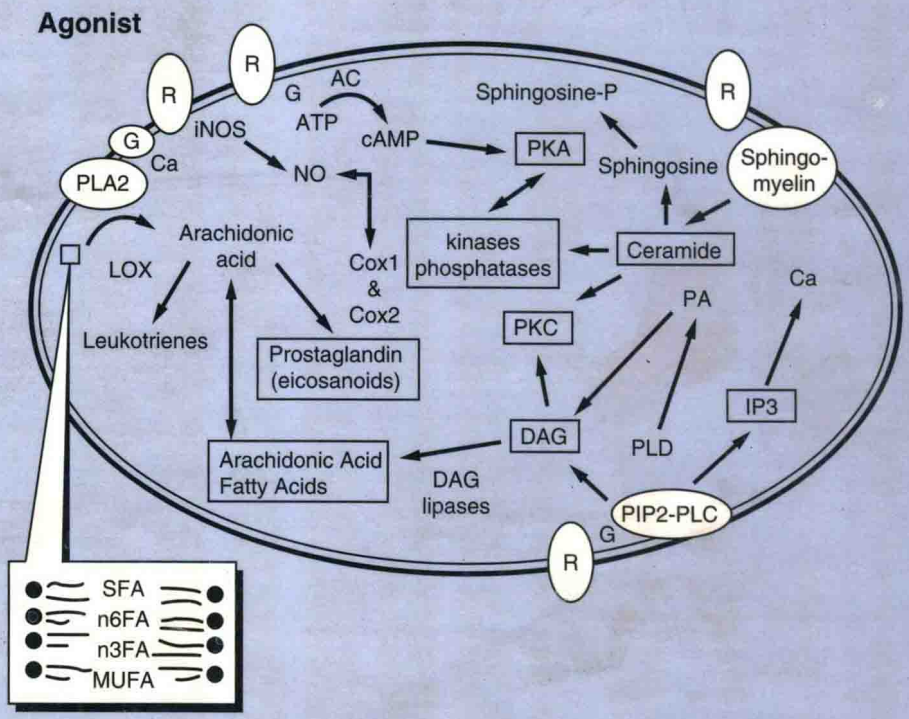
FATTY ACIDS IN FOODS AND THEIR HEALTH IMPLICATIONS

SECOND EDITION, REVISED AND EXPANDED



EDITED BY

CHING KUANG CHOW

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University of Kentucky
Lexington, Kentucky

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Preface

Since the first edition of *Fatty Acids in Foods and Their Health Implications* was published in 1992, voluminous new information on fatty acids in various foods and food products has become available. There has also been a large expansion of new knowledge dealing with the biological effects and health implications of fatty acids. In addition to being essential for normal growth, development, and maintenance, there is an increasing recognition that fatty acids play important roles in mediating the activation and expression of genes, which in turn regulate cellular signaling, differentiation, and apoptosis. Furthermore, excess intake of fats in general, and certain types of fatty acids in particular, have increasingly been implicated in the etiology of a variety of disorders including cardiovascular disease, cancer, immunity and inflammatory diseases, renal disease, diabetes, neuromuscular disorders, liver disease, visual dysfunction, psychiatric disorders, and aging. Understanding the mechanisms by which fatty acids are involved in the pathogenesis of these disorders is essential for effective preventive measures.

Overweight and obesity affect more than 40% of the adult population in the United States and a significant number in foreign countries. Overweight and obesity have been recognized as major determinants in many noncommunicable diseases, including diabetes mellitus, coronary heart disease, and stroke, and as risk factors for several types of cancer, muscular-skeletal disorders, and respiratory problems. Because fat has the highest energy density, concern about health problems associated with obesity and overweight has led to the development of fat substitutes, such as the fat-based fat substitute olestra, approved by the Food and Drug Administration for certain commercial applications. Recently, the rapid advance in biotechnology has allowed for selective alteration of fatty acid composition in oil crops. In the near future it will be possible to commercially produce oil crops that contain desirable proportions of specific fatty acids. Due to the distinct health implications of various dietary fats, genetic manipulation of fatty acid composition in oil crops can have enormous impact not only on our well-being, but also on global economy.

In addition to updating original chapters, new chapters have been added that cover subject areas that were not covered adequately or at all in the first edition: "Isotopic Methods for Assessing Lipid Metabolism" (Chapter 4), "Fatty Acid Content of Convenience Foods" (Chapter 13), "Fat-Based Fat Substitutes" (Chapter 16), "Fatty Acid Regulation of Gene Expression and Fat Cell Differentiation" (Chapter 28), "Fatty Acids, Lipids, and Cellular Signaling" (Chapter 29), "Satiating Effects of Fats" (Chapter 34), "Fatty Acids and Growth Development" (Chapter 35), "Fatty Acids and Aging" (Chapter 36), "Fatty Acids and Liver Disease" (Chapter 38), "Fatty Acids and Visual Dysfunction" (Chapter 39), and "Fatty Acids and Psychiatric Disorders" (Chapter 45).

This updated and expanded volume presents the current knowledge of fatty acids in common foods and food products. It also provides the reader with state-of-the-art information on the important

and widely diversified field of fatty acids and their health implications. However, since the precise role of fatty acids in the etiology of various disorders has yet to be delineated, it is not the intention of this book to present a unified view on the health implications of fatty acids or to provide guidelines for fatty acid consumption.

I would like to express my sincere appreciation to all the contributors for their cooperation and excellent work. Without their participation this project would not have been a reality. I would also like to thank Maria Allegra, Rod Learmonth, and Ann Pulido of Marcel Dekker, Inc., for their assistance and support during the course of this project. Finally, I wish to thank my wife, Shukwei, for her understanding and patience over these past many years.

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