Preface

We think of ourselves as consumers when we purchase homes, cars, computers, and food. We are also consumers of nutrition-related information. Nearly every day, we are literally bombarded with media messages concerning nutrition, foods, and health. Much of this information is unreliable and designed to promote sales of products or services. Nevertheless, we may use the information when making decisions about which foods or nutrition-related products to buy. Why? Many consumers lack the knowledge and skills needed to analyze such information critically and decide whether or not to apply it to their decision-making process.

Helping students become better-informed consumers, particularly as this relates to food and nutrition, is the foundation of *Nutrition for Healthy Living*. This major theme flows throughout the textbook by providing students with practical information, critical thinking skills, and the scientific foundation needed to make better-informed choices about their diet and health. By reading *Nutrition for Healthy Living*, not only will students learn basic principles of nutrition, they will also be able to evaluate various sources of nutrition information critically and to apply sound nutrition practices to improve their lives.

Who Was *Nutrition for Healthy Living* Written For?

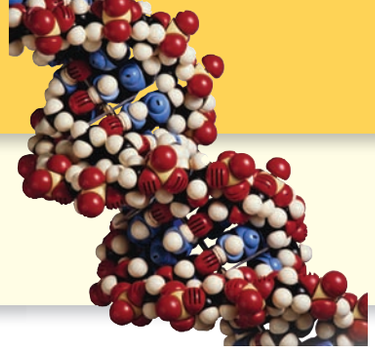
Writing a nutrition textbook is not an easy task, but throughout the process I relied on my experience teaching nutrition, foods, biology, and personal health classes at both the university and the community college level to develop a vision for a fresh approach to teaching introductory nutrition. My teaching experiences also provided valuable insights into the diversity, as well as the needs, interests, and capabilities, of today's students. In addition, manuscript reviews and introductory nutrition syllabi provided by colleagues helped define the shared goals of those who teach the course, which in turn helped shape the content of this textbook.

Nutrition for Healthy Living is intended for students who are interested in learning about nutrition for personal reasons, as well as students considering majoring in nutrition, nursing, or other health- and science-related fields. Students from a wide variety of academic backgrounds often enroll in introductory nutrition courses, and in many instances, they have not taken college-level science courses prior to this nutrition course. With this in mind, I wrote the textbook with the understanding that an introductory textbook must appeal to students who represent a broad range of interests and academic backgrounds—English majors as well as nursing majors. My hope is that this introductory course, along with my textbook, can spark students' interest in adopting healthier dietary practices and possibly even inspire some students to consider nutrition as their major.

> "I don't think I've read a better-written introductory nutrition text. It is informative, has a nice flow, and is easy to understand. The examples are engaging and clear."
>
> Danita Kelley
> Western Kentucky University

The *Nutrition for Healthy Living* Difference Is *ABC*

When I began to write this textbook, I felt strongly that I wanted to craft an alternative to established nutrition textbooks, while maintaining a focus on concepts that are fundamental to introductory nutrition courses. By building upon my experiences as coauthor of a college-level personal health textbook, I sought to develop a nutrition textbook that not only was scientifically up to date but also included consumer-oriented content and features. I wanted to create a textbook that would be visually appealing and fun to read, engage students' interest, be well organized, and have features that contribute to the pedagogy without being distracting. As my developmental editor gathered feedback from numerous instructors, the advantages that the new textbook would offer took shape—what my team at McGraw-Hill and I refer to as the **"ABCs of *Nutrition for Healthy Living*."**

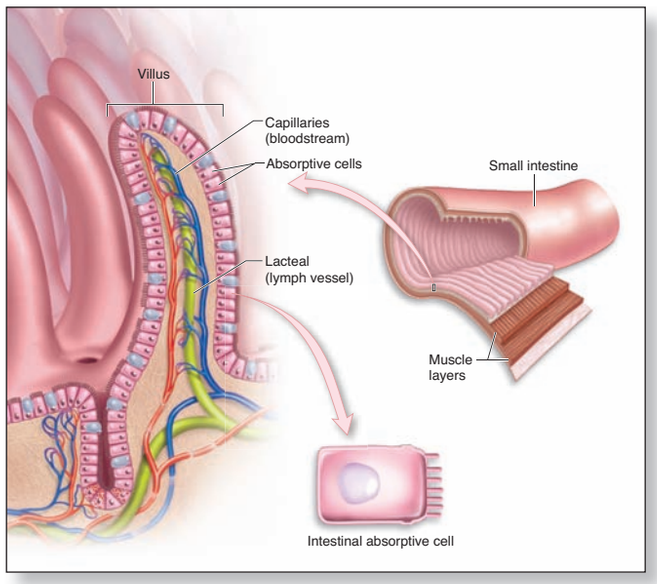


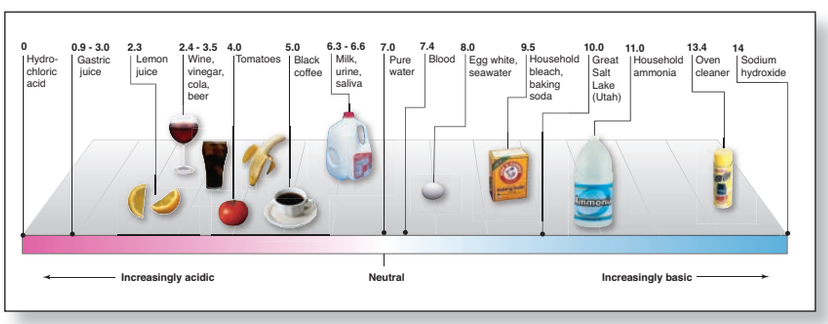
A = Accessible Science

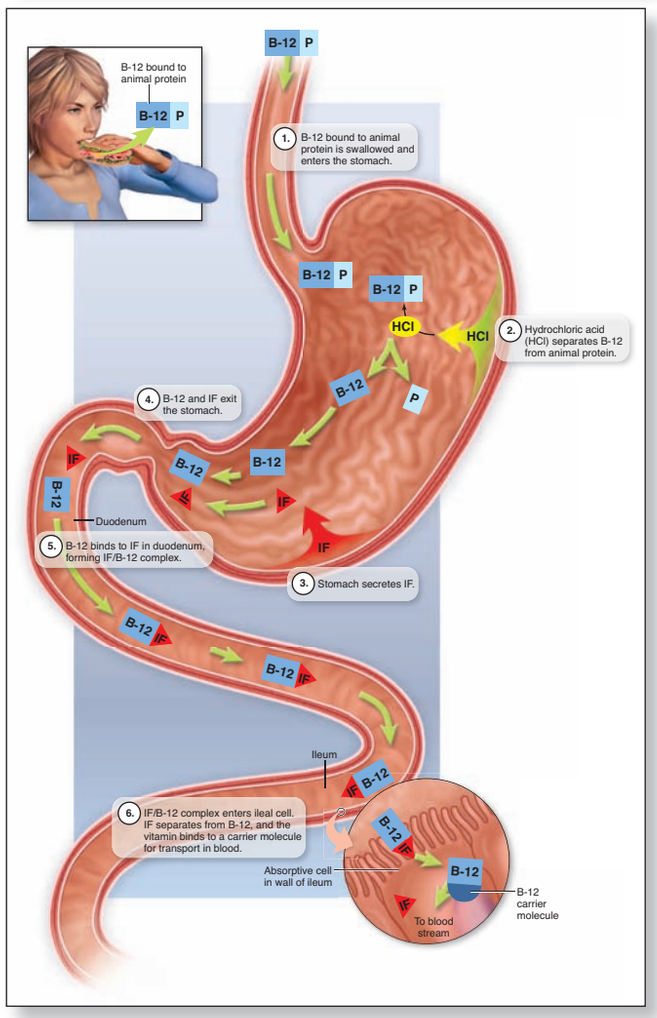
Nutrition is an "offspring" science that requires a basic understanding of certain chemical and physiological concepts and terms. Ignorance about chemistry and physiology contributes to food faddism and health quackery. By providing a solid scientific foundation, nutrition educators can more easily dispel commonly held but inaccurate beliefs, such as "When you're inactive, muscle turns into fat," and "Cellulite is a special type of body fat."

Becoming knowledgeable about nutrition requires a certain level of understanding of basic scientific principles. *Nutrition for Healthy Living* recognizes the importance of introducing such principles in a manner that every college student can understand. My primary goal for students who use this textbook is the same as it is for the introductory nutrition courses I teach—I want students to complete the course with a basic understanding of nutritional science so that they can make intelligent, practical choices that can result in improved nutrition and health.

Chapter 4 (Body Basics) presents basic principles of chemistry and human physiology as they apply to the study of nutrition, but at a level that students can easily understand. This chapter, for example, introduces and defines terms that relate to nutrition and foods, such as "acid," "basic," "enzyme," and "solvent." Because students and courses vary in the depth of scientific foundation required, this chapter features some flexibility. The chapter is divided into two main sections, chemistry and human physiology, so professors can choose to skip the chemistry section if they prefer.







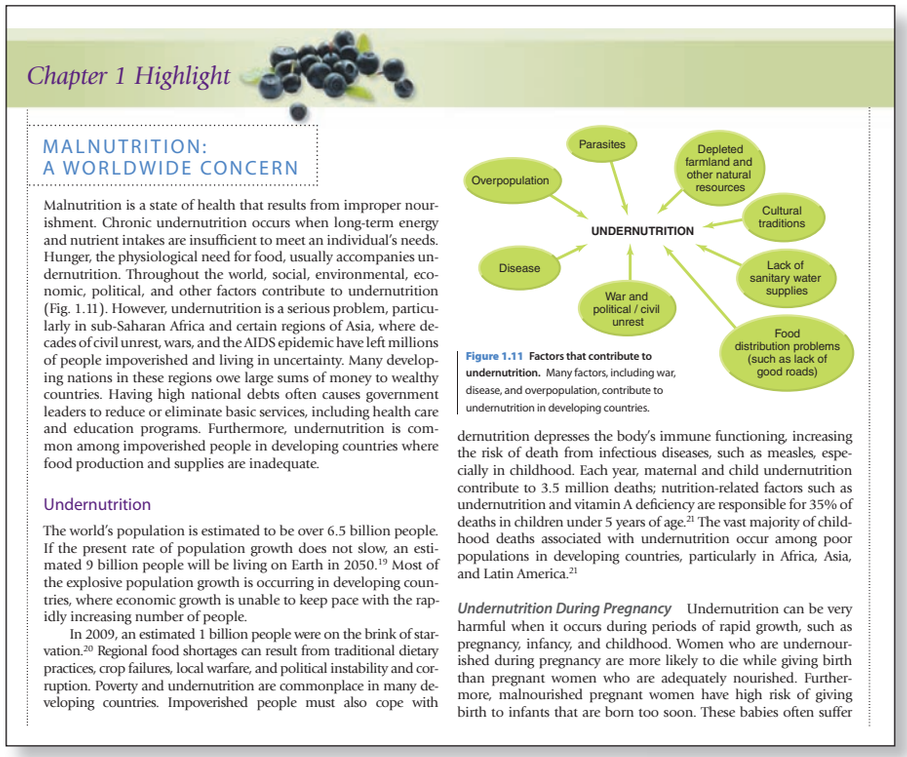
> "The text is at a very good level. Not too simple that it will insult those with a strong science background, but easy enough for those with weak science backgrounds."
>
> Janet Colson
> Middle Tennessee State University

B = Brief Organization

In developing the structure of this book, a new approach emerged; instructors often do not have the time to cover all the material in their textbooks. Based upon their feedback, I chose to organize the core content into 13 chapters. I believe this organization makes teaching introductory nutrition more manageable and fits the time frame of most courses better than textbooks that include 15 or more chapters. Some topics were important to cover, but they did not warrant using a full chapter. Thus, topics such as global nutrition concerns, alcohol and alcohol abuse, and eating disorders are presented in Highlight features at the end of chapters. Chapter 13 is devoted entirely to nutrition during the life cycle. Furthermore, key aspects of world nutrition and life cycle nutrition are also incorporated into relevant chapters throughout the book.

Nutrition for Healthy Living covers the core material instructors need in a format that is logical and practical for nearly all introductory nutrition courses:

- Chapter 1 introduces students to nutrition and nutrients, and presents 10 key nutrition concepts, such as "Most naturally occurring foods are mixtures of nutrients" and "Eating a variety of foods can help ensure the nutritional adequacy of a diet."
- Chapter 2 presents basic information about scientific methodology as it relates to nutrition research and provides tips for becoming a more wary consumer of nutrition- and health-related information.
- Chapter 3 discusses dietary standards and guidelines, food groups and guides, and how to use information provided on nutrient labels.
- Chapter 4 introduces basic chemical and physiological concepts and key terms that relate to the science of nutrition.
- Chapters 5, 6, 7, 8, and 9 present basic and practical information about the nutrients, such as their major functions in the body, food sources, and roles in health.
- Chapters 10, 11, 12, and 13 focus on applying basic nutrition information for special needs or important concerns. Chapter 10, for example, covers weight management; Chapter 12 features information about food-borne illness.



Chapter 1 Highlight

MALNUTRITION: A WORLDWIDE CONCERN

Malnutrition is a state of health that results from improper nourishment. Chronic undernutrition occurs when long-term energy and nutrient intakes are insufficient to meet an individual's needs. Hunger, the physiological need for food, usually accompanies undernutrition. Throughout the world, social, environmental, economic, political, and other factors contribute to undernutrition (Fig. 1.11). However, undernutrition is a serious problem, particularly in sub-Saharan Africa and certain regions of Asia, where decades of civil unrest, wars, and the AIDS epidemic have left millions of people impoverished and living in uncertainty. Many developing nations in these regions owe large sums of money to wealthy countries. Having high national debts often causes government leaders to reduce or eliminate basic services, including health care and education programs. Furthermore, undernutrition is common among impoverished people in developing countries where food production and supplies are inadequate.

Undernutrition

The world's population is estimated to be over 6.5 billion people. If the present rate of population growth does not slow, an estimated 9 billion people will be living on Earth in 2050.[19] Most of the explosive population growth is occurring in developing countries, where economic growth is unable to keep pace with the rapidly increasing number of people.

In 2009, an estimated 1 billion people were on the brink of starvation.[20] Regional food shortages can result from traditional dietary practices, crop failures, local warfare, and political instability and corruption. Poverty and undernutrition are commonplace in many developing countries. Impoverished people must also cope with

Figure 1.11 Factors that contribute to undernutrition. Many factors, including war, disease, and overpopulation, contribute to undernutrition in developing countries.

dernutrition depresses the body's immune functioning, increasing the risk of death from infectious diseases, such as measles, especially in childhood. Each year, maternal and child undernutrition contribute to 3.5 million deaths; nutrition-related factors such as undernutrition and vitamin A deficiency are responsible for 35% of deaths in children under 5 years of age.[21] The vast majority of childhood deaths associated with undernutrition occur among poor populations in developing countries, particularly in Africa, Asia, and Latin America.[21]

Undernutrition During Pregnancy Undernutrition can be very harmful when it occurs during periods of rapid growth, such as pregnancy, infancy, and childhood. Women who are undernourished during pregnancy are more likely to die while giving birth than pregnant women who are adequately nourished. Furthermore, malnourished pregnant women have high risk of giving birth to infants that are born too soon. These babies often suffer

Nutrition for Healthy Living follows a more traditional approach to the study of nutrition, in that the textbook's organization focuses on nutrients rather than certain tissues or diseases. Additionally, the textbook integrates health information within each chapter where it is appropriate, rather than relegate it to a single chapter near the end of the textbook. For example, the chapters that discuss nutrients provide fundamental information first and then present applications, including the nutrient-related health effects of certain lifestyle practices, particularly dietary choices. Additionally, the quantity and length of boxed features in the chapters are limited, as they tend to disrupt the flow of content and students often skip reading them.

> "The Table of Contents . . . is arranged in a logical sequence. It has the chapters that I really teach. I never have time to include all the chapters in my current book."
>
> Anne Marietta
> Southeast Missouri State University

C = Consumer Focus

Regardless of their backgrounds, students are consumers of nutrition information from a wide variety of sources, including popular magazines, diet books, infomercials, and the Internet. Oftentimes these students arrive in class with many misconceptions about their diet and health. As nutrition educators, we seek to identify these beliefs and to impart sound, reliable nutrition and health information. We also strive to equip our students with the tools they need to make intelligent, informed food- and nutrition-related decisions beyond the classroom. Chapter 2 (Evaluating Nutrition Information) presents a practical introduction to becoming an informed consumer of nutrition and nutrition-related information. This book is unique among nutrition textbooks in its inclusion of this chapter, which provides basic information concerning scientific research and a thorough discussion of how to evaluate nutrition- and health-related sources and messages.

In addition to devoting an entire chapter to the topic of evaluating nutrition-related information and ways of becoming a more wary consumer of nutrition information, the consumer emphasis is integrated throughout the book.

> "I absolutely loved Chapter 2 (Evaluating Nutrition Information). This is a concise way of presenting much needed information that is too brief in many textbooks, including the one I currently use. The author did an excellent job producing a practical, consumer-oriented approach to this necessary information for all introductory students."
>
> Lorri Kanauss
> Western Illinois University

REAL *People*
REAL *Stories*

Dallas Clasen

Dallas Clasen is an energetic teenager who loves mountain bike and road bike racing, downhill skiing, wrestling, and playing football. Not only is he athletic, he is also smart—his grades place him at the top of his class. According to his proud parents, Dallas is the perfect son—"a nice boy." Dallas *is* a special young man, but he also needs a special diet. Dallas was born with phenylketonuria (PKU).

A few days after birth, Dallas underwent standard newborn blood testing. The results of the test indicated that the level of phenylalanine in his blood was about 40 times higher than the normal amount, a sign of the inherited disorder PKU. To avoid developing severe brain damage and other physiological effects of PKU, the infant needed to receive the care of a physician who specializes in treating children with the disorder. The primary treatment for PKU is a low-phenylalanine diet.

Most foods that are rich sources of protein, especially high-quality animal proteins, contain more phenylalanine than people with PKU can tolerate. Thus, from the time Dallas was a week old, he has consumed a formula that does not contain the amino acid. In addition to the formula, Dallas eats special foods that resemble "regular" foods but are not available in supermarkets. To obtain low-phenylalanine foods, his parents order them from companies that manufacture such products. Dallas can eat limited amounts of grain products and most fruits and vegetables. To determine whether the diet is working, Dallas must have the level of

Food & Nutrition *tip*

Be wary of claims that taking vitamin A supplements will improve your vision so you won't need to wear eyeglasses or contact lenses. Vitamin A deficiency does not cause the kinds of visual defects that are correctable with glasses or contacts. Furthermore, large doses of vitamin A are toxic.

- **Food & Nutrition Tips** present practical suggestions that apply material discussed in a section. These tips provide information students can use every day—and for the rest of their lives. Such features include tips for selecting fresh foods, managing energy intake, and keeping foods safe to eat.

- **Real People, Real Stories** feature information about people who actually have recovered from or are currently living with nutrition-related conditions such as type 1 diabetes, eating disorders, and hypertension. This feature is designed to help students recognize the daily challenges people with such conditions face and the role diet and physical activity play in managing health.

- **Recipes for Healthy Living** is a practical application of nutrition and food information that will appeal to most college students. Each chapter features one or more easy-to-make, kitchen-tested recipes that help bring the chapter's content to life (e.g., complementary high-fiber waffles). In addition to the pie graph for macronutrient content, recipes now include a bar chart to illustrate % Daily Value for energy and key nutrients in a serving of the food. This feature demonstrates that preparing nutritious foods can be fun and economical. By trying the recipes, students can develop basic food preparation skills and may be inspired to cook more foods "from scratch." As a result, they may rely less on vending machines and fast-food outlets.

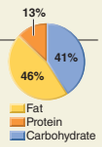
"I found the coverage of the topics adequate and highly consumer friendly—there is information they can use immediately."

Alison Miner
Prince George's Community College

Recipes for Healthy Living

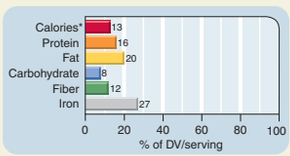
Nutty Energy Bars

You can use the following recipe to make your own "energy bars." This recipe makes eight 4″ × 2″ bars. Each bar supplies approximately 253 kcal, 8 g protein, 13 g fat, 26 g carbohydrate, 3 g fiber, and 4.9 mg iron.



INGREDIENTS:

- Oil cooking spray
- 1 egg, large
- 1 ½ cups instant oats, dry
- ¼ cup almonds, slivered
- ¼ cup enriched wheat flour
- ½ cup smooth peanut butter
- 1 Tbsp vegetable oil
- ½ cup honey
- ½ tsp ground cinnamon
- 1 tsp vanilla



*2000 daily total kcal

PREPARATION STEPS:

1. Preheat oven to 350°.
2. Spray "nonstick" oil on the inside bottom and sides of an 8″ × 8″ pan.
3. Crack open the egg, drop the egg's contents into a medium-size bowl, and discard the shell. Using a fork, beat the egg until its yolk is completely mixed with the egg white.
4. Add remaining ingredients to the egg and stir until well blended. Mixture will be thick, like cookie dough.
5. Using a large spoon, press dough into the bottom of the pan, covering the inside of the pan evenly.
6. Bake for 12 to 14 minutes.
7. Cool completely before cutting into eight 2″ × 4″ bars.

"My overall impression of the book is AWESOME!!!! Your goal of creating a dynamic textbook has been accomplished. Very easy reading and pleasing to the sight."

Karen Dahl
Youngstown State University

Did You Know?

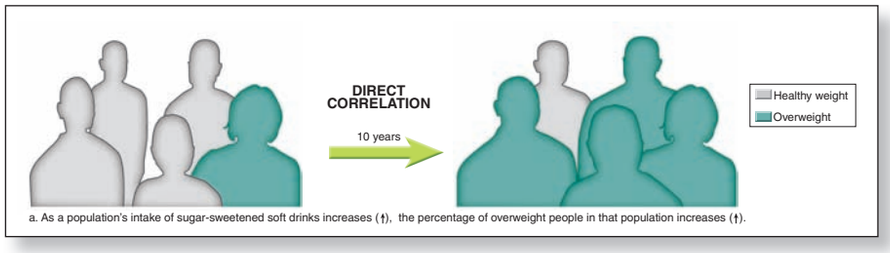
Have you heard of the "Freshman 15," the popular belief that college students gain 15 pounds during their freshman year? Results of scientific studies confirm that freshmen are likely to gain weight, but the increase is much less than 15 pounds—only 3 pounds on average.[26] In one study, 290 college students were weighed at the beginning of their freshman year and again at the completion of their sophomore year. During their first two years in college, 70% of the students participating in the study gained weight, on average, about 9 pounds.[27]

- **Did You Know?** This margin feature notes interesting nutrition-related tidbits that relate to information presented in that section of the chapter. Some of these features dispel commonly held beliefs about food and nutrition that are inaccurate.

What's New in This Edition?

The first edition of this textbook included beautiful, pedagogically based illustrations and creative page layouts that were designed to facilitate learning. The second edition maintains this energetic and visually appealing design. We've added more photos to help draw students' attention to the written information and relate content to the "real world." It is important to note that the use of products in photos is for example representation only and does not constitute an endorsement.

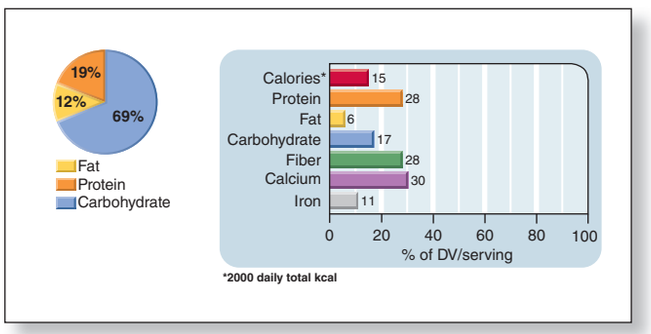
The second edition of *Nutrition for Healthy Living* has been enhanced in several ways. The content as well as many of the illustrations have been updated. For example, you'll find more information about vitamin A and vitamin K, including new illustrations to explain complex concepts such as the visual cycle and blood clotting. New "Highlights" at the end of some chapters focus on dietary supplements, diet and cancer, and ways to stretch your food dollar without sacrificing adequate nutrition. We've added three "Real People, Real Stories" features and updated many of the stories that were in the first edition. See the following list of key chapter updates to learn more about the specifics of what's new in this edition.



a. As a population's intake of sugar-sweetened soft drinks increases (↑), the percentage of overweight people in that population increases (↑).

Chapter 1: The Basics of Nutrition

- New Figure 1.3 shows a graph of the 10 leading causes of death in the United States and indicates which causes are related to diet.
- The "Recipes for Healthy Living" feature has two new recipes.
- The "Highlight," Malnutrition: A Worldwide Concern, includes information about Ready-to-Use Therapeutic Foods (RTUFs) that are being used to combat malnutrition among children in developing countries.
- The "Practice Tests" at the end of this and each other chapter now include questions derived from "Highlight" material.

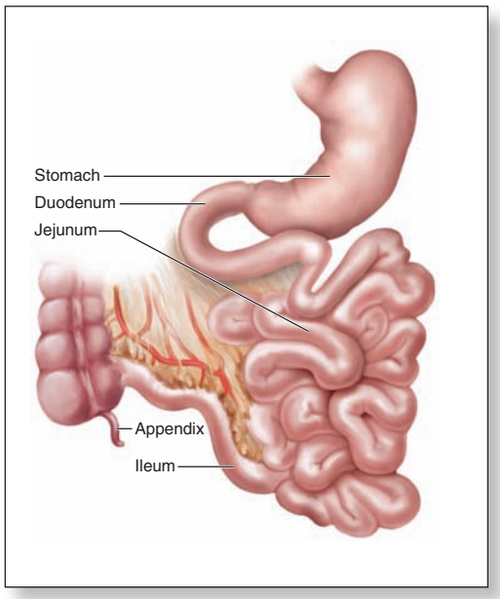


Chapter 2: Evaluating Nutrition Information

- The first section, "Understanding the Scientific Method," has been reorganized to describe research methods, particularly research involving human subjects, more clearly. New figures help illustrate differences among types of designs commonly used for human studies.
- The "Highlight" now focuses on dietary supplements. The information about becoming a dietitian that was in the Highlight of the first edition has been incorporated into the last section of the chapter, "Reliable Nutrition Experts."

Chapter 3: Planning Nutritious Diets

- Chapter 3 provides information to help students analyze the nutritional quality of their diets and choose more nutritious foods.
- A new recipe, Mango Lassi, has been added to the "Recipes for Healthy Living" feature.
- Figure 3.11 is a new representation of a dietary supplement label.



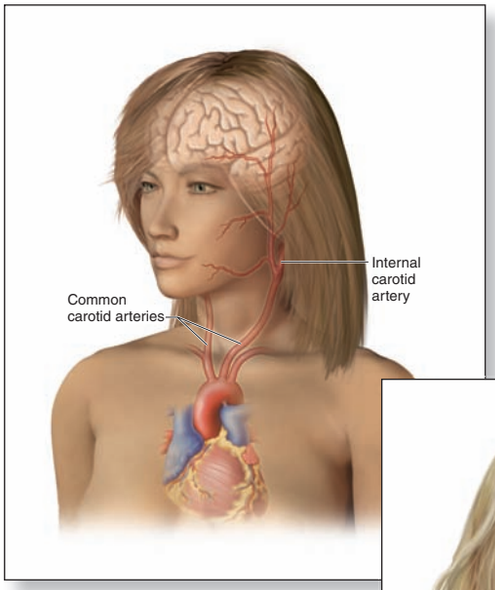
Chapter 4: Body Basics

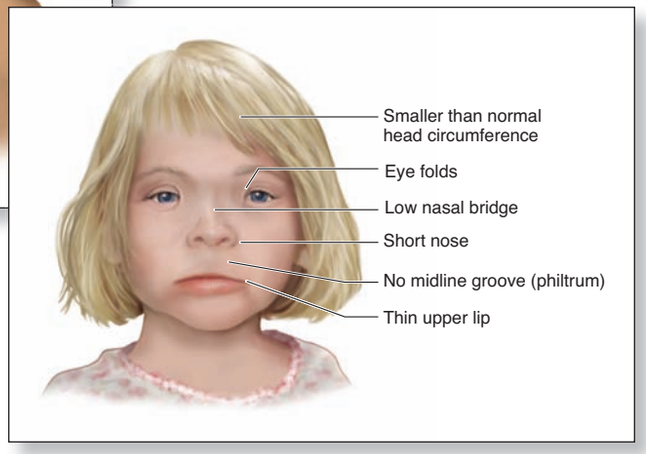
- Several chemistry-related terms, such as solvent and solute, have been redefined to make them clearer for students.
- More illustrations have been added to the "Digestion and Absorption" section. Examples include Figure 4.25, Small intestine, and Figure 4.30, Transport to the Liver.

> "I am impressed with the writing style and clarity of explanations. The author has done an outstanding job in writing at a level suitable for a non-major's textbook."
>
> Kwaku Addo
> University of Kentucky

Chapter 5: Carbohydrates

- This chapter has new information about "rebiana," the chemical in the nonnutritive sweetener stevia that provides an intense sweet taste.
- New photographs, including one of a youngster with type 1 diabetes testing his blood glucose level, have been added.





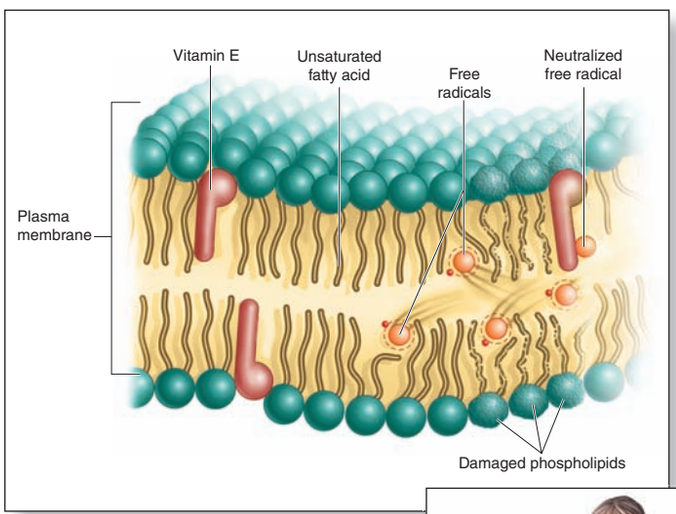
Chapter 6: Fats and Other Lipids

New figures in Ch. 6 include these:

- Figure 6.5 lists approximate percentages of saturated and unsaturated fatty acids in common fats and oils.
- Figure 6.12 helps explain the structure of a typical lipoprotein.
- Figure 6.21 shows the location of the carotid arteries, which can become blocked by atherosclerosis.
- Figure 6.31 illustrates typical physical defects associated with fetal alcohol syndrome.

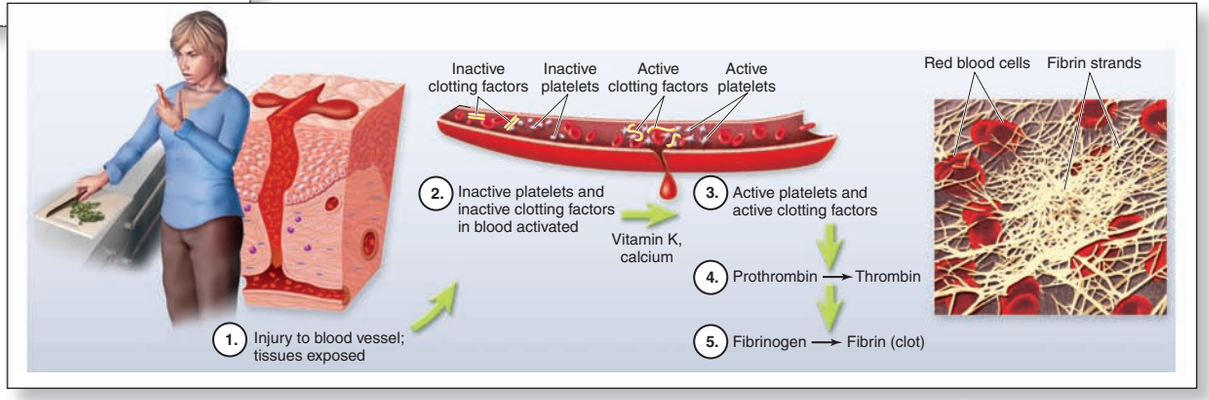
Chapter 7: Proteins

- Chapter 7 includes a new section about food allergies, celiac disease, and PKU. A new "Real People, Real Stories" feature introduces students to Katie Adams, a young woman who was diagnosed with celiac disease while in college.
- The new "Highlight" discusses practical ways to stretch food dollars. The information in the first edition's "Highlight" (Building a Bulkier Body) has been incorporated into the main narrative of the chapter.
- A new recipe, Apricot Quinoa, has been added to the "Recipes for Healthy Living" feature.



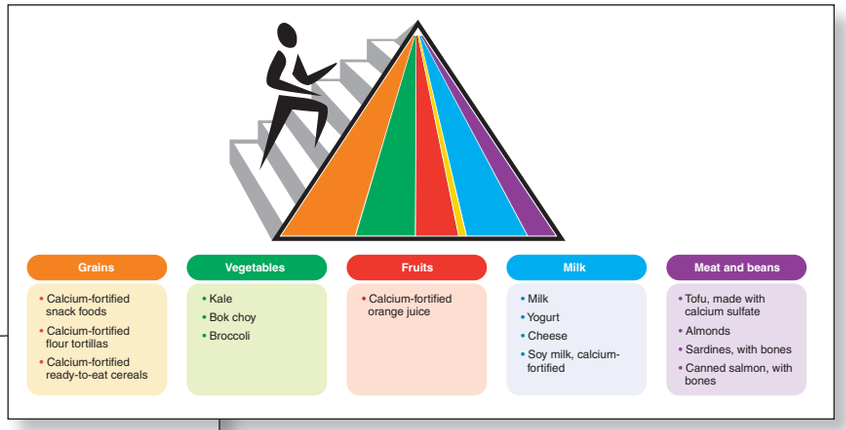
Chapter 8: Vitamins

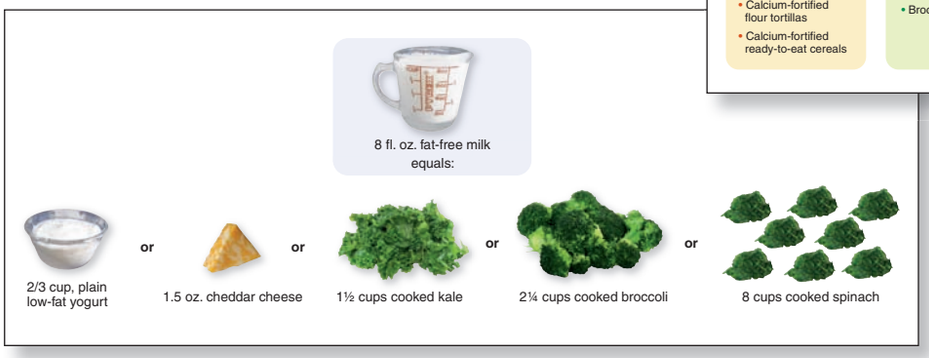
- Information about vitamin A and the visual cycle and about vitamin K has been expanded.
- The new "Highlight" presents information about cancer and focuses on the role of diet and exercise in cancer development. The information in the first edition's "Highlight" (Megadosing on Vitamins) has been woven into the last part of the chapter's main narrative.
- New figures help explain various concepts, including these:
  - Figure 8.7, Vitamin A and epithelial cell development
  - Figure 8.9, Vitamin A and the visual cycle
  - Figure 8.17, Vitamin E and cell membrane defense
  - Figure 8.18, Vitamin K and blood clotting
  - Figure 8.27, Vitamin B-12 absorption
  - Figure 8.32, Cancer development and spread



Chapter 9: Water and Minerals

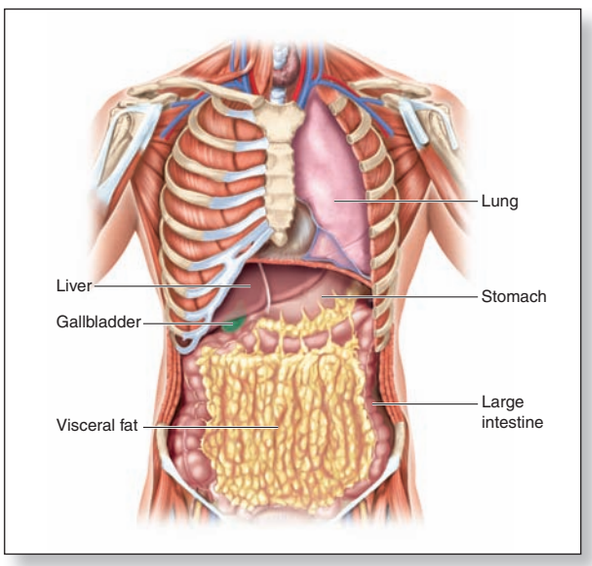
- Many illustrations in this chapter, including the food pyramids for individual minerals, have been updated to enhance clarity.
- The calcium section has been expanded and now includes Figure 9.13, which shows relationships among calcium contents of various foods.
- The "Highlight" has been expanded to include information about bisphenol A.

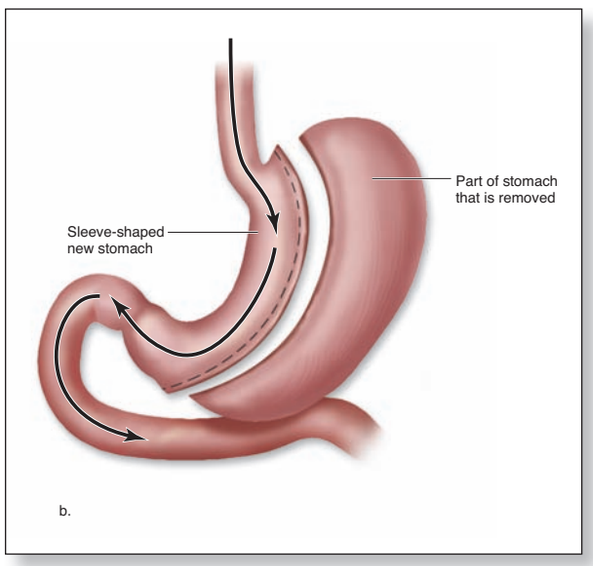




Chapter 10: Energy Balance and Weight Control

- This chapter has expanded information about visceral fat and its role in health.
- New Figure 10.19, to illustrate the sleeve gastrectomy (a form of bariatric surgery), has been added.
- A new "Real People, Real Stories" feature about a person who lost over 100 pounds by following a reliable weight loss diet and an exercise plan is included.
- The section about eating disorders that are not classified as anorexia nervosa or bulimia nervosa has been expanded in the "Highlight."





REAL *People*
REAL *Stories*

Sarah Haskins

Sarah Haskins' love of sports and athletic competition began when she learned to swim and compete in swim meets as a five-year-old. By the tim e she was nine, she was competing in local swim meets and winning them. Swimming was not the only sport in which Sarah excelled. During her junior year in high school, she finished first in her state as a cross-country runner. Sarah's success as an athlete enabled her to earn an athletic scholarship to the University of Tulsa, where she majored in elementary education.

In 2000, Sarah watched televised events of the Summer Olympics and became intrigued with the women's triathlon—a grueling combination of continuous sports activity that is comprised of swimming almost a mile (1.5 km), bicycling 24.8 miles (40 km), and running 6.2 miles (10 km). Sarah was so interested in the sport, she became determined to become an Olympic athlete. Over the next few years, she trained for the triathlon and competed in women's triathlon events held in the United States and other countries. By 2004, she was one of the top 125 female triathlon athletes in the world and one of only three women accepted by the U.S. Olympic Training Center in Colorado to prepare for the

Chapter 11: Nutrition for Physically Active Lifestyles

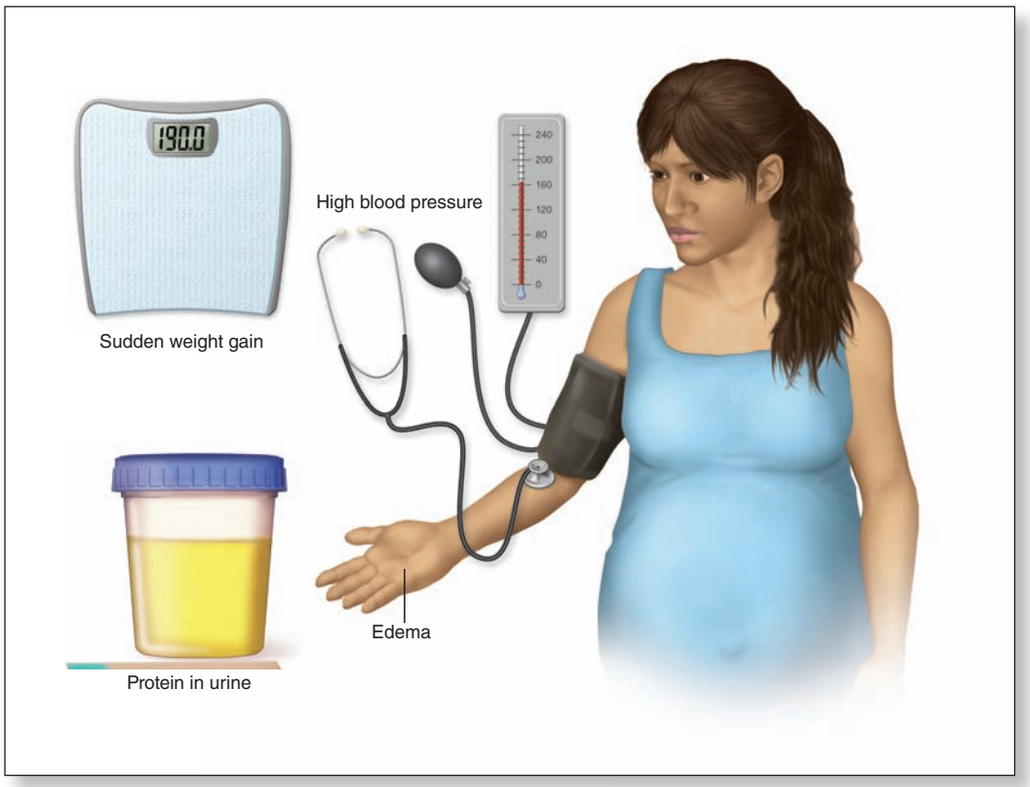
- A new "Real People, Real Stories" features an Olympic athlete and her training diet.
- Table 11.7, on popular ergogenic supplements and aids, has been updated.

Chapter 12: Food Safety Concerns

- The chapter opener has been updated to include information about the recent food-borne disease outbreaks involving raw tomatoes, raw peppers, and peanut butter.

Chapter 13: Nutrition for a Lifetime

- New illustration has been added to show pregnancy-induced hypertension.
- Information about childhood obesity and about nutrition for older adults has been updated and expanded.
- More information about DHEA has been added to the "Highlight."



Assessing and Evaluating Student Progress

One of our primary goals as nutrition educators is to ensure that our students leave the introductory nutrition course with a better understanding of the nutrition principles and concepts needed to improve their diet and health. In order to assess how well faculty are achieving that goal, many colleges and universities are implementing Student Learning Outcomes as a way to measure what students have learned upon completing an introductory nutrition course. Student Learning Outcomes can also be used to help instructors identify content areas that need more refined teaching methods. *Nutrition for Healthy Living* has been developed around the following coursewide outcomes.

Student Learning Outcomes

1. Identify functions and sources of nutrients.
2. Demonstrate basic knowledge of digestion, absorption, and metabolism.
3. Apply current dietary guidelines and nutrition recommendations.
4. Analyze and evaluate nutrition information scientifically.
5. Relate roles of nutrients in good health, optimal fitness, and chronic diseases.
6. Summarize basic concepts of nutrition throughout the life span.
7. Evaluate a personal diet record using a computer database.

Additionally, each chapter opens with a list of chapter-specific learning outcomes that build upon the broader coursewide outcomes. The "Chapter Learning Outcomes" help students prepare for reading the chapter and also clarify major concepts they are expected to learn. These measurable outcomes are further supported by assessment methods and study aids found within the chapters.

Chapter Learning Outcomes

After reading Chapter 10, you should be able to

1. Describe the uses of energy by the body and explain the concept of energy balance.
2. Identify factors that influence body weight.
3. Discuss how BMI is used to determine whether a person's weight is healthy.
4. Describe ways to measure body composition.
5. List major health risks associated with excess body fat.
6. Plan a long-term weight-loss regimen that is safe and effective.
7. Evaluate popular weight-reduction diets for safety and long-term effectiveness.
8. Identify surgical procedures for severe obesity.
9. Describe treatments for underweight.
10. Identify major kinds of eating disorders, and discuss risk factors and treatments for these conditions.

Quiz YOURSELF

Before reading the rest of Chapter 2, test your knowledge of scientific methods and reliable sources of nutrition information by taking the following quiz. The answers are on page 59.

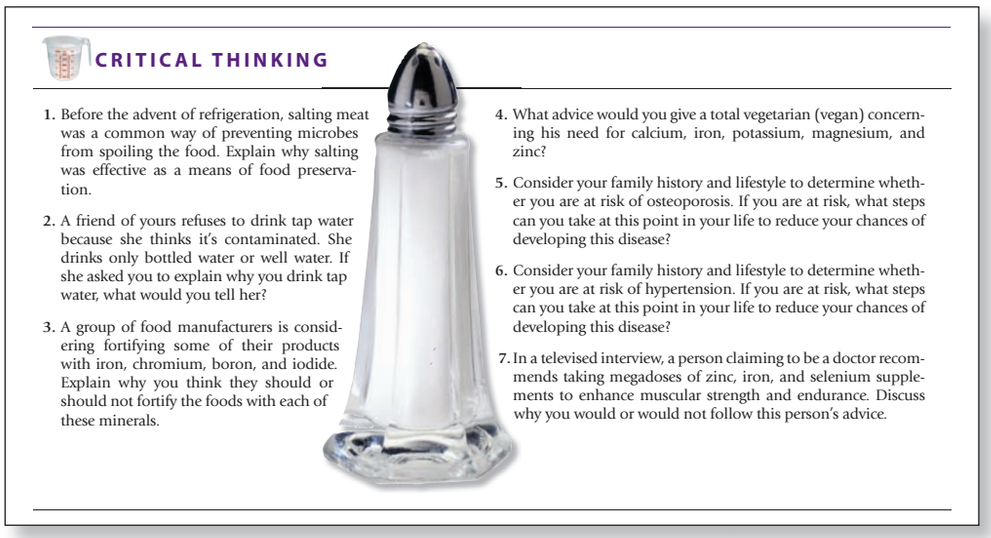
1. Scientists generally do not raise questions about or criticize the conclusions of their colleagues' research data, even when they disagree with those conclusions. _____T _____F
2. Popular health-related magazines typically publish articles that have been peer-reviewed. _____T_____ F
3. By conducting a prospective epidemiological study, medical researchers can determine risk factors that may influence health. _____T _____F
4. A placebo contains ingredients that provide no measurable effects. _____T _____F
5. In general, registered dietitians are reliable sources of food and nutrition information. _____T _____F

Quiz Yourself

This pretest, comprised of five true-or-false questions, appears at the beginning of each chapter; answers to the quiz are provided at the end of the chapter. The purpose of "Quiz Yourself" is to stimulate interest in reading the chapter. By taking the quiz, students may be surprised to learn how little or how much they know about the chapter's contents.

"I was very impressed with this area. I liked the study tools. It is great to have quizzes at the beginning of the chapters to see how much a student knows."

Jennifer L. Fuller
Bluegrass Community and Technical College



CRITICAL THINKING

1. Before the advent of refrigeration, salting meat was a common way of preventing microbes from spoiling the food. Explain why salting was effective as a means of food preservation.
2. A friend of yours refuses to drink tap water because she thinks it's contaminated. She drinks only bottled water or well water. If she asked you to explain why you drink tap water, what would you tell her?
3. A group of food manufacturers is considering fortifying some of their products with iron, chromium, boron, and iodide. Explain why you think they should or should not fortify the foods with each of these minerals.
4. What advice would you give a total vegetarian (vegan) concerning his need for calcium, iron, potassium, magnesium, and zinc?
5. Consider your family history and lifestyle to determine whether you are at risk of osteoporosis. If you are at risk, what steps can you take at this point in your life to reduce your chances of developing this disease?
6. Consider your family history and lifestyle to determine whether you are at risk of hypertension. If you are at risk, what steps can you take at this point in your life to reduce your chances of developing this disease?
7. In a televised interview, a person claiming to be a doctor recommends taking megadoses of zinc, iron, and selenium supplements to enhance muscular strength and endurance. Discuss why you would or would not follow this person's advice.

Critical Thinking

The "Critical Thinking" feature involves higher-level cognitive skills, including applying, analyzing, synthesizing, and evaluating information. This assessment features a series of thought-provoking questions at the end of the chapter. The questions can help students develop higher-level cognitive skills using nutrition-related content. Acquiring and/or sharpening these skills can help students become better consumers of nutrition-related information.

Concept Checkpoint

The "Concept Checkpoint" feature includes review questions, many of which involve critical thinking skills, posed at the end of major headings. Such questions enable students to test their acquisition of information presented in the section. Answers to the questions in each "Concept Checkpoint" are located in Appendix H.

***Concept* Checkpoint**

8. Explain why people should be careful about taking megadoses of vitamin supplements.
9. List three side effects from taking megadoses of nicotinic acid.
10. Explain why people should avoid taking high doses of vitamin B-6.
11. A friend of yours takes 1,000 mg of vitamin C daily, because she thinks the vitamin prevents colds, heart attacks, and Alzheimer's disease. After reading section 8.4, what would you tell your friend about her vitamin C use?
12. Dorothy is 85 years of age. She has excellent vision, but she takes megadoses of vitamins C and E, because she thinks these vitamins prevent macula degeneration. Based on the information in section 8.4, what would you tell Dorothy about her vitamin C and vitamin E use?

> "I like the . . . Checkpoints; they encourage critical thinking."
>
> Ingrid Lofgren
> University of New Hampshire

Practice Test

Each chapter ends with a series of 10 or more multiple-choice questions that test students' comprehension and recall of information presented in the chapter. Answers to the test questions are in Appendix H. The multiple-choice questions prepare students for classroom exams, because they are similar in type and format to those in the test bank. In many instances, the test questions are correlated to the coursewide Student Learning Outcomes and "Chapter Learning Outcomes."

PRACTICE TEST

Select the best answer.

1. Fats in foods
   a. add taste and contribute to satiety.
   b. are rapidly digested and absorbed.
   c. carry water-soluble nutrients.
   d. need to be eliminated to have a healthful diet.
2. Solid fats generally have a high proportion of _____ fatty acids.
   a. unsaturated
   b. saturated
   c. polyunsaturated
   d. monounsaturated
3. A saturated fatty acid has
   a. one double bond within the hydrocarbon chain.
   b. two double bonds within the hydrocarbon chain.
   c. no double bonds within the hydrocarbon chain.
   d. none of the above.
4. Which of the following statements is true?
   a. Certain fish are rich sources of omega-3 fatty acids.
   b. Omega-3 fatty acids increase the risk of cardiovascular disease.

Answers to Chapter 6 *Quiz* Yourself

1. To lose weight, use regular, stick margarine instead of butter because it has 25% fewer calories per teaspoon. **False.** (p. 179)
2. Egg yolks are a rich source of cholesterol. **True.** (p. 178)
3. Taking too many fish oil supplements may be harmful to health. **True.** (p. 178)
4. On average, Americans consume 60% of their energy from fat. **False.** (p. 169)
5. Increasing your intake of trans fats will reduce your risk of heart disease. **False.** (p. 160)

9. Lipoproteins
   a. are water insoluble.
   b. transport lipids in the bloodstream.

Key Terms and Pronunciation Guide

Key terms and definitions are provided in the margins on the same two-page spread where the terms first appear in the chapter. Many unfamiliar terms have pronunciations provided within the text. A glossary of these key terms is at the end of the textbook. These tools facilitate students' recall and understanding of important, and possibly unfamiliar, terminology.

The adult form of rickets is called **osteomalacia** (*ahs'-tee-o-mah-lay'-she-a*). The bones of people with osteomalacia have normal amounts of *collagen*, the protein that provides structure for the skeleton, but their bones contain less-than-normal amounts of calcium. The bones are soft and weak, and break easily as a result. Muscle weakness is also a symptom of osteomalacia.

osteomalacia adult rickets; condition characterized by poorly mineralized (soft) bones

alpha-tocopherol vitamin E

SUMMARY

Scientists ask questions about the natural world and follow generally accepted methods to obtain answers to these questions. Nutrition research relies on scientific methods that may involve making observations, asking questions and developing possi-

End-of-Chapter Summary

This feature provides a brief review of each chapter's main points. Sometimes students have difficulty determining the key points in a chapter; the chapter summary helps them focus on these points.

References

Nutrition for Healthy Living includes in-text citations and extensive lists of references in Appendix I. References provide readers with access to sources of information for more in-depth understanding or for topics that hold particular interest.

CHAPTER REFERENCES See Appendix I.

Personal Dietary Analysis

Many chapters include an end-of-chapter activity for analyzing personal eating habits. Most of these activities require the use of a dietary analysis software program, such as McGraw-Hill's NutritionCalc Plus. Students can gain insight into their eating behaviors by completing this activity.

Personal *Dietary* Analysis

Using the DRIs

1. Refer to your 3-day food log from the "Personal Dietary Analysis" feature in Chapter 3.

a. Find the RDA/AI values for minerals under your life stage/gender group category in the DRI tables (see the inside back cover of this book). Write those values under the "My RDA/AI" column in the table below.

b. Review your personal dietary assessment. Find your 3-day average intakes of iron, calcium, zinc, sodium, potassium, and magnesium. Write those values under the "My Average Intake" column of the table.

c. Calculate the percentage of the RDA/AI you consumed for each mineral by dividing your intake by the RDA/AI amount and multiplying the figure you obtain by 100. For example, if your average intake of iron was 9 mg/day, and your RDA for the mineral is 18 mg/day, you would divide 18 mg by 9 mg to obtain .50. To multiply this figure by 100, simply move the decimal point two places to the right, and replace the decimal point with a percentage sign (50%). Thus, your average daily intake of iron was 50% of the RDA. Place the percent-