



ELEVENTH EDITION

# MODERN NUTRITION

## in Health and Disease

*EDITORS*

**A. Catharine Ross**  
**Benjamin Caballero**  
**Robert J. Cousins**  
**Katherine L. Tucker**  
**Thomas R. Ziegler**





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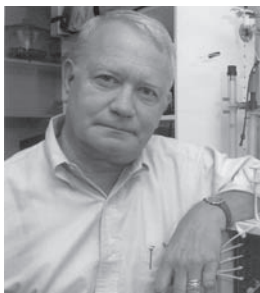
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**Robert J. Cousins** is the Boston Family Professor of Nutrition and Eminent Scholar at the University of Florida. He has a B.A. from the University of Vermont and a Ph.D. from the University of Connecticut and was a National Institutes of Health (NIH) Postdoctoral Fellow in Biochemistry at the University of Wisconsin. He has been President and Board Chair of the Federation of American Societies for Experimental Biology and President of the American Society for Nutrition (ASN). He has received numerous awards including the Mead Johnson Award, the Osborne and Mendel Award of

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# PREFACE



The eleventh edition of *Modern Nutrition in Health and Disease* follows from a long history of publishing an authoritative text related to human nutrition, from the basic science of nutrient metabolism and functions to the applications of nutrition for improving clinical outcomes and public health. The goal of this edition, like that of its predecessors, is to provide an updated, comprehensive, and authoritative text and reference source authored by experts in their fields. In this new edition, more than 190 authors have joined this effort. Nearly 60% are new authors. All authors have provided the most up-to-date view of their respective areas.

The history of *Modern Nutrition in Health and Disease* now spans more than five decades, as outlined in the following table, which lists the editions, publication year, editors, and publisher of this text.

From its outset, the book has taken a broad approach to nutritional science with a strong clinical view. The title and objectives of this work evolved from a book originally designated *Dietotherapy*, initiated by Michael G. Wohl, M.D., and Robert S. Goodhart, M.D., as Coeditors, in 1950. The second edition was the first to use the title *Modern Nutrition in Health and Disease*, subtitled *Dietotherapy*. Drs. Wohl and Goodhart continued to edit the first four editions. Beginning with the fifth edition in 1973, Maurice E. Shils, M.D., Sc.D., joined in editing the book with Dr. Goodhart. Dr. Shils became the Senior Editor beginning with the seventh edition in 1988 and continued in this role through the tenth edition. The tenth edition celebrated the 50th anniversary of *Modern Nutrition in Health and Disease*.

As planning for the eleventh edition began, Dr. Shils decided it was time to retire from this project. He and his wife, Betty, who ably assisted Maury through the organization of several editions, live in Winston-Salem, North Carolina, where they are happily taking care of two very lively Shelties as well as traveling frequently. The Editors of the eleventh edition, both those continuing and those who are new to this work, wish to extend our most sincere gratitude to Maury Shils for the guidance he has provided and for sharing his love for this book and his rigorous approach to overseeing the tasks that are involved. To many readers, *Modern Nutrition in Health and Disease* became known simply as *Goodhart & Shils* and later as *Shils*. We hope that as the book makes its most recent transition, it will continue to be the highly respected and authoritative text that this reference always has been.

The eleventh edition continues traditions and adds new ones. The basic organization remains the same as in the tenth edition, but all the topics are state of the art and some have been consolidated, with emphasis always on staying modern, as the work's title states. Beginning with this eleventh edition, the Appendices have been simplified and moved online—consistent with modern delivery of these materials—which can now be updated as needed, and it also makes the book more concise. The eleventh edition highlights many new topics that represent the most current concepts and practical concerns in nutrition and nutritional management of disease. New chapters include Functional Foods and Nutraceuticals in Health Promotion, Prebiotics and Probiotics as Modulators of the

EDITION NUMBER	PUBLICATION YEAR <sup>a</sup>	EDITORS	PUBLISHER
1	1950	Drs. Michael Wohl, Robert Goodhart	Lea & Febiger
2	1955	Drs. Michael Wohl, Robert Goodhart	Lea & Febiger
3	1964	Drs. Michael Wohl, Robert Goodhart	Lea & Febiger
4	1968	Drs. Michael Wohl, Robert Goodhart	Lea & Febiger
5	1973	Drs. Robert Goodhart, Maurice E. Shils	Lea & Febiger
6	1980	Drs. Robert Goodhart, Maurice E. Shils	Lea & Febiger
7	1988	Drs. Maurice E. Shils, Vernon Young	Lea & Febiger
8	1994	Drs. Maurice E. Shils, James A. Olson, Moshe Shike	Lea & Febiger <sup>b</sup>
9	1998	Drs. Maurice E. Shils, James A. Olson, Moshe Shike, A. Catharine Ross	Lippincott Williams & Wilkins
10	2005	Drs. Maurice E. Shils, Moshe Shike, A. Catharine Ross, Benjamin Caballero, Robert J. Cousins	Lippincott Williams & Wilkins
11	2012	Drs. A. Catharine Ross, Benjamin Caballero, Robert J. Cousins, Katherine L. Tucker, Thomas R. Ziegler	Lippincott Williams & Wilkins

<sup>a</sup>Year of the first printing.

<sup>b</sup>Lea & Febiger, Philadelphia, was purchased shortly before the publication of the eighth edition by the Waverly Company, owner of Williams & Wilkins Publishers, Baltimore. Shortly before the publication of the ninth edition, the Waverly Company was purchased by Wolters Kluwer Publishers and merged with Lippincott, the medical publisher in Philadelphia.

Gut Microbiota, Epigenetics, Mechanisms of Nutrient Sensing, Metabolic Consequences of Calorie Restriction, Bariatric Surgery, Metabolic Syndrome, Nutrition and Inflammatory Processes, Irritable Bowel Syndrome and Diverticular Disease, Food Insecurity in Children, Cancer Cachexia, Nutrition in Burn Injury, Dietary Patterns, and Approaches to Preventing Micronutrient Deficiencies.

The Editors wish to acknowledge outstanding support in the preparation, editing, and production of this extensive work. The authors who have contributed their expertise are listed alphabetically on the following pages. The Editors have worked personally with some of the staff of Lippincott Williams & Wilkins in Baltimore, whereas other members have been involved “behind the scenes” at the editorial, publication, distribution, and marketing stages. We wish to thank all of them for their support.

David Troy, Senior Acquisitions Editor, helped move the eleventh edition forward after Dr. Shils’ retirement. Matt Hauber and John Larkin served as our Product Managers. The project owes an enormous thank you to Holly Lukens, chief copyeditor. She has worked with *Modern Nutrition in Health and Disease* for three editions and has consistently improved the quality of the work. We thank the various graphic artists whose illustrations are in the eleventh edition and the staff at the graphics department at Lippincott Williams & Wilkins for the special attention paid to illustrations in this new edition. We are also very indebted to those who worked closely and efficiently with us in preparing and distributing manuscripts and managing communications, and we wish to acknowledge Madeleine Stull and Carrie Guzman for their excellent staff assistance.

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