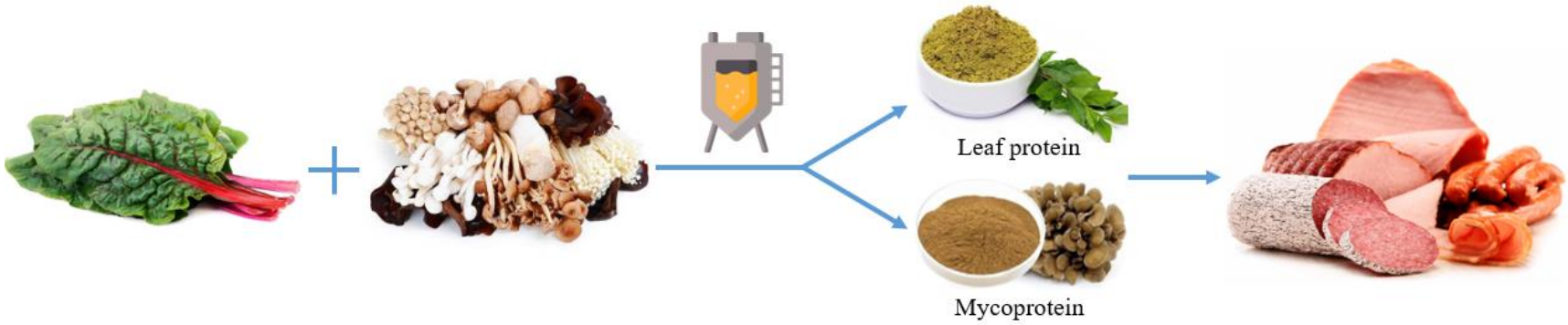
UNIVERSITÄT HOHENHEIM
Institute of Food Science and Biotechnology
Department of Flavor Chemistry

Bachelor thesis -Project work- Master thesis – from March 2025

Building-up efficient fungi bio-factory applied for sustainable production of functional leaf protein from leaf biomass

Leaf protein presents significant potential for sustainable food systems, attributed to its functional properties and availability from diverse agricultural by-products, such as sugar beet leaves. These leaves, a widely available crop by-product, contain approximately 30% protein, with over 40% comprising essential amino acids, underscoring their value as a protein source. However, current processing technologies struggle to break down their rigid cell walls and often generate an undesirable green odor, resulting in low productivity. This indicates the need for innovative and sustainable approaches to leaf protein development.

The project aims to establish a scalable fungal fermentation system that degrades plant cell wall components and reduces green odors, facilitating sustainable production of functional protein extracts with minimal sensory issues. This approach reliably extracts leaf protein and other functional ingredients from leafy side streams for use in meat analogues, 3D-printed foods, and other applications. Aroma optimization via fungal enzymes will enhance palatability without artificial flavors. In line with circular bioeconomy principles, this integrated process will produce leaf protein and mycoprotein cost-effectively, using less energy, heat, and chemicals, while allowing controllable sensory and functional qualities.



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