

1. Record Nr.	UNINA9910887805603321
Autore	Gangawane Krunal M
Titolo	Advanced Computational Approaches for Drying in Food Processing // edited by Krunal M. Gangawane, Madhuresh Dwivedi, Ram Chandra Pradhan
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2024
ISBN	3-031-62550-1
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (240 pages)
Altri autori (Persone)	DwivediMadhuresh Chandra PradhanRam
Disciplina	641.44
Soggetti	Food science Food - Analysis Chemistry Food Science Food Engineering Food Chemistry Food Analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Chapter 1 - Significance of drying technology in food processing -- Chapter 2 - Overview of computational techniques for drying -- Chapter 3 - Microwave-assisted Drying -- Chapter 4 - Convective Drying -- Chapter 5 - Spray Drying Processes in the Food Industry: Computational Fluid Dynamics Modelling -- Chapter 6 - CFD Modelling for Fluidized Bed Drying -- Chapter 7 - Solar dryers -- Chapter 8 - Electrohydrodynamic Drying -- Chapter 9 - Superheated Drying -- Chapter 10 - Computational techniques on freeze drying.
Sommario/riassunto	Computational methods have become important techniques for drying in food processing. There are two principle computational approaches for system analysis: continuous and discrete. In the continuous approach, the governing equations can be obtained by applying the fundamental laws such as conservation of mass, momentum and energy over an infinitesimal control volume. These equations are

further discretized by using a suitable discretization technique. The recovered set of algebraic equations are then solved by an applied numerical method. The discrete approach concentrates on mimicking the molecular movement within system. Recent years have witnessed a rapid development in the field of computational techniques owing to its abundant benefit to the food processing industry. The relevance of advanced computational methods has helped in understanding the fundamental physics of thermal and hydrodynamics behavior that can provide benefits to the food processing industry in numerous applications such as drying, evaporation, sterilization, mixing and refrigeration. Advanced Computational Approaches for Drying in Food Processing examines the use of different numerical/computational techniques for the simulation of fluid flow and heat and mass transfer from/within food products such as cereal, chicken, beef, fruits, vegetables and more. The text promotes a thorough understanding of the drying process and its pivotal role in various applications in food processing plus advances in computer simulation techniques which have witnessed rapid popularity due to factors such as low-cost and ease in parametric study. CFD analysis and its use in developing new dryers, modification of current systems energy saving and process optimization is covered in full plus appropriate modelling for enhancement of food quality. Different phytochemical changes are explored plus novel strategies for the use of renewable energy, optimization of energy consumption and heat recovery and application of environmentally friendly technologies. This book provides a single information source for readers interested in the use of methods based on numerical/computational analysis as applied for drying phenomenon in food science and technology.
