

Valorization of industrial oat by-products through the design of high-value ingredients to be incorporated in food formulations

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Cereals are an important food source for a significant portion of the global population, and their processing generates substantial quantities of by-products. To promote sustainability and healthy lifestyles, industries are seeking innovative approaches to manage these by-products, which can serve as an economical source of diverse compounds. Oats, which are highly nutritious cereal grains consume worldwide, are particularly rich in soluble fiber, which can lower cholesterol levels, regulate blood sugar levels, and improve gut health. The present work aimed to transform an oat drink by-product into an added-value product that could be used in the formulation of different types of foods. After studying the oat by-product composition, it was subject to aqueous thermal hydrolysis and the resulting liquid and solid fractions were separated by centrifugation (10000 rpm, 10 min). The solid fraction was dried, milled to a particle size of 500 nm, and bleached. The decolored product was washed with distilled water and subsequently centrifuged at 8,000 rpm for 5 minutes. The color of the flour was evaluated through the use of a colorimeter reporting values of 4.76 ± 0.89 for L^* , 5.25 ± 0.24 for a^* and 11.61 ± 0.32 for b^* . The resulting flour had a high protein content of 31.0 ± 2.1 g/100 DW, total dietary fiber 38.7 ± 0.8 g/100 DW and β -glucans 8.54 ± 0.16 g/100 DW. In conclusion, it was possible to obtain a bleached flour with high protein and soluble fiber concentrations, making its use a very promising ingredient for the formulation of different protein-enriched foods including pastry/bakery products, fruit preparations and/or yoghurts. Overall, this study demonstrates the potential for using by-products to create added-value products and promote sustainability in the food industry.