

patients compared with controls (25.67 $\pm$ 6.74 vs. 17.89 $\pm$ 7.30, $p < 0.001$ and 27.5% vs. 65.3%, $p < 0.001$, respectively). There were no differences in 25(OH) levels between normal weight and overweight/obese patients (26.39 $\pm$ 8.53 vs. 24.25 $\pm$ 6.89; $p = 0.304$). In controls, a similar trend was found (17.34 $\pm$ 6.95 vs. 19.51 $\pm$ 8.25; $p = 0.265$). Body fat (%) was not different between participants with VIDA or VID (patients: 23.55 $\pm$ 9.89 vs. 19.86 $\pm$ 9.59, $p = 0.137$; controls: 23.62 $\pm$ 12.10 vs. 22.80 $\pm$ 8.30, $p = 0.761$). Our results showed a trend for a higher 25(OH)D in controls after summer. In PKU patients, a seasonal variation was not observed. A positive association between the total VID intake from PKU patients (AAMMS) and 25(OH)D was found ($r = 0.249$, $p = 0.028$).

CONCLUSIONS: Our results showed that VID status in PKU patients is better than in controls. Nutritional monitoring is essential in PKU – with AAM and MMS playing an important role in micronutrient adequacy.

CO28. THE ASSOCIATION BETWEEN VEGETABLE DIVERSITY INTAKE AND THE SYMPATHETIC NERVOUS SYSTEM ACTIVITY IN SCHOOL-AGED CHILDREN

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INTRODUCTION: There is increasingly evidence showing that dietary compounds, such as polyphenols, which are present in fruits and vegetables and have antioxidant and anti-inflammatory properties, may reduce the sympathetic nervous system over activity. Although the pupillary light response has been widely used as a clinical diagnostic tool for autonomic nervous system (ANS) dysfunction, the association between vegetable and fruit diversity intake and ANS functioning is scarce.

OBJECTIVES: To evaluate the association between vegetable and fruit diversity intake and the autonomic nervous system in school-aged children.

METHODOLOGY: Data for this study were assessed from a cross sectional analysis of 540 children (49.3% girls) aged 7 to 12 years, attending 71 classrooms from 20 public schools located in city of Porto, Portugal. Dietary data was collected from children through one 24-hour recall questionnaire. Fruit and vegetable diversity intakes were obtained by summing up all the different individual vegetables and fruits consumed in one day. The pupillary light response was performed to evaluate the autonomic nervous system. Anthropometry, socio-demographic information and indoor air exposure, evaluated through the measurement of classroom levels of volatile organic compounds and aldehydes, were also assessed. Associations between vegetable and fruit diversity with pupillary light response parameters were estimated by regression coefficients using linear regression models.

RESULTS: After adjustment for sex, age, body mass categories, parental education level, school, levels of volatile organic compounds and aldehydes in classrooms, total energy intake and total amount of vegetable intake, higher vegetable diversity intake per day was significantly associated with sympathetic nervous system activity ($\beta = 0.04$, 95%CI: 4.00x10⁻³ 0.08).

CONCLUSIONS: Vegetable diversity intake seems to be associated with sympathetic activity changes in school-aged children. Further studies are needed to understand the hinder mechanisms.

CO29. OLIVE POMACE: A SOURCE OF A NATURAL INGREDIENT FOR INCORPORATION IN FOODSTUFFS?

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INTRODUCTION: The "natural" and "free from" designations are trending and perceived as beneficial by consumers. Accordingly, the industry is meeting the consumers' desires by reformulating and/or developing new food ingredients/products. Olive pomace (OP) is a by-product generated during olive oil processing. OP can be a source of natural bioactive compounds like antioxidants, with the potential to replace synthetic additives.

OBJECTIVES: This work aimed to assess the bioactive compounds of an olive-derived functional ingredient (OFI) obtained from different OP.

METHODOLOGY: OFI were extracted physically from OP obtained in Trás-Os-Montes (S1 and S2) and Alentejo (S3 and S4) Portugal according to the Patent WO/2017/212450. Total phenolics, flavonoids, and antioxidant activity (FRAP and DPPH assays) were evaluated spectrophotometrically and hydroxytyrosol contents determined by HPLC/DAD-FLD. The fatty acids (GC-FLD) and vitamin E (HPLC/DAD-FLD) profiles were also assessed.

RESULTS: Phenolics and flavonoids amounts were higher in S3 (4 g gallic acid eq. and 3 g catechin eq./100 g, respectively). Regarding antioxidant activity, S3 showed the highest FRAP value while S2 the best DPPH scavenging activity (0.96 g index eq./100 g). The hydroxytyrosol amounts was as follows: S1 (220 > S3 (172) > S2 (122) > S4 (63 mg/100 g). Oleic acid was the major fatty acid present in all samples, varying between 71.8 and 72.9%, and α -tocopherol, the major vitamin E isomer.

CONCLUSIONS: Notwithstanding the differences found in OFI samples, possibly related to the region, edaphoclimatic conditions, olive cultivars, and agronomic practices, OFI is a source of naturally occurring antioxidants as hydroxytyrosol and α -tocopherol. Hence, it is foreseen that OFI can be used as a food preservative and/or to enhance products' nutritional profile.

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CO30. COMPARAÇÃO AMBIENTAL E NUTRICIONAL ENTRE A FARINHA DE TENEBRIO MOLITOR E A CARNE BOVINA NA ALIMENTAÇÃO HUMANA

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INTRODUÇÃO: Atualmente, a produção de alimentos representa cerca de 50% das emissões globais de Gases com Efeito de Estufa, sendo a agropecuária a atividade com maior impacto – particularmente a produção de carne bovina. A procura de fontes proteicas alternativas que mitiguem o impacto no ambiente tem apontado a produção de insetos – pela abundância, valor nutricional e

aparente sustentabilidade ambiental – como uma opção interessante para enfrentar este desafio.

OBJETIVOS: Estudar o perfil nutricional e a sustentabilidade ambiental resultante da produção e consumo de duas fontes proteicas para a alimentação humana: a carne bovina (CB) e a farinha do inseto *Tenebrio molitor* (TM).

METODOLOGIA: Na componente ambiental, com base em resultados da metodologia de Avaliação do Ciclo de Vida, calcularam-se e compararam-se as pegadas de carbono (PC) da produção (acordagem do “berço à porta”) dos dois animais. Relativamente à componente nutricional, retiraram-se os dados de Tabelas de Composição de Alimentos e de artigos publicados sobre as espécies referidas, e estabeleceu-se que o inseto estaria na forma de farinha. Utilizando o teor proteico como termo comparativo, definiram-se para as variantes nutricional e ambiental as unidades funcionais de 30 g e 1 kg de proteína, respetivamente. Como cenário alternativo, incluiu-se um “bife” estruturalmente semelhante à CB, constituído por água e terras de TM e soja. **RESULTADOS:** A nível ambiental, calcularam-se PC de 133 e 14 kg CO₂ eq/kg proteína para a CB e o inseto, respetivamente. As atividades que mais contribuem para o impacto são, respetivamente, a fermentação enérgica e a produção de ração.

Nutricionalmente, o inseto apresenta uma proteína completa e um elevado teor em ácidos gordos mono e polinsaturados. A exceção da vitamina B12, o teor de micronutrientes do inseto foi superior relativamente à CB. No cenário alternativo, a composição nutricional aproxima-se da CB, excetuando a presença de fibra e hidratos de carbono, e o teor superior de ácidos gordos polinsaturados.

CONCLUSÕES: O TM apresenta uma PC expressa por autograma de proteína, 10 vezes inferior à da CB. Nutricionalmente, verificou-se a viabilidade do inseto. A influência da alimentação nas alterações clínicas é inquestionável, pelo que o potencial nutricional e ambiental dos insetos não pode ser desprezado.

CO31. ESTIMATION OF DIETARY EXPOSURE TO ACRYLAMIDE OF THE PORTUGUESE POPULATION

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INTRODUCTION: Acrylamide exposure, mainly resulting from food cooking and processing, has been associated with a higher risk of health problems, due to its probable genotoxic effects.

OBJECTIVES: Estimation of acrylamide dietary exposure of the Portuguese population.

METHODOLOGY: A representative sample of the Portuguese population (n=5811), aged 3 months to 84 years, was evaluated within the National Food, Nutrition and Physical Activity Survey, 2015-2016. Dietary data were collected by 2 nonconsecutive days of food diaries (children) or 24-hour recalls. Lower (LB) and upper bound (UB) occurrence data of acrylamide in food (mainly in cereals and potatoes) were extracted from EFSA publications. The usual intake of acrylamide was calculated with SPADE software. The margins of exposure (MOE) were analyzed using the benchmark dose lower confidence limit for a 10% extra risk for peripheral neuropathy and neoplastic effects (BMDL₁₀). MOE < 10,000 indicates human health concern.

RESULTS: Mean dietary exposure to acrylamide ranged from 0.44 (LB) to 0.54 µg/kg (UB) for the total population. Male compared to female presented higher exposure levels (0.47-0.59 µg/kg vs. 0.41-0.49 µg/kg). In all scenarios, according to the age groups, young children (1-2 years) was the group with the highest exposure (1.92-2.09 µg/kg). The mean MOE for neurotoxic effects ranged from 977 (LB) to 802 (UB) and 433 to 348 for the 95th percentile. For neoplastic effects,

MOE ranged from 386 to 317 and 171 to 138 for the mean and 95th percentile of exposure, respectively. Young children was the group with lower MOE (126-113 and 50-45, for 95th percentile of exposure for neurotoxic and neoplastic effects). **CONCLUSIONS:** The current dietary exposure to acrylamide in the Portuguese population is of concern mainly regarding neoplastic effects. Our results point to the need of reducing the exposure to acrylamide, especially in young children.

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CO32. ENERGY SHARE OF ULTRA-PROCESSED FOOD GROUPS IN PORTUGAL: THE UPPER PROJECT

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INTRODUCTION: Ultra-processed foods (UPF) have been associated with adverse health outcomes. In order to design effective nutritional education programs and food policies, it is important to identify the food groups that most contribute to this consumption, in different age ranges.

OBJECTIVES: To estimate the dietary share of UPF, and to explore which are the most consumed by age groups in Portugal.

METHODOLOGY: Participants were from the Portuguese National Food, Nutrition and Physical Activity Survey (IAN-AP) 2015-2016, aged 3m-84y(n=5,811). CAP face-to-face interviews were performed including two dietary days (diaries, in children, or 24-hour recalls). UPF were identified using NOVA classification. Dietary share of UPF in total energy intake (%UPF) and food groups contribution, in each age range, were obtained. Weighted data descriptive statistics were provided on the share of UPF and its NOVA food groups for total population, stratified by age.

RESULTS: For children, 37%UPF (SE 0.64), being mostly yogurt/milk-based drinks (7.63%; SE 0.30), packaged sweet snacks (4.43%; SE 0.29) and industrial cakes/desserts (4.04%; SE 0.24). For adolescents, 36%UPF (SE 0.80), especially industrial breads/toasts (4.58%; SE 0.43), packaged sweet snacks (4.52%; SE 0.33) and industrial cakes/desserts (4.48%; SE 0.35). For adults, 24%UPF (SE 0.42), mainly yogurt/milk-based drinks (3.40%; SE 0.09), sausage/other processed meat products (3.24%; SE 0.10) and industrial cakes/desserts (3.21%; SE 0.15). For elderly, 16%UPF (SE 0.56), principally industrial cakes/desserts (2.49%; SE 0.31), yogurt/milk-based drinks (2.11%; SE 0.18), sausage/other processed meat products (1.90%; SE 0.16).

CONCLUSIONS: Intervention programs aimed at reducing consumption of ultra-processed foods should prioritize children and adolescents, for whom may focus primarily on yogurt/milk-based drinks, as well as packaged sweet snacks and cakes/desserts. Although adults and elderly have a lower UPF consumption, it is also relevant to focus on cakes/desserts, processed meat and milk-based drinks.

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