

Proceedings | Resumos



II Jornadas lusófonas de Nutrição



Melhoria da
Qualidade de Vida
e Longevidade

Alimentação e Promoção da Saúde
/Prevenção das Doenças

Alimentação e Doenças do Envelhecimento

Degustação de pratos à base de medusa
(Parceria CBios/CiiEM/ESHTE)

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26 outubro
2018

Auditório
Agostinho da Silva



UNIVERSIDADE
LUSÓFONA

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II Lusofona's Nutrition Meeting

II Jornadas Lusófonas de Nutrição

26 October | 26 Outubro
Lisboa - Universidade Lusófona

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Programa

26 October | 26 de Outubro

Open Session | *Sessão de abertura*

1st Session | *Sessão 1*

Alimentação e Promoção da Saúde/Prevenção das Doenças
Chairman | *Moderador* - **António Raposo**

Speakers | *Prelectores*

Filipe Ferreira
Inês Vieira

Keynote - Sofia Mendes de Sousa

Chairman | *Moderador* - **Teresa Guerreiro**

Speakers | *Prelectores*

Darchite Kantelal
Paula Pereira/ Lídia Palma
Carla Motta
Ana Júlio
Luísa Serralheiro

2st Session | *Sessão 2*

Alimentação e Doenças do Envelhecimento

Chairman | *Moderador* - **Emília Alves**

Keynote - Odete Vicente de Sousa

Speakers | *Prelectores*

Cláudia Santos
Regina Capelas
Ana Sousa-Santos

Chairman | *Moderador* - **Bruno Sousa**

Speakers | *Prelectores*

Joyce Costa
Marisa Nicolai
Nelson Tavares

Open Session

Mário Moutinho
Luís Monteiro Rodrigues
Nelson Tavares
Diana Pereira

1st Session | Sessão 1 Alimentação e Promoção da Saúde/ Prevenção das Doenças

Chairman | Moderador
António Raposo

Invited Speaker | Prelector convidado

C.01 - O papel do nutricionista junto da comunidade

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Abstract / Resumo da Comunicação

A nível comunitário, o nutricionista desenvolve um trabalho fundamental, com diversas vertentes. A nutrição comunitária inclui rastreios, ações de formação para incentivar o consumo de alimentos saudáveis e a promoção da atividade física. Além disso, é possível promover métodos de cultivo sustentáveis e realizar atividades nos mercados locais, incluindo demonstrações de preparação e confeção de alimentos. Quanto ao trabalho junto da comunidade escolar, o nutricionista pode promover programas de educação. Pode ainda zelar pela segurança alimentar das cantinas escolares, realizando auditorias.

No caso específico do trabalho realizado no complexo termal Chaves Termas & Spa e no Balneário Pedagógico de Investigação e Desenvolvimento de Práticas Termais de Vidago, o nutricionista trabalha com um grupo de população composta maioritariamente por mulheres, de idade superior a 65 anos. Os utentes do balneário apresentam diversas patologias, incluindo excesso de peso e obesidade, hipertensão arterial, diabetes e doença osteoarticular. Por isso, torna-se importante realizar uma promoção adequada não só da alimentação, mas também da atividade física. As consultas de nutrição são apenas uma parte do trabalho a realizar. Dinamiza-se a atividade física através da realização de caminhadas e faz-se educação para a saúde através de palestras e de Workshops de culinária saudável (show cooking). Além disso, foram estabelecidas parcerias com as unidades hoteleiras locais, no sentido de prepararem ementas saudáveis adequadas aos utentes.

Em conclusão, o trabalho de um nutricionista numa autarquia é fundamental, porque se trata de um trabalho preventivo que reduz os custos financeiros para o Sistema de Saúde e, sobretudo, promove um estilo de vida saudável que permite uma vida mais saudável e equilibrada aos municípios.

Palavras-chave: autarquia; complexo termal; nutrição comunitária; nutrição escolar; programas de nutrição e alimentação; municípios.

Speaker | Prelector

C.02 - Influence of food consistency on food intake of institutionalized elderly with neurological diseases

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Abstract / Resumo da Comunicação

Dysphagia is a swallowing disorder that is characterized by changes at any stage and / or between stages of swallowing dynamics [1]. This disorder is a frequent symptom in individuals with neurodegenerative diseases such as Parkinson's and dementia syndromes [2]. Dysphagia is associated with increased risk of respiratory infection, dehydration and malnutrition [3]. One of the strategies for managing dysphagia and preventing its consequences is the adaptation of food consistency [3]. The main objective of the present study is to describe the% of food intake according to the different levels of consistency adaptation in institutionalized elderly with neurodegenerative diseases.

This was a cross-sectional, observational and case-control study, and patients admitted to the Senior Neurological Campus between February and June 2018 were included with at least one neurodegenerative disease and age ≥ 65 years. Food intake was quantified in percentage of consumption of each component of the dish, namely protein source, carbohydrates and fiber, through a direct and subjective observational evaluation of 3 lunches in 3 consecutive days. The sample consisted of 27 patients with mean age of 73.33 ± 3.78 (16 men and 11 women), with Parkinson's disease being the most frequent disease (52%). The control group included users without food consistency adaptation ($n = 3$), while the case group ($n = 24$) included users with adaptations. It was concluded that the level of consistency adaptation did not influence the% of food intake in both groups.

References:

- [1] Silva, R., Milm, F., & Arkl, A. (1999). Conceitos e implicações para a prática clínica e para a classificação da disfagia orofaríngea neurogénica. (e. Editorial F, Ed.) São Paulo: 2nd. [2] Mahan, L.K., & Stump, S.E. (2010). Krause, Alimentos, Nutrição e Dietoterapia (12ª ed.). Rio de Janeiro, Brasil: Elsevier. [3] Sura, L., Madhavan, A., Carnaby, G., & Crary, M.A. (2012). Dysphagia in the elderly: management and nutritional considerations. Clinical Interventions in Aging, 3, pp. 287-296.

Thanks: The authors would like to thank all CNS collaborators for the indispensable support for this work.

Keynote

Sofia Mendes de Sousa

C.03 - Programa Nacional para a Promoção da Alimentação Saudável da Direção-Geral da Saúde

Sofia Mendes de Sousa
Direção Geral de Saúde

Abstract / Resumo da Comunicação

Em 2012, foram aprovados oito programas prioritários a desenvolver pela Direção-Geral da Saúde (DGS), entre eles o Programa Nacional para a Promoção da Alimentação Saudável (PNPAS), com um horizonte temporal de cinco anos (2012-2016). O PNPAS assume-se desde então como um programa nacional de ação, na área da alimentação e nutrição tendo como finalidade melhorar o estado nutricional da população, incentivando a disponibilidade física e económica de alimentos constituintes de um padrão alimentar saudável e criar as condições para que a população os valorize, aprecie e consuma, integrando-os nas suas rotinas diárias. Tendo em conta as linhas de orientação da Organização Mundial da Saúde e da Comissão Europeia, o PNPAS, ao longo de 2012-2018, centrou parte da sua atividade no desenvolvimento de uma intervenção para a melhoria da saúde dos cidadãos em outras políticas fora do setor da saúde, considerando que a modificação dos determinantes do consumo alimentar exige o envolvimento dos diferentes setores da sociedade.

Desde 29 de dezembro de 2017 que Portugal apresenta uma Estratégia Integrada para a Promoção da Alimentação Saudável (EIPAS), tratando-se, provavelmente de um dos mais importantes documentos na área da saúde pública em Portugal, tendo sido este grupo de trabalho conduzido pela DGS.

Palavras-chave: Programa prioritário; Política Alimentar; Alimentação Saudável; Estratégia Nacional; Portugal.

Chairman | Moderador

Teresa Guerreiro

Invited Speaker | Prelector convidado

C.04 - Eat well play better

Darchite Kantelal
Portuguese Vegetarian Association

Abstract / Resumo da Comunicação

Nutrition plays a crucial role in the athletes' health and it can also help improve sports performance. Body composition data and nutrient requirements are useful to tailor dietary strategies to individual needs of the athlete while aiding in preparation and recovery from competition and training. Current sports nutrition guidelines suggest that football players should have a carbohydrate intake ranging from 5 to 10 g/kg/day, a protein intake within 1.4 to 2 g/kg/day and a fat intake ranging from 20 to 35% of total energy intake. Energy consumption of athletes has to be periodized according to training load or competition day. Dehydration can be detrimental to football and hence, fluid needs should also be met.

In elite football, the timing of nutritional strategies is of great importance as players have to quickly recover between sessions and risk of injury has to be minimized. In this sense, practical and handy snacks are useful to carry when traveling in away games. Sports supplements can also offer a convenient source of recovery nutrition and potentially enhance physical performance.

On the other hand, sustainable eating habits and reducing food waste should also be emphasized in sports nutrition and greater plant protein intake should be encouraged.

Keywords: sports nutrition; energy requirements; performance; soccer; sustainability;

Speaker | Prelector

C.05 - Vitis vinera L. pomace: chemical and nutritional characterization

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Abstract / Resumo da Comunicação

According to the International Organization of Vine and Wine (OIV), Portugal is one of the top fifteen wine-producing countries in the world, having a production of 6,600 hl in 2017. Grape (*Vitis vinera* L.) pomace, a wine-production by-product consists of stalks, seeds and skins, accounts for about 25% weight of the grape crushed. Grape pomace is a potential source of various compounds that could be applied in pharmaceutical, cosmetic and food industry to improve nutritional characteristics. The aim of this study was the characterization of five different grape pomaces from two portuguese regions, Alentejo and Ribatejo. In this sense, ash content, relative humidity, pH, phenolic content, antioxidant activity and protein of the dried samples were determined. A strong correlation between antioxidant activity and polyphenols contents was observed. Considering the obtained results, inclusion of grape pomace in the industrial production of foodstuffs could be a step towards the future of human nutrition and health.

Acknowledgment: The authors wish to thank Hélder Fernandes e Daniel Caldeira from Escola Secundária 3º CEB do Pinhal Novo.

Invited Speaker | *Prelector convidado*

C.06 - Bioacessibilidade e processamento. O caso dos cereais e pseudocereais

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Abstract / Resumo da Comunicação

Biodisponibilidade é um conceito-chave para determinar o valor nutricional dos alimentos. Corresponde à fração de um composto libertado da matriz alimentar, durante a digestão para absorção intestinal.

Os pseudocereais como o amaranto, a quinoa e o trigo-sarraceno são sementes que tal como o arroz, caracterizam-se por serem isentos de glúten, mas ainda são escassas informações sobre bioacessibilidade e retenção de nutrientes após processamento.

Estimar a bioacessibilidade de minerais e folatos nos pseudocereais e arroz utilizando um protocolo de digestão estático, harmonizado "in vitro" após processamento será objeto do estudo.

A cozedura aumenta a bioacessibilidade dos folatos para todos os pseudocereais, com valores perto dos 100% no 5-metil-tetrahydrofolato. Na maltagem a bioacessibilidade dos folatos aumenta, mas menos expressivamente que na cozedura. No arroz, verificou-se uma diminuição dessa bioacessibilidade.

Também os minerais viram a sua bioacessibilidade aumentada com o processamento com maiores aumentos no cobre, manganês, magnésio ferro e cálcio.

Comparando-se diferentes simulações de mastigação observou-se que uma moagem fina aumenta a bioacessibilidade em todas as formas de folatos e de minerais, com exceção do zinco e do cálcio que não são afetados.

O conhecimento da bioacessibilidade, relacionada com o processamento é assim importante para o cálculo da composição nutricional das dietas.

Palavras Chave: Bioacessibilidade, Folatos, Minerais, Maltagem, Quinoa, Trigo-sarraceno, Amaranto.

Speaker | *Prelector*

C.07 - Application of ionic liquids-nanoparticles hybrid systems in food technology

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Abstract / Resumo da Comunicação

When developing delivery systems, the low solubility of many compounds represents a major challenge. Since Ionic liquids (ILs) may be placed in several types of solutions, to increase solubility [1] and Nanotechnology may allow a controlled and/or targeted delivery [2], the combination of nanocarriers and ILs may be relevant to deliver poorly soluble compounds. Therefore, the aim of this work was to develop an IL-nanoparticle hybrid system as a new strategy to deliver rutin. This flavonoid has antioxidant properties, can be found in buckwheat [3] and may be used in food supplements and nutraceuticals.

Poly(lactic-co-glycolic acid) (PLGA) 50:50 or 75:25 were used to produce nanoparticles by a modified solvent-evaporation W/O/W double emulsion technique [4]. The inner phase was an aqueous solution of 0.2 % (v/v) of a choline-based IL [2], (2-hydroxyethyl)-trimethylammonium-L-phenylalaninate [Cho][Phe] or (2-hydroxyethyl)-trimethylammonium-L-glutamate [Cho][Glu], dissolving rutin to its maximum solubility. This phase was also prepared at pH 6.7 (isoelectric point of rutin) [5]. The physico-chemical proprieties of the hybrid IL-nanosystems and the association efficiency (AE) was evaluated. IL-Nanoparticles without pH adjustment had a diameter of 250-300 nm with acceptable polydispersity index (between 0.2-0.4) and good colloidal stability (-35 to -45 mV). When the pH of the inner phase was adjusted, a significant enhancement in particle size was observed while maintaining good PDI and zeta potential results. The AE in the presence of the ILs was higher than 50 % at both pH. Results show the potential of the IL-PLGA nanoparticles hybrid systems to deliver poorly soluble drugs.

Acknowledgments: The authors would like to thank to Fundação para a Ciência e a Tecnologia, Portugal (FCT/MCTES (PIDDAC), UID/TP/04567/2016) and also to by COMPETE 2020 (PTDC/MEC-DER/32610/2017). A special acknowledgment is given to Professor André Rolim Baby for the rutin gift.

References:

[1] Santos de Almeida, T. et al., Drug Development and Industrial Pharmacy, 43 (2017) 1858-1865.

[2] Fonte, P. et al., Biomacromolecules, 15 (2014) 3753-3765.

[3] Sequeira, I.R. and Poppitt, S.D., Nutrients, 9 (2017) 788-809.

[4] Fonte, P. et al., International Journal of Pharmaceutics, 456 (2013) 370–381.

[5] Cui, X.D. and Wang, Z.H., Food Chemistry, 131 (2012) 60-66.

Invited Speaker | *Prefector convidado*

C.08 - BioMol4Health_Biological Chemistry: Longevity in a cup of tea

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Abstract / Resumo da Comunicação

Infusions have been studied on what concerns Alzheimer Disease, digestive process, diet cholesterol absorption and its biosynthesis inhibition. In the first two cases the inhibition of acetylcholinesterase (AChE) has been addressed. In the last two situations, an in vitro intestinal barrier has been simulated and the inhibition of the regulator enzyme (HMGR) in cholesterol biosynthesis pathway has been studied. AChE has been the target of infusions inhibitory activity as its inhibition has been seen to improve cognition and global functioning¹ in AD suffering people and to improve the gastrointestinal motility². Given to lab animals the compounds present in the infusions were able to reach the brain and inhibit the enzyme³.

The effect of infusions on cholesterol bioavailability pointed out that some infusions were able to reduce cholesterol permeation⁴ and also to have some inhibitory effect on its biosynthesis⁴. These compounds are able to bind to serum proteins and while being bound they have no inhibitory activity⁵. Studies have indicated that phenolics are able to modify the cell proteome⁶. The infusions have also been shown to modify the amount of cholesterol transporter proteins in cell membrane and this maybe one of possible explanations for the reduction in cholesterol transport detected under the effect of infusions, on some people⁷ and on simulated intestinal barrier.

Keywords

Acetylcholinesterase, cholesterol, infusions, phenolics, intestinal barrier, cholesterol-transporter proteins

Acknowledgements

This work was financially supported by Fundação para a Ciência e Tecnologia (FCT) through the projects contract numbers: Pest – OE / QUI / UI0612 / 2013; UID / MULTI / 00612 / 2013, PEst-UID/AMB/50017/2013, BioISI (UID/MULTI/04046/2013).

References

1. Deardorff WJ, Fee E, Grossberg GT. (2015). The Use of Cholinesterase Inhibitors Across all Stages of Alzheimer's Disease. *Drugs Aging*, 32, 537-545.
2. Lepkowsky CM. (2018). Donepezil for Constipation in Lewy Body Disease: A Twelve-Month Follow-Up. *J Mol Genet Med*. 12, 1
3. Falé PLV, Madeira PJA, Florêncio MH, Ascensão L, Serralheiro MLM. (2011). Function of *Plectranthus Barbatus* Herbal Tea as Neuronal Acetylcholinesterase Inhibitor[†]. *Food Funct*, 2, 130-136.
4. Falé PL, Ferreira C, Maruzzella F, Florêncio MH, Frazão FN, Serralheiro MLM. (2013). Evaluation of cholesterol absorption and biosynthesis by decoctions of *Annona cherimola* leaves. *J Ethnopharmacol*, 150, 718-723.
5. Brito E, Silva A, Fale PLV, Pacheco R, Serralheiro A, Haris PI, Ascensão L, Serralheiro ML. (2018). Serum Albumin Modulates the Bioactivity of Rosmarinic Acid. *J Med Food* 21, <https://doi.org/10.1089/jmf.2017.0086>
6. Henriques J, Falé PL, Pacheco R, Florêncio MH, Serralheiro MLM. (2018). Phenolic compounds from *Actinidia deliciosa* leaves: Caco-2 Permeability, Enzyme Inhibitory Activity and Cell Protein Profile Studies. *JKSUS*, 30, 513-528.
7. Falé PL, Ferreira C, Rodrigues AM, Frazão MFN, Serralheiro MLM. (2014). Studies on the Molecular Mechanism of Cholesterol Reduction by *Fraxinus angustifolia*, *Peumus boldus*, *Cynara cardunculus* and *Pterospartum tridentatum* infusions. *J Med Plant Res*, 8, 9-17.

2st Session | Sessão 2 Alimentação e Doenças do Envelhecimento

Chairman | Moderador
Emília Alves

Keynote
Odete Vicente de Sousa

C.09 - Impact of Oral Nutritional Supplementation and a Psychomotor Rehabilitation Program on Community-Dwelling Alzheimer's Disease Older Adults

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Abstract / Resumo da Comunicação

In the present study, a 21-day small volume high protein energy-dense oral liquid supplement and a psychomotor rehabilitation program had a positive effect on nutritional and functional status of community-dwelling older adults with probable mild Alzheimer's disease (AD). An increase in Mini Nutritional Assessment (MNA) scores in both intervention groups [nutritional supplementation group (NSG) and nutritional supplementation psychomotor rehabilitation program group (NSPRG)] and body weight (kg) in the NSPRG, was observed. Moreover, these higher MNA scores were maintained after discontinuing intervention, at 90-day of follow up. Another positive finding was the functional status improvement among NSPRG at 90 days of follow-up.

It is therefore debatable whether the intervention focused solely on standard dietetic advice and oral nutritional supplementation (ONS) is enough to improve the nutritional and functional status. Indeed, in a systematic review by Liu et al.,¹ it was reported that "nutritional supplements," "training/education programs," "environment/routine modification," or "feeding assistance" showed low to moderate evidence in improving food intake, body weight and body mass index in older adults with dementia. Evidence is sparse concerning positive changes of nutritional, functional and cognitive status in community-dwelling patients with AD by any interventions. However, considering that decline in body composition and physical performance (muscle function) is associated with AD disease progression² as well as with a negative impact on health status and quality of life,^{3, 4} present results reveal the importance of providing an early ONS and a psychomotor rehabilitation program intervention in undernourished or nutritionally at risk community-dwelling older adults with mild probable AD. Besides, our results reinforce the importance of multidisciplinary intervention in community dwelling older adults with mild probable AD.

Keywords:

Alzheimer's disease, community-dwelling, Mini Nutritional Assessment, undernutrition, oral supplementation, psychomotor rehabilitation program.

References

- 1.Liu W, Cheon J, Thomas SA. Interventions on mealtime difficulties in older adults with dementia: a systematic review. *Int J Nurs Stud.* 2014;51(1):14-27.
- 2.Ousset J, Nourhashemi F, Reynish E, Vellas B. Nutritional status is associated with disease progression in very mild Alzheimer disease. *Alzheimer Dis Assoc Disord.* 2008;22(1):66-71.
- 3.Droogsma E, Asselt V, Scholzel-Dorenbos C, Steijn V, Walderveen V, Hoof V. Nutritional status of community-dwelling elderly with newly diagnosed Alzheimer's disease: prevalence of malnutrition and the relation of various factors to nutritional status. *J Nutr Health Aging.* 2013;17(7):606-10.
- 4.Droogsma E, Van Asselt D, Van Steijn J, Veeger N, Van Dusseldorp I, Deyn P. Nutritional interventions in community-dwelling Alzheimer patients with (risk of) undernutrition: a systematic review. *Int Psychogeriatr.* 2014;26(9):1445-53.

Invited Speaker | Prelector Convidado

C.10 - Food Bioactives and their contribution to prevent neurodegenerative diseases

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Abstract / Resumo da Comunicação

Neurodegenerative disorders comprise multifactorial disorders which are increasing and remain cureless. The possibility of altering the progression or the development of these diseases through diet is an emerging and attractive approach. Epidemiological and clinical studies have highlighted the health potential of diets rich in fruits and vegetables. These foods are sources of (poly)phenols, natural compounds described to have health benefits, having potential to prevent and/or retard the development of such disorders, by modulating several cellular and molecular pathways. The prevention and treatment of neurodegeneration, characterized by a mechanistic complexity, requires novel multi-targeted therapeutic strategies, targeting different disease hallmarks. In that sense, dietary (poly)phenols can emerge as a reliable pleiotropic alternative. However, the precise contribution of dietary (poly)phenols and their metabolites is still in the beginning of being elucidated. Absorption, blood concentrations and metabolic fate of some (poly)phenols is quite uncertain, which can hamper the research in terms of understanding their effects. In fact, it is necessary to identify the bioavailable metabolites resulting from dietary (poly)phenol, as well as their ability to overcome/interact with cellular barriers and reach target tissues. It will be reviewed the current knowledge about the polyphenols metabolites described to reach the brain and their mode of action.

Keywords: neurodegeneration; metabolism; polyphenols; blood brain barrier; dietary bioactives.

Speaker | Prelector

C.11 - Contribution of foods derived from cereals to the intake of vitamins B1 and B2 in the Portuguese diet

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Abstract / Resumo da Comunicação

Introduction: Cereals are a nutritionally relevant group due primarily to their richness in vitamins, especially water-soluble B-complex vitamins such as vitamin B1 and B2 and minerals. As such its consumption is important because they allow a good metabolization of carbohydrates, lipids and amino acids and a normal neuronal function. **Objectives:** To determine by HPLC the occurrence of vitamin B1 and B2 in samples of cereals and cereal products in order to evaluate their contribution to the intake of vitamin B1 and B2 in the Portuguese diet in adults. **Methods:** The analytical methodology used is based on the release of vitamins from the food matrix through acid hydrolysis and subsequent conversion of the phosphorylated forms into the corresponding free forms (thiamine and riboflavin) through an enzymatic treatment. Subsequently, these free forms are quantified through high performance reverse phase liquid chromatography (HPLC-RP) with fluorescence detector. **Results and Discussion:** With the exception of the rice sample, vitamin B1 and B2 are present in all samples studied. In the remaining samples, the levels found for vitamin B1 ranged from 0.02 to 0.5 mg / 100g. Since for this vitamin the RDI is 1.1 mg / day, the consumption of 100g of these foods can contribute to the intake of amounts of vitamin that vary between 1.3% and 45.5% of RDI. In the case of vitamin B2 the levels found vary between 0.014 and 1.1 mg / 100g corresponding respectively to 1.0% and 78.6% of the RDI which is 1.4 mg / day. **Conclusion:** This study allowed us to verify that foods from the group of cereals and cereal derivatives, especially the group of breakfast cereals contributes to a good contribution of vitamin B1 and B2 in the Portuguese diet in adults.

Key-words: cereals, thiamine, riboflavin, vitamin B1, vitamin B2, HPLC, RDI;

Invites Speaker | Prelector Convidado

C.12 - Frailty in Portuguese older adults: findings from Nutrition UP 65 study

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Abstract / Resumo da Comunicação

Introduction: The Nutrition UP 65 project was carried out to improve the knowledge about Portuguese older adults' nutritional status. Frailty has an increased relevance at an older age, due to its impact on health status and quality of life. Therefore, the aim of this work is to present the results of frailty frequency and its associated factors among older adults in Portugal.

Methods: Research findings concerning the results of Nutrition UP 65 study, namely about frailty status were gathered. 1457 older adults with 65 years or older, included in a cross-sectional analysis were evaluated. Sociodemographic and lifestyle characteristics were collected, and frailty was identified according to Fried's frailty phenotype definition.

Results: Pre-frailty was observed in 54.3% and frailty in 21.5% of the participants. Moreover, results from logistic regression analyses revealed that age >75, lower education level, being single, divorced or widower, being professionally inactive, poor self-perception of health status, not drinking alcohol, being obese and undernourished or at undernutrition risk were associated with frailty.

Conclusion: A high proportion of older adults in Portugal is frail or pre-frail. Several risk factors were identified in this study. This could be important to target older adults that may be vulnerable to frailty and to create public health strategies to manage this condition.

Keywords: frailty, older adults, nutritional status, community-dwelling

Chairman | Moderador
Bruno Sousa

Invited Speaker | Prelector Convidado

C.13 - Microencapsulation of food ingredients through spray drying

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Abstract / Resumo da Comunicação

The food sector has been constantly searching for new technologies that leads more practicality to the life of the consumer, and these technologies have take in account the sensorial and nutrition aspect. In this context, the development of new food products enriched with natural bioactive compounds have become an object of study and have been explored in the food industry. Researches in this area, has the focus of promoting technological quality, prolonging shelf life, adding flavors and desirable aromas, besides preventing some diseases when consumed regularly. The phenols, unsaturated fatty acids, carotenoids, and other important classes of compounds present in products of plant origin such as essential oils and vegetables, fruits and their seeds are the main compounds associated with these benefits. However, the application of these bioactive compounds in food formulations in their conventional form is limited due to instability and possible volatility and the microencapsulation through spray drying which appears as an alternative to promote greater stability and protection of the unstable compounds which guarantee the better incorporation of powdered food ingredients, in addition to ensuring the integrity of the compounds and a shelf life.

Key words: bioactive compound, food technology, microencapsulation, spray drying, new food.

Speaker | Prelector

C.14 - Effect of antioxidants from vegetables and fruits on Human Osteosarcoma U2-OS Cells

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Abstract / Resumo da Comunicação

Vegetables and fruits are the major natural sources of antioxidant compounds in human diet. The antioxidant activity of dietary phytochemicals attracted attention because of their role in the prevention and treatment of various human diseases. Regarding cancer, epidemiological data have consistently linked the consumption of fruits and vegetables to a reduced risk of several types of cancer. Although the majority of studies focus the effects of dietary antioxidants as chemopreventive agents, other reports suggest potential pharmacological anticancer properties. However, the available studies were carried out under different experimental conditions, precluding a comparative analysis of the anticancer properties of the compounds.

Osteosarcoma has a low overall incidence, but it is the third most common cancer in adolescence. Moreover, these cancers are generally locally aggressive and tend to produce early systemic metastases, justifying the search for novel therapeutic approaches.

This work evaluated the cytotoxic profile of nine antioxidants abundant in fruits and vegetables on the human osteosarcoma cell lines U2-OS: catechin, kaempferol, quercetin, ascorbic acid, resveratrol, β -carotene, melatonin, ferulic acid, and gallic acid. Cell viability was assessed using the crystal violet assay after exposure of cells for 24 h to concentrations of the compounds in the micromolar range. β -carotene and gallic acid considerably reduced U2-OS cell viability, with IC50 values of 18.8 μ M and 184.5 μ M, respectively. The remaining compounds did not markedly reduce cell viability. These results might contribute to the rational and evidence-based selection of antioxidants to be included in dietary-based anticancer strategies and to further explore possible food-inspired drugs.

Invited Speaker | *Prefector Convidado*

C.15 - Considerations for new food products for aging boomer consumers

Nelson Tavares

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Abstract / *Resumo da Comunicação*

Older customers will drive growth in developed markets. The elderly start to be a priority for food companies in developed markets. Yet they present a big opportunity: the demographic could account for more than half of all growth in urban consumption in developed markets in the next years. Dietary needs change with aging in several ways and elderly people become less active, their metabolism slows, their energy requirement decreases, all of which mean that they need to eat less. Protein intake, omega-3 fatty acids, fiber and micronutrients like vitamin E, B6, magnesium, vitamin B12, folate and vitamin D have an important role in maintaining health during aging. Functional foods may provide a health benefit beyond the traditional nutrients it contains for older adults that improve or maintain taste and smell, digestion, brain health, the immune system, bone and joint health, cardiovascular health, gut flora and eye health. Food developers and creators are making to understand what drives aging boomer consumers' food choices. The form, function, appeal and affordability are essential aspects in new products development.

Key words: new food, products, elderly, consumers, nutritional status

Panel Communications | Comunicações em Posters

Abstract List | Lista de Resumos Submetidos

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- P.02 **CYTOTOXIC EFFECTS OF THE DIETARY COMPOUND THYMOQUINONE IN HUMAN RENAL CANCER CELLS.** Jackson C., Keser V., Saraiva N., Almeida N., Costa J.G., Camões S.P., Castro M., Miranda J.P., Fernandes A.S., and Oliveira N.G.
- P.03 **MORPHOLOGICAL STRUCTURE OF CASTANHA-DO-BRAZIL OIL MICROPARTICLES PRODUCED BY SPRAY-DRYER.** Joyce Costa, Lourena Souza, Marcelo Ottoni, Pedro Campelo-Felix, Keyla Pereira
- P.04 **SENSORY ANALYSIS OF BITTER CHOCOLATE WITH BRAZIL NUT OIL MICROPARTICLES.** Joyce Costa, Lourena Souza, Jocilane Oliveira, Pedro Campelo-Felix, Keyla Pereira
- P.05 **ANTHROPOMETRIC CHARACTERIZATION OF PATIENTS OF A NUTRITION CONSULTATION.** JMariana Branco, Beatriz Brito, Lara Pombo, Lia Jesus, Emília Alves, Nelson Tavares, Bruno Sousa

P1 - The adherence to the Mediterranean Diet among a population of attendants of nutrition consultations

Barata A, Ramalho C, Pombo L, Jesus L, Alves E, Tavares N, Sousa B

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INTRODUCTION: The Mediterranean Diet (MD) is considered the most healthy and more sustainable food pattern in the world. The aim of this study is to evaluate the adherence to the MD among a population of users of Nutritionist's appointments.

METHODS: This study was carried out among a population of 43 adults, who are users of Nutritionist's appointments. Ages ranging from 18 to 71 years old, with an average age of 39.63 (± 15.03) years old, and 83.7% (n = 36) were female. To evaluate the adherence to the MD, the PREDIMED (PREvención with DIeta MEDiterránea) tool was used in the first consultation. All procedures comply with the ethical standards of the institutional body responsible for human research and experimentation, and with the principles of the "World Medical Association's Declaration of Helsinki".

RESULTS: It was observed that 18.6% (n=8) had a good adherence to the MD, with an average adherence index of 7.21 (± 2.06). It was also observed that the PREDIMED criteria with a lower commitment are wine consumption (11.6%; n=5), olive oil consumption (20.9%; n=9) and legumes consumption (23.3%; n=10). The highest adherence was observed in the use of olive oil as the main source of fat (100.0%; n=43), preference for white meat (81.4%; n=35), low consumption of sweetened beverages (72.1%; n=31) and consumption of sauces based on tomato, garlic, onion and olive oil (72.1%; n=31).

CONCLUSIONS: The low adherence to the MD and to most of its criteria shows the need to promote this kind of food pattern.

P2 - Cytotoxic effects of the dietary compound thymoquinone in human renal cancer cells

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Thymoquinone (TQ) is a monoterpene isolated from the oil of *Nigella sativa* seeds, known as black seed or black cumin. These seeds are commonly used as a spice, especially in Middle Eastern, Indian, and Pakistani cuisines, as well as in folk medicine for a wide range of ailments. In Muslim countries, *N. sativa* is used by cancer patients as dietary supplement along with chemotherapy. TQ, the most prominent constituent, has raised interest in the scientific community due to its hepatoprotective, anti-inflammatory, antioxidant and anti-cancer effects. Although several reports support beneficial effects of TQ in different types of cancer, its impact in renal clear cell carcinoma (rCCC) remains unknown. Kidney cancer is among the 10 most common cancers and is generally refractory to classical chemotherapy/radiotherapy. Therefore, other pharmacological options should be explored, namely natural compounds. We herein addressed the anticancer properties of TQ in human rCCC cells 786-O, analysing its cytotoxicity profile.

TQ decreased cell viability in a concentration- and time-dependent manner, showing low IC50 values (Crystal Violet and MTS assays). TQ also increased the sub-G1 population as shown by flow cytometry. From these studies a non-cytotoxic range of TQ concentrations was selected to be further used in migration and invasion studies. Overall, TQ exhibited a cytotoxicity profile in renal cancer cells that suggests potential anticancer properties, warranting further mechanistic studies.

Funding: Fundação para a Ciência e a Tecnologia (grants UID/DTP/04138/2013 to iMed.U LISBOA, UID/DTP/04567/2016 to CBIOS and PD/BD/114280/2016 to S.P.C.) and TUBITAK/003/2014.

P3 - Morphological structure of castanha-do-Brazil oil microparticles produced by spray-dryer

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The morphology of microparticles produced by atomization is relevant in the to evaluate the structure of food powders [1]. This work aimed to compare the morphological characteristics of Brazil nut oil microparticles produced by the spray-drying method. Whey protein isolate (WPI) and inulin (IN) were used in the following combinations: WPI, WPI/IN (4:1) and WPI/IN (3:2). Spray-drying was performed with a spray drier (Labmaq 1.0MSD, Ribeirão Preto, Brazil) with a 3 mm diameter double nozzle system in a drying chamber 670 x 200 mm in diameter. The spray-dryer operational conditions consisted of air flow of 40 l/min, air inlet temperature of 170 °C and air pressure of 400 kPa. The air outlet temperatures ranged from 101 to 107 °C and the feed flow rate was maintained at 0.70 l/h. Samples of 500 ml were used as feed solution for each treatment. The dry powder was collected and stored in opaque airtight containers at 4 °C until further analysis. The scanning electron microscopy (SEM) images showed similarity to all the treatments, presented spherical shapes, with no fractures or apparent cracks. The confocal scanning light microscopy (CSLM) micrographs confirmed the morphological results obtained with SEM. The light field, fluorescence and overlap images showed the distribution of the active material (Brazil nut oil) within the particulate structures. The authors thank Department of Food and Technology (UFVJM), Department of Pharmaceutical Sciences (UFVJM) and Faculty of Agrarian Science (UFAM).
Referências: [1] Pereira, K.C. et al., Brazilian Journal of Food Technology, (2018), Vol 21, 1-9. [2] Costa, J. M. G. et al. Powder Technology, (2015), Vol 274, p. 296- 304. [3] Campelo-Félix, P. H. et al., Journal of Agricultural and Food Chemistry, (2017), Vol 65, n.2, p.445-453.

P4 - Sensory analysis of bitter chocolate with Brazil nut oil microparticles

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Brazil nut oil has fatty acids, and oleic and linolenic are the major components. This study had the objective of evaluating the sensory acceptance of half bitter chocolate incorporated with OCB microparticles encapsulated with whey protein isolate (WPI) and inulin (IN) produced by the spray drying method, were used in the following formulations: T1 with 100% WPI, T2 WPI/IN (4:1) and T3 WPI/IN (3:2) [1,2,3]. For the sensorial analysis 100 testers were recruited, being 51% female and the analysis was approved by the research ethics committee (process n°: CAE: 77022517.4.1001.5108), the results were submitted to Principal Component Analysis (PCA), and obtaining the internal preference map and multidimensional preference analysis (MDPREF) using Senso Marker software, version 1.0. The TC (control) and T3 PIS: IN (3:2) formulations showed good sensory acceptance and high percentages of purchase intention, which may indicate a possible inclusion of this product in the market. It is expected that the aspects of scientific and technological innovation involved in this project foster interest in further research and highlight OCB as a food with high nutritional potential.

The authors thank Department of Food and Technology (UFVJM) and Faculty of Agrarian Science (UFAM).

References:

[1] Costa et al., Powder Technology, v. 274, p. 296-304, 2015

[2] Campelo et al., Journal of Microencapsulation, (2017), v. 34, p. 535-544.

[3] Pereira, K. V. and Costa J. M, Brazilian Journal of Food Technology., v. 21, 2018.

P5 - Anthropometric characterization of patients of a nutrition consultation

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School of Sciences and Health Technologies, Universidade Lusófona de Humanidades e Tecnologias

INTRODUCTION: Anthropometric measures such as body mass index (BMI), body fat percentage (%BF) or waist circumference (WC) are not only indicators of obesity but also commonly associated with chronic diseases and metabolic disturbances. The aim of this study is to characterize anthropometrically the patients that frequent a nutrition consultation, since this information is very scarce in the literature.

METHODS: A total of 43 patients participated in the study, of which 36 were female (83.7%) and presented an average mean age of 39.6 (± 15.0), ages between 18 and 71 years old. Weight (kg), height (cm) and WC (cm) were evaluated using standards procedures and the body mass index (BMI)(kg/m²) was calculated. To evaluate the body composition by bioimpedance was used the TANITA BC-418. The nutritional status and the risk of cardiovascular disease by WC were categorized using the World Health Organization (WHO) criteria.

RESULTS: At first appointment, 37% of the patients were pre-obese and 23% were obese. Using the criteria by %BF (greater than 25% for men and 35% for women) in our study, both men and women were within these parameters. Considering WC, 29% of female and 50% of male were in "incremented risk" of cardiovascular diseases, with almost 46% of women presenting a "high risk".

CONCLUSION: This population did not meet the recommendations, which shows the need to inform the population about the health risks associated.

O estudo respeitou os princípios éticos do World Medical Association's Declaration of Helsinki.