Enzymes in Food Processing

Edited by
Tilak Nagodawithana
Gerald Reed

ENZYMES IN FOOD PROCESSING

Third Edition

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FOOD SCIENCE AND TECHNOLOGY

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FOOD SCIENCE AND TECHNOLOGY

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Preface to the Third Edition

The 1967 monograph, *Enzymes in Food Processing,* and the 1975 edited second edition covered the uses of enzymes in the food industry in a comprehensive manner. The present and third edited edition has been completely rewritten because of the extensive changes in the way enzymes are used and the availability of new enzymes.

We believe that the third edition will be more useful to readers because it emphasizes basic information on enzymes, newly discovered uses, and uses that have not been adequately described in the literature. Thus, chapters on enzyme functionality and the effect of environmental parameters have been expanded, a chapter on the genetic modifications of enzymes has been added, and a chapter on the use of enzymes in fish processing has been included.

Therefore, less emphasis is devoted to the routine uses of enzymes, and subjects in which relatively few changes have occurred were omitted. The chapter on the production of microbial enzymes has been replaced by an extended introductory chapter that deals with practical aspects of the formulation, standardization, and assay of microbial enzymes as they are sold to the food industry.

We express our gratitude to Academic Press for their continued support of *Enzymes in Food Processing* and to Red Star Specialty Products Division, Universal Foods Corporation, Milwaukee, Wisconsin for their encouragement, and, most of all, to the authors who have so competently and patiently contributed to the book.

We hope that the third edition will be as well received and as widely used as the two earlier editions.

Tilak Nagodawithana
Gerald Reed

Preface to the Second Edition

The purpose and scope of *Enzymes in Food Processing* have been adequately described in the Preface to the first edition, which follows. A deeper understanding of the action of enzymes, some changes in enzyme technology, and the introduction of new enzyme processes into the food industry have made it desirable to publish a second edition.

This edition, unlike the first one, is an edited work. The authors of individual chapters have contributed a deeper knowledge of their field and a greater expertise than the editor could muster for the writing of the first edition. Hence, the chapters dealing with the properties of specific enzymes and the chapters dealing with enzyme applications should be authoritative and up-to-date.

I am greatly indebted to the contributors who have given freely of their time to share their expert knowledge with their colleagues. I am equally indebted to readers of the first edition who have contributed encouragement and criticism and who have made publication of a second edition worthwhile. I am grateful to Academic Press and to the Board of Editors of the "Food Science and Technology" series and, in particular, to Dr. George F. Stewart for assistance in editing. Finally, I wish to thank Universal Foods for permission to undertake this work.

Gerald Reed

Preface to the First Edition

The manufacture of foods has rapidly changed from an art to a highly specialized technology based on discoveries in the natural sciences. However, the translation of scientific knowledge from the fields of microbiology and biochemistry into useful food technology has been rather slow. Art and tradition still play an important part in the fermentation industries and in various uses of enzymes in food processing. It is, therefore, important to bridge the gap between available scientific knowledge and food technology in these particular areas.

During the past 25 years the use of commercial enzymes has grown from an insignificant role to an important aspect of food processing. However, no comprehensive treatise on the use of enzymes in food processing has been published in the past 15 years; this monograph was written to fill that gap. Primarily, it is directed to food technologists. They will find in it a description of the properties of those enzymes which are important in food processing as well as a description of the many practical applications of enzymes in their industry. It will also be of value to the microbiologist and enzyme chemist who may wish to acquire some knowledge of the fields in which their discoveries are put to practical use. This volume will acquaint them with present applications of enzymes in the food industry and will perhaps suggest new uses for enzymes.

The subject is treated in two parts. Part I describes the properties of enzymes in general and the properties of enzymes used specifically in food processing. Part II describes the practical application of these enzymes to various phases of the food industry with cross references to the basic properties of the enzymes described in Part I. It is hoped that this method will foster a clearer understanding of the relationship between the basic properties of enzymes and their application.

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duction of Commercial Enzymes." Without his help this subject could not have been treated adequately. He also reviewed a considerable portion of the manuscript and made many helpful suggestions. I am deeply grateful to Dr. M. L. Anson, one of the editors of the Food Science and Technology series. Without his advice, counsel, and criticism it would have been difficult to write this book.

I want to thank Mrs. F. W. Chen and Mr. R. Liu for the illustrations, and Mrs. M. Ziesch for typing the manuscript. My wife has encouraged me and helped me with the preparation of the manuscript.

April, 1966
Gerald Reed

Contents

CHAPTER 3

Environmental Effects on Enzyme Activity

KIRK L. PARKIN

CHAPTER 4

Modern Methods of Enzyme Expression and Design

JO WEGSTEIN and HENRY HEINSOHN

CHAPTER 6

Carbohydrases

RAMUNAS BIGELIS

CHAPTER 7

Proteases

JENS ADLER-NISSEN