1. Record Nr. UNINA9910983084403321

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Titolo	Advanced Technologies for Physical Properties Measurement of Food and its Processing / / by Hao Lin, Lei Zhang, Quansheng Chen, Man Zhou, Leiqing Pan, Qin Ouyang, Solomon Yao-Say Selorm Adade, Yanyu Li
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2025
ISBN	9789819623471 9819623472
Edizione	[1st ed. 2025.]
Descrizione fisica	1 online resource (403 pages)
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Disciplina	641.3 664
Soggetti	Food science Analytical chemistry Food - Analysis Biochemical engineering Food Science Analytical Chemistry Food Analysis Bioprocess Engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Chapter 1. Introduction -- Chapter 2. Basic Physical Characteristics of Food -- Chapter 3. Rheological Properties of Food -- Chapter 4. Texture of Food -- Chapter 5. Optical Characteristics and color in Foods -- Chapter 6. Thermal Characteristics in Foods -- Chapter 7.

Acoustical Characteristics in Foods -- Chapter 8. Electromagnetic Properties in Foods -- Chapter 9. Advanced Physical technologies in Foods.

Sommario/riassunto

This book provides a comprehensive overview of the physical properties of foods and the cutting-edge technologies employed to measure them. Delving into key topics such as optical, thermal, acoustic, rheological, and textural properties, it provides a detailed examination of principles, measurement methods, and applications in food quality evaluation. While it discusses advanced technologies such as near-infrared spectroscopy, computer vision, spectral imaging, acoustic resonance analysis, electronic noses/tongues/eyes, and multi-sensor data fusion in detail, the book also introduces intelligent equipment design and real-time quality monitoring systems for the food industry, including emerging technologies like 4D printing and terahertz technology. The book also addresses critical questions about the application of these technologies in real-world scenarios, making it a must-read for those seeking to understand and apply the latest advancements in food science. This book is an invaluable resource for undergraduate and graduate students, researchers, and professionals in food science and engineering. It helps readers understand the principles of various non-destructive food quality measurement techniques and applies them to in-situ evaluation and in-field monitoring. It also serves as both a textbook and a reference guide, enabling readers to understand and apply advanced measurement and processing techniques for in-situ evaluation and in-field monitoring. By providing a thorough understanding of the principles and applications of food physical properties, this book ensures that its audience remains at the forefront of technological advancements in the field. The book contains several chapters originally written in the Chinese language. The translation was done with the help of artificial intelligence. A subsequent human revision was done primarily in terms of content.