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Improving nutritional value of food through use of bioprocessed agri-food by-products and/or wastes

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Background

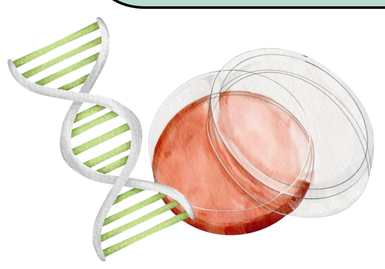
International policies indicate a radical transformation of agri-food systems by increasingly focusing on the recovery of processing residues, which includes both waste and by-products[1]. Additionally, recent studies have highlighted that the Climate Change is causing a depletion in the nutritional composition of many crops, contributing to an increase in health issues such as malnutrition among the global population[2].

Aim of the PhD project

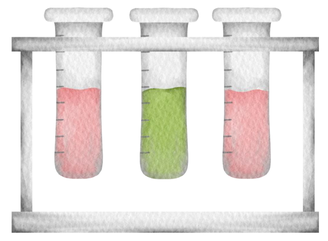
The aim is to improve the nutritional value of largely consumed foods throught fermentation by-products with microorganisms isolated from these matrices. This strategy could be effective to improve the bioavailability of nutritionally important compounds. Compositional data of *O. ficus-indica* (OFI) by-products suggest their potential as a valuable source of novel food ingredients for fortification to obtain new products[3].

Experimental chart

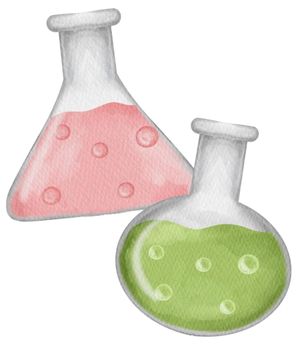
A1. Nutritional and microbial characterization of the by-products



A2. Isolation and selection of pro-technological microorganisms from spontaneously fermented by-products



A3. Development of the fermentation protocol of by-products with microorganisms isolated from the matrix



A4. Characterization of fermented by-products Microbiological and Chemical characterization

A5. Production of fortified food with fermented by-product

A6. Writing and Editing

Table 1. Gantt diagram the PhD thesis project for next twenty-four 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
A1																								
A2																								
A3																								
A4																								
A5																								
A6																								

References

[1] Gómez-García R, Campos DA, Aguilar CN, Madureira AR, Pintado M (2021) Valorisation of food agro-industrial by-products: From the past to the present and perspectives, *Journal of Environmental Management*. ***299***, 113571.
[2] Dietz WH (2020) Climate change and malnutrition: we need to act now, *The Journal of clinical investigation.* **130**(2), 556-558.
[3] Bellumori M, Innocenti M, Andrenelli L, Melani F, Cecchi L, Pandino G, Mauromicale G, La Malfa S, Mulinacci N (2023) Composition of discarded Sicilian fruits of Opuntia ficus indica L.: Phenolic content, mineral profile and antioxidant activity in peel, seeds and whole fruit, *Food Chemistry.* **428**,136756.