ICFD 2024

BOOK OF ABSTRACTS

8TH INTERNATIONAL CONFERENCE ON FOOD DIGESTION

Porto, Portugal | April 9-11th 2024

INFOGEST

U.PORTO FACULDADE DE FARMÁCIA UNIVERSIDADE DO PORTO

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WELCOME ADDRESS

Dear Colleagues & Friends,

On behalf of the Organizing and Scientific committees, we are delighted to welcome all of you to the city of Porto, Portugal, for the **8th International Conference on Food Digestion (ICFD2024)**. This conference is organized within the framework of INFOGEST, a global network created in 2011 that now gathers approximately 800 researchers (academics and food companies) from 300 institutions in 60 countries. An INFOGEST branch has been established in Latin America, facilitating collaboration between researchers from Europe and other continents, who will be connected during this conference.

As a cornerstone event in the field of Food, Nutrition, and Health, our goal is to enhance the health properties of food through the exchange of knowledge on the digestive process. **Over 400 delegates will engage in discussions covering the key themes of this conference**:

- Oral processing and sensory properties of foods
- Food structures, digestion and imaging technologies
- Bioaccessibility/absorption of beneficial and harmful compounds
- *In vitro*, *in vivo* and *in silico* models of digestion and absorption
- Impact of diet on gut microbiota

Thank you for joining us this week to experience the renowned warmth, hospitality, and rich culture of Portugal. Enjoy the science, the local food, the Porto Wine at its birthplace and our city. Porto, with its 800 years of history stands as a testemony of resilience and vitality. Designated as a UNESCO World Heritage site since 1996 and awarded several times as the World's Leading Touristic City Destination, it exudes charm and character at every turn.

The cultural night and conference dinner will be held at the historic heart of Vila Nova de Gaia, just a short distance from the center of Porto, offering an amazing view to the Porto city and Douro River. It is the perfect landscape to an unforgetable sunset, exquisite dinner and the enchanting melodies of our music.

The **FOODinteract Research Team** from the **University of Porto** and **LAQV (Associated Laboratory for Green Chemistry)** is committed to ensuring that ICFD2024 will be an unforgetable experience for all of you.

Professor Isabel M.P.L.V.O. Ferreira & Dr Miguel A. Faria
Chair & Co-chair of Organising Committee, University of Porto/LAQV

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TOPIC 2

BIOACCESSIBILITY/ABSORPTION OF BENEFICIAL AND HARMFUL COMPOUNDS

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Topic 2: Bioaccessibility/absorption of beneficial and harmful compounds | Poster

(22633) - THE INFLUENCE OF FOOD MATRIX ON THE IN VITRO DIGESTIBILITY OF WHOLEGRAIN CEREALS AND THEIR ANTIOXIDANT PROPERTIES

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Abstract

Wholegrain flours have drawn particular attention lately because of their potential to enhance life quality by preventing diseases linked to poor nutrition and by displaying numerous health benefits. The food matrix, which results in intricate relationships between specific chemical constituents and the food product's digestibility, is crucial to this subject. The objective of this study was to evaluate the nutritional potential of different oat and maize genotypes with varying grain colors as well as the antioxidant and digestive properties of microencapsulates obtained from blue maize. A modified in vitro multi-step digestion process comprising oral, gastric, duodenal, and colon phases was used to assess the digestibility of the investigated samples. The procedure developed by Hamzalıoğlu and Gökmen and proposed by Papillo et al. was carried out without any attempt to mimic the intricacies of gastrointestinal digestion. Oat hulls contained higher levels of total phenolic compounds and phenolic acids than flour. The majority of ferulic acid was found in the hulls and whole-grain flour. The oat hulls exhibited a greater antioxidant capacity. Conversely, the β-glucan level in the hulls was just 0.03–0.06%, whereas in the whole-grain oat flour samples it ranged from 4.07% to 5.33%. Brown whole-grain flour had the best *in vitro* digestibility (48.24%), followed by black (44.72%) and yellow oat flour (44.54%). Considering that the *in vitro* digestibility varied from 12.02% in the black genotype to 16.69% in the brown genotype, the powdered oat hulls' degradability was noticeably lower. Significant variations were found in the *in vitro* digestibility of all the studied maize flours. The highest digestibility was found in the flour of sweet maize hybrid (57.36%), while the lowest level was found in the flour of blue popping maize (19.67%). The pericarp was least affected by the digestive processes, while the germ showed the highest degree of degradation when it came to the digestibility of the various kernel sections. The microencapsulates had an average total free phenolic compound content of 31380 mg CE/kg. The initial raw material had an anthocyanin content of 1426 mg CGE/kg, whereas the average content in microencapsulates was 10677 mg CGE/kg. The microencapsulate digestion fluids containing 30% hydroxypropyl-β-cyclodextrin (HPCD) showed the highest anthocyanin residues (54-69%) after each *in vitro* phase. The microencapsulation system with 15% maltodextrin and 15% HPCD, on the other hand, demonstrated the least stability. As a result, these microencapsulates had the highest digestibility of 73.63%. The results indicate that the intricate processes of food degradation by digesting enzymes are significantly influenced by variations in chemical composition and inherent kernel structure. Nonetheless, more research on this specific topic is required in the near future.

References

Food Research International, 99, 2017, pp. 308–314.

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Keywords : maize, oats, in vitro digestibility, food matrix, antioxidant properties

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THANK YOU

MUITO OBRIGADO

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