FORMULATION OF FOODS WITH HIGH ADDED VALUE BY SELECTION AND USE OF FUNCTIONAL MOLECULES OF PLANT ORIGIN

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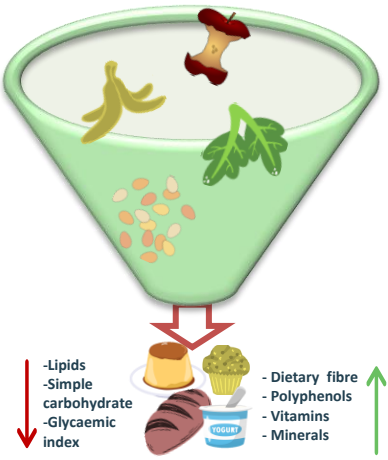
State of Art

Plant processing industries generate a large quantities of waste and by-products, approximately 50%, which are generally discarded or incinerated, causing environmental issues and economic losses (Padayachee et al., 2017). However, these waste and by-products can be exploited in different fields due to their richness in bioactive compounds like dietary fibre, proteins, essential fatty acids, polyphenols, vitamins, minerals and other phytochemicals (Gómez & Martinez, 2018). Many of these bioactive molecules have beneficial health effects: regulation of metabolic process, antioxidant activity, anti-cancer, anti-inflammatory (Rodríguez García & Raghavan, 2021). Recent years have been characterised by an increasing demand of functional foods due to the consumer awareness of the relationship between diet and health. Therefore, new valorisation strategies, based on circular economy, aim to exploit plant-based waste/by-products as a cheap source of bioactive compounds to be used for functional foods preparation. The transformation of these by products into a high added value product would represent an advantage not only for food industry but also for the environment.



Objective and Milestones

The objective of PhD project is the formulation of high added value foods through the use of plant-based waste or by-products. Studies on the stabilisation of waste/by-products, extraction of bioactive molecules and physical-chemical characterization of them will be carried out by using green techniques. The added foods will be subjected to nutritional, textural and sensory assessment. Moreover, the qualitative characteristics of innovative products will be monitored over the time through shelf-life studies and the consumer preference will be assessed by consumer tests.

Tab.1- Gantt diagram for PhD thesis project

	Work package/Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
WP0	Bibliographic search																								
WP1	Management of plant waste/by-products with different approaches																								
	1.1 Pre-treatment of waste and by-products																								
	1.2 Chemical and physical characterization																								
WP2	Use of waste/by-products and bioactive molecules in foods																								
	2.1 Formulation of foods																								
	2.2Nutritional, textural and sensory characterization																								
WP3	Assessment of the shelf-life of enriched products and consumer preference																								
	3.1 Shelf-life study																								
	3.2 Consumer test																								
WP4	Data processing, scientific papers and thesis writing and editing																								

References

Padayachee A, Day L, Howell K, Gidley MJ (2017). Complexity and health functionality of plant cell wall fibers from fruits and vegetables. Crit Rev Food Sci Nutr 57: 59-81.

Gómez M, Martinez MM (2018). Fruit and vegetable by-products as novel ingredients to improve the nutritional quality of baked goods. Crit Rev Food Sci Nutr 58: 2119-2135.

Rodríguez García SL, Raghavan V (2021). Green extraction techniques from fruit and vegetable waste to obtain bioactive compounds—A review. Crit Rev Food Sci Nutr 0:1-21.