

## **Position Paper – Roundtable Discussion on a Sustainable, Healthy and Profitable Food Production Chain**

**Submitted by: MNEXT – Centre of Expertise Material and Energy Transition, Avans University of Applied Sciences & HZ University of Applied Sciences**

MNEXT, the Centre of Expertise Material and Energy Transition of Avans and HZ Universities of Applied Sciences, works across sectors to accelerate the transition toward a sustainable, circular economy. In the agri-food domain, we agree on the vision of developing fair and future-proof food systems by integrating applied research, innovation, and education.

A healthy and sustainable food production chain must also offer a viable business model for the farmer. Yet in practice, those who take the lead in reducing environmental impact or valorizing residual streams often face economic challenges. At MNEXT, we support the development of circular business models that help producers create value from side streams, reduce waste, and access new markets. We believe in biomass cascading. This means prioritizing food and feed first, then using residual streams for materials and energy to maximize resource value.

Projects such as [Feeding Refineries](#), [ReJuice](#), [Duurzaam van Ui naar Olie](#), and [From Orange Waste to a Green Future](#) demonstrate how agricultural residues—from onion peels to citrus pulp—can be transformed into valuable inputs for food, feed, cosmetics, and packaging. While projects like [BioADD 2.0](#) focus on biobased farming materials that are biodegradable and affordable, bringing practical solutions to environmental impacts. These innovations contribute directly to more resilient business cases for farmers and processors, while reducing pressure on ecosystems.

Worth mentioning, our Smart Fermentation team (led by associate lector Dr. Miaomiao Zhou) specializes in precision fermentation and digital bioprocessing. This group has the expertise in developing microbial platforms for cellular agriculture, including the production of alternative proteins and functional ingredients without traditional animal farming. These innovations can help meet nutritional needs while lowering the environmental footprint of the food system. With strong expertise in strain engineering and process modeling, the team is well-positioned to support the Netherlands' leadership in sustainable protein transitions.

Zeeland, with its unique interplay between marine and terrestrial ecosystems, offers an exceptional testbed for integrated food system innovation. The proximity of sea and land enables cross-sectoral approaches; linking agriculture, aquaculture, water management, and biodiversity in ways that few other regions can. This makes Zeeland not only a region of opportunity, but also a model for future-proof food production in delta areas and beyond.

Practice-based (applied) research plays a pivotal role in realizing this potential. Not by studying sustainability challenges from a distance, but by working closely with local producers to co-develop, test, and refine innovations under real-life conditions. Techniques such as saline farming, soil and water management, and nature-inclusive agriculture are shaped and validated in collaboration with farmers, fishers, and food entrepreneurs. This approach ensures that solutions are not only ecologically effective, but also economically viable and practically applicable.

At the same time, our research spans the entire food chain: from production to consumption. Our research teams collaborate with SMEs to develop and reformulate food products that are both healthier and more sustainable, reducing salt, sugar, and fat, while incorporating locally sourced ingredients. In Zeeland, this includes unlocking the potential of regional specialties, such as legumes, as promising plant-based protein sources well suited to the local soil and climate. Simultaneously,

we investigate the role of sustainable marine proteins, such as mussels, seaweed, and algae, as vital elements of the protein transition.

These local opportunities are integrated into amongst others the development of hybrid food products that combine plant, marine, and fermentation-based proteins. By doing this nutritious and climate-resilient alternatives are offered to traditional animal-based foods. By embedding this innovation within the regional context and working directly with producers and processors, we create scalable, locally rooted solutions that support both the regional economy and national sustainability goals.

A sustainable food system also needs people with the right skills and mindset. At MNEXT, we invest in human capital through programs such as [FermiChem](#) and [Green EGGCh](#), which train future professionals in green chemistry, fermentation, and biobased production. By combining technical education with system thinking, we prepare a new generation to shape the sustainable food economy

To make this transition possible, the private sector needs long-term policy clarity, investment in applied research, and space for experimentation. MNEXT is committed to enabling this shift—through innovation, education, and collaboration with all partners in the food value chain.

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