



UMS
UNIVERSITI MALAYSIA SABAH



University of Novi Sad
**INSTITUTE
OF FOOD
TECHNOLOGY
IN NOVI SAD**

BOOK OF PROGRAMME AND ABSTRACTS



INTERNATIONAL CONFERENCE ON FOOD SECURITY 2025 (ICFS2025)

*"Exploring cutting-edge research and innovation in
food security for a better tomorrow"*

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 **Virtual
Conference**



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Sustainable Extraction Approaches for Improved Nutritional and Safety Profiles of Rapeseed Protein Isolates

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Abstract: Rapeseed cake obtained after oil extraction represents a valuable source of plant-based proteins with a balanced amino acid profile, making it suitable for incorporation into various food products. However, its broader application in food formulations is limited by the presence of antinutritional compounds such as phytic acid, glucosinolates, and polyphenols, which decrease protein bioavailability, impair sensory quality, and reduce overall nutritional value by forming insoluble complexes with proteins and minerals. Therefore, the development of extraction strategies that preserve protein integrity while minimizing the content of these undesirable compounds is crucial for improving the quality of rapeseed protein isolates. In this study, defatted rapeseed cake was subjected to ultrasound-assisted ethanol pretreatment to remove phenolic compounds prior to protein extraction, followed by protein isolation using three solvent systems: conventional alkaline extraction and two environmentally friendly deep eutectic solvent systems operating under near-neutral and acidic conditions. The isolates were analyzed for residual phenolic compounds, tannins, phytic acid, and glucosinolates to evaluate the efficiency of each extraction method. Alkaline extraction resulted in the highest retention of phenolics and tannins, indicating enhanced solubilization of these compounds under alkaline conditions, while deep eutectic solvent-based extractions produced isolates with markedly reduced levels of phenolic compounds and tannins, though slightly higher phytic acid content was observed. Glucosinolates were not detected in any of the isolates. Overall, the combination of ethanol pretreatment and deep eutectic solvent extraction proved to be an effective strategy for reducing major antinutritional factors in rapeseed protein isolates, offering a promising approach for producing nutritionally improved and sensory acceptable plant-based protein isolates for food applications.

Keywords: Rapeseed protein; antinutritional factors; alkaline extraction; green extraction; sustainability