

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 Medellín.

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 Medellín. 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 Medellín 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

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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 Medellín.

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: Isoprostanooids 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 cardiomyocytes, 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