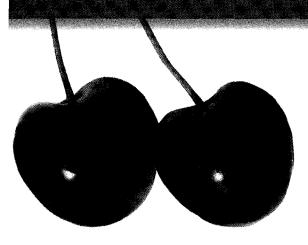
Contemporary Nutrition A Functional Approach

Second Edition

Wardlaw
Smith
Lindeman, Contributor

This
International
Student Edition
is for use
outside
the U.S.

Contents



Preface xvi



Part One Nutrition: A Key to Health 2

Chapter 1 What You Eat and Why 3

Student Learning Outcomes 3

Refresh Your Memory 4

- 1.1 Good Health: The Nutrition Connection 4What Is Nutrition? 4Nutrients Come from Food 4Why Study Nutrition? 5
- 1.2 Classes and Sources of Nutrients 7

Carbohydrates 7

Lipids 9

Proteins 10

Vitamins 11

Minerals 11

Water 11

Other Important Components in Food 12

1.3 Nutrient Composition of Diets and the Human Body 13



- 1.4 Energy Sources and Uses 14Calories 14Calculating Calories 15
- 1.5 Current State of the North American Diet and Overall
 Health 16
 Assessing the Current North American Diet 17
 Health Objectives for the United States for the Year 2010 17
- 1.6 Improving Our Diets 18
- 1.7 Why Am I So Hungry? 20 The Hypothalamus Contributes to Satiety 20 Meal Size and Composition Affect Satiety 20 Hormones Affect Satiety 21 Does Appetite Affect What We Eat? 21 Putting Hunger and Appetite into Perspective 22

Nutrition and Your Health: Eating Well in College 24

Case Study: Typical College Student 28

Summary 28

Study Questions 29

Check Your Knowledge 29

Further Readings 30

Rate Your Plate 32

Chapter 2 Guidelines for Designing a Healthy Diet 35

Student Learning Outcomes 35

Refresh Your Memory 36

- 2.1 A Food Philosophy That Works 36 Variety Means Eating Many Different Foods 36 Balance Means Consuming Food from Each Group 37 Moderation Refers Mostly to Portion Size 38 Nutrient Density Focuses on Nutrient Content 39 Energy (kcal) Density Affects Calorie Intake 39
- 2.2 States of Nutritional Health 40Desirable Nutrition 41Undernutrition 41Overnutrition 42
- How Can Your Nutritional State Be Measured? 42
 Analyzing Background Factors 42
 Assessing Nutritional Status Using the ABCDEs 43
 Recognizing the Limitations of Nutritional Assessment 44
 Concern About the State of Your Nutritional Health Is
 Important 45
- Recommendations for Healthy Eating 45
 MyPyramid—A Menu-Planning Tool 45
 The Mediterranean Diet Pyramid 52
 Dietary Guidelines—Another Tool for Menu Planning 54

2.5 Specific Nutrient Standards and Recommendations 60
 Recommended Dietary Allowance 60
 Adequate Intake 61
 Estimated Energy Requirement 61
 Tolerable Upper Intake Level 61
 Daily Value 62

How Should These Nutrient Standards Be Used? 62

2.6 Using the Scientific Method to Determine Nutrient Needs 62

2.7 Food Labels and Diet Planning 66
Exceptions to Food Labeling 66
Health Claims on Food Labels 69

2.8 Epilogue 70

Nutrition and Your Health: Evaluating Nutrition Claims and Dietary Supplements 71

Case Study: Dietary Supplements 73

Summary 74

Study Questions 74

Check Your Knowledge 75

Further Readings 75

Rate Your Plate 77

Chapter 3 The Human Body: A Nutrition Perspective 81

Student Learning Outcomes 81

Refresh Your Memory 82

- 3.1 Human Physiology 82
- 3.2 The Cell: Structure, Function, and Metabolism 83
 Cell (Plasma) Membrane 83
 Cytoplasm 85
 Mitochondria 85
 Cell Nucleus 85
 Endoplasmic Reticulum (ER) 86
 Golgi Complex 86
 Lysosomes 86
 Peroxisomes 86
 Cell Metabolism 86
- 3.3 Organization of the Body 87
- 3.4 Cardiovascular System and Lymphatic System 87Cardiovascular System 88Lymphatic System 89
- 3.5 Nervous System 91
- 3.6 Endocrine System 93
- 3.7 Immune System 95
 Skin 95
 Intestinal Cells 95
 White Blood Cells 96
- 3.8 Digestive System 96 Mouth 97 Esophagus 99

Stomach 99
Small Intestine 100
Large Intestine 103
Rectum 105
Accessory Organs 106

- 3.9 Urinary System 106
- 3.10 Storage Capabilities 107

3.11 A Closer Look at Genetics and Nutrition 108
The Emerging Field of Nutrigenomics 108
Nutritional Diseases with a Genetic Link 109
Your Genetic Profile 110

Nutrition and Your Health: Common Problems with Digestion 112

Case Study: Gastroesophageal Reflux Disease 117

Summary 118

Study Questions 118

Check Your Knowledge 119

Further Readings 119

Rate Your Plate 121



Part Two Energy Nutrients and Energy Balance 122

Chapter 4 Carbohydrates 123

Student Learning Outcomes 123 Refresh Your Memory 124

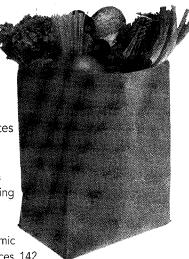
- 4.1 Carbohydrates—An Introduction 124
- 4.2 Simple Carbohydrates 125
 Monosaccharides—Glucose, Fructose, and Galactose 126
 Disaccharides—Sucrose, Lactose, and Maltose 126
- 4.3 Complex Carbohydrates 128
- 4.4 Fiber 129
- 4.5 Carbohydrates in Foods 130 Starch 131 Fiber 131

Nutritive Sweeteners 132 Alternative Sweeteners 135

4.6 Making Carbohydrates
Available for Body Use 136
Digestion 137
Absorption 138

Putting Simple Carbohydrates to Work in the Body 140
Yielding Energy 140
Sparing Protein from Use as an Energy Source and Preventing Ketosis 140
Regulating Glucose 140

The Glycemic Index and Glycemic
Load of Carbohydrate Sources 142





- 4.8 Putting Fiber to Work 144
 Promoting Bowel Health 144
 Reducing Obesity Risk 144
 Enhancing Blood Glucose Control 145
 Reducing Cholesterol Absorption 145
- 4.9 Carbohydrate Needs 145 How Much Fiber Do We Need? 146
- 4.10 Health Concerns Related to Carbohydrate Intake 146 Problems with High-Fiber Diets 146 Problems with High-Sugar Diets 148 Dental Caries 149

Nutrition and Your Health: Diabetes—When Blood Glucose Regulation Fails 151

Case Study: Problems with Milk Intake 157

Summary 157

Study Questions 158

Check Your Knowledge 158

Further Readings 159

Rate Your Plate 161

Chapter 5 Lipids 165

Student Learning Outcomes 165 Refresh Your Memory 166

- 5.1 Lipids: Common Properties 166
- 5.2 Lipids: Main Types 167

 Fatty Acids: The Simplest Form of Lipids 167
 Triglycerides 169
 Phospholipids 170

 Sterols 170
- 5.3 Fats and Oils in Foods 172
 Fat Is Hidden in Some Foods 174
 Fat in Food Provides Some Satiety, Flavor, and Texture 175
 Wise Use of Reduced-Fat Foods Is Important 176
 Fat Replacement Strategies for Foods 176
 Fat Rancidity Limits Shelf Life of Foods 176
 Hydrogenation of Fatty Acids in Food Production Increases Trans
 Fatty Acid Content 177
- 5.4 Making Lipids Available for Body Use 179Digestion 179Absorption 181

5.5 Carrying Lipids in the Bloodstream 181
 Dietary Fats Are Carried by Chylomicrons 182
 Other Lipoproteins Transport Lipids from the Liver to the Body
 Cells 183

"Good" and "Bad" Cholesterol in the Bloodstream 184

- 5.6 Essential Functions of Fatty Acids 185
 The Essential Fatty Acids 185
 Effects of a Deficiency of Essential Fatty Acids 187
- 5.7 Broader Roles for Fatty Acids and Triglycerides in the Body 188
 Providing Energy 188
 Storing Energy for Later Use 188
 Insulating and Protecting the Body 189
 Transporting Fat-Soluble Vitamins 189
- 5.8 Phospholipids in the Body 189
- 5.9 Cholesterol in the Body 190
- 5.10 Recommendations for Fat Intake 190

Nutrition and Your Health: Lipids and Cardiovascular Disease 196

Case Study: Planning a Heart-Healthy Diet 201

Summary 201

Study Questions 202

Check Your Knowledge 202

Further Readings 203

Rate Your Plate 205

Chapter 6 Proteins 209

Student Learning Outcomes 209 Refresh Your Memory 210

- 6.1 Protein—An Introduction 210
 Amino Acids 211
- 6.2 Proteins—Amino Acids Bonded Together 213
 Protein Synthesis 214
 Protein Organization 215
 Denaturation of Proteins 215
- 6.3 Protein in Foods 216Protein Quality of Foods 216A Closer Look at Plant Sources of Proteins 218
- 6.4 Protein Digestion and Absorption 219Digestion 219Absorption 220
- 6.5 Putting Proteins to Work in the Body 221
 Producing Vital Body Structures 221
 Maintaining Fluid Balance 221
 Contributing to Acid-Base Balance 222
 Forming Hormones and Enzymes 222
 Contributing to Immune Function 222
 Forming Glucose 222
 Providing Energy 223
 Contributing to Satiety 223
- 6.6 Protein Needs 225
- 6.7 Does Eating a High-Protein Diet Harm You? 227

6.8 Protein-Calorie Malnutrition 228 Kwashiorkor 229 Marasmus 230

Nutrition and Your Health: Vegetarian and Plant-Based Diets 231

Case Study: Planning a Vegetarian Diet 236

Summary 236

Study Questions 237

Check Your Knowledge 237

Further Readings 238

Rate Your Plate 240

Chapter 7 Energy Balance and Weight Control 243

Student Learning Outcomes 243

Refresh Your Memory 244

- 7.1 Energy Balance 245
 Positive and Negative Energy Balance 245
 Energy Intake 247
 Energy Output 247
- 7.2 Determination of Energy Use by the Body 250 Direct and Indirect Calorimetry 250 Estimates of Energy Needs 250
- 7.3 Estimation of a Healthy Weight 251
 Body Mass Index (BMI) 252
 Futting Healthy Weight into Perspective 253
- 7.4 Energy Imbalance 254
 Estimating Body Far Content and Diagnosing Obesity 254
 Using Body Fat Distribution to Further Evaluate Obesity 257
- 7.5 Why Some Peoplé Are Obese—Nature Versus Nurture 258 How Does Nature Contribute to Obesity? 258 Poes the Body Have a Set Point for Weight? 259 Poes Nurture Have a Role? 260
- 7.6 Treatment of Overweight and Obesity 261 What to Look for in a Sound Weight-Loss Plan 261 Weight Loss in Perspective 262
- 7.7 Control of Calorie Intake—The Main Key to Weight Loss and Weight Maintenance 263
- 7.8 Regular Physical Activity—A Second Key to Weight Loss and Especially Important for Later Weight Maintenance 265



- 7.9 Behavior Modification—A Third Strategy for Weight Loss and Management 267 Relapse Prevention Is Important 267 Social Support Aids Behavioral Change 269 Societal Efforts to Reduce Obesity 269
- 7.10 Professional Help for Weight Loss 269
 Medications for Weight Loss 270
 Treatment of Severe Obesity 271
- 7.11 Treatment of Underweight 274

Nutrition and Your Health: Popular Diets—Cause for Concern 275

Case Study: Choosing a Weight-Loss Program 278

Summery 278

Study Questions 279

Check Your Knowledge 279

Further Readings 280

Rate Your Plate 282



Part Three Vitamins, Minerals, and Water 288

Overview of the Micronutrients 289

- OM.1 Overview of the Micronutrients 289
- OM.2 Vitamins: Vital Dietary Components 289
 Absorption and Storage of Vitamins in the Body 293
 Vitamin Toxicity 294
 Preservation of Vitamins in Foods 295
- OM.3 Minerals: An Overview 295
 Absorption and Storage of Minerals in the Body 296
 Mineral Toxicities 299
 Preservation of Minerals in Foods 299
- OM.4 The Functional Roles of Microputrients 300
- OM.5 Trace Minerals—An Overview 302 lodide (I) 302
 Chromium (Cr) 303
 Manganese (Mn) 304
 Molybdenum (Mo) 304
 Zinc (Zn) 305
 Choline 306

Chapter 8 Nutrients Involved in Fluid and Electrolyte Balance 311

Chapter Learning Outcomes 311

Refresh Your Memory 312

- 8.1 Intracellular and Extracellular Fluid Distribution—A Delicate Balance Between Water and Electrolytes 312
- 8.2 Electrolytes—Essential for Nerve Function 315 Acid-Base Balance 316

8.3 Water 317
A Closer Look at the Functions of Water 317
Water Balance 319
Water Intake and Output 320
Water Sources 321

8.4 Sodium (Na) 323
Functions of Sodium 323
Sodium Sources and Needs 324
Upper Level for Sodium 326

8.5 Potassium (K) 326Potassium Sources and Needs 326Upper Level of Potassium 328

8.6 Chloride (CI) 328
Chloride Sources and Needs 328
Upper Level of Chloride 328

8.7 Nutrition and Your Health: Minerals and Hypertension 329

Case Study: Let's Focus on the Positive 332

Summary 332

Study Questions 333

Check Your Knowledge 333

Further Readings 334

Rate Your Plate 335

Chapter 9 Nutrients That Function as Antioxidants 339

Chapter Learning Outcomes 339

Refresh Your Memory 340

- 9.1 Oxidation and Reduction 340
- 9.2 Defense Against Free Radicals 342
- 9.3 Nutrients That Provide an Antioxidant Role 342

9.4 Vitamin E (Tocopherol) 343 Functions of Vitamin E 343 Vitamin E Sources and Needs 344 Upper Level for Vitamin E 346

9.5 Vitamin C (Ascorbic Acid) 346 Functions of Vitamin C 346 Vitamin C Sources and Needs 348 Upper Level for Vitamin C 349

9.6 Vitamin A (Retinoids) 350Functions of Vitamin A 350Vitamin A Sources and Needs 352Upper Level for Vitamin A 354

9.7 Carotenoids 355

 Functions of the Carotenoids 355
 Carotenoid Sources and Needs 356

 Upper Level for Carotenoids 357

9.8 Phytochemicals 357Functions of Phytochemicals 358

9.9 Selenium (Se) 358Selenium Sources and Needs 359Upper Level for Selenium 360



Nutrition and Your Health: Dietary Supplements—Who Needs Them? 361

Case Study: Choosing a Dietary Supplement 365

Summary 365

Study Questions 366

Check Your Knowledge 366

Further Readings 366

Rate Your Plate 369

Chapter 10 Nutrients Involved in Bone Health 371

Chapter Learning Outcomes 371

Refresh Your Memory 372

- 10.1 Bone Structure 372
- 10.2 Bone Growth and Remodeling 372
- 10.3 Factors That Influence Bone Health 374
- 10.4 Osteoporosis 376
 Type 1 and Type 2 Osteoporosis 377
- 10.5 Bone Health Assessment 380
- 10.6 Critical Nutrients Required for Bone Growth, Maintenance, and Repair 381
 Calcium (Ca) 381
 Phosphorus (P) 386
 Vitamin D (Calciferol or Calcitriol) 388
 Magnesium (Mg) 392
 Fluoride (F) 395
- 10.7 Other Nutrients Involved in Bone Health 396

Case Study: Worried About Grandma 397

Summary 398

Study Questions 398

Check Your Knowledge 398

Further Readings 399

Rate Your Plate 401

Chapter 11 Micronutrient Function in Energy Metabolism and Blood Health 403

Chapter Learning Outcomes 403

Refresh Your Memory 404

- 11.1 The Role of B-Vitamins in Energy Metabolism 404
 B-Vitamin Intakes of North Americans 404
- 11.2 Vitamins and Minerals Involved in Energy Metabolism 406
 Thiamin (Vitamin B-1) 406
 Riboflavin (Vitamin B-2) 408
 Niacin (Vitamin B-3) 409
 Pantothenic Acid (Vitamin B-5) 411
 Biotin (Vitamin B-7) 412
 Vitamin B-6 (Pyridoxine) 413
- 11.3 Vitamins and Minerals Involved in Blood Health 417 The Role of Vitamins and Minerals in Blood Health 417 Vitamin K (Quinone) 417

Anatomy of a Red Blood Cell 420 Anemia 420 Folate (Vitamin B-9) 421 Vitamin B-12 (Cobalamin or Cyanocobalamin) 426 Iron (Fe) 429 Copper (Cu) 433

Case Study: Anemia 435 Summary 436 Study Questions 436 Check Your Knowledge 437 Further Readings 437 Rate Your Plate 439



Part Four Nutrition: Beyond the Nutrients 440

Chapter 12 Nutrition: Fitness and Sports 441

Student Learning Outcomes 441

Refresh Your Memory 442

- 12.1 The Close Relationship Between Nutrition and Fitness 442
- 12.2 Guidelines for Achieving and Maintaining Physical Fitness 444 Aerobic Workout 445
- 12.3 Energy Sources for Exercising Muscles 446 Phosphocreatine Is the First Line of Defense for Resupplying ATP in Muscles 447 Carbohydrate Fuel for Muscles 448

Fat: The Main Fuel for Prolonged Low-Intensity Activity 450 Protein: A Minor Fuel Source, Primarily for Endurance Exercise 451

12.4 Power Food: Dietary Advice for Athletes 452 Calorie Needs 452 Carbohydrate Needs 453 Carbohydrate Loading 455 Fat Needs 456 Protein Needs 456 Vitamin and Mineral Needs 457

- 12.5 A Focus on Fluid Needs 459 Sports Drinks 461
- 12.6 Specialized Dietary Advice for Before, During, and After Endurance Exercise 462 Replenishing Fuel During Endurance Exercise 463 Carbohydrate Intake During Recovery from Prolonged Exercise 464

Nutrition and Your Health: Ergogenic Aids and Athletic Performance 466

Case Study: Planning a Training Diet 468 Summary 469

Study Questions 469

Check Your Knowledge 470



Further Readings 470 Rate Your Plate 472

Chapter 13 Eating Disorders: Anorexia Nervosa, Bulimia Nervosa, and Other Conditions 479

Student Learning Outcomes 479 Refresh Your Memory 480

- 13.1 From Ordered to Disordered Eating Habits 480 Food: More Than Just a Source of Nutrients 481 Overview of Anorexia Nervosa and Bulimia Nervosa 481
- 13.2 A Closer Look at Anorexia Nervosa 484 Profile of the Typical Person with Anorexia Nervosa 485 Early Warning Signs 485 Physical Effects of Anorexia Nervosa 486 Treatment of Anorexia Nervosa 488
- 13.3 A Closer Look at Bulimia Nervosa 489 Typical Behavior in Bulimia Nervosa 490 Health Problems Stemming from Bulimia Nervosa 491 Treatment of Bulimia Nervosa 491
- 13.4 Other Disordered Eating Patterns 493 Binge-Eating Disorder 493 Night Eating Syndrome 495 Female Athlete Triad 496
- 13.5 Prevention of Eating Disorders 497 Nutrition and Your Health: Eating Disorder Reflections 499 Case Study: Eating Disorders—Steps to Recovery 501 Summary 501

Study Questions 502

Check Your Knowledge 502

Further Readings 503 Rate Your Plate 505

Chapter 14 Undernutrition Throughout the World 507

Student Learning Outcomes 507 Refresh Your Memory 508

14.1 World Hunger: A Crisis on the Rise 508
 Hunger 508
 Malnutrition and Micronutrient Deficiences 509
 Famine 509
 General Effects of Semistaryation 511

14.2 Undernutrition in the United States 512
Helping the Hungry in the United States 512
Socioeconomic Factors Related to Undernutrition 514
Possible Solutions to Poverty and Hunger in the United States 515
14.3 Undernutrition in the Developing World 516

Food/Population in the Developing World 516
Food/Population Ratio 517
War and Political/Civil Unrest 518
Rapid Depletion of Natural Resources 519
Inadequate Shelter and Sanitation 520
High External Debt 521
The Impact of AIDS Worldwide 522
Reducing Undernutrition in the Developing World 524

14.4 The Role of Sustainable Agriculture and Biotechnology in Worldwide Food Availability 526
 Sustainable Agriculture 526
 Biotechnology 527
 Role of the New Biotechnology in the Developing World 528
 Some Concluding Thoughts 529

Nutrition and Your Health: Undernutrition at Critical Life Stages 530

Case Study: Undernutrition During Childhood 533

Summary 533

Study Questions 534

Check Your Knowledge 534

Further Readings 535

Rate Your Plate 537

Chapter 15 Safety of Our Food Supply 539

Student Learning Outcomes 539

Refresh Your Memory 540

15.1 Food Safety: Setting the Stage 540Effects of Foodborne Illness 541Why Is Foodborne Illness So Common? 541

15.2 Food Preservation—Past, Present, and Future 544

15.3 Foodborne Illness Caused by Microorganisms 544Bacteria 545Viruses 548Parasites 549



15.4 Food Additives 549
Why Are Food Additives Used? 549
Intentional Versus Incidental Food Additives 553
The GRAS List 553
Are Synthetic Chemicals Always Harmful? 553
Tests of Food Additives for Safety 554
Approval for a New Food Additive 554

15.5 Substances That Occur Naturally in Foods and Can Cause Illness 555Is Caffeine a Cause for Concern? 556

15.6 Environmental Contaminants in Food 557
Pesticides in Food 559
What Is a Pesticide? 559
Why Use Pesticides? 559
Regulation of Pesticides 560
How Safe Are Pesticides? 560
Tests of the Amounts of Pesticides in Foods 560
Personal Action 561

15.7 Food Production Choices 561
 Organic Foods 562
 Sustainable Agriculture 563
 Locally Grown Foods 563
 Community Supported Agriculture 564

Nutrition and Your Health: Preventing Foodborne Illness 565 Case Study: Preventing Foodborne Illness at Gatherings 569 Summary 569 Study Questions 570

Study Questions 570 Check Your Knowledge 570 Further Readings 571 Rate Your Plate 572



Part Five Nutrition: A Focus on Life Stages 574

Chapter 16 Pregnancy and Breastfeeding 575

Student Learning Outcomes 575

Refresh Your Memory 576

16.1 Planning for Pregnancy 576

16.2 Prenatal Growth and Development 577
Early Growth—The First Trimester Is a Very Critical Time 578

Second Trimester 579 Third Trimester 580

16.3 Success in Pregnancy 580

Infant Birthweight 581

Prenatal Care and Counseling 581

Effects of Maternal Age 581

Closely Spaced and Multiple Births 582

Smoking, Medication Use, and Drug Abuse 582

Food Safety 582

Nutritional Status 582

Nutrition Assistance for Low-Income Families 583

16.4 Increased Nutrient Needs to Support Pregnancy 583

Increased Calorie Needs 584

Adequate Weight Gain 584

Increased Protein and Carbohydrate Needs 586

A Word About Lipids 586

Increased Vitamin Needs 587

Increased Mineral Needs 587

Use of Prenatal Vitamin and Mineral Supplements 588

16.5 Food Plan for Pregnant Women 589

Pregnant Vegetarians 590

16.6 Physiological Changes of Concern During Pregnancy, 591

Heartburn, Constipation, and Hemorrhoids 591

Edema 592

Morning Sickness 592

Anemia 592

Gestational Diabetes 593

Pregnancy-Induced Hypertension 593

16.7 Breastfeeding 594

Ability to Breastfeed 594

Production of Human Milk 595

Let-Down Reflex 595

Nutritional Qualities of Human Milk 596

Food Plan for Women Who Breastfeed 597

Breastfeeding Today 598

Nutrition and Your Health: Preventing Birth Defects 602

Case Study: Preparing for Pregnancy 606

Summary 606

Study Questions 607

Check Your Knowledge 607

Further Readings 608

Rate Your Plate 610

Chapter 17 Nutrition from Infancy Through Adolescence 613

Student Learning Outcomes 613

Refresh Your Memory 614

17.1 Nutrition and Child Health—An Introduction 614

17.2 Infant Growth and Nutrition Needs 614

The Growing Infant 615

Effect of Undernutrition on Growth 616

Assessment of Infant Growth and Development 616

Adipose Tissue Growth 617 Failure to Thrive 618

Infant Nutritional Needs 618

Formula Feeding for Infants 622

Feeding Technique 623

Expanding the Infant's Mealtime Choices 623

Weaning from the Breast or Bottle 626

Dietary Guidelines for Infant Feeding 626

What Not to Feed an Infant 627

Inappropriate Infant Feeding Practices 628

17.3 Preschool Children: Nutrition Concerns 629

How to Help a Child Choose Nutritious Foods 629

Childhood Feeding Problems 629

Do Children Need a Multivitamin and Mineral Supplement? 631

Nutritional Problems in Preschool Children 632

17.4 School-Age Children: Nutrition Concerns 634

Breakfast 636

Fat Intake 636

Type 2 Diabetes 637

Early Signs of Cardiovascular Disease 638

Overweight and Obesity 638

17.5 Teenage Years: Nutrition Concerns 639

Nutritional Problems and Concerns of Teens 640

Helping Teens Eat More Nutritious Foods 641 Are Teenage Snacking Practices Harmful? 641

Nutrition and Your Health: Food Allergies and Intolerances 642

Case Study: Undernutrition During Infancy 645

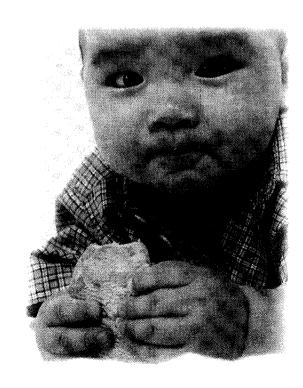
Summary 646

Study Questions 646

Check Your Knowledge 647

Further Readings 647

Rate Your Plate 649



Chapter 18 Nutrition During Adulthood 653

Student Learning Outcomes 653

Refresh Your Memory 654

18.1 The Graying of North America 654

18.2 Physiological Changes During Adulthood 655

Usual and Successful Aging 657

Factors Affecting the Rate of Aging 657

Heredity 657

Lifestyle 658

Environment 658

18.3 Nutrient Needs During Adulthood 659

Defining Nutrient Needs 660

Are Adults Following Current Dietary Recommendations? 663

18.4 Factors Related to Food Intake and Nutrient Needs 663

Physiological Factors 664

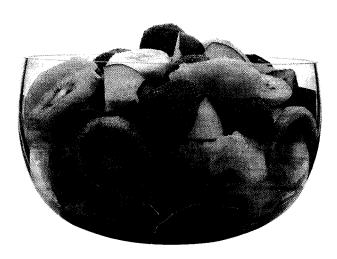
Alternative Medicine and Aging 668

Psychosocial Factors 670

18.5 Nutrition Implications of Alcohol Consumption 672

How Alcoholic Beverages Are Produced 673

Absorption and Metabolism of Alcohol 673



Benefits of Moderate Alcohol Use 673

Risks of Alcohol Abuse 673

Guidance Regarding Alcohol Use 676

18.6 Ensuring a Healthful Diet for the Adult Years 677 Community Nutrition Services for Older People 678

Nutrition and Your Health: Nutrition and Cancer 680

Case Study: Dietary Assistance for an Older Adult 684

Summary 684

Study Questions 685

Check Your Knowledge 685

Further Readings 686

Rate Your Plate 688

Appendix A Solutions: Case Studies A-1

Appendix B Daily Values Used in Food Labels A-12

Appendix C Dietary Advice for Canadians A-13

Appendix D The Exchange System: A Helpful Menu-

Planning Tool A-25

Appendix E Dietary Intake and Energy Expenditure

Assessment A-38

Appendix F Chemical Structures Important in Nutrition A-48

Appendix G Metropolitan Life Insurance Company Height-

Weight Table and Determination of Frame

Size A-53

Appendix H Sources of Nutrition Information A-55

Appendix | English-Metric Conversions and Metric

English-Metric Conversions and Metric Units A-59

Glossary G-1

Credits C-1

Index I-1