Book reviews

Autoxidation of Unsaturated Lipids (Food Science and Technology: A Series of Monographs), edited by H.W.-S. Chan (Academic Press Inc., 6277 Sea Harbor Dr., Orlando, FL 32887, 1987, 296 pp., $63.50).

With the renaissance of the field of lipid oxidation, much of the advances in research in the last decade have become scattered in the food, chemical, biochemical and biomedical literature. This book presents a useful overview of diverse aspects of lipid oxidation written by experts in the field.

Chapter 1 on the mechanism of autoxidation, by H.W.-S. Chan, is a short review of the fundamentals of free radical oxygen reactions established about 40 years ago by workers at the British Rubber Producers Research Association. Chapter 2 on lipid hydroperoxides, by H.W.-S. Chan and D.T. Coxon, is a good review of research published mainly between 1975 and 1984 with emphasis on the work by the Norwich group in England. The section on detection and measurement of lipid hydroperoxides is scanty.

Chapter 3 on hydroperoxide products of high molecular weight, by H.W. Gardner, is heavily mechanistic with considerable emphasis on esoteric problems of stereochemistry that are more relevant to enzyme oxidations than the random and complex autoxidation reactions of fats and oils. This chapter has excellent discussions

of the Russell mechanism and kinetic studies based on model t-butyloxy radicals that have been accepted recently without critical evaluation by many workers in the field.

Chapter 4 on hydroperoxide products of low molecular weight, by W. Grosch, is the most comprehenisve review of the literature on volatile lipid oxidation products published up to 1983. It is the only chapter that has a conclusion. It provides an excellent discussion of the many pathways for the formation of volatiles and how their composition is greatly affected by experimental conditions.

Chapter 5 on major factors affecting autoxidation, by J. Pokorny, surveys the literature published mainly in Europe in the last 20 years. Some conclusions made on the effects of antioxidants and sensitizers are out of date. Generalizations are made that are not based on experimental facts, e.g., that 2-t-butyl- and 3-t-butyl-4-methoxyphenol are common stabilizers of vegetable oils (pages 172 and 197), that α-tocopherol is the main isomer and that it is often added in edible oils (page 176), and that milk fats need no protection by antioxidants (page 197). Although the author often refers to antioxidants as weak or strong without explanation, he concludes that it is difficult to make comparisons of published data.

Chapter 6 on oxidation of lipids in food systems, by C.E. Eriksson, has a good review of food safety aspects and the poorly understood problems of oxidative deteriorations observed in complex systems such as fish and meats. A good discussion is given on enzyme systems and their impact on foods. Chapter 7 on oxidation of lipids in biological membranes, by R.J. O'Brien, makes a noble effort to cover the broad areas of biological lipid oxidation attracting the most attention in the last few years. It is the impact of lipid oxidation in biological systems and the significance of free radicals and active oxygen species to our health that have revived this field. The most important advances are being made in this area because lipid reactions with oxygen are involved in the basic processes of life.

This book provides a good but not integrated account of research in lipid oxidation by experts in their respective fields. Except for the last chapter, which includes papers published as late as 1986, the rest of the book covers literature through 1981-84. Some of the research questions raised (e.g., oxidation of methyl oleate in Chapter 2, malondialdehyde formation from cyclic peroxides in Chapter 4) already have been answered in papers published after the book was compiled. Some typographical, editorial and grammatical errors have escaped the scrutiny of the editors, especially in the chapters that appear to have been translated. The book is recommended for beginning and advanced researchers in the various aspects of food and biological lipid oxidation.

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Annual Review of Nutrition, Vol. 7, 1987, edited by Robert E. Olson, Ernest Beutler and Harry P. Broquist (Annual Reviews Inc., 4139 El Camino Way, PO Box 10139, Palo Alto, CA 94303-0897, 1987, 587 pp., $31).

Annual Reviews have gained the reputation as informative, accurate and timely presentations of important issues in biological and medical sciences. The **Annual Review of Nutrition**, in only the seventh year of production, has become an important reference for nutrition scientists. Volume 7 contains 25 chapters on different topics written by experts in the respective areas. The table of contents groups the individual chapters into classical subject matter areas, including energy, carbohydrates, lipids, proteins and amino acids, vitamins, inorganic nutrients, water, other food components, metabolic regulation, clinical nutrition, public health nutrition and comparative nutrition. The topics are organized in a logical manner within the table of contents. However, the placement of chapters within the book appears to be random. Consequently, the table of contents is not in numerical order.

Individuals chapters provide an excellent introduction into current research topics. Each chapter provides general background, current status of research, important questions and a summary. Reference lists for most chapters are extensive, with 70 to 100 citations being the norm. Presentation of tabular data and graphics is limited but adequate.

No attempt will be made to review each of the chapters, but specific mention of three chapters will serve to illustrate the general depth of the volume. The chapter by Alan Goodridge entitled "Dietary regulation of gene expression: Enzymes involved in carbohydrate and lipid metabolism" is an excellent review of basics for investigations of molecular biology using dietary variables. The author provides indepth evaluation of the current research about dietary regulation of gene expression for selected enzymes in carbohydrate (pyruvate kinase and PEPCK) and lipid (fatty acid synthetase and HMGCoA reductase) metabolism. He emphasizes the links between diet and hormonal regulations of gene expression.

A second chapter worth special mention is "From dietary glucose to liver glycogen: The full circle round" by McGarry, Kuwajima, Newgard, Foster and Katz. This is an interesting reevalutaion of the mechanism for glycogen synthesis during refeeding conditions. The authors carefully review the tracer studies of carbon flow and propose that glycogen synthesis under fed conditions is predominately via gluconeogenesis from lactate and not directly from glucose. Acceptance of this proposal will require a major revision of all basic nutrition textbooks.

In the public health nutrition section, A. Harper presents a chapter entitled "Evolution of Recommended Dietary Allowances—New Directions?". Harper presents a historical review of dietary guidelines and poses questions about proper use of the RDA's to define adequate intakes of essential

nutrients versus to provide therapeutic guidance to those suffering from specific diseases. Other chapters range from "Phenylketonuria" to "The Pig as a Model for Human Nutrition" to "Intracellular Vitamin A-Binding Proteins".

Annual Review of Nutrition should be of use to any scientist interested in the field of nutrition. It is well written, and the editing of this volume is outstanding. The reader can expect consistency in the level of presentation and quality among the chapters. I find that the **Annual Review of Nutrition** serves as an excellent updating and teaching reference. This is not a book that is likely to be read from cover to cover.

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Jojoba: Proceedings of the Sixth Internation Conference on Jojoba and its Uses, edited by Jaime Wisniak and Jacob Zabicky (Jojoba Growers Association, 142 Front St., Avila Beach, CA 93424, 1985, 453 pp., $30 in the US, $31 international surface delivery, $38 international airmail).

This collection consists of 58 contributed papers covering a wide range of subjects pertaining to jojoba, including agricultural development, plant physiology, genetic selection, propagation, chemistry, functionality, economics and marketing of jojoba and jojoba products. The authors include agronomists, academicians, government researchers and economists, industrial chemists and jojoba growers and marketers, many of whom have been actively involved in the development of a jojoba industry during the last decade.

The first 11 papers discuss the status of plantation development and cultivational aspects throughout the world, particularly in the U.S., Mexico, Australia, South America and Spain. The papers on Paraguay and Spain are in Spanish, while all others are presented in English. The next 26 papers deal with various agronomic aspects of jojoba including harvesting methods, genetic variability, yield optimization and propagation methods.

Chemistry and functionality of jojoba oil and meal are presented in the next block of 12 papers, including four on various nutritional aspects of jojoba oil and meal. Emphasis is given to analytical techniques, basic chemistry and derivatives of jojoba oil. The development of industry standards for commercial jojoba products, which has been a concern of the industry, is discussed. Of particular immediate interest are the papers on the cosmetic and dermatological efficacy of jojoba. According to one paper, jojoba oil has been shown to alleviate symptoms in patients suffering from acne or psoriasis.

The final block of seven papers deals with the industrial commercialization of jojoba, market development and the steps necessary to assure the viability of jojoba as a new agricultural material.

As one reads through this book, it becomes increasingly clear that the domestication and commercialization of jojoba is an enormously complex task requiring careful coordination of agricultural, economic, marketing and market development functions, all the while self-examining and refocusing upon the task at hand. Much of the information is technical in nature, and the book as a whole will appeal primarily to those directly involved in the development of the jojoba industry. However, the book is a good reference for academicians, agronomists, product development chemists and potential end-users of jojoba, clearly representing the state of the art at the time this conference was held. In a broader sense, the book represents more than just the technical developments in jojoba to date. What clearly comes through is the determination and desire of the jojoba industry to successfully commercialize this crop. Even the most casual reader can't fail to be impressed by the depth, diversity and wealth of information about jojoba, its uses and the industry developing around it.

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Personal Computers for Scientists: A Byte at a Time, by Glenn I. Ouchi (American Chemical Society, 1155 Sixteenth St. N.W., Washington D.C. 20036, 1986, 276 pp., clothbound, $34.95 US and Canada, $41.95 elsewhere; paperbound, $22.95 US and Canada, $27.95 elsewhere).

This book is written in a highly personable style and is "user friendly". It was written for persons who wish to learn about using personal computers in the laboratory. It will be useful for persons at all levels of expertise, and this reviewer actually found it a pleasure to read. It also appears to be an excellent book to introduce graduate students to the uses of computers in the laboratory, and I am using it as such. The book is divided into three sections containing 11 basic chapters, each dealing with an important topic. Section 1, personal computers in the chemical laboratory, covers introduction to personal computers, personal computer hardware and operating system hardware. Section 2, application software, covers word processing, spreadsheets, graphics, data base management systems, and project management and statistical analysis programs. The final section, communication and interfacing, covers data communication and interfacing, on-line electronic data bases, and interfacing with the real world.

This book is well illustrated with practical examples to indicate, for instance, how spreadsheets are used in laboratory work. The index is detailed and adequate. The initial step into the world of computers in the laboratory is very often bewildering and frustrating. This small volume is a big help for anyone who wishes to step into the world of computers and master them.

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