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COMUNICAÇÕES ORAIS

CO1. ASSOCIATION BETWEEN ULTRA-PROCESSED FOOD CONSUMPTION AND SUSTAINABLE HEALTHY DIETS USING NOVA CLASSIFICATION AND SHED INDEX

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INTRODUCTION: High ultra-processed food (UPF) consumption is linked with negative impacts for both human and planet health. However, evidence on the relationship between UPF consumption and Sustainable Healthy Diets adherence is limited.

OBJECTIVES: To assess the association between UPF consumption and Sustainable and Healthy Diet (SHED) Index among Portuguese adults (aged 18-65 years).

METHODOLOGY: This cross-sectional study was a secondary analysis of data from a validation study carried out between October and December 2022 using a self-reported questionnaire administered by interview. Dietary intake was recorded using a semi-quantitative food frequency questionnaire validated for the Portuguese adult population and UPF were identified according to the NOVA classification. Sustainable Healthy Diets adherence were assessed using the SHED Index, a tool for measuring healthy dietary patterns and pro-sustainability behaviours, developed by Tepper *et al.* (2021). It was calculated the UPF proportion (%) in the diet by the ratio between the amount of food consumed from fourth NOVA group and the total weight of food and beverages consumed (g/d). The association between UPF proportion and SHED Index was evaluated through linear regression models, adjusted for sex, age, education level, urbanization degree and physical activity.

RESULTS: A total of 296 participants were included (36±16 years old; 31.4% men). Mean UPF proportion was 7.9% corresponding to 155 g/day. After adjustments, we found a negative association between UPF proportion and total SHED index score (B=-0.858, confidence interval (CI) 95%: -1.136, -0.580). Higher UPF proportion was also associated with lower Healthy Eating (B=-0.308, CI 95%: -0.390, -0.225), Sustainable Eating (B=-0.075, CI 95%: -0.140, -0.010), Ready-Meals (B=-0.176, CI 95%: -0.272, -0.080) and Soda (B=-0.266, CI 95%: -0.318, -0.214) sub-scores.

CONCLUSIONS: These findings suggest that a higher UPF proportion is inversely associated with SHED index score and sub-scores, highlighting the significant role of UPF consumption on diets sustainability and healthiness.

CO2. TRENDS IN ULTRA-PROCESSED FOOD CONSUMPTION IN PORTUGAL

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INTRODUCTION: Broad changes in dietary and physical activity patterns are part of the concept of nutritional transition. A fourth nutritional transition has as main characteristic the change of consumption of processed foods for ultra-processed foods (UPF).

OBJECTIVES: This study aims to evaluate trends of UPF availability in the Portuguese population.

METHODOLOGY: Data from the Household Budget Surveys (HBS) conducted by the National Statistics Institute (INE) each 5 years within a national representative sample of households was obtained from DAFNE-Anemos Software. All the existing data sets were used: years 1990, 1995, 2000 and 2005.The food processing classification system used was NOVA. The percentage of UPF was calculated based on the total household daily amount of food and beverages available per capita (in grams).

RESULTS: As shown in table 1, between 1990 and 2005, the UPF availability increased from 3.9% to 13.8%. Over the years, with the exception of vegetables and added lipids, all other food and beverages categories increased its UPF availability contribution, mainly noticeable for milk products, sugar products, cereal products and meat products.

CONCLUSIONS: Increasing trends in UPF availability in Portugal were observed. At the same time, there is a trend towards a decrease in unprocessed availability and home-prepared foods. The Portuguese population should be made aware of the health risks resulting from excessive consumption of UPF.

TABLE 1

Trends in food availability in Portugal, using HBS data and NOVA classification System

YEAR	UNPROCESSED OR MINIMALLY PROCESSED FOOD (%)	PROCESSED CULINARY INGREDIENTS (%)	PROCESSED FOOD (%)	ULTRA--PROCESSED FOOD (%)
1990	68.0	4.1	24.0	3.9
1995	67.8	5.2	20.5	6.4
2000	66.0	4.7	19.1	10.2
2005	65.4	4.0	16.8	13.8

Note: Percentages calculated from total *per capita* household daily amounts of food and beverages availability (1990 - 1799 g, 1995 - 1659 g, 2000 - 1620 g and 2015 - 1518 g)

CO3. CONSUMPTION OF ULTRA-PROCESSED FOODS THROUGHOUT CHILDHOOD AND ADIPOSITY TRAJECTORIES: DATA FROM THE GENERATION XXI BIRTH-COHORT

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INTRODUCTION: Ultra-processed foods (UPF) consumption has been associated with worse health outcomes. However, the literature lacks robust longitudinal studies, particularly in young populations.

OBJECTIVES: To evaluate the relationship between UPF consumption throughout childhood and adiposity trajectories.

METHODOLOGY: Participants from the Generation XXI population-based birth cohort (Porto, Portugal) were included. Food frequency questionnaire items at 4, 7 and 10 years were classified according to the processing degree using the NOVA classification. To define groups of UPF consumption (grams) throughout childhood, a probabilistic Gaussian mixture model was applied using the 4203 participants with three assessments. As 79% of the total sample (n=8647) had information on at least one wave, trajectories were imputed to the remaining sample using naïve bayes To assess if the adiposity trajectories [body weight, height, body mass index z-scores (zBMI), waist circumference (WC)] depend on the UPF clusters, a mixed-effects model with linear and quadratic terms for age-adjusted for confounders (sex, birth weight, mother's pre-pregnancy BMI and education, and remaining food groups according to processing level) was used. For the outcomes, participants with at least one measurement at 4, 7, 10 or 13 years were included (nWeight=5227, nHeight=5183, nBMI=05047, nWC=5044).

RESULTS: Four UPF consumption clusters were identified: constant lower consumption (15.4%), constant intermediate consumption (56.4%), intermediate consumption at 4 and 7 years old and high at 10 years old (17.2%), and constant higher consumption (17.1%). Compared to the constant lower consumption of UPF, the constant higher consumption cluster was associated with greater acceleration in body weight (β: 0.123; 95% CI: 0.024;0.221), BMI (β: 0.013; 95% CI: 0.003;0.024), and WC (β: 0.221; 95%CI: 0.128;0.314).

CONCLUSIONS: High UPF consumption throughout childhood was associated with worse adiposity indicators. It is of high priority to define strategies to reduce UPF consumption and promote fresh/minimally processed foods.

CO4. ASSESSMENT OF FOOD WASTE AMONG URBAN AND RURAL PUBLIC PRESCHOOL AND PRIMARY SCHOOLS IN THE MUNICIPALITY OF FARO

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INTRODUCTION: School meals represent a challenge to the environment sustainability and are an opportunity to tackle food waste (FW). In this setting, FW plays a major role in children's healthy development since it can compromise their nutritional intake.

OBJECTIVES: To assess the FW, in the form of leftovers and plate waste, produced at lunchtime in preschool and primary school canteens located in the Municipality of Faro.

METHODOLOGY: In this cross-sectional study the FW was assessed during three non-consecutive days in five school canteens. The food produced and wasted were separated and weighed by aggregated components (soup, carbohydrate source, protein source and vegetables). Schools were stratified into urban or rural based on geographical location. FW was classified according to the result of the leftovers and plate waste indexes, using the categorisations of Vaz (2006) and Aragão (2005), respectively. Data collection was performed in December of 2022.

RESULTS: A total of 2751 meals were served during the study period (69% from urban area schools). The mean percentage of FW was high (45.2%), and the mean of leftovers and plate waste exceeded the acceptable limits (18.3% and 28.7%, respectively). The soup (32.7%) and vegetables (76.7%) presented the lowest and highest FW, respectively. Comparing the results according to schools' location, it was found that the amount of plate waste was significantly higher in urban area schools when compared to the rural area schools (33.5% and 22.5%, respectively; p = 0.036). Additionally, a higher production of leftovers was observed for vegetables in rural area schools (p=0.030).

CONCLUSIONS: These results highlight the need to implement urgent corrective measures to reduce FW in schools from the Municipality of Faro. Particularly, future approaches should consider the training of canteen workers, menu improvement and promoting children's and their family's food consumption, especially with regard to vegetables food group.

CO5. FERMENTEDVEGALGAE: LACTIC ACID FERMENTATION PROCESSES TO CREATE INNOVATIVE AND NUTRITIVE PRODUCTS FROM SURPLUS VEGETABLES AND MACROALGAE

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INTRODUCTION: Fermentation works in symbiosis with sustainability in the food sector transforming non-valued raw materials otherwise discarded.

OBJECTIVES: FermentedVegAlgae project aims to create innovative and nutritive added-value products by fermenting surplus vegetables and macroalgae, following plant-based, low-salt and clean label trends.

METHODOLOGY: Six lactic-acid fermented prototypes were developed: two macroalgae sauerkraut (*Palmaria palmata* and *Alaria esculenta*) and four vegetable-based products, including a vegan fermented sauce and a spread. For vegetable fermentations, a consortium of 4 lactic acid bacteria (LAB) species, and salt concentrations between 0.3% and 2.0% were tested. Probiotic bacteria (*Bacillus coagulans*) addition after pasteurization was also tried. A consortium of LAB and yeast was used for macroalgae fermentations and ultrasonic pre-treatment was required. All the fermentations were performed at room temperature. To follow the fermentation performance, titrable acidity (%), total soluble solids (TSS) (°brix) and pH were evaluated. After the end of the fermentations, products were evaluated for total and soluble proteins and phenolic compounds, antioxidant capacity and shelf-life.

RESULTS: For vegetable fermentations, the most successful trials were obtained with 1% NaCl, achieving stable pH and titrable acidity after 21 days (3.37-3.54 and 1.35-1.76% lactic acid). In the case of macroalgae, ultrasonic pre-treatment allowed successful fermentations with 0.3% NaCl after 7 days. For P. *palmata*, final and stable pH and TSS were obtained (3.72 and 5.5 °brix), while A. esculenta fermentation stabilizes at 3.95 and 3 °brix. For both macroalgae, soluble protein increased after fermentation (P. *palmata* – 7.082 to 12.660 g/100 g, A. esculenta – 17.970 to 23.447 g/100 g fresh biomass). After 30 days, the pH and °brix remain stable at room temperature without pasteurization.

CONCLUSIONS: Fermentation by LAB consortium showed to be promising processes to obtain stable and gut friendly products, from less valued plant raw materials aligned with consumer demands.

CO6. CHARACTERIZATION OF NEW MISOS PRODUCED FROM PORTUGUESE PULSES

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INTRODUCTION: Miso is a Japanese fermented soybean paste, made from soybeans fermented with koji (steamed rice inoculated with *Aspergillus oryzae*), lactic acid bacteria (LAB) and yeast. It is rich in protein, vitamins, minerals and phenolic compounds, and has antioxidant and anti-inflammatory properties, reducing chronic diseases risk.

OBJECTIVES: Produce novel miso with improved nutritional and organoleptic proprieties, and health benefits, by replacing soybean with Portuguese pulses.

METHODOLOGY: Chickpea, lupine and cowpea were mixed with koji, water and 12% salt obtaining a homogeneous paste. These pastes were inoculated with non-pasteurized miso and specific yeast and LAB. The fermentative process performance was followed through the evaluation of physicochemical parameters like pH, total and soluble sugar content (SSC), total and soluble proteins content and total and soluble phenolic compounds.

RESULTS: Misos with 15 days of fermentation were analysed and compared with the unfermented mixture (beginning of fermentation). As the fermentation evolved, a decrease in pH and an increase in SSC, soluble proteins and soluble phenolic compounds was observed. Cowpea miso showed the highest pH decrease (5.52 to 4.37). Chickpea miso showed the highest rise in SCC (1.2 to 3.3 °Brix), soluble proteins (25.24 to 40.26 mg/100 g fresh biomass) and soluble phenols (4.42 to 9.91 mg/100 g fresh biomass), followed by cowpea miso.

The hydrolytic activity due to A. *oryzae* amylases and proteases, facilitating the access to substrates and promoting the release of free sugars and smaller peptides, and the fermentative activity of LAB (production of lactic and acetic acid), may explain this result.

CONCLUSIONS: The effect of fermentation on the physicochemical parameters of the legumes was observed. The initial fermentation process is faster in chickpea and cowpea, with higher starch/protein ration content than lupine. The results point to the viability of producing new legume-fermented products from Portuguese pulses by traditional miso production methodologies.

CO7. FERMENTED OLIVE POMACE - A NOVEL FOODSTUFF NUTRITIONALLY BALANCED AND MICROBIOLOGICALLY SAFE

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INTRODUCTION: Olive pomace is the major by-product of the olive oil industry. Its management creates several constraints for producers since its rich composition in bioactive compounds makes it phytotoxic. Thus, finding new food applications for this waste seems urgent not only from an environmental perspective but also because it can respond to the increasing need for food security.

METHODOLOGY: In this work, olive pomace was fermented for one month, at different temperatures (4/20/37°C), to obtain a novel foodstuff - fermented olive pomace. Chemical analyses regarding total protein, fat, phenolics contents, antioxidant activity, amino acids, and the profiles of fatty acids and vitamin E, were carried out during this period (0, 4, and 32 days), as well as the count of total microorganisms.

RESULTS: The results showed no significant differences (p fermented samples: 12.38-28.66 mg/kg), which is the most biologically active form in the organism. The total amino acid contents varied from 42.0 to 46.0 mg/g, being glutamic acid (5.6-6.2 mg/g) the major one. In addition, an increase in the total microorganisms occurred with fermentation (control: 2.20x102 < fermented samples: 3.00x103 -2.01x107 colony forming units/mL) but no pathogenic microorganisms were present, revealing a safe product with a possible probiotic effect which will be evaluated in future work.

CONCLUSIONS: Overall, this novel product seems very promising since it presents a nutritionally balanced composition and is microbiologically safe.

CO8. NEOFOBIA ALIMENTAR E A VONTADE DE EXPERIMENTAR HORTÍCOLAS EM CRIANÇAS EM IDADE PRÉ-ESCOLAR – PROJETO VEGGIES4MYHEART

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INTRODUÇÃO: A rejeição de novos alimentos sem intenção de os experimentar é designada de neofobia alimentar, frequentemente observada face a hortícolas, em crianças em idade pré-escolar. Estratégias como a exposição repetida permitem a aquisição de experiências sensoriais, promovem a familiarização com os alimentos rejeitados, o aumento do consumo e a sua preferência. O projeto Veggies4myHeart pretende estimular a familiarização e o consumo de hortícolas em idade pré-escolar.

OBJETIVOS: Analisar/calcular a associação entre a vontade de experimentar hortícolas com a neofobia alimentar em crianças em idade pré-escolar.

METODOLOGIA: Aplicou-se um questionário aos cuidadores com dados sociodemográficos e a Escala de Neofobia Alimentar em Crianças (ENAC). Definiram-se três grupos para a pontuação da escala: [10; Média-DP[- "comportamento neofílico", [Média-DP; Média+DP[- "comportamento neutro" e [Média+DP; 70] - "comportamento neofóbico". Na avaliação inicial utilizou-se a Escala de Vontade de Experimentar de Farfan-Ramirez (EVE-FR) para registar o comportamento das crianças a 10 hortícolas oferecidos. Para comparar os grupos, utilizou-se a ANOVA *One-Way*, o teste de *Tukey* para comparações à posterior e correlações de *Pearson*.

RESULTADOS: Estudaram-se 178 crianças (54,5% do sexo feminino) de 3 jardins de infância, do concelho de Leiria. Verificou-se uma diferença estatisticamente significativa entre as pontuações totais da EVE-FR e os vários grupos da ENAC ($p = 0,032$). As crianças com "comportamento neofóbico", apresentaram pontuações da EVE-FR significativamente inferiores às das crianças com "comportamento neofílico" ($p = 0,030$). Verificou-se uma correlação negativa fraca entre as pontuações totais da ENAC e da EVE-FR (-0,288, n=99), com significância estatística ($p = 0,004$).

CONCLUSÕES: As crianças com "comportamento neofóbico" apresentaram menos vontade de experimentar hortícolas do que crianças com "comportamento neofílico". Estes resultados reforçam a importância da contribuição do projeto Veggies4myHeart para o desenvolvimento de estratégias específicas para estas crianças e respetivas famílias, para que aumentem o consumo de hortícolas em idades precoces.

CO9. CHILDREN'S NUTRIENT INTAKE OF MID-MORNING SNACKS: THE EFFECTS OF A SCHOOL-BASED INTERVENTION IN AZOREAN CHILDREN

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INTRODUCTION: Currently in Portugal, there is no mandatory legislation regarding school mid-morning snacks (MMS), allowing the children to bring all types of foods from home, such as high sugar, fat, and salt foods typically identified as high-calorie low-nutrient-dense. To improve the nutritional quality of MMS during the school year 2020/2021, a school-based nutrition intervention, named BaLanSa, was implemented in all elementary public schools of São Miguel Island.

OBJECTIVES: To assess the effects of BaLanSa intervention on children's nutrient intake of MMS among second grade.

METHODOLOGY: This quasi-experimental study included all elementary public schools (n=76) in a total of 83 classes. The intervention consisted of food education sessions, through a story book and practical weekly activities for 24 weeks. Data on MMS foods were collected at pre- and post-intervention. To measure children's nutrient intake an electronic database, including the Portuguese Food Composition Table, was used to convert the MMS foods into energy and nutrients.

RESULTS: A total of 969 students aged 7- to 8 years (50.6% male) were enrolled in the study. Between pre- and post-intervention children had a decrease in energy intake (median 214.7 kcal *vs*. 185.5 kcal, p<0.001), protein (median 8.1 g *vs*. 6.9 g, p<0.001), total fat (median 6.8 g *vs*. 4.0 g, p<0.001), saturated fatty acids (median 3.3 g *vs*. 1.9 g, p<0.001), carbohydrates (median 28.1 g *vs*. 24.6 g, p<0.001), sugars (median 13.7 g *vs*. 11.0g, p<0.001), free sugars (median 4.1 g *vs*. 0.0 g, p<0.001), added sugars (median 4.5 g *vs*. 0.0 g, p<0.001) and fibre (median 0.9 g *vs*. 0.7 g, p<0.001). Overall, the adequacy of the nutritional quality of MMS increased from baseline to post-intervention. No statistically significant differences were found between genders.

CONCLUSIONS: This school-based intervention was effective in improve children's nutrient intake of MMS. Our findings emphasize the importance of food education, consistently, through its inclusion in the school curriculum, leading to a change of eating habits.

CO10. COMPARATIVE ANALYSIS OF THE MEDITERRANEAN DIET PATTERN ADHERENCE IN PROFESSIONALS FROM ARS ALGARVE: 2019- 2022

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INTRODUCTION: The Mediterranean Diet (MD) has been recognized as an important approach in health promotion. A MD promotion plan was developed to professionals from the Regional Health Authority (ARS Algarve), within the scope of health literacy, between 2019 and 2022.

OBJECTIVES: To compare the adherence to the Mediterranean Dietary Pattern (MDP) among ARS Algarve professionals between 2019 and 2022.

METHODOLOGY: The MD literacy promotion plan comprised the development of materials designed by ARS Algarve, sent through email, to all employees: four videos and a videogame, focusing on MD. The adherence to MDP was assessed with the validated Portuguese version of the PREvention with MEDiterranean DIet tool (PREDIMED) though a self-administered online survey. Data collection occurred in February of 2019 and between October and December of 2022.

RESULTS: There was a participation rate of 38.6% in 2019 (592 respondents, 81% women) and 41.7% in 2022 (786 respondents, 84% women). According to PREDIMED score, the professionals maintained the same trend of good adherence to MDP between 2019 and 2022 (35.1% and 35.2%, respectively). Higher adherence was reported for the use of olive oil, preferential consumption of poultry, low consumption of commercial sweets/sweet pastries and sweetened/carbonated beverages, at both times. An increase in the consumption of pulses was verified (36.0% to 44.2%), although this food group remained one of the recommendations with lowest adherence. Nevertheless, there was a decrease in fruit consumption (42.6% to 37.3%) and oleaginous fruits (51.4% to 47.2%) between 2019 and 2022. At both times, a higher adherence was reported among females and in the nursing professional group.

CONCLUSIONS: These results highlight the promotion MD literacy persistent needed with ARS Algarve professionals, given that more than half presented low adherence. Additionally, more research is needed to identify the main determinants associated with the adherence to MDP.

CO11. ASSOCIATIONS BETWEEN CHRONOTYPE, DIET QUALITY AND TIMING OF ENERGY INTAKE IN PORTUGUESE CHILDREN AND ADOLESCENTS: THE EFFECT OF SUMMER HOLIDAYS

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INTRODUCTION: Later chronotypes have been associated with obesogenic behaviours such as poorer diet quality and later food intake. Summer holidays may promote worse eating and sleep habits. Studies on this topic in youth are scarce.

OBJECTIVES: This study aimed to assess the association of youth chronotype with diet quality and timing of energy intake (EI), considering the effect of summer holidays.

METHODOLOGY: This study included 578 children (6-9 years) and adolescents (10-14 years) from the Portuguese National Food, Nutrition and Physical Activity Survey 2015-2016. Using 4-day-physical activity diaries, chronotype was estimated by the midpoint of the sleep (h:min) on free days (Friday-Sunday and Sunday-Saturday) and then categorized as Early, Intermediate and Late using tertiles. Using 2-day-food diaries (children)/24-hour recalls (adolescents), diet quality was assessed by a healthy eating Index (HEI), and timing EI by the caloric midpoint (time of achievement of 50% of total daily EI). Summer holidays were categorized as yes or no, if at least 1 free day occurred within school summer holidays or not, respectively. Associations of chronotype with HEI score (points) and caloric midpoint (h) were assessed by linear regressions, adjusted for sex, age, parental education (model 1), plus BMI and sports practice (model 2), and summer holidays (model 3).

RESULTS: In model 2, a Late (*vs*. Early) chronotype was inversely associated with HEI ($\beta\hat{}$=–0.77; 95%CI:–1.47,–0.07) and positively associated with caloric midpoint ($\beta\hat{}$=0.35; 95%CI:0.02,0.69) but after adjustment for summer holidays these associations lost statistical significance ($\beta\hat{}$=–0.51; 95%CI:–1.22,0.21) and ($\beta\hat{}$=0.25; 95%CI:–0.09,0.60).

CONCLUSIONS: Summer holidays were confounding associations of chronotype with diet quality and caloric midpoint. Findings suggest that factors related to summer holidays are associated with later chronotype and energy intake and worse diet quality amongst 6-to-14-year-olds. Further studies on this topic should account for summer holidays.

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CO12. COMPOSIÇÃO CORPORAL E O RISCO CARDIOVASCULAR: COMPARAÇÃO ENTRE VEGETARIANOS E OMNÍVOROS

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INTRODUÇÃO: Evidência científica mais recente demonstrou que diferentes padrões alimentares, nomeadamente o vegetarianismo, podem ter um impacto na redução do risco cardiovascular sobretudo pela relação com a composição corporal, em concreto pelo efeito fisiológico do tecido adiposo.
OBJETIVOS: Avaliar a composição corporal e a sua relação com o risco cardiovascular entre indivíduos vegetarianos e omnívoros.
METODOLOGIA: Estudo transversal, onde os participantes foram divididos em vegetarianos (sem consumo de carne e/ou peixe) e omnívoros (consumo de carne e/ou peixe). A composição corporal foi avaliada através da absorciometria de raios-X de dupla energia (DXA) e o risco para doença cardiovascular a 10 anos, foi calculado através do *score* QRISK®3.
RESULTADOS: Foram avaliados 125 indivíduos (51 vegetarianos e 74 omnívoros) maioritariamente do sexo feminino (61,60%) com uma média de idade de 39 ± 11 anos. Entre padrões alimentares não existiram diferenças significativas (nem população total, nem entre sexos) no que respeita à percentagem de massa gorda (%MG), tecido adiposo visceral (VAT) e subcutâneo (SAT), rácio VAT-SAT (VAT/SAT) e RCV10. Não obstante, nos homens vegetarianos o RCV10 foi maior nos indivíduos com níveis mais elevados de %MG, VAT, SAT e VAT/SAT ($p \leq 0,05$), sendo que nas mulheres vegetarianas apenas a %MG, VAT e rácio VAT/SAT se correlacionaram positivamente com o RCV10 ($p \leq 0,05$). Nos homens omnívoros o RCV10 foi superior nos indivíduos com maior VAT ($p \leq 0,05$), enquanto nas mulheres omnívoras não só a VAT, como a %MG, SAT e VAT/SAT se correlacionaram positivamente com o RCV10 ($p \leq 0,05$).
CONCLUSÕES: Embora não tenham sido encontradas diferenças estatisticamente significativas entre vegetarianos e omnívoros em nenhum parâmetro de composição corporal, parece ser evidente que a quantidade e distribuição de tecido adiposo são indicadores do RCV10 independentemente do padrão alimentar.

CO13. NUTRITIONAL ADEQUACY ACCORDING TO SUSTAINABLE DIET ADHERENCE AMONG PORTUGUESE ADULTS

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INTRODUCTION: The promotion of sustainable diets is intended to increase health and minimize environmental impact related to food production, food system and consumption. However, little is known about the relationship between nutritional adequacy and adherence to sustainable diet.
OBJECTIVES: To assess the association between nutritional adequacy and sustainable diet adherence among Portuguese adults.
METHODOLOGY: Data collection was carried out between October and December 2022 using a self-reported questionnaire applied by interview to 296 adults (31.4% male; mean age: 35.6±15.9 years old). Sustainable diet adherence was assessed using Sustainable HEalthy Diet (SHED) Index, developed by Tepper *et al*. (2021). SHED index score was categorized based on sex-adjusted tertiles into low, medium and high sustainable diet adherence. Diet was evaluated using a food frequency questionnaire and EFSA's Dietary Reference Values were used to evaluate nutritional adequacy. Logistic regression models were used to estimate the association between sustainable diet adherence and nutrients intake adequacy adjusting for age, sex and energy intake.
RESULTS: The prevalence of inadequacy for saturated fat, trans fat, fibre, vitamins C and E intake was higher in participants with low adherence to sustainable diet, ranging from 42.7% to 77.1% ($p<0.05$ for all). After adjusting for confounders, participants with higher adherence to sustainable diet were less likely to have inadequate intake of fibre (OR=0.166, CI 95%: 0.072-0.385), saturated fat (OR=0.498, CI 95%: 0.261-0.951), trans fat (OR=0.315, CI 95%: 0.144-0.693), vitamin C (OR=0.250, CI 95%: 0.089-0.706) and vitamin E (OR=0.086, CI 95%: 0.034-0.219). No associations were seen for carbohydrates, total fat, protein, folate, vitamin A, calcium, iron and vitamin B12 intake.
CONCLUSIONS: Higher adherence to sustainable diet seems to be beneficial against nutritional inadequacy. Promoting adherence to sustainable healthy diets, while preserving planetary health, could be a significant part of good nutrition.

CO14. DIFFERENCES IN COOKING SKILLS ACCORDING TO SODIUM AND SODIUM POTASSIUM RATIO URINARY EXCRETION

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INTRODUCTION: Nutritional information devoid of cooking skills can compromise the improvement of eating habits. Little evidence is known about the relationship between sodium (Na) and sodium-potassium ratio (Na:K) intake with cooking skills.
OBJECTIVES: To analyze the differences between urinary excretion of sodium (Na) and the sodium-potassium ratio (Na:K) as a proxy for Na and Na:K intake and cooking skills.
METHODOLOGY: The study was cross-sectional with 114 (54.4% women) workers at a Portuguese public university, participants in the iMC SALT project, with an average age of 48 years. Na and Na:K intake was assessed using 24-hour excretion of urine, validated by the creatinine coefficient. To assess cooking skills, was used a Portuguese version of the cooking skills scale.
RESULTS: The mean Na excretion of the participants was 3132 ± 1340 and the Na:K was 2.1 ± 0.9. Almost all participants answered knowing how to cook (97.4%). More than 50% of participants consider that their cooking skills are sufficient and cook more than 4 to 6 times a week or every day. Participants who that identify as a "cooking" definition: "join "pre-prepared" ingredients to make a complete meal (e.g. frying frozen potatoes or boiling frozen vegetables)" had a higher mean intake of Na (3601 ± 1411 mg *vs*. 2993 ± 1294, p=0.38) and Na:K (2.30 ± 0.7 *vs*. 2.1 ± 0.9, p=0.49) than those who said it wasn't a definition of cooking. There were no significant differences in the other parameters.
CONCLUSIONS: Further studies with a larger sample are needed to verify the association of Na and Na:K intake with cooking skills. Our results show that cooking skills may be related to Na and Na:K intake.

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CO15. TRAJECTORIES OF FREE SUGARS INTAKE AND ITS MAIN FOOD SOURCES IN CHILDREN FROM 4 TO 13 YEARS OF AGE: THE GENERATION XXI BIRTH COHORT

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INTRODUCTION: Free sugar (FS) intake has been associated with obesity development. The World Health Organization recommends ≤10% of the total energy intake (TEI) from FS.

OBJECTIVES: To describe the trajectories of free sugars intake and its main food sources in children from 4 to 13 years of age.

METHODOLOGY: Participants from Generation XXI, a Portuguese birth cohort, were evaluated at 4, 7, 10 and 13 years of age. Dietary intake was assessed through 3-day food diaries. Energy and nutrient intake were calculated using the methodology of software eAT24 from national dietary survey (IAN_AF 2015-16). To estimate FS, a 10-step adaptation of Louie *et al*. methodology was followed to assess added sugar, and FS was based on the WHO definition. A mixed-effects model with linear and quadratic terms for time was used to estimate trajectories of FS. The contributors of each food item were measured as percentage of total FS in grams.

RESULTS: The mean daily intake of FS was 37 g/d, 47 g/d, 51 g/d, 48 g/d at 4,7,10 and 13 years of age respectively. The increasing trajectory of free sugar intake was accelerated from 4 to 10 years of age and deaccelerate from 10 to 13 years. At all ages, the main food sources were sweets, yoghurts, soft drinks, cereal bars, cookies & biscuits, and nectars. The consumption of some items declined sweets (25 g/d to 21 g/d) and yoghurts (22 g/d to 7 g/d) as children grew older. Inversely, soft drink intake increased (9 g/d to 18 g/d) as children became older, followed by cereal bars, nectars, cookies & biscuits.

CONCLUSIONS: An increased intake of FS during childhood is mainly driven by the intake of soft drinks and nectars. This study reinforces the need to develop additional policies targeting the main food sources of FS in children and adolescents.

CO16. AVALIAÇÃO OBJETIVA E SUBJETIVA DA SARCOPENIA EM DOENTES INTERNADOS NO SERVIÇO DE MEDICINA INTERNA NUM CENTRO HOSPITALAR UNIVERSITÁRIO DO PORTO

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INTRODUÇÃO: A sarcopenia é uma doença caracterizada por um distúrbio músculo esquelético progressivo e generalizado, com impactos pessoais, sociais e económicos, se não tratada. Associa-se a maior probabilidade de quedas, fraturas, deficiência física, prejuízo nas atividades de vida diárias e mortalidade.

OBJETIVOS: Estudar a frequência de sarcopenia em doentes internados num serviço de Medicina Interna, por avaliação objetiva (força de pressão da mão, circunferência muscular do braço e perímetro geminal) e subjetiva (SARC-F) e relacionar as duas metodologias.

METODOLOGIA: Avaliou-se peso (kg), estatura (m), Índice de Massa Corporal (kg/m^2), massa gorda e muscular com medição de pregas cutâneas e compressibilidade de tecidos (*lipocalibrador digital Lipowise*) e a força de preensão da mão com o *Gripwise*.

RESULTADOS: Obteve-se uma amostra de 150 homens, em média com 72 anos e valores médios de: Índice de Massa Corporal de 24,2 kg/m^2; gordura corporal de 21,5%, circunferência muscular do braço de 22,3 cm, perímetro geminal de 32,0 cm e força de preensão da mão esquerda de 20,3 kgF. Quando avaliada a força de preensão da mão, circunferência muscular do braço e perímetro geminal, 91,5%, 46,0% e 42,6% tinham critério sugestivo de sarcopenia, respetivamente e segundo o SARC-F cerca de 52% tinha risco de sarcopenia. Encontrou-se uma correlação negativa e estatisticamente significativa entre a pontuação no SARC-F e valores de circunferência muscular do braço ($r = -0,283$; $p < 0,001$), perímetro geminal ($r = - 0,269$; $p = 0,001$) e força de preensão da mão ($r = -0,400$; $p < 0,001$). Foi identificado um menor número de doentes com risco de sarcopenia através do SARC-F do que pela FPM.

CONCLUSÕES: Assim, o SARC-F deve, idealmente, ser utilizado conjuntamente com outros métodos de diagnóstico mais objetivos, para uma melhor identificação dos doentes que efetivamente têm sarcopenia e permitam uma intervenção o mais precoce possível.

CO17. AVALIAÇÃO QUALITATIVA DOS LANCHES OFERECIDOS DOS 0 AOS 3 ANOS DE IDADE EM CONTEXTO DE CRECHE: RESULTADOS DO PROJETO CRECHE COM SABOR E SAÚDE

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INTRODUÇÃO: O consumo de açúcar, gordura e sódio até aos 3 anos é elevado e as Instituições Particulares de Solidariedade Social (IPSS), onde as crianças realizam a maioria das refeições, tem um impacto significativo na aquisição dos hábitos alimentares das mesmas.

OBJETIVOS: Caracterizar a oferta alimentar relativamente aos lanches das 18 IPSS parceiras do projeto Creche com Sabor e Saúde (C2S).

METODOLOGIA: Recolheram-se as ementas relativas aos lanches das instituições. A análise foi estratificada por faixa etária, tendo os alimentos sido agrupados de acordo com uma metodologia simples de semáforo "verde", "amarelo" e "vermelho" definido no âmbito do projeto C2S. Calcularam-se as respetivas frequências absolutas e relativas para as variáveis categóricas, e medianas e percentis 25 e 75 para as variáveis continuas.

RESULTADOS: Até aos 11 meses de idade, os alimentos mais oferecidos foram as papas lácteas (82,4%), a fruta em puré ou ralada/triturada (64,7%) e as bolachas (47,1%, 6-8 meses; 52,9%, 9-11 meses). Dos 12 aos 36 meses, os alimentos oferecidos foram os iogurtes de aroma (94,4%, 12-23 meses; 83,3%, 24-36 meses), o pão (94,4%, 12-23 meses; 88,9%, 24-36 meses) e o leite simples (83,3%, 12-23 meses; 88,9%, 24-36 meses). Com o crescimento, observa-se uma mudança dos alimentos disponibilizados, sendo que o puré de fruta, o leite humano/fórmula infantil e o iogurte natural são substituídos pela fruta em natureza, leite simples e iogurte de aromas. Em todas as instituições identificou-se a oferta de pelo menos um alimento pertencente à categoria "vermelho" (leite com chocolate, cereais de pequeno-almoço açucarados, bolachas tipo maria, marmelada e doce, pão de forma, pão de leite e fiambre) ou à categoria "amarelo" (queijo, manteiga

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e/ou creme vegetal e bolacha de água e sal). O pão é o alimento fornecido em maior quantidade.

CONCLUSÕES: Os alimentos oferecidos são frequentemente nutricionalmente pobres e desadequados nesta faixa etária.

FINANCIAMENTO: O projeto Creche com Sabor e Saúde (C2S) foi cofinanciado pela Associação Cultural e Recreativa de Cabreiros e pela Direção-Geral da Saúde.

CO18. DESAFIOS E ALTERAÇÕES PROPOSTAS PELOS CONSUMIDORES PARA A ALIMENTAÇÃO COLETIVA EM PORTUGAL

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INTRODUÇÃO: A área da Alimentação Coletiva tem vindo a sofrer profundas alterações na sua atividade, decorrentes também das alterações nas necessidades e expectativas tanto dos clientes como dos consumidores.

OBJETIVOS: Identificar a perceção atual dos consumidores sobre os problemas e / ou desafios da Alimentação Coletiva em Portugal e respetivas alterações necessárias, em geral e especificamente para os seus produtos e serviços.

METODOLOGIA: Foi aplicado um inquérito por questionário, em papel e *online*, em determinados períodos dos anos de 2020 e 2021. A população em estudo foi a portuguesa, maior de idade e com experiência em serviços de AC em Portugal.

RESULTADOS: As três áreas mais referidas pelos consumidores foram: os produtos ou serviços, novos produtos ou serviços e os recursos humanos. Na área dos produtos ou serviços, os parâmetros mais referidos, tanto nos problemas ou desafios como nas sugestões de melhoria, foram a qualidade e a variedade. O terceiro parâmetro mais mencionado como um problema ou desafio para as empresas de AC foi a sustentabilidade alimentar, enquanto nas propostas de alterações foi o ambiente físico. As principais propostas como tendências para o futuro, relativamente aos produtos e / refeições, foram: os produtos frescos, as refeições nutricionalmente equilibradas, os produtos regionais ou locais, mais sustentáveis e biológicos. As principais propostas para os serviços foram os espaços amigos do ambiente, com refeições na proporção das necessidades dos consumidores, os serviços feitos ao momento, os serviços de conveniência e os serviços de *takeaway*.

CONCLUSÕES: As três áreas que os consumidores indicaram como sendo as com mais problemas ou desafios para as empresas de AC foram as mesmas para as quais propuseram mais alterações ou sugestões. O conhecimento sobre as necessidades e expectativas dos consumidores deve ser uma inspiração para as atividades a serem realizadas no setor da AC em Portugal.

CO20. EFFECT OF DIFFERENT COOKING METHODS ON COOKING LOSS OF RABBIT MEAT

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INTRODUCTION: Rabbit meat is part of the gastronomic heritage of Mediterranean diet. It has interesting nutritional value and good consumer acceptability.

OBJECTIVES: Evaluate the effect of three different cooking methods (boiling, baking and frying), on the cooking loss (CL) of rabbit meat.

METHODOLOGY: Six male rabbits were slaughtered and the carcasses obtained were dissected. Six different pieces obtained in duplicate from each animal (hind leg, ribs, belly, saddle loin, saddle rump and front leg) were analyzed. The cooking methods performed were boiling in water, oven-roasting and frying, 12 samples each. Boiling: the samples were immersed in boiling water (90°C) in the cooking assistant (iVario 2-XS, Rational®), until reaching an internal temperature of 75°C. Oven-roasting: the samples were placed in a refractory and cooked at 180 ºC in a preheated oven with air circulation (iCombi, Rational®) until reaching an internal temperature of 75°C. Frying: frying was performed in a iVario 2-XS (Rational®) using 100% vegetable cooking oil at 180 °C. After cooking, the samples were cooled to room temperature for 30 minutes and then weighed to calculate the percentage of CL (difference between raw weight and cooked weight of the samples relative to the weight of raw samples).

RESULTS: The piece that presented the highest CL (%) was the belly (oven-roasting and frying methods >50% CL) and the ones that presented the lowest CL (<30%) were the saddle hindquarter and the front leg. The CL (%) was significantly higher in the frying method to hind legs (32.7±5.1%; p=0.003), saddle hindquarters (29.7±4.7%; p=0.001), ribs (40.1±5.0%; p<0.001), saddle loin (33.1±3.6%; p=0.004) and in the oven-roasting method for belly (53.3±11.5%; p<0.001).

CONCLUSIONS: Boiling seems to be the cooking method with lower CL (%) and frying seems to be the cooking method with the highest CL (%) in most pieces of rabbit meat.

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CO21. ASSOCIATION BETWEEN ANTHROPOMETRIC INDICATORS AND DEXA DERIVED APPENDICULAR LEAN MASS IN AN ADULT'S SAMPLE: A CROSS-SECTIONAL EXPLORATORY ANALYSIS

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INTRODUCTION: Assessment of muscle mass is essential for body composition evaluation and for the diagnosis or classification of conditions such as undernutrition or sarcopenia. Although Dual energy X-ray absorptiometry (DEXA) is a widely used method to estimate appendicular lean mass, simpler and affordable bedside methods are warranted.

OBJECTIVES: To quantify the association between anthropometric indicators of muscle mass and DEXA derived total and regional appendicular lean mass in adults.

METHODOLOGY: Anthropometric measurements were performed according to standardised procedures and included tricipital and leg skinfold thicknesses and mid-upper arm (MUAG) and leg (LG) girths. Mid-upper arm (MAMC) and leg (LMC)

muscle circumferences were calculated using Jelliffe equation. DEXA was used to assess total appendicular lean mass as well as regional right arm and leg lean mass. Linear regression models were used to estimate the association between each anthropometric indicator of muscle mass and total appendicular lean mass and with regional lean mass, stratified by sex and adjusted for age and height.

RESULTS: 67 adults (67.2% women, 18-63 years) were included in this analysis. Results are presented in standardised coefficients with 95% confidence intervals (β, 95%CI). All anthropometric measurements were associated with total appendicular lean mass, both in women (MAMC:0.60, 0.35-0.85; MUAG:0.55, 0.28-0.81; LMC:0.76, 0.54-0.98 and LG:0.67, 0.42-0.91) and in men (MAMC:0.87, 0.64-1.11; MUAG:0.90, 0.70-1.11; LMC:0.85, 0.53-1.17 and LG:0.87, 0.63-1.12). Considering single limbs, the strongest association was between LG and leg lean mass in men (0.86, 0.68-1.04), followed by LMC, also in men (0.79, 0.52-1.07). All other measurements had positive and significant association with DEXA derived total and regional lean mass measurements, except for MAMC and arm muscle mass in women.

CONCLUSIONS: These preliminary results reveal a stronger association between anthropometric indicators and total appendicular lean mass than for regional lean mass. Leg anthropometry indicators were the most consistent proxy of lean mass.

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CO22. URINARY LEVELS OF ESSENTIAL TRACE ELEMENTS IN PREGNANCY AND MATERNAL AND NEONATAL OUTCOMES: A PROSPECTIVE STUDY FROM THE IOMUM COHORT

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INTRODUCTION: Essential trace elements (ETEs) are cofactors of several enzymes, and inadequate levels of ETEs have been associated with poor pregnancy and neonatal outcomes.

OBJECTIVES: The aim of the present study was to characterize urinary levels of ETEs in Portuguese pregnant women and to study their association with maternal and neonatal health outcomes.

METHODOLOGY: This prospective study (trial registration #NCT04010708, ethical approval #292/17) was conducted at Porto and Lisbon regions, from April 2018 to December 2021. Pregnant women were invited to participate during routine 1st trimester ultrasound scan when they provided a random spot urine sample and sociodemographic and lifestyle data. Clinical data were provided by clinical records. Women with twin pregnancies, gestational age at recruitment < 10 or ≥ 14 weeks, and who didn't deliver urine samples were excluded.

RESULTS: Urinary Cobalt (Co), Copper (Cu), Manganese (Mn), Molybdenum (Mo) and Zinc (Zn) urinary levels were measured by inductively coupled plasma-mass spectrometry. The mean ± SD age at recruitment of the 614 pregnant women was 33 ± 5 years. The overall median (P25; P75) ETEs urinary concentrations were, in µg/L: Co, 0.31 (0.12-0.53); Cu, 11.20 (6.89-18.21); Mn, 1.70 (0.74-3.09); Mo, 38.54 (21.57-62.35); and Zn, 255.67 (145.86-455.75). Lower Mn urinary levels were associated with the occurrence of pregnancy complications, and Mn levels above the 50th percentile (> 1.70 µg/L) associated with increased risk of birth weight small for gestational age (SGA) (crude OR [95%CI] = 2.811 [1.155-6.841]; p = 0.023). Zn urinary levels below the 50th percentile (< 255.67 µg/L) associated with an increased risk of SGA birth head circumference (crude OR [95%CI] = 2.525 [1.015-6.232]; p = 0.046).

CONCLUSIONS: Our results reinforce the nutritive properties of ETEs during pregnancy while also highlighting that, depending on the concentration, some of the ETEs may present toxicity during this critical period of life.

CO23. COMPARAÇÃO DA OFERTA ALIMENTAR DO ALMOÇO EM CONTEXTO DE CRECHE COM AS RECOMENDAÇÕES PARA CRIANÇAS DOS 0 AOS 3 ANOS: RESULTADOS DO PROJETO CRECHE COM SABOR E SAÚDE – C2S

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INTRODUÇÃO: Os hábitos alimentares na infância são essenciais na modulação das preferências alimentares. Sendo a Creche o local onde as crianças passam a maioria do dia, torna-se relevante avaliar a sua oferta alimentar.

OBJETIVOS: Comparar a oferta alimentar do almoço em creche (0-3 anos), com as respetivas recomendações.

METODOLOGIA: Para quantificar os alimentos oferecidos ao almoço em 6 instituições envolvidas no projeto C2S, realizaram-se visitas, durante 5 dias consecutivos, na hora de almoço (outubro 2022-janeiro 2023). Para reduzir o viés associado à variação da capitação servida, cada componente da refeição foi pesada três vezes aleatoriamente (6-8, 9-11, 12-23 e 24-36 meses),

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considerando-se a média obtida do peso (g) dos hortícolas, fruta, alimento fornecedor de hidratos de carbono e de proteína. Excluíram-se os pratos compostos. As recomendações para as capitações foram calculadas utilizando as recomendações nutricionais da EFSA e o Manual de Equivalentes Alimentares da APN. Estas recomendações foram, posteriormente, comparadas com as capitações oferecidas.

RESULTADOS: Analisaram-se 30 almoços diferentes. A quantidade de hortícolas no prato (12-23 meses: 9,4 g; 24-36 meses: 10,8 g) foi inferior à recomendação mínima de 20g a partir dos 12 meses. As quantidades de alimentos fornecedores de hidratos de carbono apresentaram-se sempre acima das recomendações, principalmente dos 12-23 meses (média oferecida de 62,2 g e orientação de aproximadamente 30g). As recomendações para os alimentos fornecedores de proteína foram cumpridas (9-11 meses: 14,2 g; 12-23 meses: 20,3 g; 24-36 meses: 23,9 g). As capitações oferecidas de fruta dos 6-8 meses (84,6 g) e dos 9-11 meses (133,3 g) apenas cumpririam as recomendações se esta fosse a única refeição diária. Dos 12-36 meses, as capitações médias (53,1 g e 46,6 g) cumpriam as recomendações.

CONCLUSÕES: As quantidades de alimentos oferecidas ao almoço nem sempre estavam de acordo com as recomendações, principalmente no que respeita aos hortícolas (por defeito) e ao alimento fornecedor de hidratos de carbono (por excesso).

FINANCIAMENTO: O projeto C2S foi cofinanciado pela Associação Cultural e Recreativa de Cabreiros e pela Direção-Geral da Saúde.

CO24. CHANGES IN ESSENTIAL TRACE ELEMENT LEVELS PRE- AND POST-HAEMODIALYSIS SESSION

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INTRODUCTION: Chronic kidney disease affects over 10% of the world's population and often requires renal replacement therapy, such as haemodialysis. Haemodialysis patients are at an increased risk of trace element imbalances, which may be due to factors such as inflammation, dietary restrictions, and losses during dialysis sessions.

OBJECTIVES: This study aimed to compare the serum concentration of essential trace elements in chronic haemodialysis patients pre- and post-haemodialysis session. Healthy individuals without evidence of renal impairment were used as a control group.

METHODOLOGY: Samples were collected during routine laboratory testing of patients on chronic haemodialysis. The concentration of trace elements Cu, Zn, Se and Mo was determined by ICP-MS.

RESULTS: After a haemodialysis session, the serum concentration of Cu, Zn and Se increased significantly ($p < 0.001$) by 44% 44%, and 38%, respectively, while Mo decreased by 54% ($p < 0.001$). Before the haemodialysis session, patients had significantly lower serum Cu, Zn and Se concentrations ($p < 0.001$) and a significantly higher serum Mo concentration ($p < 0.001$) compared to the control group. After the haemodialysis session, serum Zn and Se concentrations remained significantly lower ($p < 0.001$), while serum Cu and Mo concentrations were significantly higher ($p < 0.001$) than in the control group.

CONCLUSIONS: The haemodialysis process causes significant changes in the serum concentrations of some trace elements. During the haemodialysis session, Mo is extensively removed, while Cu, Zn and Se are concentrated. However, the observed increase in concentration is higher than what would be expected due to the simple effect of haemoconcentration. These findings suggest that other mechanisms (e.g., haemolysis) are also responsible for the increased serum concentrations of Cu, Zn and Se observed post-dialysis. More studies are needed to confirm these results.

CO25. ENERGY-ADJUSTED DIETARY INFLAMMATORY POTENTIAL OF CHILDREN AND ADOLESCENTS (IAN-AF 2015-2016): AN ALTERNATIVE APPROACH TO THE CHILDREN DIETARY INFLAMMATORY INDEX, BASED ON A NEW REFERENCE POPULATION

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INTRODUCTION: Low-grade inflammation is a pathological process where diet plays a significant role. The Children's Dietary Inflammatory Index has been used to estimate dietary inflammation in younger ages. However, it is limited to participants aged 6-14 years and excludes several food parameters (FP) with anti- or pro-inflammatory effects, such as flavonoids, n-3 & n-6 fatty acids, trans-fatty acids, caffeine, tea, onion and garlic.

OBJECTIVES: This study aimed to develop and describe a comprehensive tool to estimate the Dietary Inflammatory Score (DIS) among children and adolescents aged 3-17 years, accounting for 38 FP, including the abovementioned FP.

METHODOLOGY: DIS was estimated for 1073 participants (51.7% girls) from the National Food and Physical Activity Survey 2015-2016. The first step was calculating each FP's energy-adjusted intake z-score in our sample, using the energy-adjusted dietary intake means and standard deviations from a reference population within the same age range. The corresponding centered percentile was multiplied by each FP's inflammatory effect score (IES) to obtain the FP-specific DIS. Finally, the individual global DIS was calculated by the sum of all the FP-specific DIS.

Our reference population includes 30280 individuals, available on the Global Dietary Database, and IES were collected from the literature.

Mean and standard deviation (SD) were used to describe DIS. The association between DIS and sociodemographic factors and diet quality, measured through Healthy Eating Index (HEI), was assessed using linear regression analysis. Lower DIS relate to more anti-inflammatory effects.

RESULTS: The mean(±SD) DIS was 0.45±1.95, ranging between -4.71 and 5.38. Compared to children, adolescents had significantly higher DIS (β=0.87[95%CI:0.66;1.11]). Individuals in lower HEI quartiles (Q) showed significantly higher DIS: compared to Q4, Q1 was the most pro-inflammatory (β=2.29[95%CI:1.98;2.61]).

CONCLUSIONS: Our findings suggest that DIS is a promising open tool for estimating dietary inflammation among children and adolescents. Nonetheless, a full validation using low-grade inflammation biomarkers should be performed.

CO26. DEVELOPMENT OF A PHOTOGRAPH-BASED INSTRUMENT TO ASSESS NUTRITION LITERACY IN PORTUGUESE ADULTS

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INTRODUCTION: Most instruments assessing nutrition literacy are difficult to apply to less educated individuals, or focus on knowledge rather than skills to make healthier food choices.
OBJECTIVES: To develop a photograph-based instrument to assess nutrition literacy in Portuguese adults.
METHODOLOGY: A selection of 90 foods/culinary preparations usually consumed in Portugal (including main dishes, soups, sandwiches, savoury pastries/snacks, sweet pastries/desserts, confectionery, cookies/biscuits, bread, charcuterie/cheese and fruit) were photographed and evaluated using stepwise, standardized methods: (1) 9 experts compared photography angles (90º, 45º and 10º from the horizontal plane) and background colours (blue/grey) regarding food recognition and aesthetics; (2) 12 experts and 10 lay persons identified foods, classified them on a 5-point recognition scale, and quantified portions; and (3) the same panels were asked to select the food with the highest energy/sodium content, from combinations of three photographs (two foods with similar estimated contents and one with higher content); experts also classified the relevance of combinations (4-point scale).
RESULTS: The 45º angle obtained the highest recognition score (5.0 in 85.5% of photographs), the grey background was preferred in 92.7% of photographs, 24.7% of foods were misidentified/misdescribed by at least one person, 20.6% obtained a recognition score <4.5, and 37.3% presented a quantity estimation error >25%. Consequently, the 45º angle and grey background were selected; also, 36 photographs were improved, 26 excluded and 21 newly added, resulting in a selection of 85 foods/culinary preparations. Regarding the photographs' combinations, frequency of correct answers was higher in experts (energy: 81.2% *vs*. 73.5%, p=0.030; sodium: 83.7% *vs*. 76.3%, p=0.038), and six combinations (7.8%) presented a relevance score <3.0. The instrument obtained after evaluation comprised 79 combinations (55 for energy; 24 for sodium).
CONCLUSIONS: These results allow proceeding towards validation of an innovative instrument that enables an easy and equitable assessment of nutrition literacy across the Portuguese adult population.

CO27. MULTIDIMENSIONAL HEALTH IMPACT OF MULTICOMPONENT EXERCISE AND SUSTAINABLE HEALTHY DIET INTERVENTIONS IN THE ELDERLY (MED-E): BASELINE RESULTS

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INTRODUCTION: Data concerning the combined effect of diet and exercise interventions on overall health in the elderly are scarce.
OBJECTIVES: The MED-E project's primary aim was to assess the effect of 3-month sustainable healthy diet (SHD) and multicomponent training (MT) interventions on several health outcomes in the elderly.
METHODOLOGY: A quasi-experimental study assigned older adults into four groups: (1) SHD, (2) MT, (3) SHD + MT, or (4) control group (CG). The SHD intervention included a weekly mixed food supply with nuts, pulses, olive oil and oily fish and individual and group sessions about a SHD. The MT groups were submitted to 50-min exercise sessions three times a week. The outcomes included blood biomarkers, metabolic profile alterations, dietary intake and nutritional adequacy, physical activity (PA) and fitness data, anthropometry and body composition measured by Dual X-ray absorptiometry (DXA), cognitive function, quality of life, and geographical data, assessed pre- and post-intervention.
RESULTS: Preliminary baseline results show that 73,6% of the participants (n=87) were female and had a mean (±SD) age of 72.79 (±5.07) years. The participants had a mean BMI of 28.8 (±4.26) kg/m^2, a mean total fat percent of 39.8 (±6.74) and a mean waist-to-hip ratio of 0.89 (±0.07). The mean PREDIMED score was 9.34 (±1.73), suggesting a Mediterranean Diet moderate adherence. Regarding physical activity, approximately 43% of the participants have not engaged in moderate-to-vigorous PA, assessed by the International Physical Activity Questionnaire - Short Version (IPAQ-SV). Chi-square tests were performed and no significant differences were found between groups for most of the outcomes.
CONCLUSIONS: The MED-E project's baseline results will add knowledge, help strengthen the current evidence and measure the impact of the importance and beneficial contribution of combined SHD and MT interventions as complementary approaches to healthy ageing strategies.

CO28. THE QUALITY OF THE DIET OF PREGNANT WOMEN AND ANTHROPOMETRIC OUTCOMES OF NEWBORNS: A RETROSPECTIVE COHORT STUDY

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INTRODUCTION: Maternal dietary pattern plays a key-role in pregnancy outcomes, including the offspring's health. However, the specific dietary requirements for best fetal growth and development remain unknown.
OBJECTIVES: To understand the association between the Healthy Eating Index (HEI) of pregnant women and the newborn's health.
METHODOLOGY: A Portuguese retrospective cohort, involving 914 parturient from 2 hospitals, was carried out between 2017 and 2019, after Ethical approvement (Ref.:3i30-16, 91/18, 47/2018, 177/19). The HEI was calculated using parturient's food frequency questionnaire and newborns's anthropometric data were collected by birth process. Associations were studied using adjusted linear regression.
RESULTS: The median HEI was 58.8 (P25=52.6,P75=65.9) points. For each point increase in HEI, there is an increase in weight (β=0.10, CI=0.64,8.17, p=0.02) and in head circumference (β=0.10, CI=0.00,0.04, p=0.02) for boys; in Z-length (β=0.09, CI=0.00,0.02, p=0.04) for girls; and a decrease in BMI (β -0.13, CI=-0.12,-0.03, p<0.01), for both gender.
CONCLUSIONS: The quality of the pregnant's diet influences the newborn's anthropometric outcomes, suggesting an intergenerational transmission of risks, worthy of further research.

CO29. ADHERENCE TO MEDITERRANEAN DIET AMONG INDIVIDUALS AT HIGH-RISK OF DEMENTIA: BASELINE RESULTS FROM THE MIND-MATOSINHOS STUDY

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INTRODUCTION: The Mediterranean Diet (MD) has been highlighted as an important prevention strategy for reducing the risk of dementia. However, data on adherence to this dietary pattern and its determinants in people at high risk of dementia are scarce.

OBJETIVES: To evaluate MD adherence in individuals at high risk of dementia and to analyze the associated sociodemographic, lifestyle, clinical, and anthropometric factors.

METHODOLOGY: Within the MIND-Matosinhos study, sociodemographic (sex, age, education, household income, marital status, professional, social support self-perception), lifestyle (smoking habits, physical activity) health (health status self-perception, hypertension, hypercholesterolemia, and diabetes diagnosis) and anthropometric (body-mass-index, waist circumference) data and cognitive performance were collected through structured questionnaires applied by trained interviewers. MD adherence was assessed using the Portuguese version of the Mediterranean Diet Adherence Screener (MEDAS) questionnaire, and a score ≥10 points indicated good adherence to MD. A total of 103 individuals were included in this study. The factors associated with MD adherence were analyzed by calculating the Odds Ratio (OR) and respective confidence intervals (95% CI) using logistic regression by sex.

RESULTS: The participants' age ranged between 36-83 years old (mean age 69.2±7.8), and 56.3% were women. Good MD adherence was observed among 19.0% of women and 17.8% of men. After adjustment for age, education, and marital status, men who reported having reasonable health had lower odds of adhering to MD (Adjusted OR = 0.12; 95% CI: 0.02-0.88) than those reporting a good or very good health status.

CONCLUSIONS: A low MD adherence was observed in this sample of subjects at high risk of dementia. Additionally, a better perception of health status in men was associated positively with good MD adherence.

CO30. EXPLORING THE RELATIONSHIP BETWEEN URBAN ENVIRONMENT, DIET AND PUBERTY ONSET: AN EXPOSOME ANALYSIS WITHIN A POPULATION-BASED BIRTH COHORT

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INTRODUCTION: The influence of urban environment and diet on puberty onset (PO) have been studied isolated, without considering a complete spectrum and their natural interactions.

OBJECTIVES: To explore the influence of the in-utero and early childhood urban exposome, namely the surrounding environment (i.e., the built environment and blue and green spaces) and diet, on PO.

METHODOLOGY: The sample includes 210 children-mother pairs of a subcohort of the INMA Project (Spain), with complete information on urban environment indicators for pregnancy and childhood. The exposures of interest include, as main groups, air pollution, natural spaces, built environment, traffic, UV, noise, meteorology and diet. Breastfeeding duration and KIDMED, collected at 6y-visit, were considered postnatal exposures. Puberty development was assessed through the Pubertal Development Scale, applied to the main caregiver at the 9-y follow-up. Associations between urban environment exposures, diet, and the probability of being in the stage2+ for PO were tested through ExWas adjusted models.

RESULTS: The built environment during the prenatal period (Landuse Shannon's Evenness Index) was related to a lower PO probability at 9y in girls (β=-36.52; p<0.001). In boys, prenatal air pollution and traffic indicators were related to an earlier PO (e.g., PM2.5:β=20.56,p<0.001). The prenatal proximity to green and blue spaces seems protective of an earlier onset of puberty (Table 1). Breastfeeding duration appears protective of early PO in both sexes (Boys:β=-2.32,p=0.010; Girls:β=-1.33,p=0.022), while a higher KIDMED score was associated with earlier PO in boys (β=2.13,p=0.028). The proximity to blue and green spaces during the postnatal period were negatively associated with an earlier PO, while traffic and air pollution was positively associated in both sexes (Table 1).

CONCLUSIONS: The proximity to blue and green spaces, the built environment and breastfeeding are protective factors against earlier PO. Future studies must identify specific targets for preventing early-life exposures that influence an earlier PO and its associated comorbidities.

TABLE 1

Association between pre- and postnatal urban exposures and puberty onset using ExWas models

		FEMALES		MALES	
		β	P-value	β	P-value
Prenatal	Landuse Shannon's Evenness Index*	**-36.52**	**<0.001**	-20.22	0.533
	Outdoor PM2.5 value	0.41	0.256	**20.56**	**<0.001**
	Nbr of bus public transport mode stops/area (km²)*	-0.99	0.561	**-88.41**	**<0.001**
	Total traffic load of all roads in 100m	-0.01	0.761	**0.66**	**<0.001**
	Outdoor PM10 value	-0.01	0.975	**12.88**	**<0.001**
	Indoor NO2 value	1.36	0.654	**457.26**	**<0.001**
	Straight line distance to nearest bluespace >5,000 m²	-0.83	0.663	**-243.55**	**<0.001**
	Greenspace in 300 m	1.51	0.365	**-374.02**	**<0.001**
	Average Normalized Difference Vegetation Index*	2.30	0.725	**-4482.08**	**<0.001**
	Area of closest greenspace > 5,000 m²	0.61	0.360	**-236.65**	**<0.001**
	Number of facilities type present/area*	0.48	0.689	**281.53**	**<0.001**
Posnatal	**Lifestyle**				
	Breastfeeding duration	**-1.33**	**0.022**	**-2.32**	**0.010**
	KidMed, score	0.82	0.119	**2.13**	**0.028**
	Home				
	Traffic density on nearest road	**0.52**	**0.001**	**8.40**	**<0.001**
	Total traffic load of all roads in 100m	1.09	0.473	**0.87**	**<0.001**
	Outdoor PM2.5 value	0.13	0.456	**1.88**	**0.010**
	Average Normalized Difference Vegetation Index*	-10.06	0.201	**-1659.91**	**<0.001**
	Outdoor PM2.5 absorvance value	1.38	0.312	**127.78**	**0.001**
	Total traffic load of major roads in 100 m buffer	1.09	0.473	**772.83**	**<0.001**
	Straight line distance to nearest greenspace >5,000 m²	0.01	0.116	**0.57**	**0.018**
	Bluespace in 300 m	-1.19	0.442	**-52.84**	**0.005**
	School				
	Traffic density on nearest road	**0.30**	**0.010**	**10.40**	**<0.001**
	Population density	0.01	0.521	**6.70**	**<0.001**
	Walkability	8.68	0.368	**67.14**	**0.018**

*Within a buffer of 300 m
Adjusted for maternal age and education, alcohol intake and smoking during pregnancy, marital status, Family Affluence Score, Prenatal maternal body mass index (BMI), weight gain during pregnancy, birth weight, and child BMI.

CO31. EFFECTS OF A DIETARY WEIGHT LOSS INTERVENTION ON PLASMA LEVELS OF ESSENTIAL AND PRIORITY TOXIC METALS IN ADULTS WITH OBESITY

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INTRODUCTION: Increasing evidence suggests that exposure to some heavy metals contributes to the development of obesity and its metabolic complications since their endocrine disruptors' effects.

OBJECTIVES: This study aims to evaluate the impact of plasma levels of 15 different metals in weight loss and metabolic-inflammatory status in adults with obesity undergoing a 12-week dietary intervention for weight loss.

METHODOLOGY: Data and biological samples were collected from a clinical trial (NCT02169778) conducted in Norwegian adults (78% women; mean age: 39.7 ± 9.8 years) with obesity (mean BMI: 35.2 ± 3.7 kg/m²). Plasma levels of metals were measured by inductively coupled plasma mass spectrometry and it was determined their reference values (P95th). Plasma inflammatory cytokines were measured by flow cytometry.

RESULTS: Metals were present in all participant's samples (n=27). At baseline, essential metals selenium, molybdenum and zinc were below the reference values, while the non-essential metals antimony, beryllium, and nickel were above them. After weight loss, there were significant increases in the plasma levels of ∑essential metals (22.42 *vs*. 23.51 mg/L, P=0.004). Higher median priority toxic metal levels (cadmium, lead and mercury) at baseline were associated with lower

cholesterol HDL (Rs= -0.478, P=0.012) and lower weight loss percentage (Rs= -0.491, P=0.009). There was no association between priority toxic metal plasma levels at baseline and inflammatory markers after weight loss.

CONCLUSIONS: This study allows us to confirm that exposure to metals is unavoidable since their ubiquitous distribution. Our results highlight two critical issues that could be relevant not only for the development of obesity but also to be included in obesity treatment strategies: the improvement of essential metal levels and the decrease of exposure to non-essential and priority toxic metals. Raising public awareness about exposure to environmental pollutants and the identification of measures to mitigate this exposure must remain a priority.

CO32. NUTRITION LABELS AT EUROPEAN ATHLETICS CHAMPIONSHIPS: THE OPINION OF ATHLETES AND ATHLETE SUPPORT PERSONNEL

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INTRODUCTION: Nutrient composition is one of the most dictating factors for athletes' food choices. Altogether, nutrition labels can be an effective tool for providing nutritional information on food products. Research has shown that nutrition labels are helpful for athletes during international competitions.

OBJECTIVES: We aimed to assess athletes and athlete support personnel usage and opinion of the nutrition labels provided in the team restaurants during the 2022 European Athletics Championships (EAC).

METHODOLOGY: All athletes and athlete support personnel over 18 years old, participating at the 2022 EAC, held in Munich and having meals in the team restaurants, were potentially eligible to participate in this study. Written informed consent was obtained from all participants. During mealtime, at the team restaurants, participants completed an online self-administrated questionnaire. We collected 280 valid questionnaires (78.9% athletes and 21.1% athlete support personnel), 53.8% from males, and the median age was 27(8) years. Data are expressed as percentages. Mann-Whitney and Kruskal-Wallis tests were used. Statistical significance was set for $p<0.05$.

RESULTS: Nutrition labels were considered important (41.0%) or very important (28.4%) by most participants, and almost all (91.7%) would like to have nutrition labels in future championships. Most participants were confident (41.9%) or moderately confident (31.3%) in making food choices because they had nutrition labels. Also, we found that athlete support personnel compared to athletes ($p=0.037$) and that participants with dietary restrictions compared to participants without dietary restrictions ($p=0.028$) were more confident in their choices due to the existing nutrition labels. Finally, we found that this feeling of confidence was different between athletes from different events ($p=0.003$).

CONCLUSIONS: Our results highlight that nutrition labels are helpful for both athletes and athlete support personnel during international competitions. Therefore, providing nutrition labels should be a requisite when planning the catering for athletes in future competitions.

C.O. VENCEDORES

1.º Prémio

CO22 | Urinary levels of essential trace elements in pregnancy and maternal and neonatal outcomes: a prospective study from the iomum cohort

2.º Prémio

CO23 | Comparação da oferta alimentar do almoço em contexto de creche com as recomendações para crianças dos 0 aos 3 anos: resultados do projeto creche com sabor e saúde – C2S

3.º Prémio

CO15 | Trajectories of free sugars intake and its main food sources in children from 4 to 13 years of age: the generation XXI birth cohort