NEW BOOKS

J. F. GERECHT, BOOK REVIEW EDITOR

International Symposium on Deterioration of Lipids, Proceedings, Edited by Henryk Niewiadomski (Panstwowe Wydawnictwo Naukowe, Warsaw, Poland, 1973, 292 p.).

This book is a compendium of 38 papers presented by scientists from 15 different countries at the "International Symposium on Deterioration of Lipids," held in Gdansk, Poland, June 1971. The editor has assembled an impressive list of international authorities to discuss various problems of fat oxidation, processing, and food uses. Included are five plenary lectures by H. Niewiadomski (Gdansk, Poland) on the influence of lipid deterioration on technology and final product, by G. Jacini (Milan, Italy) on minor components of oils, by R. Marcuse (Goteborg, Sweden) on metal catalyzed lipid oxidation, by J. Pokorny (Praha, Czechoslovakia), and by W. Zwierzykowski (Gdansk, Poland) on kinetics and thermodynamics of fat autoxidation.

The rest of the book contains a collection of short papers dealing with such topics as the effects of chlorophylls, tocopherols, phospholipids, and steroids upon the oxidation of various oils (fish, rapeseed, and sunflower), pro- and antioxidants, components in heated fats, selective hydrogenation of linolenic acid in rapeseed oil, peroxide-protein interactions, metal removal, and inactivation.

In any such multiauthor compilation the coverage is uneven both in nature and in depth. Particularly well written, important papers are those of Zwierzykowski, et al., on the kinetics and thermodynamics of lipid autoxidation, of R. Marcuse on TBA reactive oxidation products, of G. Hoffman, et al. (Vlaardingen, The Netherlands) on relative oxidation rates of synthetic diacyl triglycerides, and of A. Prevot, et al. (Paris, France) on GLC studies of oil volatiles.

This book is aimed at the researcher and focuses attention on the many problems needing further work in this continuing vital area of concern to lipid, food, and nutrition chemists. The editor is to be complimented for assembling an impressive list of contributors who are quite international in origin.

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The Milk Fat Globule: Emulsion Science as Applied to Milk Products and Comparable Foods, H. Mulder and P. Walstra (Commonwealth Agricultural Bureaux, Farnham Royal, Bucks, England, and Centre for Agricultural Publishing and Documentation, Wageningen, The Netherlands, 1974, 296 p., ca. $15.30).

In this book, the authors use the milk fat globule as a

model with which to approach the science and technology of emulsions. They also deal effectively with the subject of milk fat in the various dairy products, i.e. cheese, butter, homogenized milk, ice cream, etc. Emphasis is on physical and colloidal chemistry of the lipid system. The fourteen chapter headings are as follows: "Structure of Milk," "The Fat in Milk," "Crystallization Behavior of Milk Fat," "The Fat Dispersion," "The Fat Globule Membrane," "Stability of the Fat Emulsion," "Changes in Fat Dispersion with Processing," "Creaming and Separation," "Homogenization," "Cream," "Fat Globules in Foam Products," "Isolation of Milk Fat," "Structure and Texture of Butter," and "Synthetic Fat Globules." There is liberal use of figures, including electron photomicrographs and tables. Each chapter includes a fairly extensive list of references, and, although the authors make no claim that their treatise is an exhaustive literature review, it is evident that they have covered the literature effectively through 1972. The index (eight pages) is adequate.

The milk fat globule contains most of the lipids and virtually all of the triglycerides of milk. Since milk fat is fundamentally important in human nutrition in the form of milk, diary products, and a wide array of processed foods, the practical value of this type of book to food technologists is readily evident.

Since there is no other book centered on the physical chemistry of milk fat in native and derived forms, and since the authors are outstanding authorities on the subject, the book clearly fills a need. The treatment is scholarly and critical but not burdened in its mathematics. For university textbook or reference purposes, this book is geared roughly at the advanced undergraduate to graduate levels. The authors have not attempted to cover the milk lipids in any depth from the standpoints of their biosynthesis, organic chemistry, or flavor chemistry. However, this is not an unreasonable limitation, since these matters have been and are being presented elsewhere adequately, e.g., the three volumes of *Lactation: A Comprehensive Treatise* edited by B.L. Larson and V.R. Smith (Academic Press, 1974) and *Odor and Flavor Compounds from Lipids* by D.A. Forss (*Progress in the Chemistry of Fats and Other Lipids*, Vol. XIII, Part 4, Pergamon Press, 1972).

To sum up, this book should be a valuable addition to the references used by food scientists and fats and oils technologists. It covers the science and technology of milk fat extremely well.

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Industrial Uses of Cereals: Symposium Proceedings, Y. Pomeranz, Symposium Chairman (American Association of Cereal Chemists, Inc., St. Paul, Minn., 1973, 417 p.).

This book is composed of the unedited proceedings of a symposium presented at the 58th Annual Meeting of the American Association of Cereal Chemists. It contains 22 chapters and subsections authored by 25 leading scientists from the USDA laboratories, universities, and industry. Four chapters are written by foreign contributors. According to Symposium Chairman, Y. Pomeranz, the purpose of this collection of papers is to provide a comprehensive survey on the industrial utilization of all cereals along with descriptions of structure, composition, functionality, and properties of whole grains and grain components.

Chapters 1 and 2 provide background information on the economic aspects and physical properties that influence industrial use of cereals. A wide variety of physical properties of cereals are discussed in Chapter 2.

Chapter 3, written in four parts, gives a detailed description of the structure and composition of the protein, starch, nonstarch polysaccharide, and lipid components of cereals along with industrial uses for these components. Methods also are given for the enzymatic and chemical modification of starch and protein.

In Chapter 4, various wet and dry processes for separation of the starch and gluten components of wheat are described, including recent process improvements. Fractionation of mill feeds and the Fesca, or direct centrifugation process, also are described.

Chapters 5, 6, and 7 are general in nature and deal, respectively, with the furfural industry, reaction of cereal proteins with vinyl compounds, and use of cereal grains as a source of industrial energy.

Industrial uses for corn starch, corn protein, and dry milled corn-derived products are discussed in three sections in Chapter 8. Also included are methods for chemical modification of starch for specific applications in paper, textile, and adhesive applications. This chapter also contains a short section on the industrial utilization of corn cobs.

The starch-gluten industry is described in Chapter 10 along with a review of industrial uses for wheat, wheat gluten, wheat flour, mill feeds, and other by-products. Work done at the USDA on the chemical modification of wheat flour for industrial uses also is discussed.

Chapters, 9, 11, and 12 review the physical properties, composition, and structure of sorghum grains and barley and oats, respectively. Wet and dry milling processes for sorghum are described in Chapter 9 along with the industrial utilization for sorghum. Chapter 11 gives an extensive review of malt and the malting and brewing processes, as well as uses for barley and barley by-products. All of these chapters provide extensive literature reviews.

Disposal of rice hulls is a critical problem because of current restrictions on burning. Chapter 13 describes the composition of rice hulls and considers several possibilities for industrial utilization.

Chapter 14, the concluding chapter, is an annotated bibliography on the industrial uses of cereals published in the last 25 years. Starches and starch derivatives are excluded. Over 2500 literature references are cited along with an index of subject matter. Papers are listed by author along with descriptive titles.

Many excellent papers are contained in this book dealing with the composition, fine structure, physical properties, functionality, and industrial nonfood uses of common cereal grains and grain components. For the most part, the papers are written in a scholarly style by recognized experts in cereal chemistry. Most of the papers provide comprehensive reviews of published literature, but they also contain results of work in progress by the authors.

This book will be of broad interest to industrial people in the wet and dry milling industries, as well as to industries that consume cereal products. It also should be a valuable reference book to university people (botanists, biochemists, and carbohydrate chemists) because of the breadth of subject matter covered—particularly in those chapters dealing with the structure and composition of cereal grains and grain components—as well as the annotated bibliography.

Readers of this *Journal* will be interested in those chapters that describe, in considerable detail, the lipid components of the various cereals.

As might be expected from an unedited book written by many authors of different backgrounds, style and perception of present and future potential for industrial utilization vary considerably. Also, the chapter headings do not adequately portray the subject matter. In spite of these shortcomings, this book is recommended highly.

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