



Preface

Welcome to New Co-Author

Before discussing the features of the sixth edition of *Contemporary Nutrition*, I am excited to have the opportunity to introduce my new co-author Dr. Anne Smith. A colleague at The Ohio State University, she has been an invaluable addition to this project. Anne has taught nutrition to nutrition majors and non-majors for many years. She is a dynamic teacher and is tremendously insightful about how best to present nutrition information to a diverse group of students. Her knack for expressing scientific concepts in an interesting, yet simple and concise manner has contributed greatly to the readability of the text. As you examine the sixth edition, you will benefit from Anne's keen eye for detail and clarity.

Our Approach to Teaching Nutrition

If you teach nutrition, you undoubtedly already find it a fascinating subject. Nutrition, however, can also be a frustrating subject to teach, for a variety of reasons. New research studies seem to emerge at an almost dizzying pace. Claims and counterclaims abound regarding the need for certain constituents in our diets. How does an instructor adequately convey changing and seemingly conflicting messages to introductory students? Our students also commonly bring to class many misconceptions about nutrition, and many have not had a college-level biology or chemistry course. How do we convey complex scientific concepts at a level appropriate for undergraduate students? And finally, how do we help our students meaningfully apply the material we cover in class to their own lives?

Keeping Current

The vast amount of research underway is constantly reshaping our knowledge of nutritional science. As authors and teachers, we constantly scour the literature to ensure that students' first exposure to the study of nutrition is reliable, accurate, and as up-to-date as this rapidly changing field allows. We are also aware of conflicting opinions in our field and thus draw on as many reputable sources as possible to create a balanced

resource for nutrition information. We strive to present an objective approach to newly emerging or controversial topics so that students learn to carefully scrutinize the nutritional information they read and hear about.

Understanding Our Audience

We have written *Contemporary Nutrition* assuming that our students have a limited background in college-level biology, chemistry, or physiology. We have been careful to include the essential science foundation needed to adequately comprehend certain topics in nutrition, such as a basic discussion of protein synthesis in Chapter 6. Scientific discussions have been written in a simple, straightforward manner.

We have also taken into consideration the fact that students enrolled in introductory nutrition often come from a broad range of majors and interests. We have addressed this by incorporating a thorough system of pedagogical tools, such as critical thinking questions and concept checks, to help them master the material. A variety of applications and real-life examples have been interspersed throughout to appeal to students whose majors range from business to education.

Personalizing Nutrition

A prominent theme in nutrition today is *individuality*. Not all of us, for example, find that saturated fat in our diets raises our blood cholesterol values above recommended standards. Each person responds differently to nutrients, and we try to reinforce this point throughout the book.

Moreover even at this basic level, the text's discussions do not assume that all nutrition students are alike. Chapter content and features, such as Rate Your Plate, repeatedly ask students to learn more about themselves and their health status and to use their new knowledge to improve their health. After reading this textbook, students will be better equipped to understand how the nutrition information coming from all directions—whether on the evening news, on ready-to-eat cereal boxes, in popular magazines, or from government agencies—applies to them. Our goal is for students to understand that their knowledge of nutrition will allow them to evaluate and personalize nutrition information, rather than to

follow every guideline issued for an entire population. After all, a population consists of individuals with varying genetic and cultural backgrounds, and these individuals will have varying responses to diet.

As a final note on bringing nutrition down to a personal level, the book covers important questions students often bring to class, concerning topics such as eating disorders, dietary supplements, vegetarianism, popular weight-loss diets, and diets for athletes. Regardless of topic, the overall emphasis remains the same—the importance of understanding one’s food choices and modifying one’s diet to best meet personal needs.

Organization

This book is organized into six parts that reflect the major topics typically covered in an introductory nutrition course:

- Part One Nutrition: A Key to Health
- Part Two The Energy-Yielding Nutrients and Alcohol
- Part Three Vitamins and Minerals
- Part Four Energy: Balance and Imbalance
- Part Five Nutrition: A Focus on Life Stages
- Part Six Nutrition: Beyond the Nutrients

The Table of Contents also reflects the inclusion of two chapters not typically found in introductory textbooks: Chapter 7, Alcohol and Chapter 12, Eating Disorders. The expanded discussion of these topics is the result of feedback from instructors who felt it was important to provide their students with a thorough, balanced discussion of these relevant topics.

Although most frequently used in semester-long courses, the text’s organization allows instructors to omit Parts or Chapters to fit the needs of quarter-length courses. We have also tried as much as possible to make each chapter function independently so that instructors can cover the material in the order that best fits their particular course needs.

New to This Edition

Streamlined Chapter Features

In addition to thoroughly updating the content to reflect latest guidelines and research findings, we have made some changes to the composition of the chapter features. With the help of colleagues, reviewers, symposium participants, and our own students, we have determined that the number and length of boxed readings should be reduced. We also learned that most people prefer that the end-of-chapter boxed readings should instead fall within the main body of the chapter (before the summary, study questions, and the readings). We have therefore condensed some of the material previously covered in the boxed readings to focus on essential content. Other boxed reading content has been moved into the main body of the

text, such as the discussion of dietary fiber in Chapter 4 on carbohydrates. The sixth edition chapters typically contain only one or two boxed readings, which are now entitled “Looking Further.” We hope that you will agree that this arrangement better suits the needs of introductory students.

New Art and Design

Two important enhancements have been made to the visual appeal and pedagogical function of this edition. First, the design layout has been streamlined and the colors are more vivid to better capture students’ attention; and, more importantly, the sixth edition features dramatically improved illustrations. Per feedback and suggestions from professors, we have made the figures more colorful and simplified the labeling within the figures. One by one, each diagram and photo was scrutinized with an eye toward improving its visual appeal and ability to convey nutrition concepts.

Chapter-by-Chapter Revisions

In response to feedback from instructors using this text, we have reduced the complexity and refined the content to better meet the needs of today’s students. The following list highlights just some of the changes and updates you will find in the sixth edition of *Contemporary Nutrition*. Please refer to this list to help your transition from the previous edition to the sixth edition.

Chapter 1: What You Eat and Why

- The number of nutrition glossary terms in Table 1-1 has been decreased.
- You will find an additional Another Bite section to briefly introduce *trans* fatty acids, since they will now be listed on the Nutrition Facts panel. All the Nutrition Facts panels in the book have been revised to reflect the addition of *trans* fatty acids.
- Household units have been added to the Looking Further box, “Math Tools for Nutrition.”
- New Figure 1-4 showing the location of the hypothalamus has been added to the discussion of satiety.

Chapter 2: Tools for Designing a Healthy Diet

- The summary of the Food Guide Pyramid in Table 2-5 has been simplified.
- Looking Further box, “The Alphabet Soup of Nutrient Needs” contains a new figure comparing nutrient standards, such as RDA and UL, as well as a discussion of the Estimated Energy Requirements recently set by the Food and Nutrition Board.

- Figure 2-5 shows an updated and simplified example of the Nutrition Facts panel on a macaroni & cheese box.
- Another Bite (p. 63) discusses the new types of preliminary health claims allowed by the FDA.

Chapter 3: The Human Body: A Nutrition Perspective

- New Figure 3-5, illustrating blood circulation, has been enlarged and the corresponding labels simplified.
- New Figure 3-6 shows a more detailed depiction of capillary flow.
- A brief mention of the Heimlich maneuver and a website address for further details has been added.
- Elements in Figure 3-13 and the legend have been color-coded to make it easier to identify the specific method for nutrient absorption.
- A figure on enterohepatic circulation has been added.

Chapter 4: Carbohydrates

- Chapter 4 has been updated throughout to reflect the latest guidance for carbohydrate intake provided by the Food and Nutrition Board.
- The Carbohydrate Food Guide Pyramid is accompanied by a table of 15 common food sources of carbohydrate and the amount provided in a typical serving.
- Fiber is discussed in the body of the text (rather than in a box) and includes the differentiation of *dietary fiber* and *functional fiber*.
- The Looking Further box on diabetes and hypoglycemia includes a table that compares and contrasts type 1 and type 2 diabetes.
- Figure 4-7 has been simplified to illustrate the key hormones that regulate blood glucose.
- Table 4-5 provides diet plans containing 25 grams and 38 grams of fiber per the latest recommendations of the Food and Nutrition Board.
- Discussion of glycemic index now includes a discussion of glycemic load.

Chapter 5: Lipids

- The Lipid Food Guide Pyramid is now accompanied by a table of 15 common food sources of lipids and the amount provided in a typical serving.
- The discussion of atherosclerosis has been moved to the Looking Further box on cardiovascular disease to simplify the main content of Chapter 5.
- The text has been updated to reflect the inclusion of *trans* fatty acids on Nutrition Facts panels, which will be required on the labels of all U.S. foods by 2006.

- New Figure 5-3 more clearly compares the common food sources for saturated, monounsaturated, and polyunsaturated fats, and *trans* fatty acids.
- New Figure 5-9 depicts lipoprotein interactions in the body.

Chapter 6: Proteins

- The Protein Food Guide Pyramid is accompanied by a table of 15 common food sources of proteins and the amount provided in a typical serving.
- New Figure 6-1 presents a more visually appealing and realistic view of a cell to help students better understand the process of protein synthesis.
- The discussion of soy protein in the Looking Further box has been expanded to include plant proteins in general.
- Other improved illustrations include the following: Figure 6-8 contains more realistic presentations of organs involved in amino acid metabolism; Figure 6-10 has been redrawn to better convey the concept of protein balance; Figure 6-11 uses photos to illustrate protein balance in practical terms; and Figure 6-13 includes photos of children afflicted with kwashiorkor and marasmus.
- In Looking Further, “Vegetarian Diets,” the discussion of vegan diets has been expanded to include infants and children. Updates include a reference to the vegetarian pyramid from the June 2003 issue of the *Journal of the American Dietetic Association*.

Chapter 7: Alcohol

- Content regarding problems associated with alcohol abuse (other than cirrhosis) has been reduced.
- New illustration on the effects of alcohol abuse (Fig. 7-2) has been redrawn with a more realistic-looking person, and the content of the labeling has been simplified.
- New Table 7-4 summarizes the negative effects of binge drinking on society.

Chapter 8: Vitamins

- Coverage throughout Chapter 8 has been thoroughly updated to reflect latest vitamin intake recommendations.
- New margin note comparing the whole-grain advantage of bread versus rice has been added.
- New Figure 8-14 applies a pyramid approach to evaluating nutrient supplement use.
- The Looking Further box examines the debate on need for daily multivitamin and mineral supplements by including the latest advice from the U.S. Preventive Services Task Force, as well as opposing advice provided by recent articles in the *Journal of the American Medical Association*.
- The previous coverage of nutrition and cancer has been moved to Chapter 15.

Chapter 9: Water and Minerals

- The latest nutrient standards for sodium, potassium, chloride, and water have been incorporated.
- Discussion of the possible health benefits of calcium has been updated to reflect latest findings.
- A new Another Bite box explains how to calculate the calcium content of supplements.
- The Looking Further box on osteoporosis has been thoroughly updated and revised.
- New figures include improved presentation of fluid compartments in the body (Fig. 9-1), a summary of how minerals contribute to body functions (Fig. 9-11), and a chart relating peak bone mass and risk of osteoporosis (Fig. 9-15).

Chapter 10: Energy Balance and Weight Control

- The latest statistics on weight status of North Americans are provided.
- A brief discussion of resting metabolic rate (this term is used in available diet analysis software programs) has been added.
- Formulas provided by the Food and Nutrition Board for estimating the energy needs of adults are included.
- New figures of a BodPod and dual energy X-ray absorptiometry have been added to the discussion of diagnosing obesity and determining body composition.
- New Figure 10-15 illustrates a typical surgical procedure to treat severe cases of obesity.

Chapter 11: Nutrition: Fitness and Sports

- New Figure 11-1 summarizes the health benefits of physical activity.
- Improved Figure 11-2 provides easy-to-follow diagram tracing the flow of energy-yielding nutrients into metabolism.
- The discussion of carbohydrate needs of athletes based on the latest guidance from the American Dietetic Association and the American College of Sports Medicine has been updated.
- Current recommendations for protein intake for athletes have also been updated.
- New Table 11-6 summarizes the nutrient content of popular energy bars.

Chapter 12: Eating Disorders: Anorexia Nervosa, Bulimia Nervosa, and Other Conditions

- A second Looking Further box, "Thoughts of an Anorexic Woman," has been added as a counterpoint to Looking Further, "Thoughts of a Bulimic Woman."

- Chapter 12 has been reorganized so that binge-eating disorder is introduced before the female athlete triad.

Chapter 13: Pregnancy and Breastfeeding

- There is greater emphasis on the discussion of the importance of adequate folic acid intake prior to pregnancy to reduce the risk of neural tube defects.
- Chapter 13 includes the updated increase in calorie, carbohydrate, and protein needs of pregnant and lactating women recently issued by the Food and Nutrition Board.
- The food plan for pregnant women and lactating women has been updated to reflect the latest guidance provided by the American Dietetic Association.
- New Figure 13-5 better illustrates the processes of the let-down reflex.
- Chapter 13 presents the latest American Academy of Pediatrics recommendation that breastfeeding infants be given 200 IU per day of vitamin D.

Chapter 14: Nutrition from Infancy Through Adolescence

- The latest estimates for calorie, carbohydrate, fat, and protein needs for the appropriate infant age groups recommended by the Food and Nutrition Board are included.
- Chapter 14 simplifies the discussion of snacks for children.
- Discussion of the causes and treatment of childhood obesity has been updated.

Chapter 15: Nutrition During Adulthood

- The discussion on nutrition and cancer in the Looking Further box (previously located in Chapter 8) has been simplified and updated. (This content was previously in Chapter 8.)
- The discussion of alternative medicines and herbal supplements has been incorporated within the main body of the text. Table 15-4 now lists the benefits and risks of the ten most popular herbal remedies.

Chapter 16: Food Safety

- Table 16-2, which lists the U.S. agencies responsible for monitoring the food supply, has been moved to an earlier section of Chapter 16 for greater emphasis.
- Table 16-3 now focuses on the most important microorganisms involved in foodborne illnesses.

- New Figure 16-1 shows the minimum internal temperatures for cooking or reheating foods.
- New Table 16-4 lists the caffeine content of common beverages.

Chapter 17: Undernutrition Throughout the World

- The discussion of hunger in the United States has been simplified to emphasize the concept of food insecurity.
- Statistics related to North American and world hunger and health issues have been updated to reflect latest data.
- New Figure 17-4 promotes some possible approaches to solving the problem of undernutrition, in part to give a more hopeful tone to Chapter 17.

Special Acknowledgments

We would like to especially thank Angela Collene, M.S., R.D., for all her help with this edition, including proof-reading. Many of the text's improvements are the result of her suggestions. Michelle Asp M.S., R.D. also helped proof-read and edit the manuscript. Our editor, Lynne Meyers, supported and assisted us through every step of the revision and facilitated the many decisions required to accomplish the enhancements of this edition. Jodi Rhomberg and the rest of the McGraw-Hill production staff carefully oversaw the myriad of tasks needed to create a beautiful and precise textbook.

Thank You to Reviewers and Contributors

As with earlier editions, our goal remains to provide students with the most accurate, up-to-date, and useful textbook possible. These ambitious goals would not be possible without the meticulous, professional assistance of colleagues who have aided us in so many ways. Their advice and suggestions helped us formulate the vision that makes this sixth edition a more effective and efficient learning tool. Whether it was

reviewing the fifth edition or evaluating materials for this edition, participating in an instructional symposium, or responding to a survey, we owe our sincere thanks to each of these individuals. Along with our editors, we would like to acknowledge these dedicated educators whose contributions did so much to guide the direction of the sixth edition of *Contemporary Nutrition*.

A Request to Professors Who Use Contemporary Nutrition: Issues and Insights

The first edition of this text began with a dream. Each new edition is fostered by the excitement that improvements bring, and ends with the satisfaction of knowing that we have produced a dependable tool that will guide students as they begin their study of nutrition. As you might imagine, it is difficult to thoroughly address the vast range of nutrition science, keeping pace with countless new developments and controversies. We try our best but realize that sometimes we miss a side of an argument that deserves attention. As you read this book, if you find content that you question or believe warrants further attention, feel free to contact either of us:

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