

Protein aggregates to replace texturing agents in clean label dairy products

GARRIC G. (1)

1 INRAE, Rennes, France

The PROFILAP project [April 2021 - March 2022] aimed to produce and use protein aggregates studied in PROFIL in order to replace the usual texturing agents such as carrageenans and modified starches in two selected "clean label" dairy products, the cream desserts and the cream cheeses.

In detail, we first inventoried various protein aggregates amongst fractal or microgel ones, and then selected and characterised the most functional one, i.e. large fractal aggregates, regarding the 2 selected dairy products. Then, we optimised their manufacture by studying the effect of 1. [whey protein isolate (WPI)], 2. [NaCl], 3. [OH⁻] ramp, 4. thermal scale, 5. flow regime and 6. type of chambering i.e. static or dynamic.

Then, all the levers influencing the development of the best technological itinerary to manufacture the 2 selected dairy products were studied: contents of protein aggregates and fat, homogenization parameters such as the number of passes, the pressures on the first and second head and the temperatures throughout the process were studied in order to build the most robust and sober technological itinerary from the bench scale to the pilot scale. Finally, two continuous technological routes were developed up to a scale of 500 l.h⁻¹.

Once optimised, the two target products were organoleptically tested at ONIRIS by a panel of 54 tasters. For the most successful product, the cream dessert, an overall score of 15.50/20 combining textural and sensory characteristics was awarded, proving the potential of the technology. Similarly, the viscosity and the firmness of the current creams and of creams from the market were similar.

The proof of concept is thus made that texturizers can be replaced in some dairy products by protein aggregates to obtain "clean label" products or to design new products such as cereal- or legume-based desserts or other mixed products.