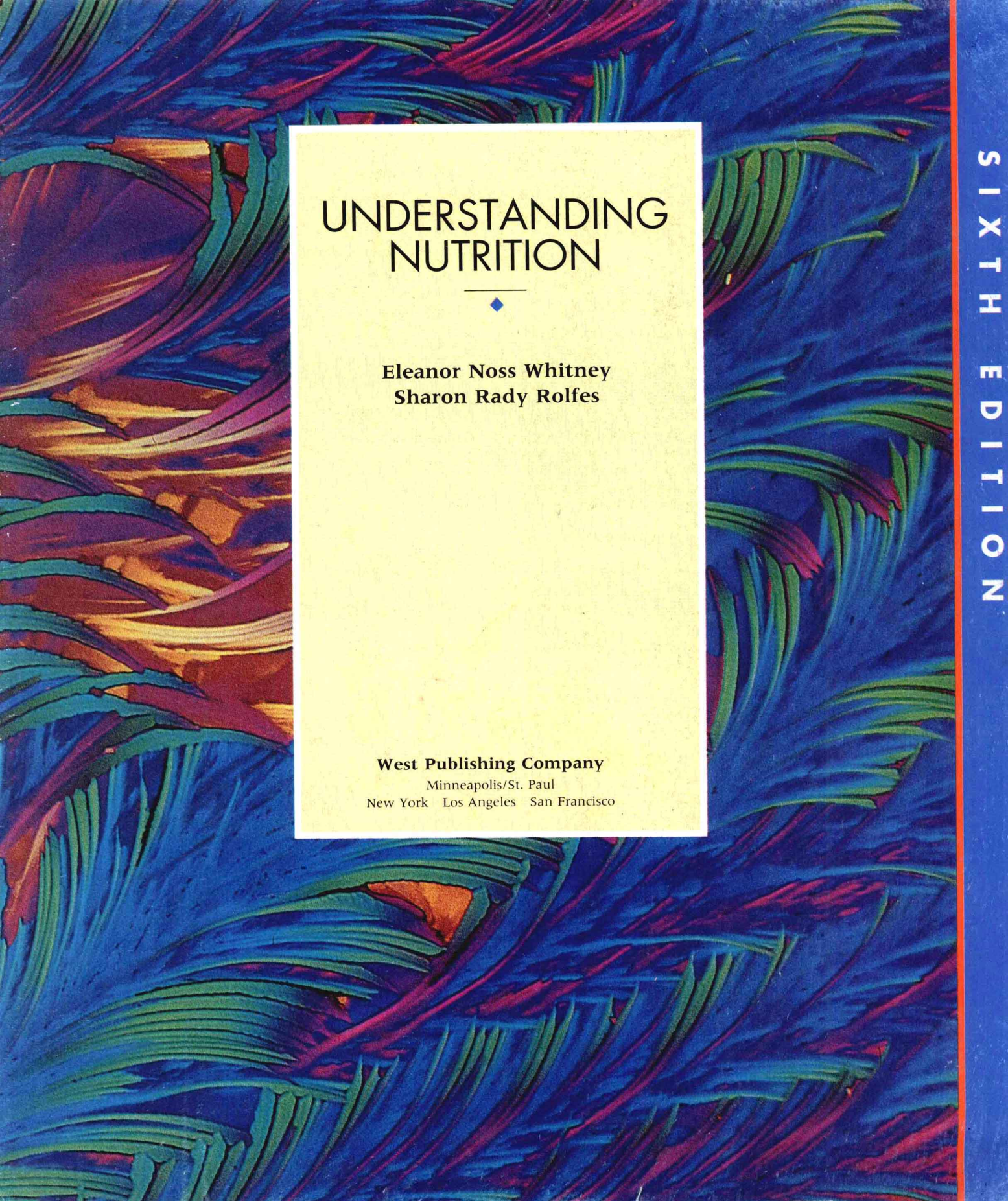




**UNDERSTANDING
NUTRITION**

W H I T N E Y ◆ R O L F E S

SIXTH EDITION



UNDERSTANDING NUTRITION



**Eleanor Noss Whitney
Sharon Rady Rolfes**

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CHAPTER OPENING ELECTRON MICROGRAPHS

1 α -tocopherol; **27** biotin; **66** DNA; **92** glucose; **131** cholesterol; **169** hydroxyproline; **204** ATP; **242** sucrose; **293** vitamin C; **336** β -carotene; **367** sodium chloride; **405** copper/nickel; **442** phosphocreatine; **476** folate; **513** acetyl choline; **551** aspirin; **585** aspartame; **622** methyl mercury; **659** calciferol.

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**TO THE MEMORY OF MAY
HAMILTON, WHOSE WIT, GRIT, AND
WISDOM HELPED LAUNCH THE FIRST
TWO EDITIONS OF THIS BOOK**

Ellie and Sharon

ABOUT THE AUTHORS



Eleanor Noss Whitney, Ph.D., R.D., received her B.A. in biology from Radcliffe College in 1960 and her Ph.D. in biology with an emphasis on genetics from Washington University, St. Louis, in 1970. Formerly an associate professor at the Florida State University, she now devotes full time to research, writing, and consulting on nutrition, health, and the environment. Her textbooks include *Nutrition: Concepts and Controversies*, *Nutrition and Diet Therapy*, *Life Choices*, and *The Fitness Triad*, among others. She serves on the editorial board of *Topics in Clinical Nutrition*, a quarterly series published by Aspen. She is president of Nutrition and Health Associates, an information resource center in Tallahassee.

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When we wrote the first edition of *Understanding Nutrition*, our goal was to provide a textbook that would both reveal the fascination of the science of nutrition and share the fun and excitement of nutrition with the reader—to provide more than just facts. We also wanted readers to understand how the scientific facts apply to people in daily life. Our goals for this sixth edition are basically unchanged. We have revised every chapter substantially, however, to reflect the many changes that have occurred in the field of nutrition over the years.

This book presents the core information of an introductory nutrition course. Based on the principles of chemistry and molecular biology, the first 12 chapters describe the nutrients and how the body handles them. Chapter 1 wastes no time in introducing the nutrients and their importance to the human body; it continues with a brief discussion of recommendations, assessment, and guidelines. Chapter 2 shifts from recommendations to food choices and illustrates how to use diet-planning principles to create diets that support good health. In Chapter 3, readers follow the journey of digestion and absorption as the body transforms foods into nutrients. Chapters 4 through 6 describe carbohydrates, fats, and proteins—their chemistry, health effects, roles in the body, and places in the diet. Then Chapter 7 shows how the body derives energy from these three nutrients. Chapter 8 continues the story with a look at energy balance, the factors associated with overweight and underweight, and the benefits and dangers of weight loss and weight gain. Chapters 9 through 12 complete the introductory lessons by describing the vitamins, the minerals, and water—their roles in the body, their deficiency and toxicity symptoms, and their sources.

The next six chapters weave that basic information into practical applications, showing how nutrition influences people's lives. Several of these chapters reflect the public's interest in promoting good health through optimal nutrition. Chapter 13 recognizes that the partnership of physical activity and nutrition enhances health and shows how the nutrients work together to support fitness. Chapters 14 and 15 show the special nutrient needs of people through the life span—pregnancy, infancy, childhood, adolescence, and adulthood. Chapter 16 describes the relationships between diet and health, and Chapter 17 addresses consumer concerns about the safety of the food supply. Chapter 18 examines foods from the environmental point of view and offers suggestions for establishing sustainable foodways.

To the person reading this text, it will be obvious that, like even the most exact sciences, nutrition possesses no absolute certainties. Nutrition is a young science dating only from around the turn of the century. Consequently, nutrition scientists simply do not have all the answers yet; in some cases, we have not even asked all the questions yet. One of the missions of this text is to show readers how researchers ascertain the "facts." For example, Highlight 9 uses the topic of vitamin C and the common cold to describe methods used in research.

Many of the chapters in this edition include skill boxes that guide readers through problem-solving tasks. For example, one box shows readers how to calculate niacin intake from a given protein and niacin intake; another shows how to calculate iron absorption from a meal.

This edition presents the Healthy People 2000 nutrition-related priorities wherever their subjects are discussed. Healthy People 2000 is a report developed by the U.S. Department of Health and Human Services that establishes national objectives in health promotion and disease prevention for the year 2000.

Each chapter closes with study questions, and many chapters include self-study exercises. Study questions offer readers the opportunity to review the major concepts presented in the chapters. The self-study exercises assist readers in examining their own diets; one, for example, shows how to calculate nutrient intakes from a day's meals.

Highlights on current issues of interest alternate with the chapters. Each highlight provides readers with a brief look at a topic that relates to its companion chapter. New highlights in this edition address current food labeling regulations, osteoporosis, caffeine, and the impact of agriculture on the environment.

The appendixes provide valuable references for a number of purposes. Appendix A summarizes background information on the hormonal and nervous systems, complementing Appendixes B and C on basic chemistry, the chemical structures of nutrients, and major metabolic pathways. Appendix D assists readers with calculations and conversions. Appendix E provides detailed coverage on nutrition assessment, and Appendix F lists nutrition resources, including book and journal recommendations as well as addresses. Appendix G presents the U.S. Exchange System, the Canadian Exchange System, and the Canadian Food Guide and Guidelines. Appendix H is a 1600-item food composition table prepared from the latest nutrient data base assembled by ESHA Research, Inc., of Salem, Oregon. Appendix I presents the Recommended Dietary Allowances (1989 RDA), the Canadian Recommended Nutrient Intakes (1990 RNI), Nutrition Recommendations for Canadians, and Nutrition Recommendations from the World Health Organization. Appendix J describes measures of protein quality, and Appendix K provides the forms needed to complete the self-study exercises presented at the ends of chapters.

We have tried to keep the number of footnotes to a minimum. Most statements that have appeared in previous editions with footnotes now appear without them, but every statement is backed by evidence, and the authors will supply references upon request.

We hope our informal, conversational writing style makes the study of nutrition an enjoyable experience. Nutrition is a fascinating subject, and we hope our enthusiasm for it comes through on every page.

Eleanor Noss Whitney
Sharon Rady Rolfes
December 1992

ACKNOWLEDGMENTS



To produce a book requires the coordinated effort of a team of people—and, no doubt, each team member has another team of support people as well. We salute, with a big round of applause, everyone who has worked so diligently to ensure the quality of this book.

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Preface xvi

- CHAPTER ONE** AN OVERVIEW OF NUTRITION 1
HIGHLIGHT: Who Speaks on Nutrition? The Qualified versus the Quacks 23
- CHAPTER TWO** FOOD CHOICES AND DIET-PLANNING GUIDES 27
HIGHLIGHT: Food Labels 58
- CHAPTER THREE** DIGESTION, ABSORPTION, AND TRANSPORT 66
HIGHLIGHT: Common Digestive Problems 86
- CHAPTER FOUR** THE CARBOHYDRATES: SUGARS, STARCH, AND FIBERS 92
HIGHLIGHT: Alternatives to Sugar 126
- CHAPTER FIVE** THE LIPIDS: TRIGLYCERIDES, PHOSPHOLIPIDS, AND STEROLS 131
HIGHLIGHT: Alternatives to Fat 166
- CHAPTER SIX** PROTEIN: AMINO ACIDS 169
HIGHLIGHT: Health Aspects of Meatless Diets 200
- CHAPTER SEVEN** METABOLISM: TRANSFORMATIONS AND INTERACTIONS 204
HIGHLIGHT: Alcohol and Nutrition 233
- CHAPTER EIGHT** ENERGY BALANCE AND WEIGHT CONTROL 242
HIGHLIGHT: Eating Disorders—Anorexia Nervosa and Bulimia 286
- CHAPTER NINE** THE WATER-SOLUBLE VITAMINS: B VITAMINS AND VITAMIN C 293
HIGHLIGHT: Vitamin C—Rumors versus Research 332
- CHAPTER TEN** THE FAT-SOLUBLE VITAMINS: A, D, E, AND K 336
HIGHLIGHT: Vitamin and Mineral Supplements 363
- CHAPTER ELEVEN** THE BODY FLUIDS AND THE MAJOR MINERALS 367
HIGHLIGHT: Osteoporosis and Calcium 396
- CHAPTER TWELVE** THE TRACE MINERALS 405
HIGHLIGHT: Our Children’s Daily Lead 438
- CHAPTER THIRTEEN** FITNESS: PHYSICAL ACTIVITY, NUTRIENTS, AND BODY ADAPTATIONS 442
HIGHLIGHT: Supplements and Ergogenic Aids Athletes Use 471
- CHAPTER FOURTEEN** LIFE CYCLE NUTRITION: PREGNANCY, LACTATION, AND INFANCY 476
HIGHLIGHT: Fetal Alcohol Syndrome 510
- CHAPTER FIFTEEN** LIFE CYCLE NUTRITION: CHILDHOOD, ADOLESCENCE, AND AGING 513
HIGHLIGHT: Nutrition and the Aging Brain 545
- CHAPTER SIXTEEN** DIET AND HEALTH 551
HIGHLIGHT: Immunity, Nutrition, and AIDS 580

- CHAPTER SEVENTEEN** CONSUMER CONCERNS ABOUT FOODS 585
HIGHLIGHT: Caffeine—The Brewing Controversy 617
- CHAPTER EIGHTEEN** U.S. FOODWAYS AND GLOBAL ENVIRONMENTAL PROBLEMS 622
HIGHLIGHT: Progress Toward Sustainable Agriculture 651

APPENDIXES

- A** Cells, Hormones, and Nerves
B Basic Chemistry Concepts
C Biochemical Structures and Pathways
D Aids to Calculation
E Nutrition Assessment
F Nutrition Resources
G Dietary Guidelines and Food Exchange Systems
H Table of Food Composition
I Recommended Nutrient Intakes and Other Nutrition Recommendations
J Measures of Protein Quality
K Self-Study Forms

Index

- Recommended Dietary Allowances (RDA) *inside front cover, left*
Daily Values for Food Labels *inside front cover, right*
Body Mass Index Tables *inside back covers*

CHAPTER ONE
AN OVERVIEW OF NUTRITION
1

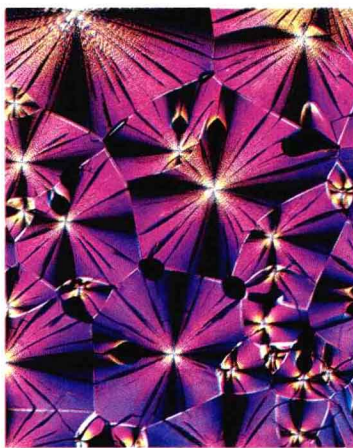


The Nutrients 3
 The Energy-Yielding Nutrients 4
 The Fibers 7
 The Vitamins 7
 The Minerals 8
 Water 8
Recommended Nutrient Intakes 9
 Energy, the Energy-Yielding
 Nutrients, and Water 10
 Fiber 11
 Vitamins and Minerals 11
 Using the RDA 14
 Malnutrition 15
Nutrition Assessment 15
 Nutrition Assessment Methods 15
 Surveys of Populations 18
Nutrition and Disease Prevention 18
 The Roles of Nutrition in Disease 18
 Dietary Recommendations against Disease 20
HIGHLIGHT: Who Speaks on Nutrition? The Qualified versus
 the Quacks 23

CHAPTER TWO
FOOD CHOICES AND
DIET-PLANNING GUIDES
27



Food Selection: Practices and Principles 28
 Food Choices 28
 Diet-Planning Principles 30
Diet-Planning Guides 32
 Food Group Plans 32
 Exchange Lists 36
 Combining Food Group Plans and Exchange
 Lists 43
 A Comparison of Two Days' Meals 44
The Guidelines Applied 45
 From Guidelines to Groceries 45
 The Guidelines Applied to Ethnic Diets 50
HIGHLIGHT: Food Labels 58



CHAPTER THREE
DIGESTION, ABSORPTION,
AND TRANSPORT
66

66



Digestion 67
 Anatomy of the Digestive Tract 68
 The Muscular Action of
 Digestion 70
 The Secretions of Digestion 72
 The Final Stage 75
Absorption 76
 Anatomy of the Absorptive
 System 76
 A Closer Look at the Intestinal
 Cells 78

The Circulatory Systems 79
 The Vascular System 79
 The Lymphatic System 81
Regulation of Digestion and Absorption 83
 Gastrointestinal Hormones and Nerve
 Pathways 83
 The System at Its Best 84
HIGHLIGHT: Common Digestive Problems 86

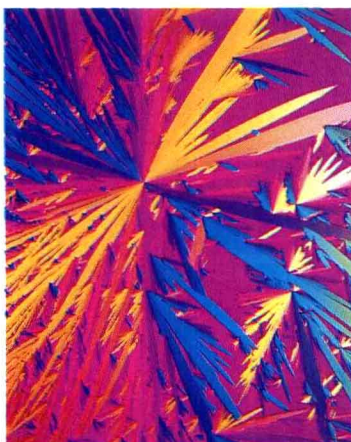
CHAPTER FOUR
THE CARBOHYDRATES: SUGARS,
STARCH, AND FIBERS
92

92



The Chemist's View of Carbohydrates 93
The Simple Carbohydrates 94
 Monosaccharides 94
 Disaccharides 96
The Complex Carbohydrates 98
 Glycogen 98
 Starch 98
Digestion and Absorption of Starch and Sugars 99
 The Processes of Digestion and Absorption 100
 Lactose Intolerance 103
Glucose in the Body 105
 A Preview of Carbohydrate Metabolism 105
 The Constancy of Blood Glucose 106
Health Effects and Recommended Intakes of Sugars
 and Starch 109
 Health Effects of Sugars 109
 Health Effects of Starch 112

Recommended Intakes of Sugars and Starch	113
Using the Exchange System to Estimate Carbohydrate	113
The Fibers	115
The Chemist's View of Fibers	115
The Major Fibers	117
Other Classifications of Fibers	118
Digestion and Absorption of Fibers	119
Health Effects and Recommended Intakes of Fibers	120
Positive Health Effects of Fibers	120
Negative Health Effects of Fibers	121
Recommended Intakes of Fiber	122
HIGHLIGHT: Alternatives to Sugar	126
CHAPTER FIVE	
THE LIPIDS: TRIGLYCERIDES, PHOSPHOLIPIDS, AND STEROLS	
	131
♦	
The Triglycerides	132
The Chemist's View of Fatty Acids	133
Processed Fat in Foods	138
Roles of Triglycerides and Fatty Acids	139
The Essential Polyunsaturated Fatty Acids	140
The Phospholipids and Sterols	142
The Chemist's View of Phospholipids	142
Phospholipids in Foods	143
Roles of Phospholipids	143
The Chemist's View of Sterols	144
Sterols in Foods	144
Roles of Sterols	145
Digestion, Absorption, Transport, and Metabolism	146
Emulsification	146
Digestion	146
Absorption	147
Transport	149
A Preview of Lipid Metabolism	153
Health Effects and Recommended Intakes of Lipids	154
Health Effects of Lipids	154
Recommended Fat Intakes	155
Using the Exchange System to Estimate Fats	160
Low-Fat Foods	162
HIGHLIGHT: Alternatives to Fat	166



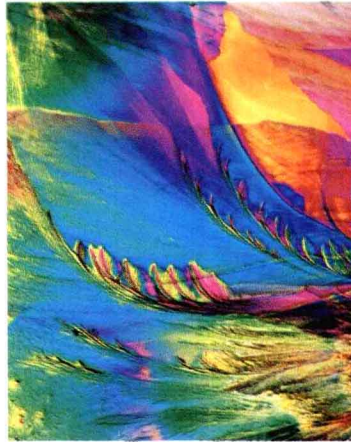
CHAPTER SIX	
PROTEIN: AMINO ACIDS	
	169
♦	
The Chemist's View of Proteins	170
Amino Acid Structure	170
Essential Amino Acids	171
Amino Acid Sequence	172
Folding of the Chain	172
The Completed Protein	173
Digestion and Absorption	174
Roles of Proteins and Amino Acids in the Body	174
Protein in Growth and Maintenance	176
Enzymes	176
Fluid Balance	178
Acid-Base Balance	178
Antibodies	179
Hormones	179
Transport Proteins	180
Blood Clotting	181
Visual Pigments	181
Amino Acids in the Body	181
Protein in the Body	182
Protein Synthesis	184
Protein Quality	185
Measurement of Protein Quality	186
Health Effects of Protein	186
Protein-Energy Malnutrition	187
Protein Excess	189
Animal versus Vegetable Protein	190
Recommended Protein Intakes	191
Nitrogen Balance Studies	191
Protein Recommendations	191
Protein in Food	193
Meat Eaters' Protein Sources	195
Vegetarian Protein Choices	195
HIGHLIGHT: Health Aspects of Meatless Diets	200
CHAPTER SEVEN	
METABOLISM: TRANSFORMATIONS AND INTERACTIONS	
	204
♦	
Chemical Reactions in the Body	205
Breaking Down Nutrients for Energy	209

Glucose	210
Glycerol and Fatty Acids	214
Amino Acids	218
The Final Steps of Catabolism	222
The Body's Energy Budget	226
The Economics of Feasting	226
The Economics of Fasting	226
HIGHLIGHT: Alcohol and Nutrition	233

CHAPTER EIGHT
ENERGY BALANCE
AND WEIGHT CONTROL
242



Energy Balance	243
Energy In: The kCalories in Food	244
Estimating Food Energy	244
Determinants of Food Intake	244
Energy Out: The kCalories the Body Spends	247
Components of Energy Expenditure	247
Estimating Energy Requirements	250
Body Weight and Body Composition	253
Body Weight	253
Body Composition	256
What Is Ideal?	257
Causes of Obesity	258
Fat Cell Development	258
Genetics	259
Fat Cell Metabolism	260
Set-Point Theory	260
The "Fattening Power" of Fat	261
Inactivity	264
Controversies in Obesity Treatment	265
Dangers of Weight Loss	265
Benefits of Weight Loss and Maintenance	267
Treatments of Obesity: Poor Choices	267
Pills, Procedures, and Other Possibilities	267
Very-Low-kCalorie Diets	269
Treatments of Obesity: Good Choices	271
Eating Plans	271
Physical Activity	273
Behavior and Attitude	274
Underweight	278
Problems of Underweight	279
Weight-Gain Strategies	279
HIGHLIGHT: Eating Disorders—Anorexia Nervosa and Bulimia	286



CHAPTER NINE
THE WATER-SOLUBLE VITAMINS:
B VITAMINS AND VITAMIN C
293



The Vitamins	294
The Water-Soluble Vitamins	295
The B Vitamins—As Individuals	296
Thiamin	296
Riboflavin	300
Niacin	303
Biotin	305
Pantothenic Acid	307
Vitamin B ₆	308
Folate	311
Vitamin B ₁₂	316
B Vitamin Relatives	318
The B Vitamins—in Concert	319
B Vitamin Interactions	321
B Vitamin Deficiencies	321
B Vitamin Toxicities	322
B Vitamin Food Sources	322
Vitamin C	322
Vitamin C Roles	323
Vitamin C Recommendations	325
Vitamin C Deficiency	326
Vitamin C Toxicity	326
Vitamin C Food Sources	328
HIGHLIGHT: Vitamin C—Rumors Versus Research	332

CHAPTER TEN
THE FAT-SOLUBLE VITAMINS:
A, D, E, and K
336



Vitamin A	337
Vitamin A Roles	337
Vitamin A Recommendations	341
Vitamin A Deficiency	342
Vitamin A Toxicity	344
Vitamin A in Foods	346
Vitamin D	349
Vitamin D's Bone Formation Role	350
Vitamin D Deficiency	350
Vitamin D Toxicity	351
Vitamin D Recommendations and Sources	351

Vitamin E	353
Vitamin E's Antioxidant Role	354
Claims of Vitamin E Benefits	355
Vitamin E Deficiency	355
Vitamin E Toxicity	356
Vitamin E Recommendations	356
Vitamin E in Foods	356
Vitamin K	358
Vitamin K Deficiency and Toxicity	358
Vitamin K from Bacterial Synthesis and Foods	360
The Fat-Soluble Vitamins—In Summary	360
HIGHLIGHT: Vitamin and Mineral Supplements	363



CHAPTER ELEVEN
THE BODY FLUIDS
AND THE MAJOR MINERALS
367



The Minerals	368
The Body Fluids	369
Water Balance and Recommended Intakes	370
Fluid and Electrolyte Balance	372
Fluid and Electrolyte Imbalance	375
Acid-Base Balance	376
Sodium	377
Chloride	381
Potassium	382
Calcium	384
Calcium in the Body	384
Calcium Recommendations and Intakes	387
Calcium Deficiency	390
Phosphorus	391
Magnesium	392
Sulfur	394
HIGHLIGHT: Osteoporosis and Calcium	396

CHAPTER TWELVE
THE TRACE MINERALS
405



Iron	406
Iron Roles in the Body	406

Iron Absorption and Metabolism	407
Iron Deficiency	408
Iron Toxicity	412
Iron Recommendations and Intakes	412
Contamination, Supplement, and Fortification Iron	415
Zinc	417
Zinc Roles in the Body	418
Zinc Absorption and Metabolism	418
Zinc Deficiency	420
Zinc Toxicity	421
Zinc Recommendations and Intakes	421
Contamination and Supplement Zinc	421
Iodide	424
Copper	426
Manganese	427
Fluoride	427
Chromium	429
Selenium	430
Molybdenum	431
Other Trace Minerals	432
The Trace Minerals—In Summary	432
Meal Selections Revisited	433
HIGHLIGHT: Our Children's Daily Lead	438

CHAPTER THIRTEEN
FITNESS: PHYSICAL ACTIVITY,
NUTRIENTS, AND BODY ADAPTATIONS
442



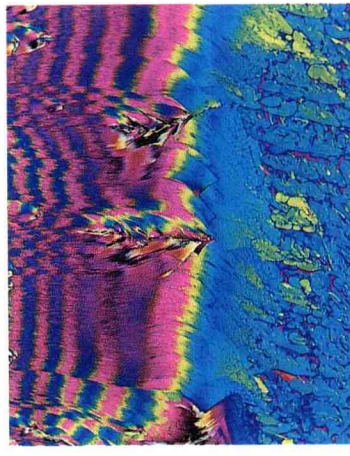
Fitness and Its Benefits	443
Physical Activity Begets Fitness	444
Muscle Fibers and Work	445
Cardiovascular Endurance	446
A Safe, Balanced Fitness Program	448
Fuels and Nutrients to Support Activity	448
The First Fuels of Exercise—ATP and PC	448
Glucose Use during Physical Activity	449
Fat Use during Physical Activity	453
Protein Use during Physical Activity—and Between Times	455
Vitamins and Minerals to Support Activity	457
Fluids and Electrolytes to Support Activity	459
Special Nutrition-Related Problems of Athletes	462
Iron Deficiency States	462

- Special Problems of Female Athletes 463
- Diets for Physically Active People 464
- Choosing a Diet to Support Fitness 464
- Caffeine and Alcohol 468
- Meals before Competition 468
- HIGHLIGHT: Supplements and Ergogenic Aids Athletes Use 471

CHAPTER FOURTEEN

LIFE CYCLE NUTRITION: PREGNANCY, LACTATION, AND INFANCY 476

- Growth and Development During Pregnancy 477
- The Placenta 477
- The Stages of Fetal Development 478
- Critical Periods 479
- Nutrition Prior to Conception 479
- The Risks of Malnutrition 479
- Establishing Healthful Habits 480
- Nutrition during Pregnancy 481
- Energy and Nutrient Needs during Pregnancy 481
- Food Choices during Pregnancy 484
- Weight Gain and Exercise 486
- Nutrition-Related Problems of Pregnancy 487
- High-Risk and Low-Risk Pregnancies 488
- The Infant's Birthweight 489
- The Mother's Health Status 489
- Adolescent Pregnancy 491
- Alcohol Use and Other Practices Incompatible with Pregnancy 492
- Breastfeeding 493
- The Mother's Nutrient Needs 494
- Concerns of Breastfeeding Mothers 496
- Nutrition of the Infant 497
- Nutrient Needs 497
- Breast Milk 499
- Infant Formula 501
- Special Needs of Preterm Infants 504
- Introducing Cow's Milk 504
- Introducing First Foods 504
- Mealtimes with Infants 507
- HIGHLIGHT: Fetal Alcohol Syndrome 510



CHAPTER FIFTEEN

LIFE CYCLE NUTRITION: CHILDHOOD, ADOLESCENCE, AND AGING 513

- Growth and Development during Childhood 514
- Energy and Nutrient Needs during Childhood 514
- Energy Intake and Activity 515
- Other Nutrients 515
- Malnutrition in Children 515
- Adverse Reactions to Foods 516
- Nutrition and Behavior 517
- Nutrient Deficiencies and Behavior 518
- Hunger and Behavior 519
- Nutrition and Hyperactivity 520
- Caffeine and Other Stimulants 521
- The Effects of Television 521
- Food Choices and Eating Habits of Children 521
- Mealtimes at Home 522
- Nutrition at School 525
- Nutrition during Adolescence 526
- Growth and Development 527
- Energy and Nutrient Needs 523
- Food Choices and Health Habits 529
- Adulthood and the Later Years 531
- Nutrition and Longevity 532
- Genetics, Fitness, and Stress 533
- Nutrition, Cataracts, and Arthritis 534
- Water, Energy, and Nutrients in Later Life 536
- Water 536
- Energy Needs and Activity 536
- Vitamins and Minerals 537
- Supplements for Older Adults 539
- Interactions of Drugs with Nutrients 539
- Food Choices and Eating Habits of Older Adults 541
- HIGHLIGHT: Nutrition and the Aging Brain 545