

INNOVATIONS IN FOOD SCIENCE AND HUMAN NUTRITION



Sep 13 - 15, 2018 at Rome, Italy



Development of optimization models for food processing operations with focus on adding value to by products

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Great scientific and technological effort has been invested in the field of food engineering due to the increasing focus on innovating on the engineering process design while reducing the environmental impact. Mathematical modeling is a relevant tool for food process design and optimization in order to test different process configurations or sample new food matrices as raw materials. Specifically, solid-liquid extraction is a widely implemented operation in industrial scale processes to extract different compounds such as oil, proteins, and antioxidants, among others. Our research group has focused on developing rigorous mathematical models aiming to carefully describe mass transfer extraction mechanisms for different food matrices (soybean meals, fish meat, grape pomace and chicory roots) considering microstructural aspects of the solid matrix and compounds and macro aspects related to the unit operation and process equipment. When analyzing sets of experimental runs, the developed mathematical models become useful and predictable tools to design and optimize the studied process in order to contemplate quality contains while minimizing the associated environmental impact. Specific case studies comprising the extraction of soluble proteins from soybean meals, extraction of protein from Argentinian fish, and extraction of polyphenols from chicory roots, are presented in order to demonstrate how the proposed model constitutes a predictable tool for process design configuration and operating policies proposal.

Biography

María Agustina Reinheimer completed her PhD in Chemical Technology at the age of 29 years at the Universidad Nacional del Litoral, Chemical Engineering Faculty in Santa Fe, Argentina. Then, she carried out her postdoctoral studies at the Universidad Tecnológica Nacional in Rosario, Argentina. Now, she is an Assistant Research at CONICET, Argentina, and a Professor at the Universidad Tecnológica Nacional in Rosario. Her field of application is modeling and optimization of food processes and operations. She has published more than 20 peer-reviewed papers and has been herself serving as reviewer in renowned journals related to food processing technologies.