



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"*

 **11-12
November 2025**

 **Virtual
Conference**



EXECUTIVE COMMITTEE MEMBERS

PATRON

Professor Datuk Dr. Kasim Hj. Mansor

ADVISORS

Professor Ts. Dr. Hasmadi Mamat
Ts. Dr. Fan Hui Yin

CHAIRPERSON

Professor Dr. Chye Fook Yee

DEPUTY CHAIRPERSON

Associate Professor Dr. Lee Jau Shya

SECRETARY

Mdm. Noorfarahzilah Masri

SECRETARIAT AND REGISTRATION

Dr. Khadidja Chekima

TREASURER

Dr. Adilah Md Ramli

SCIENTIFIC

Dr. Siew Chee Kiong

PUBLICITY AND PROMOTION

Ts. Dr. Ahmad Hazim Abdul Aziz

WEB AND TECHNICAL

Dr. Chan Pei Teng

SPONSORSHIP

Associate Professor Chm. Dr. Norliza Julmohammad

GRAPHIC DESIGN

Mdm. Jayanti Jamaluddin

PROTOCOL AND MEDIA

Dr. Nur Hanisah Azmi

EVENT COORDINATOR

Dr. Sylvester Mantihal

COMMITTEE MEMBERS

SECRETARY

Mdm. Noorfarahzilah Masri
Mdm. Marlina Yacho

SECRETARIAT AND REGISTRATION

Dr. Khadidja Chekima (Leader)
Dr. Ainaa Almardhiyah Abdul Rashid
Dr. Oliver Dean John
Ms. Felicia Ling Wen Xia

TREASURER

Dr. Adilah Md Ramli (Leader)
Mdm. DK Rafidzah Ak Mohiddin
Dr. Dynatalie Delicious
Mdm. Rosmariyani Saibin

SCIENTIFIC

Dr. Siew Chee Kiong (Leader)
Dr. Ramlah George @ Mohd. Rosli
Associate Professor Ts. Dr. Nor Qhairul Izzreen
Mohd Noor
Dr. Ho Ai Ling
Ms. Umi Hartina Mohd Razali
Dr. Yanty Noorzianna Abdul Manaf
Dr. Ng Seah Young
Dr. Siti Nur Ezzati Yazid

PUBLICITY AND PROMOTION

Ts. Dr. Ahmad Hazim Abdul Aziz (Leader)
Dr. Mohamad Norisham Mohamad Rosdi
Dr. Fadzal Wong Chee Ping
Mdm. Jayanti Jamaluddin
Dr. Muhamad Hanif Rawi

WEB AND TECHNICAL

Dr. Chan Pei Teng (Leader)
Dr. Jumardi Roslan
Mr. Fitzgerald Anak Andrew
Mr. Masran Muhamad Ali
Mr. Othman Ismail
Mr. Lawrence Dussek
Mr. Mohd Wafi Abu Bakar
Ms. Maximilia Jumi
Mr. Musa Usop
Mr. Melvin Adrian Jimoli
Mdm. Roslinah Musa

SPONSORSHIP

Associate Professor Chm.
Dr. Norliza Julmohammad (Leader)
Mdm. Jenifer Rolland L
Mdm. Nurshada Ramdin
Dr. Norazlina Mohammad Ridhwan
Dr. Yanty Noorzianna Abdul Manaf

GRAPHIC DESIGN

Mdm. Jayanti Jamaluddin (Leader)
Mdm. Arneh Dullah

PROTOCOL AND MEDIA

Dr. Nur Hanisah Azmi (Leader)
Associate Professor Ts.
Dr. Nor Qhairul Izzreen Mohd Noor
Mdm. Hayati Salleh Baihaki

EVENT COORDINATOR

Dr. Sylvester Mantihal

P_ID082

Development and Characterization of Protein-Enriched Gluten-Free 3D- Printed Snacks: Implications for Nutritional and Functional Properties

^{1*}Jovana Simeunović, ¹Jelena Miljanić, ¹Lidija Perović, ¹Bojana Kokić, ²Jelena Jovančević, ²Slobodan Birgermajer, and ²Jovana Kojić

¹Institute of Food Technology in Novi Sad, University of Novi Sad, Bulevar Cara Lazara 1, 21000 Novi Sad, Serbia

²BioSense Institute - Research and Development Institute for Information Technologies in Biosystems, University of Novi Sad, Dr Zorana Đinđića 1a, 21000 Novi Sad, Serbia

*Corresponding author: jovana.simeunovic@fins.uns.ac.rs

Abstract: Three-dimensional (3D) printing technology, as a form of additive manufacturing, offers an innovative way to design personalized gluten-free foods tailored to specific nutritional and sensory needs. This study focused on creating a gluten-free 3D-printed snack with enhanced nutritional and functional properties by incorporating plant- and microbial-derived proteins into a millet-based matrix. A dough formulation consisting of proso millet flour, almond protein, and yeast protein was prepared and processed using extrusion-based 3D food printing. The rheological properties of the gluten-free dough were analysed to ensure proper flow during extrusion and shape stability after printing. Thermal processing followed to produce ready-to-eat snacks suitable for further evaluation. The enriched gluten-free dough demonstrated favourable rheological behaviour, supporting smooth printing and stable shape retention. The snack contained a high protein content (28.16 g/100 g dry basis of sample) meeting the criteria for the “high protein” nutrition claim in accordance with Regulation (EC) No. 1924/2006. Amino acid analysis revealed a significant increase in essential amino acids (EAAs)—lysine, leucine, isoleucine, tryptophan, arginine, threonine, valine, phenylalanine, tyrosine, and methionine— compared to the control. The total EAA content was 11.78 g/100 g, while non-essential amino acids amounted to 16.93 g/100 g of dry sample. Polyphenolic analysis revealed diverse phenolic acids and flavonoids in various binding forms, with the proportion of free polyphenols being up to ten times higher than esterified and bound forms. The textural properties of the final gluten-free snack remained acceptable, and sensory evaluation indicated improvements in flavour, aroma, and overall acceptability. This research shows that integrating almond and yeast proteins into a millet-based gluten-free formulation successfully enhances both nutritional quality and functional performance of 3D-printed snacks. The findings highlight the potential of combining sustainable protein sources with advanced food fabrication technologies to create clean-label, nutrient-dense, gluten-free, and consumer-appealing functional foods.

Keywords: 3D printed snack; gluten-free snack; plant/microbial proteins