

CONTENTS

Preface	IX
Scientific Programme	1
Author Index.....	209

Invited Speech

A Coloured Indicator based on Object Fuzzy Vector Spaces to advise Customers on Healthy Feeding

Joël Colloc5

Predictive Modelling

Simplified Zonal Model of Fluid and Heat Transfer inside a Pallet of Cheese Accounting for Free/Mixed Convection

Dihia Aguenihanai, Steven Duret, Jean Moureh and Denis Flick.....21

Experimental and Numerical Study of Heat and Mass Transfer during Contact Heating of Pancake Dough

Thibaut Viné, Emmanuel Bernau, Denis Flick and Bertrand Broyart.....24

Interaction Types Determine the Emergent Stability in Microbial Communities

Jian Wang, Ihab Hashem, Satyajeet Sheetal Bhonsale
and Jan F.M. Van Impe.....32

Interactions between *Bacillus subtilis* and *Escherichia coli* in the Presence of Ampicillin

Simen Akkermans, Meike T. Wortel, Ruben Claus, Stanley Brul
and Jan F.M. Van Impe.....37

Approximating Metabolic Behaviour of *E. COLI* using Reduced Extreme Pathway Matrices

Wannes Mores, Satyajeet S. Bhonsale, Filip Logist and Jan F.M. Van Impe ...42

Quantitative Risk Assessment

Risk-Benefit Assessment of using Chlorine-Based Treatment in the Process Chain of Ready-to-Eat Fresh Produce

Vaibhav Bhatia, Rhea Sanjiv Chhaya, Rajat Nag, Martin Danaher,
Michael Gaffney, Catherine M. Burgess, Jesús María Frías Celayeta
and Enda Cummins47

CONTENTS

Behavioural Descriptor and Human Exposure Assessment of Residual Fish-Pathogen-Trapping Biomolecular Protein Solutions Rajat Nag and Enda Cummins.....	52
--	-----------

Multiscale Simulation

Modelling Ice Nucleation and Growth during Food Freezing: A Microscale Approach Christophe Doursat, Hayat Benkhelifa, Denis Flick, Violette Mulot and Fatou-Toutie Ndoye	57
---	-----------

Physics-Informed Image Analysis for Mechanical Stress Reconstruction in Food Systems Han Chen, Murielle Hayert, Brian Guthrie and Olivier Vitrac	64
--	-----------

Food Safety and Spoilage

Impact of Probiotic <i>Lacticaseibacillus rhamnosus</i> on <i>Cronobacter sakazakii</i> in Infant Formula during In-Vitro Simulated Digestion Spiridon J. Konteles, Anthimia Batrinou, Vasileios Bartzis, Natalia Stavropoulou, Ekaterini Pyrovolou and Efstathia Tsakali	71
--	-----------

A Combined Experimental and Computational Approach to detect Sheep, Goat and Cow Milk Adulteration using Cryoscopy Simen Akkermans, Sofia Pavlaki, Jan F.M. Van Impe and Efstathia Tsakali....	76
--	-----------

Bacterial Fingerprinting of Traditional Cheese by 16S rRNA Next Generation Sequencing: A Pilot Study in Anthotyros Cheese Anthimia Batrinou, Spiridon Konteles, Efstathia Tsakali, Ekaterini Pyrovolou, Despina Vougiouklaki and Dimitra Houhoula	81
--	-----------

Modelling Microbial Inactivation by Radio Frequency Heating: Handling Variation in Processing Temperatures Davy Verheyen, Maria Tonti, Simen Akkermans, Dmytro Kozak, Torstein Skåra and Jan F.M. Van Impe.....	84
--	-----------

Effect of Fat Presence on Radio Frequency Inactivation and DNA Damage of <i>Listeria Monocytogenes</i> and <i>Salmonella Typhimurium</i> in Meat Model Systems Julian Espitia, Davy Verheyen, Shubhangi Mehrotra, Dmytro S. Kozak and Jan F.M. Van Impe.....	89
---	-----------

Sustainable Food Systems Engineering

Mathematical Modeling of Hamburger Grilling in an Infrared System	
Ozan Karatas, Yasar A. Ozkaya and Ferruh Erdogan	97
Effect of the Methanol Concentration on the Production Rate of Thaumatin and Consumption Rate of Methanol by <i>Pichia Pastoris</i>	
Nivedita Parsekar, Simen Akkermans, Dmytro Kozak and Jan F.M. Van Impe.....	103
Modeling and Optimization of UV-C Intensity Distribution for Safe and Sustainable Postharvest Orange Preservation	
Jakia Sultana Jothi, Fumina Tanaka and Fumihiko Tanaka.....	107

Innovative Food Production and Processing Technologies

Effect of Drying Methods on Drying Kinetics and Quality of Black Chokeberries	
Merve Silanur Yilmaz and Necla Ozdemir-Orhan	115
Numerical Characterization of Continuous Food Sterilization: A Predictive Working Tool for OHMIC Heating	
Jorge Rivera and Felix Schottroff.....	120
Radio Frequency Processing of Peanut Butter: Computational Model Development and Process Design	
Eda Coskun, Samet Ozturk, Caner Tasci, Kubra Polat, Shuxiang Liu, Rui Li, Shaojin Wang, Behic Mert, Francesco Marra and Ferruh Erdogan.....	125
Modeling High Pressure Homogenization Process of Dairy Products	
Marine Haas, Artemio Plana-Fattori, Raphaël Gondallier de Tugny, Veronique Bosc, Delphine Huc Mathis and Denis Flick	133
Modeling the Antibacterial Effect of Copper Oxide Nanoparticles	
Büşra Erol Aygün, Tomás Guillermo Cerda Drago, Simen Akkermans, Dmytro Kozak and Jan F. M. Van Impe	137
Transport Phenomena in OHMIC Heating of Heterogeneous Food Systems	
Fabrizio Sarghini, Angela De Vivo, Ezgi Son and Francesco Marra	143

Food Process Systems Engineering and Food Industry 4.0

A Tutorial on Interpreting GC-MS Data in Foods	
Huabin Luo, Simen Akkermans, Satyajeet Bhonsale, Dominique Swennen and Jan F.M. Van Impe.....	151

CONTENTS

Calibration of Multi-Scale Heat and Mass Transfer Simulations of Coffee Roasting towards Development of a Digital Twin Mark Al-Shemmeri, Estefania Lopez-Quiroga, Robert Farr and Peter Fryer.....	156
Simulation-Based Synthetic Training Environments for AI-Driven Agricultural Robots Mariano Crimaldi, Angela De Vivo and Fabrizio Sarghini	161
Development of a Dynamic <i>in Vitro</i> Food Digestion Simulator (FooDSIM): A Deterministic Model System for Human Digestion Sotiria Gaspari, Simen Akkermans and Jan F.M. Van Impe	166
I-Optimal Experimental Design in Non-Standard Design Regions for Solubility Studies in Food-Related Products Gustavo L. Quilló, Satyajeet S. Bhonsale and Jan F. M. Van Impe	169

Food Chains

Climate Change impacts Dairy Lydia Katsini, Satyajeet S. Bhonsale, Styliani Roufou, Sholeem Griffin, Vasilis Valdramidis, Simen Akkermans, Monika Polanska and Jan F.M. Van Impe.....	175
A Simulation Approach to investigating Disruption Events in a Food Supply Chain Andrew Greasley and Daniel Chicksand.....	178

Sensitivity Analysis of a Continuous Powder Mixing Process using Flowsheet Modeling Pau Lapiedra Carrasquer, Satyajeet S. Bhonsale and Jan F.M. Van Impe	183
--	------------

Numerical Modelling of Airflow and Heat Transfer within Strawberries Multi-Packaging Ahmad Nasser Eddine, Steven Duret, Jean Moureh and Denis Flick	186
---	------------

E-MUSE

Metabolic-Informed Neural Network for Multi-Omics Data Integration Gabriele Tazza, Vidács László, Francesco Moro and Bas Teusink	193
Introducing MLOps to facilitate Reproducible Model Development on Omics Data Dario Ruggeri and Vidács László.....	198

CONTENTS

Multi-Omics Data Mining and Integration with Kernel Methods: A Nutrigenomic Case Study

Mitja Briscik.....**204**