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BOOK OF ABSTRACTS

Valorization of vegetable side streams into high-quality and low-processed fermented foods for human consumption using solid-state fermentation.

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● One-third of the food produced for human consumption is lost across the food value chain, amounting to 1.3 billion tons per year. The vegetable processing industry generates substantial food-grade side streams that are commonly discarded despite their nutritional value, primarily due to safety concerns and high consumer expectations. This study explores the potential of solid-state fermentation (SSF) to valorize two of such streams – white button mushroom and mung bean sprout production residues – into safe, palatable, and protein-rich food prototypes for human consumption. Inspired by traditional tempeh production, we developed a two-step fermentation approach adapted for vegetable streams. First, selected lactic acid bacteria (LAB) strains were screened for their ability to rapidly acidify low-moisture substrates, enhancing safety by suppressing pathogens. Subsequently, various filamentous fungi, including *Rhizopus* spp. and *Aspergillus* spp., were evaluated for their ability to generate a compact, protein-rich texture through mycelial growth. The resulting prototypes were then assessed for a range of possible industrial applications and post-processed to yield scalable food products. Our results demonstrate that SSF can effectively transform vegetable side streams into nutritious fermented foods with potential consumer appeal. This approach presents a scalable, circular solution that aligns with sustainable food production goals and paves the way for next-generation plant-based food products.

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