

NOVEL EXTRACTION TECHNOLOGIES APPLIED FOR PROTEIN RECOVERY FROM OILSEED PROCESSING BY-PRODUCTS

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ABSTRACT

The objective of this work was to evaluate the efficient recovery of proteins from oilseeds processing side streams via the implementation of conventional and novel extraction technologies^[1-2].

By-products from edible oil industry, and specifically defatted sunflower and canola press cake, were used as raw material for the recovery of proteins through conventional and novel technologies, including Microwave Assisted Extraction (MAE), Ultrasound Assisted Extraction (UAE) and Pressurized Liquid Extraction (PLE). Following the alkaline extraction at pH 8 (using NaOH aqueous solutions) of the sunflower and canola press cakes, the soluble proteins were precipitated by adjusting the pH to their isoelectric point (PI) and the residues were freeze-dried to obtain the protein isolates. The extraction parameters including solid-liquid ratio (1:10, 1:25, 1:50), microwave and ultrasound power, pressure and extraction time (5, 10, 20 and 60 min) were optimized in order to achieve high protein recovery yields. The protein content of the extracts was evaluated using analytical technologies, such as Kjeldahl method, and the proteins' amino acid profile was determined using HPLC-DAD.

According to the results of this research, protein extracts from canola and sunflower flours can be effectively recovered via the studied methods presenting recovery yields from 30 to 60%. The novel technologies resulted in higher yields decreasing the extraction time using green solvents and leading to the production of high-standards proteins. Canola's and sunflower's protein content was calculated 33% and 75%, respectively. Valorisation of solid residues from edible oil industry is of high interest, contributing to circular economy and sustainability. The recovery of high yield extracted content using novel extraction methods, such as MAE, UAE and PLE, resulted in high value protein with promising application in various fields.

KEYWORDS: oilseed processing by-products, extraction, protein

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