A sustainable approach for valorization and nutritional characterization of dietary flour from different Brassica cultivars and its application in functional foods targeting elderly consumers

PhD Program: Innovación en Seguridad y Tecnologías Alimentarias, Universidad de Santiago de Compostela

Cristina Duarte 1,2,3, Elísabete Pinto 4, Manuela Vaz Velho 2

1. THE AIM OF THE STUDY

Several research studies reported the association of many ingredients of Atlantic Diet, including Brassica spp. consumption, to a preventive effect against chronic diseases. Thus, this research proposal aims the valorisation and nutritional characterization of dietary flours from different Brassica cultivars and its application in the enrichment of different food matrices targeting elderly consumers.

2. OBJECTIVES

1. Development of dietary flours from different Brassica cultivars

To obtain dietary flours from different Brassica cultivars such as Portuguese “Tronchuda” and Portuguese “Galega”, two autochthonous cabbages from the North of Portugal, under drying optimal conditions.

2. Evaluation of the quality of the final flours: nutritional and physicochemical characterization

To characterize the final Brassica flours from a nutritional, physicochemical and shelf-life point of view and evaluate their functional properties.

3. Development and optimization of new functional food products

New food products will be developed through their enrichment with the previously selected Brassica flours, included in the Index of Sead Adherence of the Southern European Atlantic Diet

4. To evaluate the stability of Brassica flours during storage and the bioaccessibility of food prototypes components, such as dietary fibre and antioxidants

Evaluating the impact of two Brassica flours and the final food prototypes on the intestinal microbiota composition and metabolic outputs under simulated gastrointestinal tract (SGI) conditions.

3. METHODOLOGY

Drying is one of the most important steps to produce dietary fibre flours and it is a very important tool for the retention of antioxidants; however, dehydration is unavoidably accompanied by physical, biological and chemical modifications.

Drying optimal conditions

Evaluation of the quality of the final flour

Bioactive compounds

Glucosinolates, Phenolic compounds and organic acids. The antioxidant activity will be determined by the colorimetric assay ABTS (2,2’-Azino-bis-(3-ethylbenzothiazoline-6-sulfonic acid) and DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging activity.

Development and optimization of new functional food

Soup and bread are typical meal items which will facilitate the acceptability of elderly consumers, who, usually, are not like to be receptive to great or disruptive food innovation. Several formulations and process-related are studied and nutritional quality and antioxidant activity are evaluated.

Bioaccessibility

Evaluation of the content and the bioaccessibility of dietary fibre and the main antioxidant bioactive compounds (ascorbic acid, total carotenoids, total soluble polyphenols) and total antioxidant capacity, provided by Brassica flours and in the food prototypes enriched with selected Brassica flours.

4. RESULTS SO FAR

Drying showed advantages on physicochemical characteristics and antioxidant activity of cabbage flours compared to the fresh samples. Brassica flours may constitute an important natural source of antioxidants to be applied to different food matrices.

5. FUTURE WORK