an important source of bioactive properties.

Conflicts of interests: none

Keywords: drying; sugars; color; fungi

P3.34

Food and Nutritional Security Situation in Homes with Adolescents in the *Bella Italia* and *Punta de Rieles* Neighborhoods of the City of Montevideo

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Introduction: Food insecurity (FI) implies the lack of regular access to sufficient, safe, and nutritious food, and affects nutrition and other fundamental rights. In *Bella Italia* and *Punta de Rieles* of Montevideo, teachers and social policy operators observed high school students with weakness, confusion, discomfort, and fainting due to inadequate food access.

Objective: To analyze the food and nutritional security situation of households with adolescents in *Bella Italia* and *Punta de Rieles* during 2022.

Methods: A mixed-methods study was conducted. The quantitative phase was a descriptive observational study of a representative sample of households with adolescents aged 12 to 17 from the analyzed neighborhoods, while the qualitative phase was an ethnographic study using interviews.

Results: In the quantitative phase, 56.7% of adolescents were male, 92.1% attended educational centers, and 29.3% attended school cafeterias or received canteen scholarships. Of the total households, 56.8% had five or more members, 72.3% received cash transfers from the State, 4 out of 10 received baskets or meals from civil society or the State, and 73.5% had a low socioeconomic level. 39.7% of households presented moderate (27.3%) or severe (12.4%) food insecurity (FI). In the qualitative phase, interviews revealed the material and subjective implications of FI. Uncertainty regarding food availability generated anxiety and stress, affecting economic and family planning. Strategies to obtain food included utilizing all available resources, with women playing a predominant role in household management and prioritizing young children. Food intake was reduced, and less nutritious but more satiating foods were chosen.

Conclusions: The high prevalence of FI in households with adolescents in *Bella Italia* and *Punta de Rieles* highlights the need to implement nutritional strategies for this group and to preserve socio-environmental conditions to guarantee the right to adequate and equitable food.

Conflict of interest: none

Keywords: right to food; food and nutritional security; adolescents

P3.35

Risk Factors for High Blood Pressure in *Telesecundaria* Adolescents

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Introduction: In contemporary medicine, high blood pressure is one of the most important health problems. Essential systemic arterial hypertension is the most common in adolescents. Its prevalence in Mexican adolescents is 5.5% in men and 6.4% in females.

Objective: Identify nutritional status, eating habits, and lifestyle, as risk factors for high blood pressure in adolescents from *Telesecundaria*, in Tuxtla Gutiérrez, Chiapas, Mexico, for timely prevention

Methods: Descriptive, quantitative, cross-sectional study. Selection criteria: adolescent men and females ages 13 to 15 from *Tuxtla Gutiérrez*, Chiapas, Mexico; enrolled in *Telesecundaria* school, morning shift, with consent to participate. Sampling at the convenience of the researcher. A lifestyle questionnaire was used, with 17 questions in four sections: Identification and consent of the respondent. Habits and addictions. Consumption of sodium, sugars, and fats. Physical activity; carrying out weight and height evaluation using body mass index. The analysis expressed by frequency and percentage

Results: Forty-six percent presented normal nutritional status, 44% were underweight, and 10% were overweight. 65% of the students indicated how to regulate their diet, accepting that it is not adequate, aware that they must improve eating habits because they have heard of the consequences for health; 28% relate food to good habits and healthy physical and mental development for them; 50% reported eating industrialized fried foods at home and school, 30% reported consuming bottled soft drinks, 10% reported sometimes smoking, and 18% sometimes drinking alcoholic beverages. 65% do physical activity one to four times a week, 12% do not exercise

Conclusions: Participants expressed insufficient knowledge about the factors that cause high blood pressure; They know about foods high in fat and sodium, differentiating foods that are advisable to consume, and they should modify their eating habits; Even when overweight is low, attention to this vulnerable population is necessary, with a wide availability of foods high in calories, fats and sugars.

Conflicts of Interest: none

Keywords: high blood pressure; adolescents; food consumption; risk factors

P3.36

Music Therapy with the Use of a New Musical Instrument: "The Sonakete" and Nutrition, Strengthened Alliance in Elderly People

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Introduction: The assessment of nutritional status helps to know the state of health. The inclusion of music therapy with sonakete is a novelty and can be related to nutrition.

Objectives: To analyze the evolution of residents after the implementation of a group music program: *Music & Sonakete* (M&S), used to address depression and symptoms associated with dementia, as well as the study of nutritional, cognitive, and sarcopenia measures.

Methodology: The intervention was to introduce the "Sonakete" and teach its use, assessing acceptance and response over 6 months. Nutritional measurements were used: MNA screening and complete version and MNA-SG (Geriatric Syndromes), sarcopenia (SARC-F scale) and functional measurements: FAC. Descriptive analysis by calculating minimum and maximum values and the median. The analysis was performed with RCommander software.

Results: n=20 Sex: 90% women. Age: (66-94, M:median 84.50). MNA-SF:(9-13, M:11). Total NAM (18.5-25. M: 23.5). Global MNA-SG: Minimum 11-26.M:22. SARC F: 0-9.M:5. FAC score (0-5, M:2). MMSE:8 -27.M.24. Spearman correlation (rho): Correlation total MNA with total MNA SG: rho 0.91, strong correlation. Correlation MNA normal screening with MNA SG screening: rho 0.83, strong correlation. All correlations were statistically significant (p-value <0.005). Positive emotional responses were evident in 85%, enjoying the sessions.

Conclusions: The program (M&S) has had excellent acceptance in the center, supposing a novelty as active music therapy being very easy to use. It has had a positive impact on the emotional state of almost all the residents, 90% of whom have learned the name of the instrument. A nutritional assessment very close to normal has been observed. Among the geriatric syndromes assessed, in addition to malnutrition, cognitive impairment, sarcopenia (SARC-F), and functional impairment (FAC), all with good results. It is shown that the MNA-SG test is adequate in the nutritional and clinical assessment of this group of patients and that music therapy with the sonakete may be influencing a better nutritional status.

Conflict of Interest: none

Keywords: music therapy; nutritional assessment; geriatric syndromes

P3.37

Antiangiogenic Effects of Bioactive Compounds Present in Fermented Products

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Introduction: The role of yeasts in the occurrence of bioactive compounds in fermented foods and beverages has been reported. Both *Saccharomyces* and *Non-Saccharomyces* species have the capacity to synthesize melatonin, serotonin, and hydroxytyrosol, among other compounds. Angiogenesis is involved in cancer and cardiovascular disease as it promotes the growth and expansion of tumor cells and drives the evolution and destabilization of atherosclerotic plaques. Vascular endothelial growth factor (VEGF) is the main endogenous pro-angiogenic factor in humans. Bioactive compounds derived from aromatic amino acids (serotonin, melatonin, 3-indoleacetic acid, 5-hydroxytryptophol, and hydroxytyrosol) showed anti-VEGF activity.

Objective: To understand the bioactive properties unraveling biologically plausible mechanisms.

Methods: Experiments including endothelial cell migration (wound-healing assay), the molecular mechanisms (ELISA assay) and the downstream effects (phospholipase C gamma 1 (PLCγ1), protein kinase B (Akt) and endothelial nitric oxide synthase (eNOS) by Western blot) on human umbilical vein endothelial cells (HUVECs) suggest the mechanisms involved.

Results: Hydroxytyrosol interacts with surface components of the endothelial cell membrane, preventing VEGF from activating its receptor and inhibiting PLCγ1 phosphorylation. Serotonin and 5-hydroxytryptophol significantly inhibited HUVEC migration (98% and 50%, respectively). Conversely, the anti-angiogenic effect of melatonin, serotonin, 3- indoleacetic acid, and 5-hydroxytryptophol is not mediated via PLCγ1. Additionally, melatonin and serotonin maintained eNOS phosphorylation, and hydroxytyrosol significantly activated eNOS—all via Akt.

Conclusions: These data provide new evidence supporting the interest in melatonin, serotonin, 3- indoleacetic acid, 5-hydroxytryptophol, and hydroxytyrosol for their further exploitation as anti-VEGF ingredients in food.

Conflicts of Interest: none

Keywords: bioactive; angiogenesis; VEGF; fermentation; yeast; hydroxytyrosol

P3.38

Hydroxytyrosol: Dietary Intake, Synthesis Pathways and Production Factors

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Introduction: Hydroxytyrosol (HT) is a phenolic compound found in a limited number of foods such as table olives, virgin olive oil, and wines. The average contents of HT in olives, olive oil, and wine were 629.1 μg/g, 5.2 μg/g, and 2.1 μg/g respectively. Our group estimated the dietary intake of HT in the European population through a revision of HT content in foods reported in scientific literature and the EFSA Consumption Database. The mean dietary intake of HT across EU countries is around 1.97 ± 1.82 mg/day. HT presents a range of bioactive properties including its capacity as antioxidant, antiatherogenic, anti-inflammatory, antimicrobial, neuroprotector, and antiangiogenic. Among all its properties and consumption, HT supports the evidence of the health claim extra virgin olive oil can exhibit for its ability to protect LDL particles from oxidative damage. Moreover, HT is an authorized novel food ingredient in the EU that can be added to different foods. It can be used as a food ingredient as the HT intake is substantially low. Apart from its presence in olives and olive oil, yeast can synthesize HT during alcoholic fermentation. Recent experiments have been focused on understanding the biosynthesis of HT by yeast.

Objective: The capacity of synthesis of HT by different yeast strains was evaluated, as well as the relevance of certain factors (Yeast available nitrogen (YAN) and glucose).

Results: It was observed that higher glucose concentration and lower YAN content in the fermenting must lead to increased HT production. Certain yeast strains, particularly those with elevated nitrogen requirements, like Uvaferm VRB, exhibited higher HT production rates. Moreover, we have used labeled precursors to study the different pathways involved. Based on that, two possible pathways were identified, the Ehrlich pathway and the shikimic pathway from glucose.

Conclusions: The intake of hydroxytyrosol, a bioactive compound of interest, can be increased through fermented foods, directing the fermentative processes.

Conflicts of Interest: none

Keywords: hydroxytyrosol; yeast; bioactive properties; dietary intake; multi-step total synthesis of phenolic phytoprostanes

P3.39

Multi-Step Total Synthesis of Phenolic Phytoprostanes

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Introduction: Lipophenols, polyphenolic compounds acylated by a fatty acid, have recently been identified in food matrices naturally rich in both polyphenols and fatty acids, making them natural derivatives present in the human diet. The identification of natural lipophenols is particularly relevant to understand their pharmacological actions, and metabolism or to use them as analytical standards. As an example, hydroxytyrosol (HT) linked to polyunsaturated fatty acids (PUFA) is naturally present in extra virgin olive oil (EVOO) and should participate in its antioxidant properties. As a preliminary work, the chemical synthesis of HT lipophenols allowed UHPLC-MS/MS quantitative study in EVOO for 12 months, mimicking both commercial and inappropriate conditions of storage. The results highlighted HT-OA as a relevant marker for the monitoring of oil storage conditions and quality.

Objective: Based on this study, an emphasis was put on HT-ALA, exhibiting a different analysis pattern than its analogs. This result might be due to the oxidation of this compound to form phenolic phytoprostanes. Phytoprostanes (PhytoPs) are non-enzymatic lipid peroxidation products coming from ALA, biomarkers of oxidative stress in plants. This hypothesis was strengthened by the literature, showing that phytoprostanes coming from ALA were present in some vegetal oils, as well as preliminary oxidation studies on HT-ALA in flask.

Results: The first stereoselective total synthesis of phenolic PhytoPs as analytical standards was therefore performed in 20 steps with a 3% global yield (84% average yield by step) from commercially available 1, 3-cyclooctadiene. The lactol key intermediate was synthesized in 11 steps with controlled stereochemistry, which then allowed the introduction of the two side chains using Wittig and HWE reactions.

Conclusions: We describe the first synthesis of HT-PhytoPs derived from non-enzymatic oxidation of HT-ALA and performed a test tube preliminary oxidation of HT-ALA, to provide evidence of characterization of such new natural lipophenols.

Conflicts of Interest: none

Keywords: lipophenols; total synthesis; HT-PhytoPs; biomarkers

P3.40

Oxidative Stress Mitigation in Horticultural Crops Using Foliar Applications of Ilex Paraguariensis Extract: A Dose-Dependent Study

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Introduction: Abiotic stress has been shown to induce the formation of reactive oxygen species (ROS) in plant cells. When the level of ROS surpasses the capacity of the endogenous defense mechanism, oxidative stress status is reached, leading to plant damage and a drop in crop productivity. Under oxidative stress conditions, ROS can react with polyunsaturated fatty acids to form oxidized derivatives called phytoprostanes (PhytoPs) and phytofurans (PhytoFs), which are recognized as biomarkers of oxidative damage advance. Modern agriculture proposes the use of biostimulants as a sustainable strategy to alleviate the negative effects of oxidative stress on plants.

Objective: This work evaluates the dose effect of natural antioxidant extract to mitigate the oxidative-stress deleterious effects in melon and sweet pepper exposed to thermal stress.

Methods: The plants were sprayed with Ilex paraguariensis (IP) aqueous extract in three different concentrations before exposure to abiotic stress. PhytoP and PhytoF levels were determined in the leaves of melon and pepper plants.

Results: IP1 and IP2 were effective against oxidative stress in both plants, with IP1 being the most protective one. IP1 decreased the levels of PhytoPs and PhytoFs by roughly 44% in both melon plants and pepper plants. The yield, with IP1, increased by 57 and 39% in stressed melon and pepper plants, respectively. IP3 foliar application in melon plants induced a pro-oxidant effect rather than the expected mitigating action. However, in sweet pepper plants, IP3 decreased the oxidative stress progress and increased the fruit yield.

Conclusions: These findings become important to mitigate losses in crop productivity in the context of climate change in which crops will have to grow in increasingly unfavourable conditions. Finally, to take advantage of this promising agricultural management practice in warmer years due to climate change, specific conditions should be evaluated for different crops and their hybrids under different abiotic stresses.

Conflicts of Interest: none

Keywords: oxidative stress; antioxidants; melon; sweet pepper; PhytoPs/PhytoFs; biomarkers

P3.41

Knowledge and Sustainable Food Practices in a Group of Teachers and Students of Nutrition and Dietetics from Two Universities in the *Atlántico* Department, Colombia

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Introduction: Sustainability, as a term associated with the current development of societies, holds great global importance due to its crucial role in the prevention and protection against the adverse effects of climate change. Sustainable perspectives emerge as inclusion strategies in political, economic, and social realms, guiding every day and widespread aspects such as human food practices. This represents a hopeful mitigation measure for the environmental issues currently afflicting the planet.

Objective: To uncover the knowledge and sustainable food practices in a group of teachers and students of nutrition and dietetics from Atlántico.

Methodology: This research was conducted using a qualitative approach, supported by a focused ethnography method. Semi-structured interviews were conducted with 8 teachers and 9 students of Nutrition and Dietetics from two universities in the *Atlántico* Department. Additionally, observations of their food dynamics within these educational spaces were made. A process of coding and categorizing the interviews followed.

Results: Sustainable food practices were identified, such as purchasing food at local markets, self-sufficiency, good management in shopping, preparations, and portion handling to avoid waste. In terms of knowledge, a connection with the terms of utilization, reuse, and care of available resources was established, always highlighting the environmental context. Some students acknowledged having no knowledge about the topic investigated.

Conclusion: Most participants have an understanding of sustainable food practices as activities within daily food dynamics that contribute to the protection and preservation of the environment. Although they did not explicitly present a concept, the activities identified as sustainable fall within the context of the topic.

Conflict of interest: none

Keywords: sustainability; sustainable food practices

P3.42

Knowledge and Attitudes of the Staff Working in the Child Development Centers of Two Cantons Belonging to *Azuay*-Ecuador with Respect to Post-Pandemic Food Security 2023-2024

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Introduction: Worldwide, 149 million children under 5 years of age suffer from chronic undernutrition and 40 million are overweight. In Latin America and the Caribbean, chronic undernutrition is of concern, reaching 23% in Ecuador. In a 2018 investigation by Child Development Centers (CDI) in *Cuenca*-Ecuador, 71.4% of children faced food insecurity, a figure that has increased after the COVID-19 pandemic. This situation affects the health and development of preschoolers, so specific measures are needed to improve their food security.

Objective: To describe the knowledge, attitudes, and challenges of staff working in Child Development Centers (CDI) in two cantons belonging to *Azuay*-Ecuador regarding post-pandemic 2023 food security.

Methods: Two tools were used: a focus group, consisting of 9 questions, and a semi-structured interview, consisting of 10 questions, to assess staff knowledge, attitudes, and challenges regarding food safety. Five people from each of the CDIs were interviewed. The data collected were analyzed in the ATLAS.ti program.

Results: The educators at the Cuenca CDI (private establishment) limit their knowledge of food security to providing healthy and nutritious food, without a global vision of all the dimensions that affect food security. Meanwhile, the educators of the CDI of *Sígsig* (public establishment) have greater knowledge due to training provided by public institutions, although there is no follow-up and control over them. Both CDIs presented attitudes of mistrust and concern about the issue, as well as shared challenges such as: lack of physical and economic access to food and lack of monitoring of public policies on food security. The CDI of *Cuenca* does not have training, which is the biggest and most exclusive challenge of this center.

Conclusions: In both CDIs, the staff shows a worrying lack of knowledge about food security, attributed to the lack of education on the subject. This demonstrates the urgent need to implement training programs and strengthen policies to ensure a safe and healthy environment for preschoolers.

Conflict of Interest: none

Keywords: food safety; personnel; preschools and pandemic

P3.44

Reformulation of Two Corn *Totopos*, Incorporating Grasshopper Protein and Black Beans as a Sustainable Protein Source in *San Blas Atempa*, Oaxaca, Mexico

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Introduction: Currently, the global food issue is to maintain the source of food of both plant and animal origin with the least impact on the environment. Edible insects are considered a good source of proteins, vitamins, minerals, and essential amino acids, so they complement the regular diet and contribute to achieving some of the SDGs.

Objective: Reformulate two types of corn *totopo* with *Sphenarium purpurascens* (Chapulín de milpa) flour and *Phaseolus vulgaris* L. (black bean) paste as a sustainable protein source.

Methods: A standard recipe for traditional *totopos*, based on corn *zapalote chico* variety Oax-826 native of the municipality of *San Blas Atempa*, Oaxaca, Mexico, was reformulated using concentrations of 90:10 (C2), 85:15 (C3) corn: chapulin and (F2) 70:30 and (F3) 60:40, corn: bean. The *totopos* were subjected to nutritional composition analysis, protein by Kjeldahl method, total fat by Soxhlet method, total ash and moisture by thermogravimetric methods, dietary fiber by Weende method, minerals by flame atomic absorption and essential AA by HPLC. Analyses were performed at the Centro Universitario del Sur, University of Guadalajara, Jalisco, Mexico. Differences by ANOVA and Kruskall-Wallis for mean contrasts. Graph Pad Prism 9.4.1 software.

Conclusions: The reformulation of natural *totopo* with grasshopper and black beans improves the nutritional quality of a traditional food of the population of *San Blas Atempa* and can be implemented as a sustainable source of protein.

Conflicts of Interest: none

Keywords: entomophagy; sustainability; Chapulin; black bean; SDGs

P3.45

Effect of Convective Drying-Frying Combination on the Physicochemical Characteristics and Quantification of Acrylamide in Banana Chips

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Introduction: The formation of acrylamide during frying is influenced by a number of factors, including time, temperature, and moisture distribution within the product. It has been observed that the temperature must exceed 120 °C for acrylamide to develop. Additionally, the uneven distribution of acrylamide on the surface and core of fried products highlights the complexity of the process.

Objective: To evaluate the effect of the convective drying-frying combination on the physicochemical characteristics and quantification of acrylamide in banana chips (*Musa cavendish AAA cvs. Gran Enano*).

Methods: In the study, the raw material, Cavendish banana from *Tuxtepec, Oaxaca,* was stored at room temperature to avoid starch hydrolysis. Convective drying was carried out at 60 and 70 °C for 90 minutes, followed by drying kinetics and moisture determination by gravimetric method. Frying was performed at temperatures of 160, 170, and 180 °C for 120, 150, and 180 seconds, respectively. Fat content was determined by Soxhlet and acrylamide by HPLC. Physicochemical properties, water activity, and texture were also evaluated. The results were statistically analyzed using the multiple-range test with a confidence level of 95%.

Results: The decrease of only 13% of moisture in the banana chips before frying does have a significant impact on the oil absorption content, and the 170 °C - 2.5 min treatment is selected which represents lower oil and acrylamide content, time, and energy consumption.

Conclusions: The study contributes to the understanding of acrylamide formation in banana chips, allowing the development of strategies to reduce its presence and, at the same time, improve the quality of fried products, providing healthier options in response to the growing public concern about the intake of trans fats and toxic compounds.

Conflicts of Interest: none

Keywords: banana chips; reduced fat; acrylamide

P3.46

Impact of Drying at Different Temperatures and Airflow on the Phenolic Composition of *Chamburo* and *Pitahaya*

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Introduction: Today's lifestyle, characterized by poor diet and chronic stress, has led to a worrying increase in health problems such as obesity, high blood pressure, and high cholesterol. In this context, phenolic compounds, present in various parts of plants, have aroused great scientific interest due to their importance in the human diet and their biological properties. In addition, food drying, an ancient technique that has evolved in modern times, uses temperature and pressure-controlled methods to preserve the nutritional and sensory quality of food.

Objective: To evaluate the effect of drying at different temperatures and with different air flow rates on the phenolic composition of *chamburo* and *pitahaya*.

Methods: Ripe *pitahaya* (*Selenicereus megalanthus*) and *chamburo* (*Vasconcellea pubescens*) fruits were analysed by physicochemical methods (weight, size, pH, soluble solids, titratable acidity, and ash). The fruits were cut into 4 mm thick slices and dried in an oven with circulating air to compare the process with freeze-drying. A 2x2 experimental design was used with two levels of temperature (70°C and 90°C) and airflow (0% and 10%). Drying curves were constructed and the concentration of total phenolics was determined by the Folin method.

Results: *Pitahaya* had higher values for weight, size, soluble solids (13.8 °Brix), and ash (12.7 %), while *chamburo* had higher pH (5.0) and titratable acidity (5.6 %). The concentration of phenols varied according to fruit and drying conditions, being higher in *pitahaya* at 90 °C and 10% airflow (8.5 mg GAE/100 g DW), and in *chamburo* at 90 °C and 0% airflow (25.5 mg GAE/100 g DW), as well as in freeze-drying (28.7 mg GAE/100 g DW).

Conclusions: The results indicate the significant influence of drying conditions on the concentration of phenolics in *chamburo* and *pitahaya*, suggesting the importance of optimizing parameters to maximize the content in dried products.

Conflict of interest: none

Keywords: phenols; freeze-drying; bioactive compounds; functional foods

P3.47

Effect of Altitude on the Concentration of Bioactive Compounds and the Antioxidant Activity of *Solanum Betaceum* Grafted on *Nicotiana Glauca*

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Introduction: The tree tomato (*Solanum betaceum* Cav.) is a fruit native to the Andean region of South America and is of great cultural and economic value. It grows in the Ecuadorian highlands at an altitude of 2000 to 2500 meters above sea level (masl). This crop suffers from root diseases such as fusarium and nematodes, which can seriously affect the yield and quality of the crop. Given this problem, the development of alternatives such as *Nicotiana glauca* rootstocks has been sought. However, despite the growing interest in this practice, there is still little information on the bioactive compounds present in these new species.

Objective: To evaluate the effect of altitude on the concentration of bioactive compounds and antioxidant activity in *Solanum betaceum* grafted on *Nicotiana glauca*.

Methods: Tree tomatoes of the orange giant ecotype were harvested at different altitudes (2200, 2315, 2616, and 2850 masl) in the province of *Tungurahua*, Ecuador. The physicochemical characteristics of the samples studied included weight, size, pH, soluble solids, moisture, and ash. In addition, individual carotenoids and organic acids in the peel, pulp, and freeze-dried placenta were quantified by high-performance liquid chromatography and spectrophotometry to determine total phenolic compounds and antioxidant activity.

Results: Physicochemical analysis showed that fruits at 2616 masl had higher size, weight, moisture, and pH. At the same altitude, bioactive compounds showed a high concentration of β-carotene (22.6 mg/100 g DW), and phenolics in the shell (242.2 mg/g DW), while tartaric acid (24.6 mg/100 g DW) was observed in the pulp. Finally, the highest antioxidant activity was observed in the shell (23.7 μmol ascorbic acid equivalent/ g DW).

Conclusions: The results suggest that altitude affects the concentration of bioactive compounds and antioxidant activity, as well as on the part of the fruit analyzed (shell, pulp, and seed jelly) in the fruit of grafted plants, which could have implications for the cultivation and nutritional value of the species.

Conflicts of interest: none

Keywords: lyophilization; bioactive compounds; functional foods

P3.48

Formulation of Alternative Feed for Hens *(Gallus gallus domesticus)* from Domestically Produced Ingredients

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Introduction: With the idea of constructing an alternative feed for hens starting from the partial substitution of the conventional feed to a mixed formulation between alternative feed and conventional feed.

Objective: To elaborate an alternative feed for laying hens from amaranth, orange, mulberry, pega-pega, beach purslane, eggshells, and vegetable oil.

Methods: To carry out the elaboration of the feed, the raw material was harvested and collected, washed and disinfected, and then dehydrated and processed in a mill to obtain the flours, samples of each ingredient and the formulation were taken for proximate analysis. Crude protein (Kjeldahl 1883), Moisture (COVENIN 1553-80), Ash. COVENIN 1783-81, Carbohydrates by difference (INN, 2000), Fat by reference. The data of the ingredients were organized with their nutritional composition and animal requirement, the portions were arbitrarily placed to obtain the formulation, and finally, the whole process of mixing, pelleting, and feeding tests was done.

Results: Three treatment tests were carried out T1: Alternative exclusive, T2: 50% Alternative 50% traditional, T3 traditional. Differences in egg laying were evidenced with T1, but no significant differences were observed in T2 and T3. The ingredients used for the formulation presented considerable nutrient contents after proximal analysis, 18% PC *Amaranthus dubius* and 22% CNZ *Trichantera gigantea*.

Conclusions: In the conformation of the alternative feed, it was obtained necessary to cover the nutritional requirements of the hens. The research proves that it is possible to develop feeding strategies based on non-conventional, accessible ingredients with nutritional potential. Successfully achieved the determination of nutritional elements, and quantification of them to adjust an adequate formulation and feeding of hens. The formulation of food with non-conventional and non-GM ingredients and without agro-toxic management could be a valuable strategy for healthy nutrition in the chain, from the time it is raised and produced until it reaches human consumption. In the formulation of food based on wild plants and agro-industrial residues, it is difficult to manage anti-nutritional elements and mycotoxins, which could be a disadvantage in the whole process.

Conflicts of interest: none

Keywords: alternative-feed; hens; proximal analysis; feed formulation; nutritional requirements; feed-formulation

P3.49

Characterization of Different Varieties of Tarwi (*Lupinus Mutabilis* Sweet) Germplasm for the Sustainable Production of Food

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Introduction: *Tarwi (Lupinus mutabilis sweet)* is an Andean legume that has been considered in recent years as a sustainable crop due to its ability to adapt to climate change by fixing nitrogen in symbiotic associations, thus improving soil fertility. Its nutritional composition is very important due to its high protein content (50%), and it also contains minerals, fibers, and phenolic compounds, which could be an alternative vegetable protein for the population.

Objective: To describe and estimate the agro-morphological variability of *tarwi* from the Agricultural Experimental Station - Santa Ana, Peru (AES-SA) and to classify it using 16 quantitative and 60 qualitative descriptors.

Methods: The study was conducted with 186 accessions from the national collection of the *tarwi* germplasm bank of the (AES-SA) and were collected in June 2023 from 9 regions of Peru. With climates between (12.4-13.6) °C. The descriptors were developed according to the methodology of IPGRI (1981), with some modifications. For the characterization of the accessions, they were analysed by multivariate techniques using the software InfoStat/Professional version 2020, and the PCA was carried out using the software R version 4.3.3.

Results: The results showed that the coefficient of variation (CV) of 13 *tarwi* accessions ranged from 8.5 to 11.30%, with a lower CV than the cultivars known as *Andenes* (11.31%) and *Masacanchino* (14%). In addition, this group of accessions is characterized by high yields, with values from 1072-2120.5 kg/ha. On the other hand, the descriptors stem thickness, number of primary branches, number of leaflets per leaf, inflorescence length, number of pods per central axis, and pod length showed less phenotypic variation, important factors for the conservation, production, and commercialization of this crop.

Conclusions: The results of the present study indicate the importance of *tarwi* genetic diversity and provide relevant evidence for germplasm conservation, future studies, production, and commercialization of accessions. In addition, it could be considered as a sustainable food in the food industry for the healthy consumption of the population.

Conflicts of interest: none

Keywords: tarwi; agro-morphological; accessions; conservation; Peru

P3.50

Spirulina as a Functional Ingredient in Breaded Fish Products

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Introduction: Spirulina sp. (*Arthrospira sp.*), an undifferentiated filamentous cyanobacterium, inhabits alkaline lakes. It is currently cultivated for human consumption due to its nutritional content; it is classified as the natural food with the highest protein content (60-75% of dry matter). It contains all the essential amino acids and ten to twelve non-essential amino acids.

In studies carried out, it has been possible to know the favorable effects in the treatment of various varieties of allergies, anemia, and leukemia, it has also been used in some types of cancer, in the reduction of hepatotoxicity, viral and cardiovascular diseases, diabetes, obesity, immunodeficiency and inflammatory processes, among others.

Objective: To elaborate fish breading and evaluate its nutritional quality with the addition of Spirulina in breading mix.

Methods: The type of research was experimental and descriptive. The elaboration of the breaded products was handmade using a breading mixture with the addition of Spirulina at 10 and 15%. The fish's raw material was *Sarda chiliensis chiliensis*, the used ingredients (salt, milk, seasoning) for the preparation of the breading were rice flour for the "predust" and for the "breading" it was made with a mixture with addition of 10% and 15% of Spirulina.

Results: The nutritional characteristics of the breaded fish with the addition of 15% Spirulina were: 39.83% protein, 12.3% fat, 0.14% crude fiber, 2.25% ash, and 4.28% nitrogen-free extract. The addition of 10% Spirulina had the following nutritional characteristics: 32.12% protein, 13.44% fat, 0.23% crude fiber, 1.95% ash, and 4.97% nitrogen-free extract.

Conclusions: It is feasible to elaborate breading mixtures with the addition of 10% and 15% of Spirulina flour for fish products, where the nutritional components of greatest increase are proteins and nitrogen-free extract. The addition of Spirulina in breading mixes can be an alternative as a functional food of high biological value and low-calorie content that would contribute to the consumer's health.

Conflict of Interests: none

Keywords: spirulina; nutritional analysis; breaded

P3.51

Nutritional Upcycling: Eggshell-Enriched Cookies for Older Adults with Osteoporosis and Celiac Disease

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Introduction: Osteoporosis is a chronic, silent disease that mainly affects older adults, characterized by a decrease in bone density and an increased risk of fractures. It affects 200 million people, being more prevalent in postmenopausal women and men over 70 years of age. Celiac disease influences the absorption of nutrients, in this case calcium. It is estimated that 50-68% of celiac patients may develop osteoporosis. The use of eggshells as a source of calcium is an innovative and sustainable strategy, classified as upcycling since it transforms a common waste product into a valuable product for bone health.

Objective: To develop a calcium-enriched cookie obtained from recycled eggshell (upcycling), offering a sustainable and accessible nutritional alternative for calcium intake in older adults with osteoporosis, especially those with celiac disease.

Methods: Eggshells were washed and pasteurized at 65°C for 30 minutes, calcined at 220°C for 30 minutes, and pulverized to a 200 μm powder. This powder was mixed with citric acid and allowed to stand at 5°C/24 hours. The filtered solution provided the desired form of calcium, which was incorporated at 4 % in the cookie formulation. Two formulations were developed and sensory evaluated by 68 judges using 10-point hedonic scales, measuring color, flavor, texture, and odor. Results were processed in Statgraphics Centurion, and Moisture (AOAC Method 925.10), Ash (AOAC Method 925.03), Total Fat (Micro Soxhlet Method), and Calcium were measured by spectrometry.

Results: The percentage yield of eggshells was 60%, the formulations did not show significant differences in the sensory analysis, and the overall results determined that the best score had a value of 7.2/10. The values for fat are 13%, moisture 15.8%, ash 1.5%, fiber 3.5%, and calcium 3877mg (approx).

Conclusions: It is feasible to develop calcium-enriched cookies from recycled eggshells, improving calcium intake in older adults with osteoporosis and celiac disease. Sensory evaluations indicated high acceptability, with no significant differences between formulations. The eggshell upcycling process proved to be an effective source of calcium citrate in citrate form, contributing to improved bone health in this vulnerable population.

Conflict of Interests: none

Keywords: osteoporosis; celiac: eggshell, upcycling

P3.52

Urban Gardens for Safe, Healthy, Sustainable, and Social Nutrition among Inhabitants of Chiapas, Mexico: A Success Story

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Introduction: The food sovereignty of communities and individuals relies on safe, high-quality nutritious food for maintaining health, as well as the conservation and defense of ancestral territories and customs that promote human integration into ecosystems, thereby achieving "Good Living" (in Spanish *Buen Vivir*).

Objective: To promote family and community urban gardens as a path to food sovereignty, thus achieving healthy and sustainable nutrition for the inhabitants of Chiapas.

Methods: This work was conducted based on participatory action research in the city of Tuxtla Gutiérrez, Chiapas, Mexico. A series of training workshops on urban gardens were conducted with twenty participants, incorporating knowledge sharing and emphasizing the concepts of food security, food sovereignty, agroecology, and healthy and sustainable nutrition.

Results: At the end of the workshops, all participants worked actively and coordinately on implementing gardens in different spaces (homes, primary schools, universities, and collective spaces), thus promoting the production of local food. As an exercise in healthy, safe, and sustainable nutrition, participants prepared various foods with the products harvested from their gardens. Before the training began, participants' prior knowledge was identified through a questionnaire, and afterward, their perception of the contribution of urban gardens to their food sovereignty was evaluated.

Conclusions: Participants in the study demonstrated great interest in environmental care topics, especially young people aged 20 to 30; those aged 50 and older showed interest in having the cultivated products benefit their health, particularly being free of pesticides and synthetic fertilizers, while those aged 31 to 50 were particularly interested in organizing themselves to obtain economic benefits through small-scale agroecological food production for local sale, in addition to self-consumption and exchange for other foods or goods as part of healthy, sustainable, safe, and social nutrition.

Conflicts of Interest: none

Keywords: urban gardens; community; sustainable; food sovereignty

Methods and Tools in Nutrition

P4.01

Biological Evaluation of Structured Lipids Enriched with Caprylic Acid in Avocado Oil *Var. Hass*

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Introduction: In the department of Tolima, 2 out of 10 adults and 5 out of 10 children are obese. In turn, during the last 10 years, the child population in Ibagué has 15.5% overweight and 7.3% obese. Consumption of fats not easily broken down by the body, such as trans and saturated fatty acids, could be one of the risk factors. Structured lipids (SL) are proposed as an alternative by modifying triglycerides through chemical or enzymatic reactions to improve bioavailability and provide nutraceutical benefits. One example is MLM triglycerides, consisting of medium and long-chain fatty acids, which are more easily absorbed by the body, offering significant contributions to reducing obesity risk factors and using them as efficient energy sources for metabolic processes.

Objective: To biosynthesize structured lipids from Hass avocado oil enriched with caprylic acid and evaluate their anti-proliferative and cell viability activity in HepG2 cells.

Methods: SL were synthesized by enzymatic acidolysis reactions between avocado oil and caprylic acid (C8:0). The lipid profile of the produced oil and LS was characterized by gas chromatography according to AOCS Ce 2-66 method. Triglycerides were then hydrolyzed, and both these GAs and triglycerides were incorporated at different concentrations in HepG2 cell culture media and incubated for 24 and 48 h. Anti- proliferative and cell viability activity was determined by Sulforhodamine B colorimetric assay.

Results: The initial avocado oil presented more than 50% of unsaturated fatty acids. A new SL was obtained with a degree of incorporation of 33% caprylic acid in avocado oil. The hydrolyzed oil and SL compounds exhibited not only anti-proliferative but also cytotoxicity activity at concentrations ranging from 91 to 5.68 mg/mL. Greater induced cell death in HepG2 was obtained with the SL hydrolysate than with the avocado oil hydrolysate, and in turn with the hydrolysates than in their triglyceride form.

Conclusions: SL type MLM presents potential biological activity in HepG2 liver cancer cells which, could contribute to in vivo studies for acceptance, consumption, and possible nutraceutical in the prevention of non-alcoholic fatty liver disease.

Conflicts of Interest: none

Keywords: oils; dietary; obesity; nutraceutical

P4.02

Use of Agroindustrial Orange Peel *(Citrus Sinensis [L.] Osbeck)* Waste to Obtain Phenols with Antiproliferative Effect in SW480 Colon Cancer Cells

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Introduction: Colorectal cancer is one of the main causes of death worldwide, and in Colombia, it is one of the cancers with the highest incidence, rates of morbidity, and mortality in both men and women. The presence of various bioactive compounds, such as phenolic acids and flavonoids, has been confirmed in orange peel, with a greater abundance of hesperidin, quercetin, and naringin. These, such as naringin, present in the peel albedo, can be hydrolyzed by immobilized naringinase (NgseIM) to produce naringenin, while purified and immobilized naringinase (NgseIMP) can yield flavanones of interest such as prunine. These natural phenolic compounds consumption could be a protective factor to contribute to the reduction of colorectal cancer.

Objective: To evaluate the anticancer potential of naringin and its enzymatically obtained flavanones prunin and naringenin in the SW480 cell model.

Methodology: The albedo of 'Valencia' orange *(Citrus sinensis (L.) Osbeck)*, from a commercial establishment in Tolima Department, was divided into two fractions (freeze-dried and dried in a convection oven) both were subjected to extraction by maceration, using a 2x2 rotating compound central design. Design variables: the extraction time and the concentration of methanol; response variable: total flavanones. Subsequently, the antiproliferative effect and cell viability in SW480 cells in primary stage B (colon adenocarcinoma) were evaluated cytotoxicity test using the sulforhodamine (SRB). The treatments evaluated comprised commercial naringin, naringin hydrolyzed by NgseIM, naringin hydrolyzed by NgseIMP, and flavanones extracted from orange peel, as well as their hydrolysates by NgseIM and NgseIMP.

Results: A significant decrease in antiproliferative and SW480 cell viability was obtained after exposure to the compounds. In particular, it was found that the extracts obtained from orange peel and its hydrolysates (NgsaIM and NgsaIMP) showed no differences compared to commercial naringin.

Conclusions: This study showed an interesting strategy for reusing agroindustrial waste such as orange peel and at the same time allowed us to understand the antiproliferative effect of phenolic compounds present in this waste on SW480 cells that could have an impact on reducing the risk of colorectal cancer.

Conflict of Interest: none

Keywords: flavanones; naringin; orange peel; colon cancer

P4.03

Cross-sectional Study on the Relationship between Body Composition with Glycated Hemoglobin and Lipid Profile in Adult and Elderly Patients Diagnosed with Non-Communicable Chronic Diseases

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Introduction: The description of the relationship between body composition, glycated hemoglobin, and lipid profile in patients diagnosed with NCDs is relevant for better understanding aspects of assessment, as well as nutritional follow-up and monitoring.

Objective: Describe the relationship between body composition, HbA1c, and lipid profile in patients with NCDs using the results of biochemical tests and body composition analysis.

Methods: The study is observational, cross-sectional, and descriptive. INBODY anthropometry equipment from the BWA series and the LIPIDPRO device were used, along with laboratory tests previously conducted by the health center to collect biochemical data. The data processing was carried out using the statistical software STATA version 18.

Results: The results show that although a significant portion of the population has high muscle mass, the vast majority have a high percentage of body fat and elevated levels of visceral fat. Regarding glycated hemoglobin control, only a minority have good control, while the majority show inadequate control. In the lipid profile, approximately one-third have desirable levels of cholesterol and HDL, but most have LDL levels close to or above optimal, and only a small percentage have normal triglyceride levels. These results indicate that patients have significant risk factors for non-communicable chronic diseases.

Conclusions: Patients have a significant amount of muscle mass, but more than 90% have a high percentage of body fat, which affects the control of their disease, along with excess visceral fat. In biochemical terms, the majority show inadequate control of HbA1c and triglycerides, although the rest of the lipid profile is within desirable ranges.

Conflicts of Interest: The authors declare no conflicts of interest with pharmaceutical companies or the food industry. However, the study received support from SIOMED, the company that markets the equipment used to evaluate body composition and lipid profile.

Keywords: body composition; non-communicable chronic diseases; glycated hemoglobin; lipid profile

P4.04

Implementation of a Group Intervention for the Treatment of Childhood Obesity: Pinpo Program

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Introduction: Childhood obesity is one of the most prevalent diseases and has important effects on health, being considered a public health problem. Most interventions are aimed at education in healthy habits, avoiding sedentary lifestyles, and increasing physical activity. There are few interventions in health systems that have achieved satisfactory results, most of them focusing on individual programs.

Objective: The PInPO program aims to carry out a comprehensive intervention in children with obesity, generating motivation and change toward healthy lifestyle habits to achieve greater adherence and better health.

Methods: The program contains 9 educational sessions designed by specialized multidisciplinary professionals (pediatrician, psychology, nursing, nutritionist), for a group with 10 children and 10 family members. They are face-to-face, of 1.30 hours per fortnight, and are held in the hospital area. At the beginning and end of the program, bioimpedance and biochemical studies, nutritional evaluation, physical activity and sedentary lifestyle, and psychological evaluation are performed. Finally, we conducted a satisfaction survey of the participants.

Results: Three editions have been carried out between March 2022 and September 2023. Of the 30 patients selected from pediatric endocrinology, 16% dropped out of the program early, 14% dropped out halfway through, and 70% completed the program. The satisfaction survey was completed by 22 participants. All reported being more aware of the consequences of obesity on their health, more than 95% have modified their lifestyle habits, increasing their self-esteem by 68%; 22% propose semi-presential sessions (online and face-to-face), and 68% sessions in primary health care. Seventy-seven percent report difficulties in reconciling work and 13% report travel problems that have prevented adherence to the intervention. Nevertheless, overall satisfaction is 8-10/10 in 95.5% of respondents.

Conclusions: A group intervention program can offer pediatric patients and their families personalized medicine to treat obesity and its complications comprehensively. However, it is necessary to analyze the reasons for low adherence in order to adapt the intervention and improve results.

Conflict of Inters: none

Keywords: group intervention; childhood obesity

P4.05

Use of Anthropometric Variables for the Identification of Sarcopenia in Mexican Older Adults

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Introduction: Sarcopenia is a disease characterized by low levels of muscle mass, muscle strength, and physical performance. As the aging population is an increasingly challenging reality worldwide, improved diagnosis is imperative. Several criteria establish guidelines for sarcopenia. However, the absorptiometry (DXA) is not available to all professionals. In Mexico, depending on the criteria used, the prevalence can vary from 4.6% to 41%. Novel methods, such as the use of anthropometry to estimate muscle mass, have not yet been established as valid for case detection.

Objective: Compare the prevalence of sarcopenia according to different diagnostic criteria in a sample of Mexican older adults. Correlate anthropometric variables with values obtained with DXA.

Methods: Data were obtained from 184 community-dwelling older adults (32.6% men, 67.4% women) in municipalities of Jalisco, Mexico. To assess appendicular lean mass, Luna iDXA equipment was used, and anthropometric measurements were performed to obtain corrected arm and leg perimeters. For the diagnosis of sarcopenia, physical performance was evaluated with the SPPB test, and muscle strength with the Takei manual pressure dynamometer. Spearman and Pearson correlations were performed according to the normality of the data.

Results: The prevalence of sarcopenia differed according to the criteria used. According to the European EWGSOP2 Group, the prevalence in men was 3.3% and in women 3.2%. According to the cut-off points of Lopez-Teroz et al. (2019), in men, it was 3.3% and in women 0.8%. According to the FNIH criteria, in men, it was 21.7%, and in women 14.5%. Significant correlations were found between appendicular lean mass values obtained with DXA and corrected arm (IMMA, $r = 0.77$, $p<0.001$; MMA, $r = 0.68$, $p<0.001$) and leg (IMMA, $r = 0.78$, $p<0.001$; MMA, $r = 0.82$, $p<0.001$) perimeters with anthropometry.

Conclusions: Although different criteria indicate different prevalence of sarcopenia in the same population, the use of anthropometry is a promising method to assess muscle mass in older adults.

Conflicts of Interest: none

Keywords: sarcopenia; muscle mass; anthropometry; older adults

P4.06

Abdominal Obesity in Adolescents from Antioquia-Colombia Using Different Cut-off Points for Waist Circumference

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Introduction: Waist circumference (WC) is not commonly used to evaluate abdominal obesity (AO) in adolescents. This is due in part to the lack of consensus about what cutoff point for WC should be used.

Objective: To generate evidence for a consensus, this study describes how the selection of cutoff points for WC affects the prevalence of AO in adolescents from Antioquia.

Methods: This is a secondary analysis derived from the Survey Food and Nutritional Profile of Households in Antioquia 2019 (PANA). PANA was carried out by the Government of Antioquia and the School of Nutrition and Dietetics of the University of Antioquia. Body weight, height, and waist circumference were measured in adolescents (10–17 years old) by health staff following standardized procedures. The 90th percentile of the populations reported by Fernandez (USA-2004), Ramirez (Colombia-2017), Serrano (Hispanic-2020) and Lee (Korea-2022), and International Diabetes Federation (IDF, 2007) criteria were compared as cutoff points to determine AO using WC.

Results: A total of 1432 adolescents (60.9% women) with 13.5±2.3 years were included. Sixty-one percent had adequate body mass index, 17.5% were overweight and 6.4% had obesity. There were significant differences ($p<0.05$) in the prevalence of AO using the cutoff points of Fernandez (4.9%), Ramirez (20.8%), Lee (17.4%), Serrano (5.7%), and IDF (9.4%). The concordance to classify adolescents with AO oscillated from 0.327 to 0.844. Highest concordances were between IDF and Serrano (Kappa=0.731; $p<0.001$) and between Lee and Ramirez (Kappa=0.844; $p<0.001$). Lowest concordances were between Fernandez and Ramirez (Kappa=0.327; $p<0.001$) and between Serrano and Ramirez (Kappa=0.375; $p<0.001$).

Conclusions: The prevalence of AO is significantly affected by the cutoff point used for WC, and the concordance among the cut-off points is highly variable. It is necessary to identify the optimal cutoff to determine AO using WC in this population in order to promote the correct application of this tool in health promotion and disease prevention activities.

Conflict of interest: none

Keywords: adolescents; waist circumference; abdominal obesity

P4.07

Compilation for Argentina Food Composition Database

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Introduction: ARGENFOODS is a National non-profit Association. It has worked on the generation and compilation of food composition data since its creation in the 1980s. University teachers/researchers and professionals specializing in the subject from various public and private entities in the northern, central, and southern regions of the country are currently participating. The national data are incorporated into the Food Composition Portal of the LATINFOODS Network, which is a unique computer instrument that will provide in a versatile manner updated, and complete information originating from the National Chapters that are part of the Network.

Objective: The objective is to establish, manage, and update a database of nutritional components of national foods; evaluate and organize information, as well as its availability to users.

Methods: A compilation team was formed and trained with professionals specializing in the subject. To compile, a form was used with harmonized forms according to international standards, for all LATINFOODS National Chapters. They gather information on food identification, its proximal composition and micronutrients, and an evaluation of data quality.

Results: An updated national reference base was created, and the data was reported to the LATINFOODS Portal (https://latinfoodsportal.net/index.php). In 2022/2023, composition data was compiled for around 200 natural and processed foods, including meats (16%), whole Andean grains and flours (16%), regional fruits (15%), tubers (14%), oilseeds, and oils (12%). The proximal composition and sodium content of the following high-consumption prepared dishes were also analyzed and compiled: *empanadas*, *tamales*, *humitas*, crumb sandwiches, *milanesas* with salad, goat cheese, chicken skewer, pickles, cornstarch, *tortilla,* and *pastafrola*.

Conclusions: Having a BDCA from Argentina and providing information to the LATINFOODS Portal generates multiple benefits and contributes to research into regional foods, some of which are underutilized. It promotes the exchange of information at the regional level and contributes to expanding the credibility and dissemination of the information generated.

Conflicts of Interest: none

Keywords: database; food composition; Argentina; LATINFOODS Portal

P4.08

Impact of Maternal BMI on Umbilical Cord Fatty Acid Profiles in Newborns from the OBESO Cohort

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Introduction: Maternal nutritional status has been associated with adverse effects on children at birth and throughout infancy into adulthood. The identification of biomarkers in the early stages can contribute to the diagnosis and implementation of prevention strategies.

Objective: This study aimed to examine the effect of maternal obesity on umbilical cord fatty acid profiles of newborns from Mexican pregnant women.

Methods: Cross-sectional comparative study with eighty patients divided into two groups: healthy control (HC, n = 31), and overweight/obesity (OO, n = 49). Anthropometric and clinical data were determined. Fatty acid profiles from phospholipid (PL) and cholesterol ester (CE) fractions in umbilical cord serum were analyzed by gas chromatography.

Results: HC group had significantly lower pBMI (23.65 ± 2.98 kg/m^2) compared to OO group (28.99± 5.34 kg/m^2) ($p < 0.01$). Additionally, significant differences were observed in the type of delivery among Mexican pregnant women, with a higher frequency of cesarean sections in the OO group (73.5%) compared to the HC group (58.1%) ($p < 0.05$). Moreover, several metabolites including PL- caprylic acid (C8:0), PL-eicosapentaenoic acid (C20:5 n-3), and PL- docosapentaenoic acid (C22:5 n-3) were significantly higher in the HC group ($p < 0.05$). Meanwhile, CE-myristic acid (C14:0) and CE- heptadecenoic acid (C17:1) were significantly higher in the OO group ($p < 0.05$). Finally, significant positive correlations were found between maternal body weight and the CE- n-6/n-3, PL- eicosadienoic acid (C20:2 n-6), PL-arachidonic acid (C20:4 n-6), and PL- nervonic acid (C24:1 n-9) ($p < 0.05$).

Conclusions: This study underscores the programming of early lipidomic profile by maternal nutritional status. Maternal obesity is associated with cord serum PL- eicosadienoic acid, PL- arachidonic acid, and PL- nervonic acid supporting the hypothesis of Developmental Origins of Health and Disease (DOHaD). However, these fatty acids and the development of metabolic diseases are still being studied.

Conflicts of Interest: none

Keywords: caprylic acid; heptadecenoic acid; maternal obesity; myristic acid; omega-3; omega-6

P4.09

In silico Analysis of the Effect of Omega-3 Fatty Acids EPA and DHA on Inflammation

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Introduction: The omega-3 fatty acids EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) are essential for humans and have been described with anti-inflammatory properties. However, the molecular mechanism of this function has not been completely elucidated. Some *in silico* tools could help to predict bioactive compounds' mechanisms of action, such as fatty acids.

Objective: Propose mechanisms of action of EPA and DHA acts on inflammation using *in silico* tools.

Methods: The chemical structures of EPA and DHA were obtained from the PubChem database, and their molecular targets were inferred with the SWISS TARGET PREDICTION tool. Using the DisGeNET website, genes associated with inflammatory processes were identified. Subsequently, common molecules between these two groups were identified. To identify the function of these common genes, gene ontology enrichment was performed with the ShyniGO 0.80 database, and the protein-protein interaction network was built with the Cytoscape tool to identify hub genes. Finally, the union of the hub genes with EPA and DHA was verified by molecular docking using the CB-DOCK tool.

Results: One hundred forty-seven molecular targets were found for EPA and DHA, 467 genes associated with inflammation; and 24 genes in common between EPA/DHA and inflammatory processes. The genes in common participate in biological processes related to the response to UV-A rays, chemicals, and defense systems. Its molecular function is related to the activity of prostaglandins, eicosanoids, and endopeptidases. The metabolic pathways are related to the renin-angiotensin system, IL-17, and relaxin. The main genes through EPA and DHA exert their anti-inflammatory action are MMP9, PPARG, ALOX5, PPARA, and MMP2, which spontaneously bind to EPA and DHA.

Conclusions: EPA and DHA regulate inflammation through metalloproteinases and nuclear receptors, affecting metabolic pathways related to cytokines and eicosanoids by *in silico* analysis.

Conflicts of Interest: none

Keywords: *in silico*; fatty acids; EPA; DHA; inflammation

P4.10

Pharmacological Network Study to Explore the Effect of Creatine on Type 2 Diabetes Mellitus

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Introduction: The increasing prevalence of Type 2 Diabetes Mellitus (T2DM) presents a global challenge in terms of public health, driving the search for new therapeutic strategies. Creatine supplementation has sparked interest due to its potential to improve glucose regulation, increase insulin sensitivity, and regulate lipid levels in the blood.

Objective: To identify the therapeutic targets of creatine and their impact on T2DM using network pharmacology analysis.

Methods: The MalaCards database we obtained 632 genes related to T2DM and 31 genes were identified in the Comparative Toxicogenomics Database for creatine. The Venny 2.1 program was used to identify common genes between creatine and DM2. These genes were analyzed in ShinyGO 0.77 for gene ontology and KEGG pathways. A protein-protein interaction network was constructed in STRING and proteins with more than 10 interactions were considered target proteins. PBD files were downloaded from Alphafold and Protein Data Bank, and an SDF file from PubChem for the 2D structure of creatine. Molecular docking analyses were performed in SwissDock between proteins and creatine, visualizing results in UCSF Chimera and BIOVIA.

Results: Gene ontology and KEGG pathway results were related to apoptosis processes, gene regulation, lipid metabolism, and insulin signaling pathways. A total of 12 target proteins for creatine were highlighted, which showed high interaction in molecular docking studies.

Conclusions: Our findings propose that creatine may contribute to restoring blood glucose levels and improving lipid profiles by modulating pathways involving IGF1-PI3K-Akt/PKB- mTOR. This integrated approach of network analysis and molecular docking offers a deeper understanding of creatine's mechanism of action in T2DM, thereby fostering novel therapeutics of treatment.

Conflicts of Interest: none

Keywords: creatine; type 2 diabetes mellitus; pharmacological networks; molecular docking; bioinformatics

P4.11

Interaction Between the Bioactive Compounds of Kiwi (*Actinidia Chinensis*) and Dyslipidemias: Bioinformatic Analysis

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Introduction: Dyslipidemias are alterations in lipid concentrations that have a high worldwide prevalence. Kiwi contains a great variety of bioactive compounds that may have a positive effect on blood lipid levels; however, the molecular mechanism has not been fully elucidated.

Objective: To explore the bioactive compounds, molecular targets, and metabolic pathways through which kiwi acts on dyslipidemias using bioinformatics tools.

Methods: Bioactive compounds of kiwi were obtained from the IMPPAT website and molecular targets from SWISSTARGETPREDICTION. Genes associated with dyslipidemias were searched in the DISGENET database and a Venn diagram was used to define common genes. The shared functions among genes were inferred with the ShinyGO 0.80 website, and a protein-protein interaction network was constructed using CYTOSCAPE software. The hub genes were identified, and the interaction between bioactive compounds and genes was through molecular docking using the CB-Dock website.

Results: It was found six bioactive compounds of kiwi (citric acid, arabinose, quinic acid, 1- hexanol, L-fucose, L-rhamnose) with adequate oral bioavailability (greater than 0.3), these 6 compounds showed molecular targets with more than 7 interactions. We found 472 genes associated with dyslipidemias, 60 genes associated with kiwi-related molecular targets, and 15 genes in common between both. Enrichment analysis showed that these genes participate in lipid metabolism (regulating at transcriptional level), as well as in PPAR metabolic pathways: in lipid absorption and digestion. From the protein-protein interaction network analysis, it was found that PPARA, HMGCR, PPARD, and FABP4 are the molecules with the most interactions. Finally, the interaction of these 4 proteins with the bioactive compounds of kiwi was confirmed, showing that the interaction of PPARA and PPARD with quinic acid has a higher probability of spontaneous binding.

Conclusions: Kiwi may impact dyslipidemias mostly through quinic acid, interacting with PPAR metabolic pathways, and the main molecular targets are PPARA, HMGCR, PPARD, and FABP4.

Conflicts of Interest: none

Keywords: kiwi; dyslipidemias; bioinformatics; bioactive compounds

P4.12

Relationship between Body Composition and the Consumption of Sugary Drinks, Ultra-Processed Products, Salt, and Sugar Among Healthcare Staff at a Health Center

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Introduction: The "Get Active and Live" (in Spanish *"Actívate y Vive")* Plan, promoted by the Ministry of Public Health (MPH) through Ministerial Agreement 2022-049, aims to promote health in the workplace. As part of this program, a nutritional assessment was conducted, which included measuring body composition and surveying the consumption of sugary drinks, ultra-processed products, salt, and sugar among the staff.

Objective: Analyze the relationship between healthy body composition and the consumption of sugary drinks, ultra-processed products, salt, and sugar among staff at the Primary Health Care Center, as part of the "Get Active and Live" program.

Methods: This is an observational, descriptive, and cross-sectional study. A body composition assessment was conducted, and a survey was administered to analyze the consumption of sugary drinks, ultra-processed products, salt, and sugar among the staff.

Results: Regarding body fat percentage, 21 participants had high levels, while only 2 were within the normal range. Additionally, 21 individuals were at high metabolic risk based on their waist circumference. In terms of eating habits, 15 participants consumed sugary foods daily, equivalent to a glass of water, and 80% admitted to consuming fast food, with 35% doing so weekly.

Conclusions: The results indicate a high prevalence of unhealthy body composition and metabolic risk among healthcare professionals, despite their training. There is a high consumption of ultra-processed products, such as sugary foods and fast food. These findings highlight the urgent need to intervene to promote healthier eating habits in this professional group, with the goal of improving their metabolic health and reducing the risks associated with obesity and overweight.

Conflicts of Interest: We declare no conflicts of interest with pharmaceutical companies or the food industry; however, the study was supported by InBody, a company that markets body composition assessment equipment.

Keywords: body composition; ultra-processed products; food consumption

P4.13

Nutritional Classification of Maria Cookies Using Artificial Intelligence

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Introduction: María cookies are a versatile food staple integrated into various ways in the daily diet, whether suggested or not by nutrition specialists. Additionally, they are popular in a wide variety of recipes. In 2023, the Federal Consumer Prosecutor's Office (PROFECO) conducted and published a study on María cookies analyzing the nutritional composition of several María cookie brands.

Objective: To use artificial intelligence techniques to group María cookies based on their nutritional characteristics and, thus, allow users to make more informed decisions.

Methods: Based on the quality studies published by PROFECO in 2023 on 16 brands of María cookies, a database was generated considering 100 g portions, and generalizing whether they contained any type of syrup, either corn or fructose; subsequently, a Silhouette coefficient analysis was performed to determine the best clustering technique, and to determine the recommended number of groups for classification.

Results: It was found that the best technique for classifying the database is the Spectral Clustering technique and that María cookies can be classified into 4 groups: syrup and low fat, syrup, and high fat, no syrup and low fat, and no syrup and high fat.

Conclusions: In general, the cookies produced by commercial chains are found in group 3, without syrup and low in fat, except for Great Value cookies, which have more fat. All those produced by Gamesa have syrup, and only the traditional ones have less fat. The only gluten-free cookies analyzed on the market turned out to have syrup and be high in fat. This classification presents a unique and understandable analysis for the public that seeks to influence consumer choice based on their dietary needs and personal preferences.

Conflicts of Interest: none

Keywords: artificial intelligence; classification; Maria cookies; pattern recognition

P4.14

An Unbiased Analysis of Soft Drinks in Mexico Using Artificial Intelligence

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Introduction: The consumption of sugar-sweetened beverages (SSBs) and its association with health issues is a widely studied and well-known public health concern. The term SSBs is often used interchangeably with "soft drinks" since they are the most commonly consumed beverages in this category. Soft drinks are carbonated beverages containing sugars and flavorings primarily. Although the components are generally similar across all varieties of soft drinks, the quantities, especially sugars, can vary significantly. In 2023, PROFECO conducted an analysis of the components of 46 soft drinks available in the Mexican market.

Objective: To create an unbiased classification for soft drinks using pattern recognition techniques. This will help determine the recommended consumption patterns for specific groups of soft drinks.

Methods: Based on the quality studies published by PROFECO in 2023 regarding 46 soft drinks in the Mexican market, we generated a database considering 100 ml portions and calculated the energy content using a conversion factor of 4 kilocalories per gram. Subsequently, we performed a Silhouette coefficient analysis to determine the best clustering technique and the recommended number of groups for classification.

Results: We found that the Gaussian Mixture Model (GMM) was the most suitable technique for classifying the database. Soft drinks can be categorized into three groups: Traditional Soft Drinks, Soft Drinks without preservatives or sweeteners, and Non-caloric Alternatives (sugar-free).

Conclusions: From a nutritional standpoint, only soft drinks within the non-caloric alternatives group are considered suitable for consumption. Among the traditional soft drinks and those without preservatives or sweeteners, the latter group may be preferred. Despite having a higher caloric content, they offer a greater variety of flavors and options without additives, which may be preferable for those seeking to avoid such additives. This classification can facilitate straightforward comparisons due to data standardization.

Conflicts of Interest: none

Keywords: artificial intelligence; classification; pattern recognition; soft drinks

P4.15

Relative Fat Mass and Body Mass Index for the Diagnosis of Metabolic Risk Factors in the Peruvian Adult Population

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Introduction: An elevated body mass index (BMI) is associated with the development of multiple metabolic risk factors. Recently, relative fat mass (RFM) has been postulated as a new estimator of fat accumulation when considering sex and waist circumference. Knowing which indicator can predict metabolic risk factors will contribute to the diagnosis and prevention of metabolic syndrome.

Objective: The aim of the present study was to compare the predictive capacity of both indicators on some metabolic risk factors.

Methods: Anthropometric and biological data from 978 Peruvian workers from a higher education institution were used for the analyses. ROC analyses were performed to determine the area under the curve (AUC) and to know the predictive value of BMI (weight(kg)/height(m)^2) and RFM (Women: 79 - (22 x (Height(m)/Waist(m)), Men: 74 - (22 x (Height(m)/Waist(m)) with respect to the diagnosis of hypertension, hypertriglyceridemia, and hyperglycemia. A p-value of less than 0.05 was considered.

Results: In females, for the diagnosis of hyperglycemia, the AUC of RFM (0.76) was higher and statistically significant with respect to the AUC of BMI (0.714) ($p = 0.049$). Additionally, in males, no significant difference was found between RFM (0.669) and BMI (0.651). For hypertension, the AUC of RFM (0.765) shows a slight superiority to the AUC of BMI (0.752) in males, while in females RFM (0.715) also shows a slight superiority to BMI (0.703), in both sexes there was no significant difference. For hypertriglyceridemia, in men, there was a slight superiority of MFR (0.716) concerning BMI (0.695), while in women there was also a slight superiority, MFR (0.702) and BMI (0.687). In both cases, there were no significant differences.

Conclusions: The RFM shows significant superiority for the diagnosis of hyperglycemia in women. It is recommended that sex be assessed in nutritional status evaluations for the diagnosis of hypertension, hypertriglyceridemia, and hyperglycemia.

Conflicts of Interest: none

Keywords: relative fat mass; body mass index; hyperglycemia; hypertension; hypertriglyceridemia

P4.16

Validation of Internal Consistency: Questionnaire of Knowledge, Attitudes, and Practices of Fruit and Vegetable Consumption in Schoolchildren

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Introduction: Fruits and vegetables are indispensable food groups in a healthy diet, given their nutritional contribution and their positive effects on health. Schoolchildren represent a group of interest in health promotion, so it is necessary to have instruments to evaluate their consumption.

Objective: To validate a questionnaire on knowledge, attitudes, and practices of fruit and vegetable consumption in the school population.

Methods: A validation study was carried out on a composite of 75 items grouped into the categories: variety of preferences, knowledge, attitudes, and practices of fruit and vegetable consumption. The questionnaire was applied to a sample of 100 participants to determine the internal consistency of the dimensions. To evaluate temporal stability, two measurements were taken 15 days apart. Internal consistency was evaluated for the entire instrument by estimating Cronbach's alpha. The statistical analysis of the stability of the questionnaire was performed through the test-retest, using Spearman's correlation coefficient.

Results: The internal consistency obtained by Cronbach's Alpha for the entire questionnaire was 0.76. All the categories analyzed, except for daily fruit and vegetable consumption and vegetable preferences, showed a significant and positive correlation above 0.3.

Conclusions: The questionnaire showed adequate overall internal consistency and moderate temporal stability for most of the categories.

Conflicts of Interest: none

Keywords: surveys and questionnaires; validation study; eating behavior; schools; fruits; vegetables; health education

P4.17

Investigating the Microbiota-Mediated Biotransformation of Coumarins and its Potential Therapeutic Effects through the Transcriptional Activities of the Aryl Hydrocarbon Receptor

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Introduction: Coumarins are secondary heterocyclic metabolites composed of fused benzene and α-pyrone rings, widely present in various edible plants either as heterosides or in free form. Studies have revealed that several compounds in the coumarin class exhibit pronounced anti-inflammatory activities in the gastrointestinal epithelium. Therefore, they have been considered a non-pharmacological strategy for managing inflammatory bowel disease (IBD) and preventing colorectal cancer (CRC). In this context, the transcriptional activities of the aryl hydrocarbon receptor (AhR) have shown to exert anti-inflammatory and differentiating effects on the gastrointestinal mucosa, making it a promising therapeutic target for both disorders. Additionally, this protein acts as a sensor for dietary phenolic compounds and their metabolic derivatives. However, little is known about the biotransformations mediated by commensal bacteria on the structure of coumarins and their potential effect on interactions with the AhR.

Objective: To explore the microbiota-mediated biotransformation of dietary coumarins and their effects on affinity for the AhR.

Methods: Structural changes produced by reduction, dehydroxylation, hydrolysis, and fission were predicted using the Biotransformer tool and compared with the literature. The chemical structures of the five most abundant dietary coumarins and twenty-five of their metabolic derivatives were obtained from PubChem and subjected to molecular docking tests. The AhR protein was retrieved from the Protein Data Bank, and molecular docking was performed using AutoDock.

Results: Microbiota-mediated biotransformation produces furanocoumarins (-6.75 kcal/mol) and coumarins (-5.51 kcal/mol) with affinity energies comparable to the semisynthetic drug targeting the AhR protein (-7.68 kcal/mol). Furthermore, Blautia sp. and Lactobacillus reuteri were identified as exhibiting beneficial enzymatic qualities for biotransformation and even for the biogenesis of coumarins.

Conclusions: Coumarins present in plant-based foods possess structural qualities that render them potential ligands for the AhR protein. Additionally, biotransformation by probiotic bacteria induces modifications that enhance their affinity energy, and some can synthesize coumarins from degradation products. Therefore, the combination of furanocoumarins and probiotics could serve as a potential therapeutic tool for managing IBD and preventing CRC.

Conflict of Interest: none

Keywords: coumarins; biotransformation; microbiota; AhR, in silico

P4.18

Association between the Catabolism of BCAA and Insulin Resistance in Children with Obesity: Findings from the PUBMEP Study

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Introduction: Pediatric obesity is a global challenge, linked to a wide range of comorbidities in adulthood, with Insulin resistance (IR) being a key early metabolic complication. For these reasons, the discovery of novel early biomarkers of IR would be highly of interest. Several studies have reported an association between branched-chain amino acids (BCAA) and IR in children with obesity. However, the nature of this association remains unclear.

Objective: The aim of this study was to validate the association between BCAAs and their respective products with IR in children and adolescents with obesity.

Methods: The PUBMEP study is a prospective study in which 123 children were evaluated at two-time points, namely before and during pubertal development. In this study, a series of biological samples, including blood, anthropometric data, fasting glucose, and insulin measurements, were collected. A semi-targeted metabolomic analysis was conducted on blood samples using liquid and gas chromatography coupled to mass spectrometry. The ratios of signal to internal standard were transformed logarithmically, scaled, and normalized. Multivariate analyses were conducted using linear regression to identify significant associations.

Results: In prepubertal children, only valine was associated with obesity and IR. In contrast, BCAA were associated with obesity but not IR in the pubertal stage. However, subproducts of BCAA catabolism, such as glutamate, alanine, and acylcarnitine C3, were associated with obesity and IR in prepubertal and pubertal stages.

Conclusions: The associations reported in the literature between BCAA and obesity were validated in our cohort. The association was not found for IR. Nevertheless, we demonstrated that the products of BCAA catabolism may serve as potential early biomarkers of IR. These findings may contribute to a more comprehensive understanding of the molecular pathways involved in the development of IR in the pediatric population.

Conflicts of Interest: none

Keywords: metabolomics; amino acids; branched-chain; pediatric obesity; insulin-resistance; puberty

Funding: This research was supported by the Instituto de Salud Carlos III co-funded by the European Union and ERDF A way of making Europe (grant #PI20/00563, PI20/00711, PI20/00924, P20/00988, PI23/00028, PI23/00129, PI23/01032, PI23/00165, PI23/00191).

P4.19

Epigenetic Clocks Through Pubertal Development: Insights into Childhood Obesity and Overweight

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Introduction: Obesity, a complex and inheritable condition, increases the risk of developing age-related diseases. Estimating biological age through DNA methylation using various "epigenetic clocks" provides valuable insights into this process. There is a particular scarcity of research focusing on pediatric and pubertal groups.

Objective: This study aims to clarify the effect of childhood obesity on the discrepancy between DNA methylation age and chronological age (age acceleration) during pubertal development.

Methods: Data from the PUBMEP and IBEROMICS projects are incorporated, comprising a total of 477 children (235 girls, 242 boys). Participants were categorized into prepubertal (184, including 87 boys and 97 girls) and pubertal (206, with 103 boys and girls) groups based on their Tanner stage. Data collection included blood samples, anthropometric measurements, and clinical and biometric records. DNA methylation profiling was performed on the blood samples using the 850k array. Epigenetic clocks were estimated using the methylclock R package. Specifically, we focused on Wu's epigenetic clock, since it is well validated in the child population. Multivariate analyses were conducted to identify significant associations.

Results: It is noteworthy that differing results were found in the association between epigenetic age acceleration in children based on their pubertal status and sex. Prepubertal girls exhibit a stronger association between epigenetic age acceleration and adiposity variables compared to boys in the same prepubertal stage. However, upon reaching puberty, this association becomes more pronounced in pubertal boys than in girls, in whom a significant association is no longer observed.

Conclusions: The results imply a gender-specific correlation between obesity-related factors and epigenetic age acceleration, exhibiting variations across pubertal development. This emphasizes the significance of accounting for both the developmental stage and sex-specific disparities in the interplay between metabolic health and epigenetic aging mechanisms.

Conflicts of Interest: none

Keywords: epigenetic clocks; childhood obesity; EWAS; puberty; sex-specific

Funding: Supported by the ISCIII co-funded by the EU and ERDF A way of making Europe (Grant #PI20/00563, PI20/00711, PI20/00924, PI20/00988, PI23/00028, PI23/00129, PI23/01032, PI23/00165, PI23/00191), and by the European Union through the Horizon Europe Framework Programme (eprObes project, grant number GA 101080219).

P4.20

LC-HRMS-Based Untargeted Metabolomics to Assess the Impact of Cacao in Mice: Sex as a Major Driver in the Response

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Introduction: Evidence supports that cocoa consumption has numerous health benefits, mainly attributed to the potent antioxidant activity of cocoa polyphenols (especially flavanols). Metabolomics, a crucial component of systems biology, aims to uncover the relationship between metabolites contained in biofluids and physiological or pathological changes in organisms. Additionally, the use of metabolomics techniques is increasingly used to identify dietary biomarkers, such as biomarkers of cocoa intake, to assess their impact on host metabolism, their implication in disease risk, and even in neurobiological outcomes.

Objective: To assess the effect of high-polyphenol content (HPC) cocoa and low-polyphenol content (LPC) cocoa on plasma metabolic biomarkers, considering sex differences.

Conclusion: Sex differences appear to be the major driver of group separation. This should be considered in future study designs and in interpreting the results.

Methods: Nineteen young adult C57BL/6JRj mice were arbitrarily divided into three groups and assigned to receive either the standard CTR, HPC, or LPC diet (n = 4–8 animals per experimental group, comprising 2–4 males and 2–4 females each) during thirty days. Animals were deeply anesthetized and quickly sacrificed by decapitation. Intracardiac blood specimens were collected and centrifuged to obtain plasma. Plasma samples were analyzed using liquid chromatography coupled with high-resolution mass spectrometry (LC–HRMS) in negative ionization mode. Analytical blanks and quality controls (QCs) were included to assess system suitability. Raw data were processed using MZmine 3.9.0. Data was curated using QC-based filtering and presence among groups. Principal component analysis was used to detect clusters and potential outliers. Discriminating variables were determined using orthogonal partial least squares discriminant analysis (OPLS-DA). Multivariate analyses were done in SIMCA 18.

Results: While significant separation was not observed in the multivariate analysis among intervention groups, the OPLS-DA model ($p \leq 0.05$) based on sex could discriminate between samples

regardless of the intervention group, indicating the significant role of sex in the response.

Conflict of interest: none

Keywords: cocoa; metabolomics; chemometrics; sex differences

P4.21

Use of Scientific Information Sources and Social Networks in Nutrition Degree Students: Pilot Study

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Introduction: During academic training, students must consult both physical and digital information sources (IS). Social networks (SN) play a crucial role in fulfilling this need due to their availability and immediacy. Understanding SN as a computer service that allows people to communicate and connect through digital or physical platforms. However, this can bring benefits and challenges, depending on whether boundaries are drawn between formal and informal learning.

Objective: Analyze the use of IS and SN that Bachelor of Nutrition students make to support their educational process.

Methods: Exploratory, descriptive cross-sectional pilot study to analyze the patterns of use of SN in students of the degree in nutrition. A self-managed questionnaire was applied electronically and anonymously using Microsoft Forms. Excel was used for data analysis. Descriptive analysis was used: frequencies and proportions.

Results: A Questionnaire was answered by 38 students (mean age 21 years, 79% women, 21% men). The majority from the seventh semester (n=13); 31% spent 5 to 6 hours/week browsing SN, the best-known was Instagram (100%; n=38), followed by Facebook and WhatsApp (97.4%; n=37). Regarding use, the most was WhatsApp (97.4%; n=37), followed by, Instagram (92.1%; n=35) and Facebook (89.5%; n=34). For academic purposes, 42% spent between 3-4 hours/week searching for information for schoolwork, with PUBMED (78.9%; n=30), followed by Google Scholar (71.1%; n:=27). The most used SN was Microsoft Teams (81.6%; n=31), followed by WhatsApp (63.2%;n=24). Students noted that these platforms facilitate research and communication but also mentioned potential drawbacks, such as being distracting, presenting dubious information, and encouraging poor time management

Conclusion: Students have experienced a digital development of education, which has modified the styles of education, which has allowed them to have a more active participation in their educational process and communicate in more flexible environments; It was accelerated by the COVID-19 pandemic and allowed them to personalize the information they received and learn independently, without barriers of place or time.

Conflict of interest: none

Keywords: education; social-networks; bachelor's degree in nutrition

P4.22

Evaluation of School Food Environments in Latin America through M-Health

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Introduction: The school food environment influences the nutritional health of children. Teachers, as mediators of the interpersonal and community environment, influence actions in the school food environment.

Objective: To validate the content of an instrument and develop a web application to evaluate school food environments in Latin America (LA).

Methods: A conceptual design was carried out based on the questionnaire "Perceptions of parents, experts, and teachers from LA about the food environment at home and its connection with the school promoting healthy habits in students during the Covid-19 pandemic (3PyEN-SAN)". Dimensions were defined considering the eco-social model. Responses were designed on a Likert scale to assess the level of implementation of actions and elements to promote healthy school food environments in LA. A first proposal of 48 items and 7 dimensions was subjected to content validation with 22 experts from LA. The level of agreement on the relevance, coherence, clarity of the items, and sufficiency of the dimensions was analyzed using Aiken's V with STATA 16.0. The final questionnaire was developed in a progressive web app https://app.nutrento.org/auth/login and content management system; a ß version and usability were tested with Health-ITUES.

Results: Aiken's V validity registered an overall result of 0.94. All items in the dimensions had values greater than the critical decision point V≤ 0.70. Relevant suggestions from judges were incorporated, resulting in a final version of 52 items with 7 dimensions. Usability, as assessed by the Health-ITUES questionnaire, was high (4.6 out of 5).

Conclusions: An instrument with content validity was obtained to assess teachers' perceptions of elements and actions that promote healthy school food environments. The app has the capacity to evaluate schools in Mexico and Chile and to continue scaling to other LA countries

Conflicts of Interest: There are no conflicts of interest; the project was funded by the Mexico-Chile Joint Cooperation Fund.

Keywords: food environments; schools; schoolchildren; content validation; m-health

P4.23

Phase Angle Cut-Off Points as an Indicator of Excess Malnutrition in a Young Population

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Introduction: Bioelectrical impedance is a doubly indirect method for estimating body composition that is widely used in clinical practice. It is useful for determining the bioimpedance parameters: resistance, reactance, and phase angle (PA), which measure the conduction capacity of the different tissues against an electric current and, in addition, allow estimation of the composition of the different body compartments through predictive equations. The FA is an objective, sensitive, and specific parameter whose cut-off points have applicability in different areas of the clinical context due to the information it provides on cellularity and cellular functioning.

Objective: To estimate phase angle cutoff points as an indicator of malnutrition by sex in a young population.

Methods: Cross-sectional study. Using non-probabilistic sampling, 608 students from a higher education institution in the city of Cartagena, Colombia, were recruited between 2022 and 2023. For the estimation of body composition variables and bioimpedance parameters, the Biody Xpert multifrequency and multialgorithm equipment was used. ROC curves were performed to determine the area under the curve and the cut-off points in the identification of excess compared to the classification obtained by BMI. All statistical analyses were performed with STATA ® version 16 software.

Results: The sample consisted of 608 persons between 15 and 29 years of age, 66.12% of whom were women. The AF cut-off point for women was 6.3%, with a sensitivity of 62.99% and specificity of 58.65%, 60.16% were correctly classified. For men, a cut-off point for PA for men of 7.5% was determined, with a sensitivity of 62.50% and specificity of 62.7%, 62.63% were correctly classified.

Conclusions: Phase angle is a reliable indicator for predicting excess malnutrition in a young population because of its ability to predict the quantity and quality of soft tissue mass.

Conflicts of Interest: none

Keywords: electric impedance; body composition; reference values; nutrition assessment; phase angle

P4.24

Development of the Ratio Index Between the Consumed Food Pattern and Dietary Guidelines

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Introduction: Indicators based on dietary patterns expand understanding by addressing nutrient consumption and their synergistic effects with foods. This type of analysis is crucial for the development of national dietary guidelines, as it makes the information available in a simple and practical way.

Objective: To develop an index and a graph that compare the consumed dietary pattern and the recommendations of the dietary guidelines.

Methods: Secondary analysis was conducted using data from the food consumption component of population surveys in Colombia and Antioquia. The foods reported in the first 24-hour recall were classified into the six food groups of the Food-Based Dietary Guidelines (GABAS, by its acronym in Spanish) for the Colombian population, and the Consumption Ratio Index (IRC, by its acronym in Spanish) was calculated. The IRC represents the ratio between the calories consumed from a food group and the recommended calories for that group. Analysis was performed using the Dietary Intake Evaluation Software (EVINDI, by its acronym in Spanish) v5, Stata 16, and Jamovi 1.6.23.

Results: The dietary pattern of children under 18 years old, pregnant and lactating indigenous women in Colombia; lactating women in Colombia; and pregnant and lactating women in Antioquia is considered deficient. Most of these population groups consumed cereal similar to the recommendations in the GABAS but did not comply with the fat, protein sources, dairy products, fruits, and vegetables recommendations, and some groups exceeded sugar consumption recommendations.

Conclusions: The methodology developed can be applied to all population groups and with dietary guidelines from different countries. Priority was given to analyzing the maternal and infant group, early childhood, and adolescence, considering these periods as opportunities to break the intergenerational cycle of malnutrition. The nutritional situation in this population calls for the design and implementation of food programs that transcend assistance and promote healthy and responsible food consumption.

Conflicts of Interest: none

Keywords: consumption ratio index; dietary pattern; dietary guidelines; graph; 24-hour recall

P4.25

Phage Therapy as Gut Microbiota Modulator in Obesity

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Obesity is a major public health problem in Mexico and around the world, affecting millions of people. There are several comorbidities associated with obesity, so the search for effective treatments continues to be a priority. Mexico is considered the fifth country with the highest prevalence of obesity in the world. The WHO defines it as an abnormally excessive accumulation of fat with detrimental effects on health. Its etiology is multifactorial, highlighting intestinal dysbiosis as a trigger, being less diverse in individuals with obesity. Bacteria presence, such as *Enterobacter cloacae;* has been associated with the development of obesity and its possible contribution to the pathophysiology through inflammation. Strategies to modulate the microbiota include phage therapy, which, having a limited spectrum of infection, does not alter the natural microbiota targeting precisely the pathogen bacteria related to obesity. In this sense, the present work aims to evaluate the effect of a bacteriophage cocktail on the standardized gut microbiota of people with obesity, using an *ex vivo* model based on bioreactors that emulate the large intestine and foods typical of the diet consumed by people with obesity. A cocktail of bacteriophages (AS5 and AS6) of *Enterobacter cloacae* was isolated and genomic characterized, and their lytic effect was subsequently evaluated in an *ex vivo* model of the gut microbiota of people with obesity, by microbiological analyses before and after inoculation. Among the most noteworthy results is that the bacteriophages analyzed did not present genes related to virulence, antibiotic resistance, or lysogenic life cycle. Once inoculated in the bioreactors, survival throughout digestion was observed, with significant changes in the abundance of enterobacteria, especially in the descending colon area. From this study it is concluded that the bacteriophage cocktail proved to be safe and the changes in bacterial counts evidence a lytic effect on the gut microbiota, underscoring the need for more detailed genomic analyses to fully understand its impact. This study highlights the potential of phage therapy as a promising strategy to modulate the microbiota in the context of obesity.

Conflicts of interest: none

Keywords: obesity; gut microbiota; gut dysbiosis; phage therapy; bioreactors

P4.26

The Usefulness of BAI as a Diagnostic Tool to Determine Body Fat Percentage in Mexican Adults

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Introduction: BMI does not distinguish between body fat (BF) and muscle mass (MM), leading to misdiagnosis. The BAI emerges as a complementary tool to estimate body BF.

Objective: To evaluate the usefulness of BAI in determining body %BF in Mexican adults, comparing it with tetrapolar bioelectrical impedance (BIA).

Methods: Prospective, comparative, cross-sectional study in 262 Mexican individuals (18-65 years old). Body BF percentages obtained by BAI and BIA were correlated and compared.

Results: Of the 262 individuals, 41% (n=108) were women and 59% (n=154) were men. Considering the entire group, the average weight was 78.9 kg and the average height was 1.67 m. The average hip circumference was 103.9 cm and the body fat percentage, determined by BIA, was 29.4%, while the estimate by BAI was 31.1%. Concordance and correlation analyses were performed in the entire group and separated by gender. In the entire group, the %BF calculated with BAI correlated moderately and directly proportionally with the %BF determined by impedance, indicating that for each increase in impedance, there is a corresponding increase in the adiposity index (n=262; r=0.6690; p= <0.005, CI 95%= 0.51 – 0.71). The r2 corresponds to 0.44, implying that the increase of each point in BIA is responsible for 44% of the increase in the BAI result. The result was corroborated using Lin's Concordance Correlation Coefficient (CCCL) obtaining (0.61) demonstrating a lack of correlation between methods. Separating the group by gender, we observed a moderate correlation in men (n= 158; r=0.6275; p= <0.005; CI= 0.41 – 0.60). However, when performing the statistical correction with the CCCL, 0.51 was obtained, demonstrating a lack of correlation between the results of both methods. For women, similar results were found to those reported in the literature (n=108; r=0.6491; p=<0.005; CI=0.50 – 0.73), however, they presented no concordance according to the CCCL (0.61).

Conclusions: Mexican adults larger sample studies are needed to better evaluate its usefulness.

Conflict of interest: none

Keywords: obesity; BMI; waist circumference; body fat mass; bioelectrical impedance

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