A much-needed guide to *in vitro* food functionality evaluation principles, processes, and state-of-the-art modeling

There are more than a few books devoted to the assessment of food functionality but, until now, there were no comprehensive guides focusing on the increasingly important subject of *in vitro* food evaluation. With contributions from the world’s foremost experts in the field, this book brings readers up to speed on the state-of-the-art in *in vitro* modeling, from its physiological bases to its conception, current uses, and future developments.

Food functionality is a broad concept encompassing nutritional and health functionality, food safety and toxicology, as well as a broad range of visual and organoleptic properties of food. *In vitro* techniques bridge the gap between standard analytical techniques, including chemical and biochemical approaches and *in vivo* human testing, which remains the ultimate translational goal for evaluation of the functionality of food. Although it is a well- established field, *in vitro* food testing continues to evolve toward ever more accurate predictions of *in vivo* properties and outcomes. Both ethical and highly economical, these approaches allow for detailed mechanistic insights into food functionalities and, therefore, a better understanding of the interactions of food and human physiology.

- Reviews the core concepts of food functionality and functionality evaluation methodologies
- Provides an overview of the physiology of the gastrointestinal tract, including host-microbial interactions within it
- Delves into the physiology of sensory perception of food, taste and texture as they relate to *in vitro* modeling
• Explores the challenges of linking *in vitro* analysis of taste, aroma and flavor to their actual perception

• Addresses *in vitro* models of the digestion and absorption of macronutrients, micronutrients, and phytonutrients

• Describes *in vitro* evaluations of toxicants, allergens and other specific food hazards

*Functional Foods and Beverages* is an indispensable working resource for food scientists as well as researchers working in government facilities dedicated to tracking food safety.

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