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Innovating with assemblies of animal- and plant-based proteins



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Hinderink E. *et al.*

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Current Opinion in Colloid & Interface Science . 2021

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Mixing milk, egg and plant resources to obtain safe and tasty foods with environmental and health benefits

Trends in Food Science & Technology . 2021

<https://doi.org/10.1016/j.tifs.2020.12.010>

Partnerships

- Wageningen University & Research (WUR)

Contacts

Claire Berton-Carabin, Adeline Boire, Valérie Gagnaire and Fanny Guyomarc'h

UR BIA and UMR STLO

claire.berton-carabin@inrae.fr

adeline.boire@inrae.fr

valerie.gagnaire@inrae.fr

fanny.guyomarc-h@inrae.fr



Context

The increasing consumption of animal proteins by populations in developed countries places unsustainable pressure on resources and increases the prevalence of chronic metabolic diseases such as inflammatory bowel disease and cancer. The challenge of replacing animal proteins with plant-based proteins in Western diets involves successfully transitioning towards healthier and more sustainable food. For many consumers, this transition will only be acceptable if they have a choice of food products that are appealing, convenient and affordable. One possible solution is to offer innovative mixed products combining dairy, egg and/or plant-based proteins to consumers who find vegan products unappealing or reject them altogether.

Results

To make this happen, the animal and plant sectors need information to drive their development and innovation activities forward. Recent research undertaken by the TRANSFORM teams describes interaction mechanisms between animal- and plant-based proteins. Dispersing proteins in the form of coacervates or heat-induced aggregates thus offers an effective technological solution to the instability that plant-based proteins are commonly known for. An intimate

understanding of interactions can also help diversify the texture of food gels, foams and emulsions to enable the use of plant-based proteins in foods that the public is more inclined to accept than purely plant-based foods. These 'mixed' or 'hybrid' foods provide essential amino acids and vitamins that are sometimes lacking in vegan diets. Fermentation further enhances this performance by degrading indigestible or anti-nutritional compounds arising from the plant fraction and by producing pleasant aromas. Hedonic testing has shown that these mixed foods are a lever for improving the extent to which Western consumers accept plant proteins.

Future outlook

This global investigation of innovative mixed foods, from the molecular scale and manufacturing and functional properties to consumer preferences, seeks to provide a multi-criteria assessment of sensory, economic, health and environmental performance aspects. A benefit-risk analysis would also be useful in better identifying the effects of the various components of animal and plant fractions. This knowledge could open up areas in which the plant and animal sectors could complement rather than replace each other.