Editorial

# Virtualization of processes in food engineering

Modeling, simulation, optimization and dynamic studies are a part of a wider scheme that is described as 'virtualization'. While a number of manufacturing sectors (e.g., aerospace, defense, automotive) are benefiting for decades from modeling activities and virtualization of processes, the food industry (that represents more than 5% of the global GDP) is still lagging to utilize the wide spectrum potential offered by virtualization as an engineering design tool. In 2004, Prof. R Paul Singh and Prof. Ferruh Erdogdu published a book on "Virtual Experiments in Food Processing", claiming that virtualization allows to conduct experiments about food processing, using a computer and/or a mobile device. Undoubtedly, the use of virtual tools reduces the overall time needed for developing, designing and validating processes and equipment, circumvents the tailor-made production of inefficient numerous prototypes, reduces development costs and consequently reduces the time to market. Thus, virtualization addresses and fulfills the needs of new and sophisticated strategic tools for innovation in the food industry.

Scientific literature, including the Journal of Food Engineering, has published a number of papers devoted to modeling, simulation and in some cases studies about process dynamic, optimization and control in food processes, food engineering and food technology. Hence, it is timely that a special issue of the Journal of Food Engineering collects wide spectrum aspects of virtualization, its possible utilization and benefits for the food domain.

This special issue seeks to contribute to the enhancement of fundamental knowledge, covering most recent advances and progress in Virtualization of Processes in Food Engineering.

The one-day scientific meeting at the University of Salerno, Italy (VirProFood, Oct. 3, 2014) devoted to this topic, provided only the initial base and stimulated for submissions.

Experts discussed their approaches, methodologies, practices and software, to define the state of art, and to help clarify the plethora of roles of virtualization in its many forms in the practices of the food industry and to foresee the future challenges, prospects and vast potential.

Additional manuscripts were received from a wide spectrum of researchers to bridge different topics in the field of virtualization in food processes, food engineering and food technology, including transport phenomena analysis, formal modeling, multi-physics approach, virtual design, optimization and innovation challenges and opportunities.

As Guest Editor, I would like to thank all the authors for their valuable contributions, all the referees for their help in reviewing the submitted manuscripts, and for their competence, their diligence and the time spent.

I am very grateful to Prof. R Paul Singh, Editor in Chief of Journal of Food Engineering, for his support while developing this special issue; also my deep gratitude goes to Prof. Sam Saguy, for having inspired this special issue and for having encouraged me to fulfill this editorial task. Finally, I would like to express my personal conviction that Virtualization will become a cornerstone of utmost importance to Food Engineering domain.

Francesco Marra
*Dipartimento di Ingegneria Industriale,*
*Università degli studi di Salerno,*
*Via Giovanni Paolo II, 132, 84084 Fisciano, SA, Italy*
*E-mail address:* fmarra@unisa.it.