

Book Review

Drying Technologies for Foods: Fundamentals and Applications

Prabhat K. Nema, Barjinder Pal Kaur and Arun S. Mujumdar
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It was my pleasure to read book on 'Drying Technologies for Foods: Fundamentals and Applications'. This book is a great effort to present in a progressive and systematic form the basic knowledge required both for selection and technical design of appropriate drying systems. Over and above, the focus and coverage on the recent advances in drying processes makes this book unique and important.

This book consists of 15 chapters; the first chapter is dedicated to fundamental principles, basic terminology of drying, psychrometry, sorption isotherm and drying kinetics. Chapter contributed by Professor Mujumdar on the classification and selection of industrial dryers gives critical points about the same.

Recent advances in osmotic dehydration is adequately covered in Chapter 3. Various models for fitting drying data in osmotic dehydration are addressed, followed by short discourse of the mechanism of mass transfer. Spray drying is described comprehensively in Chapter 4. Reaction engineering approach modeling has been given its due place of importance amongst the recent trends in spray drying technology besides detailed description of atomizers. Principles and prospects of microwave drying are covered in Chapter 5 and in Chapter 6 hybrid drying based on microwave get a thorough coverage apart from a brief summarization of different microwave technologies. Superheated steam drying, an original contribution of Professor Mujumdar, is introduced and elaborated in Chapter 7. Operating principle, classification and configuration of heat pump dryer are given very lucid treatments along with coverage of models and exergy analysis in chapter 8. Grain drying theory, practices and developments are covered in Chapter 9 outlining classical drying theories of thin layer and deep bed drying. Sun drying, bin drying, re-circulatory dryer, continuous flow dryer, fluid bed dryer, pneumatic dryer and belt dryers are explained. Recent advances of applications of superheated steam drying, heat pump drying, infrared drying, microwave drying, radiofrequency drying, electrohydrodynamic drying as these apply to grains also got look-ins. Solar drying and solar tunnel drying are the focus of Chapters 10 and 11, respectively. Simple heat and mass transfer models are applied to solar drying. Solar tunnel dryer has been shown to dry leafy vegetables and grapes. Chapter 12 outlines a novel method of drying, namely impingement drying where vegetables, fruits, herbs etc. are dried using high velocity air impinging on the products to reduce the thermal boundary layer, resulting in higher heat and mass transfer coefficients. In chapter 13 empirical and artificial neural network (ANN) modeling has been given its due place of importance for analyses of drying data. Computational modeling techniques based on finite difference, finite element and finite volume methods have been covered in chapter 14. Shrinkage and porosity effects on potato drying, airflow pattern and particle trajectories in spray drying have got prominence in case studies here. The concluding Chapter summarizes the advances in food drying by covering what had been left in other Chapters.

In nut shell each chapter has offered a detailed description of various drying techniques and their applications in a very easy to read and understandable language with very clear explanation of the concept. What makes this book stand out in the crowded drying literature is that each of the contributors of this book have worked extensively in respective areas of drying technology and their wide experience will greatly benefit the readers.

Each section of this book is state-of-the-art in food drying and thus very useful as supplementary reading material for undergraduate and postgraduate courses in food process engineering. It covers themes of current research interest as well, that can stimulate industrial R&D, which is valuable for preservation of scarce food supplies. Thus the book is of great interest and value to industrial researchers as well. It is impossible to cover in one book the broad spectrum of topics relevant to drying technologies. It is expected these topics will be covered in a follow-up volume. My congratulations to the editors for successful and meaningful compilation in the form of this book. I am pleased to recommend acquisition of this book by libraries as well as individuals in academia and industry.

Prof. Ashis Kumar Datta
Indian Institute of Technology, Kharagpur, India
Email- akd@agfe.iitkgp.ernet.in