

Active proteins with more functionality

16

Proteins play an important role in food for its nutritional value but also as structuring agents. One role of protein is its water holding capacity, for which it is used in sausage, noodles and meat substitutes, for example. TNO investigates the functionality and health-promoting value of such protein compounds. An initial successful study for Bouwhuis Enthoven has led to a second collaboration.

In the study of food quality and production, TNO focuses on the development of health-promoting and functional ingredients for future market needs. Such projects involve close customer collaboration and this is the case in the field of bioactive protein ingredients, TNO's Dr Anneke Martin explains. 'For instance, we work closely with Bouwhuis Enthoven, a protein powder producer, which is very involved in the research. This is key to being able to make the step from lab scale to plant process.'

FUNCTIONALITY

Collaboration with Bouwhuis Enthoven began with a study of the bioactivity of egg protein components. This project, part of the knowledge development being co-financed by the Ministry of Economic Affairs and with co-funding from Bouwhuis Enthoven, began with a literature review. 'We investigated whether there are egg ingredients that have a favourable effect on health and can thus help produce healthier food. We found an interesting component, ovomucin, which has a positive impact on cholesterol. The results are promising, and final experiments are in

preparation.' The literature review also came up with another component: ovalbumin, the main constituent of egg protein powder. A spin-off from the first project is now being geared to improving the functionality of this component.

Whereas the first project targeted the health angle, the emphasis in the second project is on optimising functionality. In contrast to milk protein, ovalbumin hardly unfolds when heated, which means that it is not very accessible for interactions with other ingredients and can not be optimally used for water binding. 'If we can change the structure, that would have a positive effect on functionality. And it would also be positive in terms of sustainability because this protein can be more widely used, and energy and transport costs could be reduced,' Martin explains. 'And if it succeeds, we could also offer the same functionality using less raw material, which would cut the cost price,' adds Jan Zijderfeld, executive director and product manager of Bouwhuis Enthoven.

MORE INSIGHT

The new project comes within the 'Food & Nutrition Delta' (FND) innovation programme and is just into its second year. Martin: 'Initial results look good and biochemically we can see changes in the protein structure. It is now a question of putting it into products like sausage or gels. Only then will we be able to see the extent to which the functionality has actually been changed.'

Zijderfeld reckons the next few months will be exciting. 'We are at a crossroads. Hopefully the results will be positive. Collaboration with TNO has certainly been instructive for us. Whether we reach our research target or not, we have gained greater insight into our product. And that is perhaps just as valuable.'

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'Hot cream' treatment of crystal protein. By drying the protein on a sheet at a particular time-temperature combination, the structure of the protein changes. It thus acquires the optimum functionality to be used as a filling in products like chocolate éclairs.

Photo: Bouwhuis Enthoven