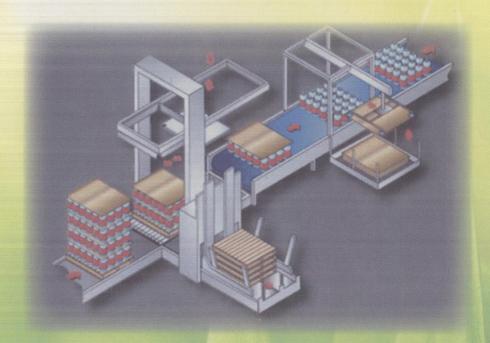
## Handbook of Nutraceuticals

Volume II

Scale-Up, Processing and Automation



Edited by Yashwant Pathak



## **Contents**

Forewordxi Prefacexiii Contributorsxvii
Chapter 1 Nutraceuticals: Advancing in a Right Direction
Uyen Le and Yashwant Pathak
Chapter 2 Advances in Extraction of Plant Products in Nutraceutical Processing
Lijun Wang
Chapter 3 Liquid–Liquid Extraction and Adsorption Applied to the Processing of Nutraceuticals and Functional Foods
Antonio J. A. Meirelles, Eduardo A. C. Batista, Mariana C. Costa, and Marcelo Lanza
Chapter 4 Application of Enzyme-Assisted Oil Extraction Technology in the Processing of Nutraceuticals and Functional Food
María Elvira Zúñiga, Carmen Soto, Jacqueline Concha, and Eduardo Pérez
Chapter 5 Nutraceutical Processing Using Mixing Technology: Theory and Equipment 135
Sri Hyndhavi Ramadugu, Vijay Kumar Puli, and Yashwant Pathak
Chapter 6 Separation Technologies in Nutraceutical Processing
Vijay Kumar Puli, Sri Hyndhavi Ramadugu, and Yashwant Pathak
Chapter 7 Size Reduction, Particle Size, and Shape Characterization of Nutraceuticals 167
Sri Hyndhavi Ramadugu, Vijay Kumar Puli, and Yashwant Pathak

Chapter 8 Application of Spray Drying Technology for Nutraceuticals and Functional Food Products
Donald Chiou and Timothy A. G. Langrish
Chapter 9 Rheology of Complex Fluids Containing Nutraceuticals
Samiul Amin and Krassimir P. Velikov
Chapter 10 Scaling Up and Processing Nutraceutical Dispersions: Emulsions and Suspensions
Jayant Lokhande and Yashwant Pathak
Chapter 11 Validation of Nutraceutical Process Equipment
Don Rosendale
Chapter 12 Bioprocessing of Marine Products for Nutraceuticals and Functional Food Products
Se-Kwon Kim, Isuru Wijesekara, and Dai-Hung Ngo
Chapter 13 The Packaging of Nutraceuticals Derived from Plants
Melvin A. Pascall
Chapter 14 Addressing Powder Flow and Segregation Concerns during Scale-Up of Nutraceutical Solid Formulations
Thomas Baxter, James Prescott, Roger Barnum, and Jayant Khambekar
Chapter 15 Complying with FDA Regulations for the Manufacture and Quality Control of Nutraceuticals: Do What You Say, Say What You Do
Mike Witt, Girish J. Kotwal, and Yashwant Pathak

	ification and Value Enhancement of Food Products during Nutraceutical essing Using Microencapsulation and Nanotechnology
Xiac	oqing Yang, Yuping Huang, and Qingrong Huang
App	oter 17 le Nutraceuticals and the Effects of Processing, and Their Therapeutic lications
Johi	n Eatough and Brian Lockwood
	oter 18 on Concepts in the Food Industry
Anw	vesha Sarkar, Shantanu Das, Dilip Ghosh, and Harjinder Singh
	oter 19 oring of Nutraceuticals
Apa	rna Keskar and William Igou, Jr.
	pter 20 raceutical Clinical Batch Manufacturing
Wei	yuan Chang
	pter 21  Technologies Protect Nutraceuticals against Counterfeiting
Rola	and Meylan
	pter 22 omated Manufacturing of Nutraceuticals
	esh Rajanna