

Application of innovative technologies for the functionalization of legume flours

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Background

Due to the rise of plant-based products, companies are using more and more legume flour; however, they are characterized by some technological issues, such as low viscosity, low solubility.... Thus, different modification techniques have emerged to address those issues, among them physical non thermal treatment showed interesting potentialities.



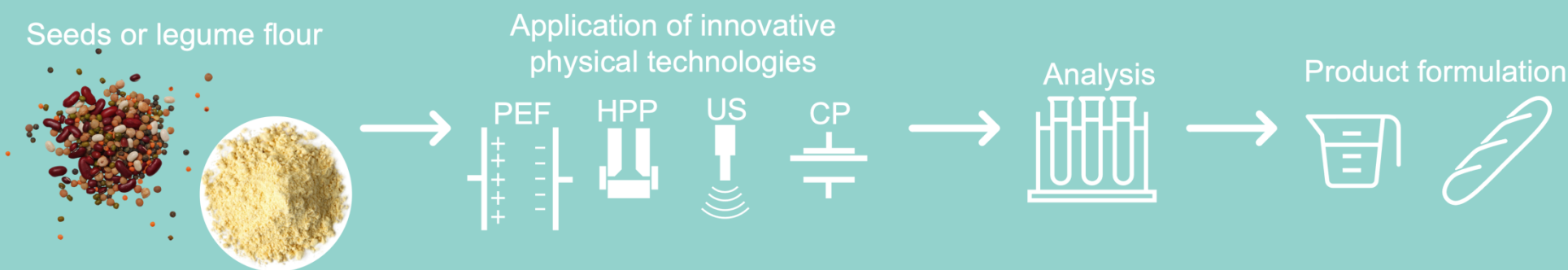
Literature: Good Food Institute, 2023; Akharume FU et al., 2021

Project Goals

- Apply innovative physical treatments such as Ultrasounds (US), Pulsed Electric Fields (PEF), Cold Plasma (CP) and High Pressure Processing (HPP)
- Understand the main effect on the legume flour components such as starch and protein
- Use the obtained modified flours to develop food products with improved qualities

Experimental Approach

Here a schematization of the main steps of the experimental approach used:



Expected Outcomes

Results showed improved functionalities of the treated products. For example, upon high pressure homogenization (left graph), chickpea flour formed better foams. Thus, making it more useful when air retention is a key aspect, such as in baking gluten free breads. Another example is the formation of stronger gel when heating pea protein isolate upon cold plasma treatment (right graph). The improved and modified techno-functionalities may widen the use of legume flours for different food applications, thus increasing their value and the overall sustainability of the food sector.

