ADVANCED NUTRITION
Micronutrients

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Carolyn D. Berdanier
Professor, Foods and Nutrition
University of Georgia
Athens, Georgia

Illustrations by: Toni Kathryn Adkins

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Ira Wolinksy, Ph.D.
Series Editor

Preface

In the first volume of this two-volume book, *Advanced Nutrition: Macronutrients*, the needs for the macronutrients were discussed. The absorption, metabolism, excretion, and function of the various sources of energy as well as detailed discussions of the need for water and energy balance were presented. The needs for the micronutrients, as well as explanations of how these nutrients function in the body, were deferred to this, the second volume.

While most vitamins function at the metabolic level, the discoveries of how some of the vitamins and minerals work at the genomic level are quite exciting. Finally, we have an understanding of the pathophysiology of the plethora of diseases labeled nutrient deficiency disorders. Beriberi, pellagra, anemia, scurvy, embryonic and fetal malformation, rickets, osteoporosis, and a number of subtle (and not so subtle) disorders are finally connected to specific nutrients such that we can now understand why certain symptoms develop when an inadequate intake occurs. We have also come to understand, in part, the genetic diversity of the many species that require these nutrients. Nutrient-gene interactions as well as nutrient-nutrient and nutrient-drug interactions have become major research endeavors by nutrition scientists throughout the world. These scientists are truly hybrids in the world of science. They must have expertise in nutrition, biochemistry, physiology, and genetics, and if they are interested in human nutrition they must also understand human social systems and human medicine or have a physician collaborator.

Nutrition science is not as simple as finding a nutrient and determining its function. Today's science requires a far more complicated approach. The techniques of yesteryear are no longer adequate by themselves. The techniques of other disciplines must be brought to bear as well. The student will make new discoveries by studying the present database and finding the gaps in our knowledge. Nowhere is this as apparent as in the study of the micronutrients. While the animal of primary interest is the human, most research uses animals of other species because of the need to make organ, cell, and subcell measurements that are impossible to perform in the human. For this reason, the scientist needs to be all-inclusive in the study of nutrient needs.

Interspecies comparisons provide ample opportunities to learn how specific nutrients function and interact with other nutrients. After all, nutrition is a composite science requiring skills of integration and comprehension of the whole living system.

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Author

Carolyn D. Berdanier, Ph.D., is a Professor of Nutrition at the University of Georgia in Athens, Georgia. She received a B.S. degree from The Pennsylvania State University and M.S. and Ph.D. degrees from Rutgers University in Nutrition in 1966. After a post-doctoral fellowship year with Dr. Paul Griminger at Rutgers, she served as a Research Nutritionist with the Human Nutrition Institute which is part of ARS, a unit of the U.S. Department of Agriculture. In 1975 she moved to the University of Nebraska College of Medicine where she continued her research in nutrient gene interactions. In 1977 she moved to the University of Georgia where she served as Head of the Department of Foods and Nutrition. She stepped down from this post ten years later and devoted her full time efforts to research and teaching in her research area. Her research on the diet and genetic components of diabetes and vascular disease has been supported by NIH, USDA, U.S. Department of Commerce, The National Livestock and Meat Board, and the Egg Board. She is a member of the American Institute of Nutrition, the American Society for Clinical Nutrition, The Society for Experimental Biology and Medicine, American Diabetes Association, and several honorary societies in science. She has served on the Editorial Boards of the *FASEB Journal, The Journal of Nutrition, and Nutrition Research and Biochemistry Archives.* She has also served as a Contributing Editor for *Nutrition Reviews* and Editor of the AIN News Notes. Current research interests include studies on aging, the role of diet in damage to mitochondrial DNA, and the role of specific dietary ingredients in the secondary complications of diabetes.

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