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VALORISATION OF BREWER'S SPENT YEAST BY-PRODUCTS: SUSTAINABLE INNOVATIONS FOR ALTERNATIVE PROTEIN DEVELOPMENT

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Background: The food industry generates substantial food losses and waste, significantly impacting the environment. To address this, industries are exploring innovative strategies to valorise these by-products, recognising their potential as sources of valuable compounds. Among these by-products, brewer's spent yeast (SBY) is a notable residue from the brewing process. It has a rich nutritional composition and is high in proteins and carbohydrates. This makes SBY a promising candidate for use as a food ingredient, aligning with sustainability goals, promoting healthy lifestyles, and adhering to circular economy principles. This study aims to transform SBY into high-value ingredients suitable for incorporating protein-enriched food formulations.

Methodology: The investigation involves the compositional analysis of the SBY and explores the production of new fractions by combining an autolysis process with fractionation by membrane filtration to obtain functional fractions. Size exclusion high-performance liquid chromatography (SE-HPLC) analysis performed on the obtained fractions showed a chromatography profile with high diversity in the molecular size distribution. The obtained fractions were dried, and their bioactivities, including antioxidant capacities and phenolic content, were assessed.

Results: Our results demonstrate the successful production of a high-protein food ingredient from SBY, positioning it as a promising ingredient for formulating various protein-enriched foods. This study underscores the potential of utilising by-products to create value-added ingredients, contributing to the sustainability and circular economy goals within the food industry and providing reassurance about the feasibility of our research.

Keywords: BSY by-product, Protein-enriched foods, Sustainable process, Circular food systems.

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This work is in line with the United Nations Sustainable Development Goals (2030 Agenda), particularly Goal 3 (ensure healthy lives and promote well-being for all at all ages) and Goal 12 (ensure sustainable consumption and production patterns). Producing protein extracts from sustainable sources aims to improve access to high-quality protein, thereby creating healthier food options. Additionally, using by-products such as BSY promotes a circular economy in the food industry, enhancing both production and consumption sustainability.

