BRIEF CONTENTS

Chapter 1  Psychology of Eating: The Nexus of Nutrition, Brain, and Behavior 1
Chapter 2  Macronutrients and the Food We Eat 12
Chapter 3  The Chemical Senses 27
Chapter 4  You are What You Eat: Evolution, Energy, and Foraging 45
Chapter 5  Basic Learning Processes and Eating Behavior 60
Chapter 6  The Development of Eating Behaviors 76
Chapter 7  Social Influences on Eating 96
Chapter 8  Mood and Food, Cravings, and Addiction 107
Chapter 9  Hunger, Satiety, and the Brain 122
Chapter 10  Eating Disorders and Treatment 138
Chapter 11  Genes, Epigenetics, and Obesity 155
Chapter 12  Treatments for Obesity 168
Chapter 13  Where Do We Go from Here? 180
Diet-Induced Thermogenesis (DIT) 24

Let’s review and apply your knowledge. Take some time to answer these chapter questions 24 • Do the math energy calculation 24 • Glossary 24 • References 26

Chapter 3 The Chemical Senses 27

Olfaction: The Sense of Smell 28

Odorants and Receptors 28

Projections to the Brain 30

■ BOX 3.1: Do You Smell What I Smell or Your Dog Smells? 31

Anosmia 31

■ Talking Point 3.2 32

Gustation: The Sense of Taste 32

GPCR Taste Receptors: Sweet, Umami, and Bitter 33

■ BOX 3.2: Taste Bud Turnover 34

Ionotrophic Taste Receptors: Salty and Sour 34

Other Tastes 34

■ Talking Point 3.3 35

Taste Coding in Higher Brain Regions 35

Flavor 35

■ BOX 3.3: So You Think You Can Taste? 36

Taste- or Flavor-Guided Behaviors 36

Stimulus Presentation 36

Innate or Learned 36

■ Talking Point 3.4 37

Palatability 37

Chemical Sensing and the Enteric Nervous System 38

■ Talking Point 3.5 39
Chapter 4 You are What You Eat: Evolution, Energy, and Foraging 45

Ancestors and Evolution 45
  ► Talking Point 4.1 47
Energy 48
  ► Talking Point 4.2 48
Optimal Foraging 49
  ► Do the Math 50
  ► Talking Point 4.3 51
Economics of Food 51
  Unit Price and Access Cost 52
  Meal-Defining Criteria 53
  ► Talking Point 4.4 53
  ► Talking Point 4.5 54
Portion Size 54
  Economics and humans 56
  ► Talking Point 4.6 56
  ► Talking Point 4.7 57
Concluding Remarks 58
  Let’s review and apply your knowledge. Take some time to answer these chapter questions 58 • Answers to Do the Math 58 • Glossary 58 • References 59

Chapter 5 Basic Learning Processes and Eating Behavior 60

Overview of Classical Conditioning and Terminology 60
Learning of Post-Ingestive Consequences: Taste Aversions and Preferences 62
Taste and Food Aversions 62
Learning of Food by Experience: Increasing Preferences 63
Medicine Effect 63
Mere Exposure 64
  ► BOX 5.1: Do Food Preferences of Babies Increase with Exposures? 65
Flavor-Flavor Associative Learning 65
  ▶ Talking Point 5.1 66
Flavor-Nutrient Associative Learning 66
  ► BOX 5.2: Can Flavor-Flavor Learning Happen Easily? 66
  ► BOX 5.3: Do Animals Learn Associations Between Flavors and Nutrients? 67
  ► Talking Point 5.2 68
Learning of Appropriate Food Quantity: Conditioned Satiety 68
  ► BOX 5.4: How Do Rats Know When It’s Mealtime? 69
Learning of When to Eat: Conditioned Hunger 69
  ► BOX 5.5: Do Food Cues Trigger Eating Even in Absence of Hunger? 69
Influence of Learned Contextual Cues 70
  ► Talking Point 5.3 71
Conditioned Immune System Activity 71
Neurobiology of Food Learning 71
  Let’s review and apply your knowledge. Take some time to answer these chapter questions 73 • Glossary 73 • References 74

Chapter 6 The Development of Eating Behaviors 76

The Ontogeny of Human Feeding: Prenatal Experience 76
  ► BOX 6.1: What’s the Evidence? 71
  ► BOX 6.2: Can Babies Taste and Smell Before Birth? 79
Biopsychosocial Explanations of Eating Disorders 144

Biological Factors 145

▶ Talking Point 10.1 145

Psychological Factors 146

Sociocultural Factors 147

Treatments 147

Is Treatment Effective? 148

Animal Models of Anorexia and Bulimia 149

Concluding Remarks 150

Let’s review and apply your knowledge. Take some time to answer these chapter questions 151

• Glossary 151 • References 151

Chapter 11 Genes, Epigenetics, and Obesity 155

Monogenic Obesity 156

■ BOX 11.1: What’s the Evidence? Mutant Mice and the Lipostatic Hypothesis 158

Polygenic Obesity 159

▶ Do the Math: Genes and Obesity 159

■ BOX 11.2: Gene Therapy 162

Epigenetics and Developmental Programming 162

Dietary Obesity 163

▶ Talking Point 11.1 164

Answers to Do the Math 166 • Let’s review and apply your knowledge. Take some time to answer these chapter questions 166 • Glossary 166 • References 167

Chapter 12 Treatments for Obesity 168

Anti-Obesity Drugs 168

Drugs That Reduce Energy Intake 168
Chapter 13 Where Do We Go from Here? 180

Obesity, the Disease 180
► Talking Point 13.1 181

Exercise, the Cure (?) 182
► Do the Math 183
► Talking Point 13.2 184

Roles for Government and/or Industry 184
► Talking Point 13.3 187

Eating In, Eating Out, and Eating All About 188
► Talking Point 13.4 189

To the Future 189

Answers to problems in Do the Math 189 • Glossary 190
• References 190

Appendix 1 Overview of Neurons and Brain Architecture 191

Appendix 2 Genetics 196

Credits 201

Index 202
People are obsessed with food. If you do not have enough food, which was almost always the case for our distant ancestors, your thoughts and actions are directed toward obtaining food. Even in today’s world in which many of us have plenty of “mouth-ready” food available, people spend large amounts of time thinking about food or rituals in which food plays a prominent role. Huge for-profit industries have been built on these human proclivities, ranging from advertising, production or retailing of an increasing array of tasty foods, to weight management or loss and medical treatment of obesity-related diseases.

Have you ever stopped to ask why humans are so attracted to food, or whether it is unique to humans? This book attempts to pose these questions, and explore answers. We firmly believe that psychological science is the only academic discipline that is capable of spanning and integrating the vast range of subdisciplines that are relevant to the topic. In this text, we focus on “normal” eating: How did it evolve, how does it develop and become manifest in modern society, and what functions does it fulfill? We also address contemporary problems associated with eating. We have a chapter devoted to diagnosable eating disorders including anorexia and bulimia nervosa; however, from a perspective of sheer numbers and adverse economic impact, eating too much and becoming obese is by far the biggest problem. Thus, much of the book is focused on explanations of and possible solutions to what many in the field now refer to as an obesity epidemic.

This book has arisen out of an undergraduate special topics course “Psychology of Eating” we first taught about a decade ago. Our impetus was to develop an integrative or capstone course for undergraduates who simply want to learn more about their own eating, who are contemplating a career in one of the for-profit industries mentioned earlier, or in a related government or nonprofit activity. With more than 50% of the adult population and up to 25% of children now classified as overweight or obese, this field will provide considerable employment opportunities for the foreseeable future! Our book might also serve as background material from which to launch discussions at a graduate level. Most of our chapters include citations to primary or additional resources.

Most human behaviors, and misbehaviors, have biological and sociocultural determinants. Eating is an excellent example of this, and in addition uses commodities (foods) that themselves have defined physical and chemical properties. So you cannot understand eating without knowing something about nutrition, energy, genes, chemical sensing, and brain structures. This book contains information about all of these, and it would have been easy to write an entire book on these topics. Instead, we have tried to present these topics in a relatively simple form within the context of the science background typical of many psychology majors. That is, you don't have to be an expert in all or any of these areas to be able to read and hopefully understand the book. We believe that even if your primary interest is in the sociocultural topics, taking the time to read about biological foundations will enrich your understanding. Conversely, we do not believe that exclusive focus on the basic science aspects enables you to appreciate the complexity of human thought and behavior that dominates most people’s decisions about what, when, and how much they eat. The book is not organized in a rigidly linear or progressive manner: Each chapter stands alone and can be sequenced in more or less any order, but this order works for us! In the last chapter of the book, which you probably should leave for last, we discuss treatments or strategies to reverse this trend toward an obese world—a trend that is economically unsustainable. It’s convenient to point the finger of blame at the food industry, and some entities have done just that by implementing controversial taxes or other restrictions.

PREFACE
But we regard the real problem as the love affair that people have with food and its manifestations such as marketing. What strategies have the best chance to cool off this affair and implement sustainable lifelong relationships with food?

The “obesity problem” is not fundamentally different from other contemporary issues, for example, climate change. In both cases, technologies have over time enabled humans to develop unsustainable behaviors: We have to find technological and psychological approaches to change those behaviors.

We want to thank the editors and staff at Pearson for encouragement and help throughout this project. We also thank the reviewers of earlier drafts of these chapters for their insightful comments that have improved every aspect of the book: Charlotte Markey, Rutgers University; Jennifer Harriger, Pepperdine University; Deb Briihl, Valdosta State University; Sarah Savoy; Alison Ventura, Drexel University; Doris Davis; Thomas Alley, Clemson University; Steven St. John, Rollins College; Lori Forzano, The College at Brockport, State University of New York; Bryan Raudenbush, Wheeling Jesuit University; Kevin Myers, Bucknell University and Carla Bluhm, College of Coastal Georgia, and especially all of our students who are our enduring inspiration.