

FOOD ENGINEERING HANDBOOK

FOOD ENGINEERING
FUNDAMENTALS

EDITED BY

Theodoros Varzakas
Constantina Tzia



CRC Press

Taylor & Francis Group

Boca Raton London New York

CRC Press is an imprint of the
Taylor & Francis Group, an **informa** business

Contents

Series Preface.....	xi
Preface.....	xiii
Acknowledgments.....	xv
Series Editor.....	xvii
Editors.....	xix
Contributors.....	xxi
Chapter 1 Introduction	1
<i>Theodoros Varzakas and Constantina Tzia</i>	
Chapter 2 Mass and Energy Balances	3
<i>N. Zogzas</i>	
Chapter 3 Fundamental Notes on Chemical Thermodynamics.....	41
<i>Petros Tzias</i>	
Chapter 4 Heat Transfer	75
<i>Ioannis K. Kookos and Nikolaos G. Stoforos</i>	
Chapter 5 Steam Generation: Distribution.....	113
<i>Theodoros Varzakas</i>	
Chapter 6 Heat Exchangers.....	141
<i>Theodoros Varzakas</i>	
Chapter 7 Rheology in Use: A Practical Guide	179
<i>Niall W.G. Young</i>	
Chapter 8 Fluid Mechanics in Food Process Engineering	217
<i>Ricardo D. Andrade P., Carmen E. Pérez C., and German J. Narvaez G.</i>	

Chapter 9	Diffusion.....	263
	<i>Theodoros Varzakas</i>	
Chapter 10	Absorption.....	309
	<i>Giovanni A. Escamilla García and Eleazar M. Escamilla Silva</i>	
Chapter 11	Distillation for the Production of Fortification Spirit.....	343
	<i>Malcolm S. Allen, Andrew C. Clark, Leigh M. Schmidtke, and Peter J. Torley</i>	
Chapter 12	Food Products Evaporation	369
	<i>Jorge F. Vélez-Ruiz</i>	
Chapter 13	Food Irradiation Processing	427
	<i>Joong-Ho Kwon, Jae-Jun Ahn, and Hafiz Muhammad Shahbaz</i>	
Chapter 14	Food Formulation.....	491
	<i>V. Giannou, Constantina Tzia, and Theodoros Varzakas</i>	
Chapter 15	Reaction Kinetics	529
	<i>Petros S. Taoukis, Theofania N. Tsironi, and Maria C. Giannakourou</i>	