Session 3	Artificial Intelligence in service of biomanufacturing
Pitch Title	AI and Precision Fermentation for Sustainable Plant-Based Food Production
Company	Wageningen University & Research
Speaker	
Keywords feedstock	Plant-based substrates, side-streams
Keywords technology	AI, flavor volatiles, optical spectroscopy, scaling
Keywords End-Product	Industrial processes for optimized flavour volatile profiles

Abstract:

The food industry faces growing demands for sustainable production methods while delivering nutritious, high-quality, and flavorful products. One challenge hindering the growth of plant-based meat and dairy alternatives is the difference in sensory properties compared to their animal-based counterparts.

Within a Public Private Partnership initiative coined ALL-INFORMED we seek to transform this by using artificial intelligence (AI) to optimize fermentation processes and improve the sensory experience of plant-based foods. The AI will analyze vast datasets from combinatorial fermentations, predicting and enhancing aroma profiles similar to meat and dairy, while minimizing off-notes. Through advanced analytical tools high-resolution mass spectrometry (HRMS), the AI tool will predict natural, clean-label flavors from plant proteins and food processing side streams, whilst NIR will be employed fro reproducible scaling. Additionally, in a follow-up project we will integrate insights from the optical spectroscopy analyses to allow full process control of fermentations at an industrial scale. This is employed both in standard fermentation process as well as more advanced processes such as precision fermentation.