Understanding protein interactions to reduce astringency perception

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The growth of plant-based food products has been incredible over the last years to answer the need for more sustainable and healthier sources of proteins. In this context, pulses (pea, chickpea, lentils, faba bean, …) are considered to be a particularly promising source of proteins to make plant-based dairy alternatives. However, their sensory acceptability is a major limiting factor for their wide popularity with a negative impact of sensory characteristics such as beany off-flavor, bitterness, or astringency on the overall acceptability of consumers.\(^1\)\(^2\)

Astringency is a complex sensation described as a sensation of drying-out and roughening in the mouth. The mechanisms leading to its perception are still discussed, and innovative approaches are needed to gain a better understanding of the mechanisms responsible for astringency perception.

The current research is based on the hypothesis that astringency is produced by interactions occurring between highly reactive plant proteins of the food matrix and human salivary proteins. As little is known about the reactivity of plant proteins with salivary proteins, the first step is to identify the highly reactive plant and salivary proteins. The reduction of astringency will then be obtained by preventing protein interactions and reducing the reactivity of the identified binding sites.

The goal of this project is to fractionate pea protein flour to obtain different pure fractions of pea proteins. The interactions between the plant protein fractions and human saliva will be investigated and characterized to be able to modulate these interactions. This is part of a multidisciplinary project with the ultimate objective to transfer the results to food applications, and with opportunities to discuss with the industrial partners of the project.

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\(^1\) Sethi, Tyagi, et Anurag, « Plant-Based Milk Alternatives an Emerging Segment of Functional Beverages ».

\(^2\) Kundu, Dhankhar, et Sharma, « Development of Non Dairy Milk Alternative Using Soymilk and Almond Milk ». 