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RESULTADOS: Dos 43 produtos analisados, nenhum produto foi classificado como A; apenas 2,3% (n=1) foram classificados como B; a classificação C foi atribuída a 9,3% (n=4) dos produtos; a maioria (55,8%) foi classificada como D (n=24) e classificados como E foram 18,6% (n=8). Não foi possível classificar os restantes (n=6) por informação insuficiente para o cálculo.

CONCLUSÕES: A maioria dos géneros alimentícios analisados apresentam *Nutri-Score* indicativo de contributo nutricional pouco favorável. Torna-se, assim, evidente a necessidade de reformulação, adequação e equilíbrio da composição destes alimentos, de forma a contribuir positivamente para escolhas mais conscientes e saudáveis.

PO109. WHOLE MEALS NUTRITIONAL COMPOSITION: COMPARISON BETWEEN EXPERIMENTAL AND THEORETICAL DATA

Mafalda Ribeiro¹; Marta Silva¹; Olga Viegas^{1,2}; Zita Martins¹; Susana Casal¹; Eulália Mendes¹; Edgar Pinto¹; Miguel A Faria¹; Isabel MPLVO Ferreira¹

¹ LAQV-REQUIMTE, Laboratory of Bromatology and Hydrology, Department of Chemical Sciences of Faculty of Pharmacy of University of Porto

² Faculty of Nutrition and Food Science of University of Porto

³ Department of Environmental Health, School of Health, P.Porto. Research Center in Health and Environment

INTRODUCTION: Information concerning food composition is essential in public health and nutrition. Chemical analyses are the most accurate methodologies for the assessment of food composition, however, these procedures are very expensive and time-consuming. Therefore, food composition data has been compiled in databases to facilitate the access and manipulation of information. Although food composition databases (FCDB) are vital tools, they have some limitations.

OBJECTIVES: Compare macro and micronutrients contents of six meals obtained from two different FCDB, as well as, by chemical analyses.

METHODOLOGY: Six meals (Table 1) were prepared and cooked under controlled conditions. Nutrient contents were assessed experimentally using official methods as well as calculated using both the Portuguese food composition table (TCAP) and the USDA FCDB. Hierarchical clustering on principal components with Euclidean distance measure and Ward's method was performed on each diet for all nutrients, macro, and micro. The characterization significance threshold considered to characterize the category was 5%.

TABLE 1

Food components of meals (M)

M	Food components
M1	Roasted fatty beef + French fries + Sugary soft drink
M2	Roasted mackerel + French fries + Sugary soft drink
M3	Canned chickpeas + French fries + Sugary soft drink + Vegetable oil
M4	Roasted lean beef + Olive oil French fries + Sugary soft drink + Olive oil
M5	Roasted fatty beef + French Fries + Broccoli + Sugary soft drink
M6	Roasted fatty beef + French fries + Freshly made strawberry juice

RESULTS: Overall, USDA database values were separated from the experimental results (ER). As for TCAP, it was grouped with ER for M1, M2, M4 and M6. Interestingly, when macro and micronutrients were analyzed separately, different trends between TCAP and ER were observed: unlike M3, the other 5 meals are grouped by macronutrients and separated by micronutrients. The different trends found for the referred 5 meals may be due to the seasonal variation of foods.

CONCLUSIONS: Meals composition predicted by TCAP were closer to the real values found in whole meals than the predicted by USDA database, probably due to food origin. However, regarding micronutrients, ER and TCAP values diverged. In order to attenuate the observed discrepancies between theoretical and experimental results, FCDB should provide a correction factor to adjust

composition data to seasonality of foods. Notwithstanding, FCDB represents a reliable tool to assess nutritional composition of meals.

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PO110. IMPACT OF FOOD REPLACEMENTS WITHIN A MEAL IN THE NUTRIENTS PROFILE AND QUALITY INDICES

Marta Silva¹; Mafalda Ribeiro¹; Olga Viegas^{1,2}; Zita Martins¹; Susana Casal¹; Eulália Mendes¹; Miguel Faria¹; Edgar Pinto^{1,3}; Isabel MPLVO Ferreira¹

¹ LAQV-REQUIMTE, Laboratório de Bromatologia e Hidrologia, Departamento de Ciências Químicas da Faculdade de Farmácia da Universidade do Porto

² Faculdade de Ciências da Nutrição e Alimentação da Universidade do Porto

³ Department of Environmental Health, School of Health, P.Porto. Research Center in Environment and Health

INTRODUCTION: Modern societies are increasingly prone to chronic non-communicable diseases linked with inadequate nutrition. Knowledge about macronutrients balance, micronutrient deficiencies, bioactive and harmful compounds is the starting point of a holistic approach concerning the effects of ingestion of a whole meal in human health.

OBJECTIVES: Assess the impact of integrating healthy foods in a whole meal based on "Western diet" (WD) pattern in the nutrients profile and nutritional quality indices.

METHODOLOGY: A WD model and other 5 meals (Table 1), resulting from replacement of foods within the WD model were prepared. 25 Nutrients were analysed at laboratory. Atherogenicity (AI) and Thrombogenicity (TI) Indices were also calculated. Parametric analysis was carried out by one-way ANOVA and non-parametric test by Kruskal-Wallis.

RESULTS: Compared to WD: all meals presented similar amounts of carbohydrates ($p < 0.05$); Fiber content of R2 was higher while R4 and R5 were not significantly different. Concerning AI and TI (Table 1): R4 presented the highest values by reduction of polyunsaturated (PUFAs) and monounsaturated fatty acids, although not significant ($p > 0.05$); R2 and R1 presented the lowest AI and TI respectively, with highest PUFA and less SFA, as well as lower fat content ($p < 0.05$); R3 also presented lower AI and TI levels, with more MUFA and less SFA ($p < 0.05$).

TABLE 1

Food components of WD model and healthier food replacements (R)

				FAT CONTENT	AI	TI
WD (Control)	Fatty beef	French fries	Sugary soft drink	5.08±0.50	0.52 (0.49-0.57)	1.01 (0.94-1.08)
R1	Mackerel	French fries	Sugary soft drink	3.12±0.11*	0.17 (0.17-0.18)*	0.18 (0.18-0.19)*
R2	Chickpeas	French fries	Sugary soft drink	3.97±0.20*	0.08 (0.08-0.09)*	0.21 (0.20-0.22)*
R3	Lean beef	Olive oil French fries	Sugary soft drink	4.92±0.27	0.26 (0.26-0.27)*	0.60 (0.58-0.61)*
R4	Fatty beef	½ French fries + ½ broccoli	Sugary soft drink	4.23±0.38*	0.61 (0.60-0.63)*	1.06 (1.03-1.09)
R5	Fatty beef	French fries	Freshly made strawberry juice	5.58±0.13*	0.47 (0.46-0.48)*	0.89 (0.88-0.90)*

WD: Western Diet meal model

The beef (both fatty and lean) were roasted in all meals; Mackerel was also roasted; Chickpeas were canned; Broccoli were boiled.

Extra vegetable oil and olive oil were added R2 and R3, respectively.

In each column, * indicate statistical significant differences ($p < 0.05$) with WD

AI: Atherogenicity Index = $(C12:0 + 4x C14:0 + C16:0) / (n-6 PUFA + n-3 PUFA + MUFA)$

TI: Thrombogenicity Index = $(C14:0 + C16:0 + C18:0) / [0.5 MUFA + 0.5 n-6 PUFA + 3 n-3 PUFA + (n-3 PUFA/n-6 PUFA)]$

CONCLUSIONS: Healthier replacements generally translated into expected differences (e.g. better fat profile) although strawberry replacement did not translate into higher fiber levels ($p > 0.05$). The impact of whole meals on health depends on many factors; AI and TI are useful, however should not be interpreted alone, while total fat and other constituents (e.g. bioactives) also impact health. To uncover mechanisms behind diet impact on health, further *in vitro* studies on oxidative stress, inflammation and adipogenesis are essential and will be performed.

ACKNOWLEDGEMENTS: PTDC/SAU-NUT/30322/2017.

PO111. CHUB MACKEREL (*SCOMBER COLIAS*): A SUSTAINABLE SEAFOOD AND A PRIVILEGED SOURCE OF DHA

Inês Ferreira^{1,2}; Ana Gomes-Bispo^{1,3}; Joana Matos^{1,2}; Cláudia Afonso^{1,3}; Carlos Cardoso^{1,3}; Isabel Castanheira⁴; Carla Motta⁴; José Prates⁵; Narcisa M Bandarra^{1,3}

¹ Division of Aquaculture, Upgrading and Bioprospection, Portuguese Institute for the Sea and Atmosphere

² Faculty of Sciences of University of Lisbon

³ Interdisciplinary Centre of Marine and Environmental Research, University of Porto

⁴ National Health Institute Doutor Ricardo Jorge

⁵ Faculty of Veterinary Medicine of University of Lisbon

The chub mackerel (*Scomber colias*) is a pelagic fish with an high nutritional value due to its composition with high protein contents and vitamins from complex B. Furthermore it is rich in omega 3 polyunsaturated fatty acids (n 3 PUFA), mainly docosahexaenoic acid (DHA, 22:6 ω 3) that has already been recognized to have benefits regarding with mental health, namely Alzheimer's disease, but also in the prevention of anti-inflammatory processes and cardiovascular disease. Moreover, due to its biological cycles, chub mackerel composition, namely its lipid fraction, can undergo important seasonal changes that have not been fully documented so far, namely in what concerns to its fatty acid profile. Our research aimed to study the chub mackerel fatty acids along the year. The chub mackerel fatty acid profile was determined by Gas Chromatography (GC-FID). Our results highlighted n 3 PUFA as the globally most abundant fatty acids, ranging from 37.3 up to 62.7% (Summer and Winter, respectively) of total fatty acids. For these, DHA accounted nearly half of the total n 3 PUFA with levels between 16.2 and 37.3% (Summer and Winter, respectively). The lowest DHA content was found in Spring samples, where the detected level corresponded to 498.4 mg/100 g, and the highest occurred during Autumn reaching more than 2200 mg/100 g. Such contents become even more important if we consider that the intake of > 250 mg/day of DHA was linked to a neuroprotective effect.

Our research, together with its high abundance within the Portuguese shore, indicates chub mackerel as a sustainable seafood with a great potential. In this context, its consumption is a good alternative to other species whose fishery is facing strong restrictions.

PO112. NUTRITIONAL QUALITY AND IN VITRO DIGESTIBILITY OF PROTEIN CONCENTRATE FROM MORINGA LEAVES (*MORINGA OLEIFERA*)

Tassadit Benhammouche¹; Zita E Martins²; Armindo Melo^{3,4}; Marta Silva²; Farid Zaidi¹; Isabel MLPVO Ferreira²

¹ Department of Food Science, Faculty of Nature and Life Sciences of Bejaia University

² LAQV-REQUIMTE, Departamento de Ciências Químicas, Laboratório de Bromatologia e Hidrologia, Faculdade de Farmácia de Universidade do Porto

³ Department of Environmental Health of Instituto Nacional de Saúde Doutor Ricardo Jorge

⁴ LAQV-REQUIMTE of Universidade do Porto

INTRODUCTION: Moringa Oleifera L (*fam. Moringaceae*) is a potential foliated tree widely cultivated in many tropical latitudes of the world. Their protein content range from 22.2% to 34.4% and so far, leafy biomass presents a unique challenge for plant protein production due to their vast availability. However, their interaction with non-protein components can form irreversible complexes with proteins, thus, affecting their solubility [1]. Moreover, the presence of antiphenological proteins (protease inhibitors, lectins) and their compact structure, causes less susceptibility to *in vivo* digestion compared with animal proteins [2].

OBJECTIVES: Evaluate the nutritional quality and *in vitro* digestion of a protein concentrate (PC) derived from *Moringa Oleifera* defatted leaves (MODL) obtained by enzymatic extraction.

METHODOLOGY: Kjeldahl method was used to evaluate the protein content. PC was obtained enzymatically, under optimal extraction conditions, pH=5.5, ratio= 1:20, viscozyme L concentration= 60 FBG units, temperature= 30 C° and incubation time=0.3 h. Amino acid profile of MODL and PC was evaluated by HPLC using OPA/FMOC derivatives, in order to evaluate the nutritional protein quality by calculating their amino acids scores and index. *In vitro* digestion was compared [3] in MODL and in PC.

RESULTS: MODL and PC presented 24.1% and 55.7% of protein (Kjeldahl), respectively.

Comparing to MODL, PC presented a significant ($P < 0.05$) improvement in the amino acids (AA) content evaluated by HPLC. The same was observed for the sum of essential AA (EAA) (ranging from 402.9 to 488.6 mg/g of protein) and their profile (increase for Cys, Ile, Thr, Trp, Tyr, and Val). While His, Ile, and Leu were limiting EAA in MODL, His was the only limiting AA for PC. Moreover, PC was closer to the quality requirement of FAO/WHO, presenting higher EAA scores (EAAS > 1) [3]. As for *in vitro* digestion, there was a significant ($P < 0.005$) improvement in protein bioaccessibility from MODL to the PC (64.75 % to 99.86 %, respectively).

CONCLUSIONS: The advantages of PC in comparison with MODL are the nutritional quality of proteins as well as their digestibility.

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PO113. PROTECTIVE EFFECT OF AVOCADO BYPRODUCTS EXTRACTS IN GRILLED BEEF BURGERS AGAINST LIPID AND PROTEIN OXIDATION.

Igor Trujillo-Mayol¹; M Madalena C Sobral²; Olga Viegas^{2,3}; Julio Alarcón-Enos⁴; Olívia Pinho^{2,3}; Isabel MLPVO Ferreira²

¹ Departamento de Ingeniería de Alimentos, Universidad del Bío-Bío

² LAQV-REQUIMTE, Laboratório de Bromatologia e Hidrologia, Departamento de Ciências Químicas, Faculdade de Farmácia da Universidade do Porto

³ Faculdade de Ciências da Nutrição Alimentação da Universidade do Porto

⁴ Laboratorio de Síntesis y Biotransformación de Productos Naturales, Facultad de Ciencia, Universidad del Bío-Bío

INTRODUCTION: The dynamic eating incremented the consumption of meat products naturally preserved, hence, the incorporation of rich in polyphenols extracts such as from avocado byproducts ecofriendly obtained, is an exciting alternative to traditional antioxidants.

OBJECTIVES: To assess the incorporation of avocado peel hydroethanolic (APE) extracts, obtained by Ultrasound-Microwave method, in pan-seared beef burgers to limit the lipid and protein oxidation.

METHODOLOGY: 1 and 0.5% of APE were incorporated in a beef burger's recipe. Burgers with sodium ascorbate and without any antioxidants were used as positive and negative controls, respectively. Samples were thermally treated, simulating the conventional pan cooking, packed, and stored at $\pm 4^{\circ}\text{C}$. Consequently, cooking loss, pH, moisture, TBARS, and carbonyls were measured at the 1st and 10th days.