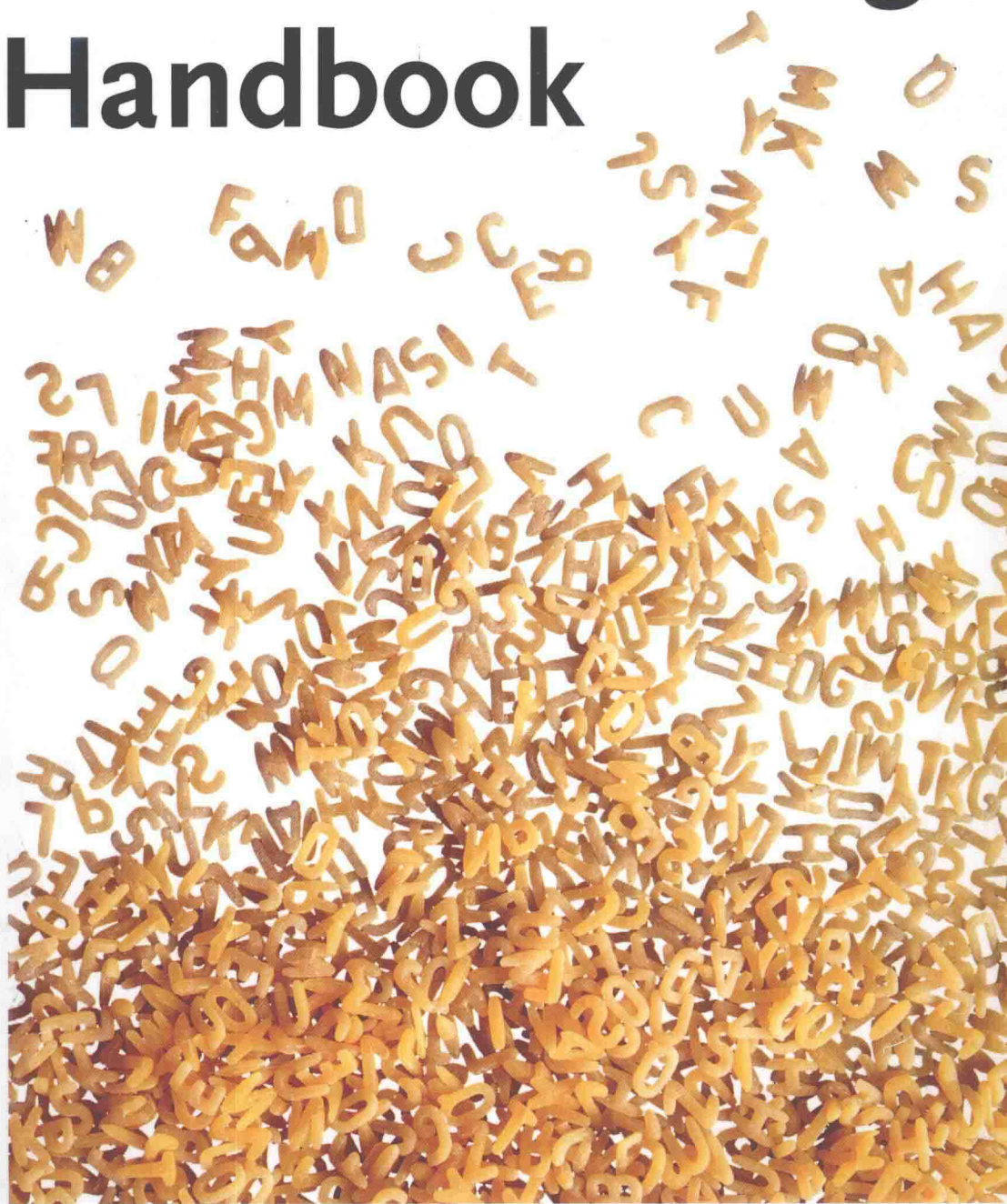


Edited by James G. Brennan

 WILEY-VCH

Food Processing Handbook



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Library of Congress Card No.: applied for

British Library Cataloguing-in-Publication Data:

A catalogue record for this book is available from the British Library.

**Bibliographic information published by
Die Deutsche Bibliothek**

Die Deutsche Bibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data is available in the Internet at <<http://dnb.ddb.de>>

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Typesetting K+V Fotosatz GmbH, Beerfelden

Printing Strauss GmbH, Mörlenbach

Binding Litges & Dopf Buchbinderei GmbH, Heppenheim

Printed in the Federal Republic of Germany

Printed on acid-free paper

ISBN-13: 978-3-527-30719-7

ISBN-10: 3-527-30719-2

**Food Processing
Handbook**

*Edited by
James G. Brennan*

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Preface

There are many excellent texts available which cover the fundamentals of food engineering, equipment design, modelling of food processing operations etc. There are also several very good works in food science and technology dealing with the chemical composition, physical properties, nutritional and microbiological status of fresh and processed foods. This work is an attempt to cover the middle ground between these two extremes. The objective is to discuss the technology behind the main methods of food preservation used in today's food industry in terms of the principles involved, the equipment used and the changes in physical, chemical, microbiological and organoleptic properties that occur during processing. In addition to the conventional preservation techniques, new and emerging technologies, such as high pressure processing and the use of pulsed electric field and power ultrasound are discussed. The materials and methods used in the packaging of food, including the relatively new field of active packaging, are covered. Concerns about the safety of processed foods and the impact of processing on the environment are addressed. Process control methods employed in food processing are outlined. Treatments applied to water to be used in food processing and the disposal of wastes from processing operations are described.

Chapter 1 covers the postharvest handling and transport of fresh foods and preparatory operations, such as cleaning, sorting, grading and blanching, applied prior to processing. Chapters 2, 3 and 4 contain up-to-date accounts of heat processing, evaporation, dehydration and freezing techniques used for food preservation. In Chapter 5, the potentially useful, but so far little used process of irradiation is discussed. The relatively new technology of high pressure processing is covered in Chapter 6, while Chapter 7 explains the current status of pulsed electric field, power ultrasound, and other new technologies. Recent developments in baking, extrusion cooking and frying are outlined in Chapter 8. Chapter 9 deals with the materials and methods used for food packaging and active packaging technology, including the use of oxygen, carbon dioxide and ethylene scavengers, preservative releasers and moisture absorbers. In Chapter 10, safety in food processing is discussed and the development, implementation and maintenance of HACCP systems outlined. Chapter 11 covers the various types of control systems applied in food processing. Chapter 12 deals with envi-

ronmental issues including the impact of packaging wastes and the disposal of refrigerants. In Chapter 13, the various treatments applied to water to be used in food processing are described and the physical, chemical and biological treatments applied to food processing wastes are outlined. To complete the picture, the various separation techniques used in food processing are discussed in Chapter 14 and Chapter 15 covers the conversion operations of mixing, emulsification and size reduction of solids.

The editor wishes to acknowledge the considerable advice and help he received from former colleagues in the School of Food Biosciences, The University of Reading, when working on this project. He also wishes to thank his wife, Anne, for her support and patience.

Reading, August 2005

James G. Brennan

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