
Preface

More research is done on calcium with resultant publications than for any other mineral. This interest in calcium is appropriate with its diverse biological functions, the dietary inadequacies in calcium all over the world, and the relationship of calcium status to so many disorders. Calcium serves as a second messenger for nearly every biological process and stabilizes many proteins. It is an unusual nutrient in that the storage reserve of calcium in the skeleton has a biological function. Bone mass predicts risk of fracture. Aside from bone health, calcium insufficiency has been associated with hypertension, cardiovascular health, stroke, polycystic ovary disease, kidney stones, certain types of cancer, weight loss, diabetes, and insulin resistance syndrome.

The aim of *Calcium in Human Health* is to provide students, scientists, and health professionals including physicians, nutritionists, dentists, pharmacists, dietitians, and health educators with up-to-date research on calcium function and its relationship to health. The amount of new information has been almost explosive linking calcium to health in the last decade with the associations to weight loss, diabetes, and insulin resistance syndrome evolving in the last 5 years. Equally exciting are the discoveries coming from molecular biology and genetics. Our basic understanding of calcium absorption and the influence of gene polymorphisms is evolving. Single book chapters cannot do justice to the amount of new information available.

Calcium in Human Health is divided into six parts. Part I discusses calcium function as the main element in bone, as an intracellular messenger, and as a stabilizer of proteins. This section explains why calcium status is part of the etiology of so many disorders. Part II discusses methods for estimating calcium intakes of various populations as well as how to conduct controlled feeding studies. The ability to determine calcium intake sheds light on interpretation of studies of the relationship of calcium intake to disease. The third section discusses calcium intakes, requirements, and dietary sources of calcium. One chapter illustrates how widespread calcium deficiencies are throughout the world. Circumstances that create calcium excesses and the implication of exceeding upper tolerable levels are reviewed. Another chapter discusses calcium bioavailability and food factors that influence calcium absorption. Part IV reviews calcium homeostasis. Molecular mechanisms of calcium absorption and regulators of calcium homeostasis from genetics to lifestyle choices are reviewed in this section. One chapter suggests an interesting role for regulation of intake driven by calcium appetite. The influence of total diet and lifestyle choices on calcium metabolism is also covered in this section. A fifth section covers calcium through development. Various chapters in this section cover infancy and childhood, adolescence, pregnancy, and lactation. The last section covers many of the diseases now associated with calcium intake. Each chapter begins with an overview of the literature, but the emphasis is on recent findings.

We have devoted most of our careers to the study of calcium and its relationship to health. As editors, we hope *Calcium in Human Health* will serve as a critical resource for

health professionals to enhance their ability to improve health outcomes of individuals; for researchers who study calcium function and application; for students of health science, nutrition, and medicine; and for those setting dietary requirements and developing disease-prevention programs. This comprehensive coverage of calcium in human health is assembled by the leading researchers in the field of calcium. We believe that *Calcium in Human Health* will serve as a useful text and reference. We invite comments from users of this book about its content and use of various chapters in their investigations and in training.

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<http://www.springer.com/978-1-58829-452-4>

Calcium in Human Health

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2006, 472 p. 89 illus., Hardcover

ISBN: 978-1-58829-452-4

A product of Humana Press