



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
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TABLE OF CONTENTS



i	Welcoming Message from the Vice-Chancellor of Universiti Malaysia Sabah
ii	Welcoming Message from the Dean of the Faculty of Food Science and Nutrition, Universiti Malaysia Sabah
iii	Welcoming Message from the Chairperson of the International Conference on Food Security 2025 (ICFS2025)
01-02	Committee Members
03	Speakers
04-16	Conference Schedule
17-32	List of Abstracts
33-136	Abstracts
137-140	Sponsorship
141	Acknowledgement

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Effect of Different Heat Treatments on Techno-Functional Properties of Pea (*Pisum sativum* L.) Flours

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Abstract: The valorization of legumes as sustainable protein sources depends largely on understanding how processing affects their techno-functional properties. This study aimed to evaluate the impact of various heat treatments on the water absorption index (WAI), water solubility index (WSI), and swelling power (SP) of two pea cultivars, “Dunav” and “Tamiš”. Raw seeds were subjected to different heat treatments: cooking (95°C/35 min), microwave roasting (2 min), autoclaving (121°C/20 min), oven roasting (120°C/30 min and 160°C/30 min), and air frying (180°C/16 min). Results revealed that cultivar “Tamiš” exhibited consistently higher WAI, WSI, and SP values compared to “Dunav”, indicating a better hydration and swelling capacity. Cooking significantly increased WAI (up to 3.72 g/g) and SP (up to 4.45 g/g), likely due to starch gelatinization and unfolding of protein structures, exposing polar amino acids and enhancing water binding. Conversely, WSI was highest in raw samples (0.17–0.21 g/g) and decreased upon heat treatment, possibly due to the formation of protein–carbohydrate complexes with reduced solubility. Moderate oven roasting at 120°C showed a similar positive effect on SP as cooking, suggesting that mild thermal conditions can optimize starch–protein interactions without excessive denaturation. These findings highlight the role of thermal processing in tailoring functional properties of pea flours for plant-based food formulations. Cooking and mild roasting can enhance water retention and swelling, crucial for improving texture, mouthfeel, and stability of legume-derived products, supporting their broader use in sustainable food applications.

Keywords: Pea flour; heat treatment; techno-functional properties; protein denaturation