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Preface

Welcome to *Essentials of Nutrition: A Functional Approach*! This book is written for students who are not majoring in nutrition, but want to learn about the fundamental aspects of nutrition and how it applies to their own lives. We have written this book with the assumption that you have little or no prior knowledge of college level chemistry, biology, or physiology. But that does not mean it's not scientific! Nutrition is a science-based discipline, so all the material included is backed up by rigorous scientific research, but it is presented in a clear, easy-to-understand fashion without requiring a background in science.

Focus on Sustainability

People are increasingly interested in sustainable food issues. They are looking for favorable ways to impact not only their health, but also the environment and their local economy. However, misinformation about how one can make a positive impact abounds. By highlighting effective sustainable food behaviors, supported by science, this book will provide you with a significant resource for increasing the sustainable practices in your day-to-day life.

Organization

This book is organized using a functional approach, which means that the material is organized around physiological functions, such as fluid and electrolyte balance, antioxidant function, bone health, energy and metabolism, and blood health, instead of organizing it strictly by nutrient. This makes the information easier to understand, retain, and apply to your own life. As this text explores the relationship between nutrition and physiology, you will receive a “behind the scenes” examination of health and disease in the body.

- In Chapter 1 "Nutrition and You", we provide an overview of nutrition as an evidence-based science and explore the concepts of health, wellness, and disease. We also provide an introduction to the different types of nutrients, health factors, personal health assessment, and the concept of sustainable food systems.
- In Chapter 2 "Achieving a Healthy Diet", we explore the tools you can use to achieve a healthy diet, as well as important nutrition concepts like balance and moderation.

- In Chapter 3 "Nutrition and the Human Body", because we know that you may not have a background in biology, we start with a tour through the human body, from the single cell to the full organism, we set up for a discussion about the processes of digestion and absorption, followed by explorations of the other organ systems. After that, we discuss the concept of energy and calories. We also discuss some disorders and diseases related to nutritional health.
- In Chapter 4 "Carbohydrates", we explore the many types of carbohydrates, including their functions. We also take a look at diabetes and at sugar substitutes.
- In Chapter 5 "Lipids", we look at the types, structure, and roles of lipids, and we explain the different types of cholesterol in the blood. We also explore topics of interest such as omega-3 and omega-6 fatty acids and trans fats.
- In Chapter 6 "Proteins", we cover the structure and roles of protein, and explore the consequences of getting too little or too much protein in your diet. Tips for getting the right amount and quality of protein, as well as a look at special populations, such as the elderly and athletes, are also covered.
- In Chapter 7 "Nutrients Important to Fluid and Electrolyte Balance", we look at the nutrients important to fluid and electrolyte balance, including water, sodium, chloride, and potassium. We also look at sports drinks, caffeinated beverages, and alcohol.
- In Chapter 8 "Nutrients Important As Antioxidants", nutrients important as antioxidants are explored, starting with an explanation of what oxidation and antioxidants are, then looking at vitamins E, C, and A, selenium, and phytochemicals.
- In Chapter 9 "Nutrients Important for Bone Health", we delve into nutrients important for bone health. First, we explore the structure and function of bones, and then calcium, vitamin D, phosphorus, magnesium, fluoride, and vitamin K. A look at osteoporosis and at supplements rounds out this chapter.
- In Chapter 10 "Nutrients Important for Metabolism and Blood Function", we look at the nutrients important in energy metabolism and blood health, by first looking at blood and at metabolism, and then discussing the B vitamins, vitamin K, magnesium, iron, zinc, and other micronutrients. We also explore iron-deficient anemia and iron toxicity.
- In Chapter 11 "Energy Balance and Body Weight", we take a look at the obesity epidemic and eating disorders—the extremes of energy imbalance—and we look at evidence-based recommendations for maintaining a healthy weight.
- Chapter 12 "Nutrition through the Life Cycle: From Pregnancy to the Toddler Years" is the first of two chapters exploring nutrition through

the life cycle and it looks at pregnancy through the toddler years. Topics include pregnancy, breastfeeding, introducing solid foods, and nutrition during the toddler years.

- In **Chapter 13 "Nutrition through the Life Cycle: From Childhood to the Elderly Years"** we continue to explore nutrition through the life cycle, this time looking at childhood to the elderly years.
- In **Chapter 14 "Nutrition and Society: Food Politics and Perspectives"**, we explore food politics, sustainability, the food industry, food security, and diets from around the world.
- In **Chapter 15 "Achieving Optimal Health: Wellness and Nutrition"**, we look at a number of topics of interest to students: diet trends, food supplements and food replacements, fitness, chronic diseases, and food safety. Also included in this chapter are tips for living a sustainable lifestyle, and information about careers in nutrition.

Features

Each chapter starts with a “**Big Idea**,” which provides a preview of the main theme of the chapter.

You Decide challenges you to apply what you are learning about nutrition topics—sometimes controversial ones—to your own life.

Key Takeaways and **Key Terms** provide the key take-home messages and definitions from each section, helping you to focus on the main points you should be learning.

Discussion Starters are questions that can prompt discussions with fellow students and your instructor to examine and extend what you’ve learned in the chapter.

There are many **Videos** available online and it is not always clear which ones have reliable information. We have done the legwork for you by providing interesting videos from reputable sources to accompany and highlight the content. Similarly, we provide links to useful online learning tools through the **Interactive** feature.

Most of the databases for **diet analysis** programs primarily feature industrial food. As we promote sustainable food activities in our text, we cannot use these common diet analysis programs because they do not cater to students who eat real food prepared at home. As a result, we provide links to <http://www.choosemyplate.gov/> throughout the text. You will be encouraged to create your own meals, shop

smarter, choose wisely, and, at the same time, foster an active attitude toward food sustainability.

Every chapter ends with **Exercises**, which are activities that can be used to test what has been learned in the chapter and may be used by your instructor as homework or assignment questions. There are exercises at three different levels (It's Your Turn, Apply It, and Expand Your Knowledge) to meet the varied needs of different students.

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