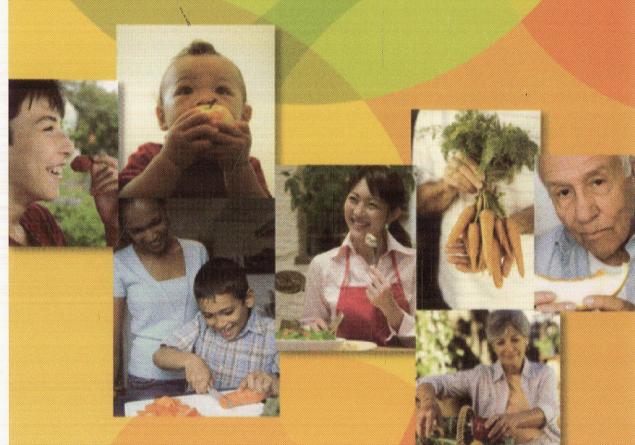
Judith E. Brown

Nutrition

Through the Life Cycle



Third edition

Not United States

Contents

Preface xix	Nutritional Assessment 36 Community-Level Assessment 36 Individual-Level Nutritional Assessment 36
All chapters include Resources and References	Dietary Assessment 36 Anthropometric Assessment 38 Biochemical Assessment 38
Chapter 1	Monitoring the Nation's Nutritional Health 38
Nutrition Basics 1	Public Food and Nutrition Programs 39 WIC 39
Introduction 2 Principles of the Science of Nutrition 2 Essential and Nonessential Nutrients 3 Dietary Intake Standards 3 Carbohydrates 4	Nationwide Priorities for Improvements in Nutritional Health 39 U.S. Nutrition and Health Guidelines 40
Protein 5	Chapter 2
Fats (Lipids) 6 Vitamins 12 Other Substances in Food 13 Minerals 13	Preconception Nutrition 47 Introduction 48
Water 21 Nutritional Labeling 32 Nutrition Facts Panel 32	Preconception Overview 48 2010 Nutrition Objectives for the Nation Related to the Preconceptional Period 48
Ingredient Label 33 Dietary Supplement Labeling 33 Herbal Remedies 33 Functional Foods 34	Reproductive Physiology 49 Female Reproductive System 49 Male Reproductive System 52
Meeting Nutritional Needs across	Sources of Disruptions in Fertility 52
the Life Cycle 35 Dietary Considerations Based on Ethnicity 35 Dietary Considerations Based on Religion 35	Nutrition-Related Disruptions in Fertility 52 Undernutrition and Fertility 53 Body Fat and Fertility 54

Nutrition Time Line

1621 First Thanksgiving feast at Plymouth colony



1702

First coffeehouse in America opens in Philadelphia



1734

Scurvy recognized

Exercise and Infertility 55
Diet and Fertility 55
Other Factors Contributing to Infertility in Males 5

Nutrition and Contraceptives 58

Oral Contraceptives and Nutritional Status 59
Contraceptive Injections 59
Contraceptive Implants 59
Contraceptive Patches 59
Emerging Forms of Contraceptives 60

Other Preconceptual Nutrition Concerns 60

Very Early Pregnancy Nutrition Exposures 60
Recommended Dietary Intakes for Preconceptional
Women 61

Model Preconceptional Nutrition Programs 61

Preconceptional Benefits of WIC 61

Decreasing Iron Deficiency in Preconceptional Women in Indonesia 62

Preconception Care: Preparing for Pregnancy 62

Chapter 3 Preconception Nutrition

Conditions and Interventions

Introduction 68

Premenstrual Syndrome 68

Caffeine Intake and PMS 68

Exercise and Stress Reduction 68

Magnesium, Calcium, Vitamin D, and Vitamin B₆ Supplements and PMS Symptoms 69

Obesity and Fertility 69

Central Body Fat and Fertility 70 Weight Loss and Fertility 70

Hypothalamic Amenorrhea 70

Nutritional Management of Hypothalamic Amenorrhea 71

The Female Athlete Triad and Infertility 71

Nutritional Management of the Female Athlete Triad 71

Eating Disorders and Fertility 72

Nutritional Management of Women with Anorexia Nervosa or Bulimia Nervosa 72

Diabetes Mellitus prior to Pregnancy 72

A Closer Look at Insulin Resistance 72

Nutritional Management of Type 2 Diabetes 73

Other Components of the Nutritional Management of Type 2 Diabetes 74

Reducing the Risk of Type 2 Diabetes 75

Polycystic Ovary Syndrome 75

Nutritional Management of Women with PCOS 76

Disoders of Metabolism 76

Phenylketonuria (PKU) 76
Nutritional Management of Women with PKU 76
Celiac Disease 77
Nutritional Management of Celiac Disease 77

Herbal Remedies for Fertility-Related Problems 78

Chapter 4

Nutrition during Pregnancy 83

Introduction 84

67

The Status of Pregnancy Outcomes 84

Infant Mortality 85

Low Birth Weight, Preterm Delivery, and Infant Mortality 86

Reducing Infant Mortality and Morbidity 87

Health Objectives for the Year 2010 87

Physiology of Pregnancy 87

Maternal Physiology 87

Normal Physiological Changes during Pregnancy 88

The Placenta 91

Embryonic and Fetal Growth and Development 93

Critical Periods of Growth and Development 93
Fetal Body Composition 95
Variation in Fetal Growth 95
Nutrition, Miscarriages, and Preterm Delivery 97

The Fetal-Origins Hypothesis of Later Disease Risk 97 Mechanisms Underlying the Fetal-Origins Hypothesis 98

Limitations of the Fetal-Origins Hypothesis 99

Pregnancy Weight Gain 99

Pregnancy Weight Gain Recommendations 100 Composition of Weight Gain in Pregnancy 101 Postpartum Weight Retention 101

Nutrition Time Line



1744

First record of ice cream in America at Maryland colony



Lind publishes "Treatise on Scurvy," citrus identified as cure

1750

Ojibway and Sioux war over control of wild rice stands

1762

Sandwich invented by the Earl of Sandwich



Nutrition and the Course and G	Outcome
of Pregnancy 103	
Famine and Pregnancy Outcome	103

Contemporary Prenatal Nutrition Research Results 104

Energy Requirement in Pregnancy 104

Carbohydrate Intake during Pregnancy 105

Alcohol and Pregnancy Outcome 105

Protein Requirement 105

Vegetarian Diets in Pregnancy 106

Maternal Intake of Omega-3 Fatty Acids and

Pregnancy Outcome 107

The Need for Water during Pregnancy

Folate and Pregnancy Outcome 109

Folate and Congenital Abnormalities 110

Vitamin A and Pregnancy Outcome 111

Vitamin D Requirement 111

Calcium Requirements in Pregnancy 112

Fluoride

Iron Status and the Course and Outcome of Pregnancy 113

Zinc Requirement in Pregnancy 115

lodine and Pregnancy Outcome 116

Antioxidants from Plants 116

The Need for Sodium during Pregnancy 116

Caffeine Use in Pregnancy 116

Healthy Diets for Pregnancy 117

Effect of Taste and Smell Changes on Dietary Intake

during Pregnancy 117

Pica 117

Assessment of Dietary Intake during Pregnancy 117

Vitamin and Mineral Supplementation during Pregnancy 119

Herbal Remedies and Pregnancy 120

Exercise and Pregnancy Outcome 120

Exercise Recommendations for Pregnant Women 120

Food Safety Issues during Pregnancy 121

Mercury Contamination 121

Common Health Problems during Pregnancy 121

Nausea and Vomiting 121

Heartburn 122

Constipation 122

Model Nutrition Programs for Risk Reduction

in Pregnancy 123

The Montreal Diet Dispensary 123

The WIC Program 123

Chapter 5

Nutrition during Pregnancy

Conditions and Interventions

Introduction 130

Hypertensive Disorders of Pregnancy

Hypertensive Disorders of Pregnancy, Oxidative Stress,

and Nutrition 131

Chronic Hypertension 131

Gestational Hypertension 131

Preeclampsia-Eclampsia 131

Preeclampsia Case Presentation 133

Nutritional Recommendations and Interventions

for Preeclampsia 133

Diabetes in Pregnancy 134

Gestational Diabetes 134

Potential Consequences of Gestational Diabetes 135

Risk Factors for Gestational Diabetes 136

Diagnosis of Gestational Diabetes 136

Treatment of Gestational Diabetes 137

Presentation of a Case Study 137

Exercise Benefits and Recommendations 137

Nutritional Management of Women with Gestational

Diabetes 137

Consumption of Foods with a Low Glycemic Index 139

Postpartum Follow-Up 140

Prevention of Gestational Diabetes 140

Type 1 Diabetes during Pregnancy 140

Multifetal Pregnancies 140

Background Information about Multiple Fetuses 142

Risks Associated with Multifetal Pregnancy 143

Interventions and Services for Risk Reduction 143

Nutrition and the Outcome of Multifetal Pregnancy 144

Dietary Intake in Twin Pregnancy 144

Nutritional Recommendations for Women

with Multifetal Pregnancy 145

HIV/AIDS during Pregnancy 145

Treatment of HIV/AIDS 146

Consequences of HIV/AIDS during Pregnancy 146

Nutritional Factors and HIV/AIDS during Pregnancy

129

Nutrition Time Line

1771

Potato heralded as famine food

1774

Americans drink more coffee in protest over Britain's tea tax



1775

Lavoisier ("the father of the science of nutrition") discovers the energy-producing property of food

1816

Protein and amino acids identified followed by carbohydrates and fats in the mid 1800s

Nutritional Management of Women with HIV/AIDS during Pregnancy 147

Eating Disorders in Pregnancy 147

Consequences of Eating Disorders in Pregnancy 147
Treatment of Women with Eating Disorders during Pregnancy 147
Nutritional Interventions for Women with Eating Disorders 148

Fetal Alcohol Spectrum | 148

Effects of Alcohol on Pregnancy Outcome 148 The Fetal Alcohol Syndrome 148

Nutrition and Adolescent Pregnancy 149

Growth during Adolescent Pregnancy 149
Dietary and Other Recommendations for Pregnant
Adolescents 149

Evidence-Based Practice | 150

Chapter 6

Nutrition during Lactation 155

Introduction 156

Breastfeeding Goals for the United States 156

Lactation Physiology 157

Functional Units of the Mammary Gland 157
Mammary Gland Development 158
Lactogenesis 158
Hormonal Control of Lactation 159
Secretion of Milk 159
The Letdown Reflex 159

Human Milk Composition 160

Colostrum 160
Water 160
Energy 160
Lipids 162
Protein 162
Milk Carbohydrates 162
Fat-Soluble Vitamins 163
Water-Soluble Vitamins 163
Minerals in Human Milk 163
Taste of Human Milk 164

Benefits of Breastfeeding | 164

Breastfeeding Benefits for Mothers 164 Breastfeeding Benefits for Infants 164

Breast Milk Supply and Demand 167

Can Women Make Enough Milk? 167

Does the Size of the Breast Limit a Woman's Ability to Nurse Her Infant? 167

Is Feeding Frequency Related to the Amount of Milk a Woman Can Make? 167

Pumping or Expressing Milk 167

Can Women Breastfeed after Breast Reduction or Augmentation Surgery? 168

Does Silicone from Breast Implants Leach into the Milk? 168

The Breastfeeding Infant 168

Optimal Duration of Breastfeeding 168
Reflexes 168
Breastfeeding Positioning 168
Identifying Hunger and Satiety 169
Feeding Frequency 169
Vitamin Supplements for Breastfeeding Infants 169
Identifying Breastfeeding Malnutrition 170
Tooth Decay 171

Maternial Diet 172

Energy and Nutrient Needs 172

Maternal Energy Balance and Milk Composition 172

Weight Loss during Breastfeeding 172
Exercise and Breastfeeding 172
Vitamin and Mineral Supplements 173
Vitamin and Mineral Intakes 173
Functional Foods 174
Fluids 174
Alternative Diets 174
Infant Colic 174

Factors Influencing Breastfeeding Initiation and Duration 174

Obesity and Breastfeeding 174 Socioeconomic 174

Breastfeeding Promotion, Facilitation, and Support 175

Role of the Health Care System in Supporting
Breastfeeding 175
Prenatal Breastfeeding Education and Support 175

Nutrition Time Line



1833

Beaumont's experiments on a wounded man's stomach greatly expands knowledge about digestion

1871

Proteins, carbohydrates, and fats determined to be insufficient to support life; that there are other "essential" components



1895

First milk station providing children with uncontaminated milk opens in New York City Lactation Support in Hospitals and Birthing Centers 177
Lactation Support after Discharge 177
The Workplace 179
The Community 180

Public Food and Nutrition Programs 180

National Breastfeeding Policy 180 USDA WIC Program 181

Model Breastfeeding Promotion Programs 181

WIC National Breastfeeding Promotion Project—Loving Support Makes Breastfeeding Work 181
Wellstart International 182

Chapter 7

Nutrition during Lactation 189

Conditions and Interventions

Introduction 190

Common Breastfeeding Conditions 190

Sore Nipples 190
Letdown Failure 190
Hyperactive Letdown 191
Engorgement 191
Plugged Duct 191
Infection 191

Maternal Medications 192

Herbal Remedies 195

Specific Herbs Used in the United States 197

Alcohol and Other Drugs and Exposures 198

Alcohol 198
Nicotine (Smoking Cigarettes) 199
Marijuana 200
Caffeine 200
Other Drugs of Abuse 200
Environmental Exposures 200

Neonatal Jaundice and Kernicterus 201

Bilirubin Metabolism 202
Physiologic versus Pathologic Newborn Jaundice 203
Hyperbilirubinemia and Breastfeeding 204
Prevention and Treatment for Severe Jaundice 206
Information for Parents 206

Breastfeeding Multiples 206

Infant Allergies 207
Food Intolerance 207

Near-Term Infants 208

Human Milk and Preterm Infants 208

Medical Contraindications to Breastfeeding 210

Breastfeeding and HIV Infection 210

Human Milk Collection and Storage 212

Milk Banking 212

Model Programs 213

Breastfeeding Promotion in Physicians' Office Practices (BPPOP) 213
The Rush Mothers' Milk Club 213

Chapter 8 Infant Nutrition

2.19

Introduction 220

Assessing Newborn Health 220

Birthweight as an Outcome 220
Infant Mortality 220
Combating Infant Mortality 220
Standard Newborn Growth Assessment 221

Infant Development 221

Motor Development 221 Critical Periods 223 Cognitive Development 223 Digestive System Development 223 Parenting 223

Energy and Nutrient Needs 224

Caloric Needs 224
Protein Needs 224
Fats 225
Metabolic Rate, Calories, Fats, and Protein—How Do
They All Tie Together? 225
Other Nutrients and Non-nutrients 225

Physical Growth Assessment 226

Interpretation of Growth Data 227

Nutrition Time Line

1896

Atwater publishes Proximate Composition of Food Materials



1906

Pure Food and Drug Act passed by President Theodore Roosevelt to protect consumers against contaminated foods

1910

Pasteurized milk introduced



1912

Funk suggested scurvy, beriberi, and pellagra caused by deficiency of "vitamines" in the diet

Feeding in Early Infancy 228

Breast Milk and Formula 228 Cow's Milk during Infancy 228

Development of Infant Feeding Skill 229

Introduction of Solid Foods 231 The Importance of Infant Feeding Position 232 Preparing for Drinking from a Cup 232 Food Texture and Development 233 First Foods 233 Inappropriate and Unsafe Food Choices 235 Water 235 How Much Food Is Enough for Infants? 235 How Infants Learn Food Preferences 236

Nutrition Guidance 236

Infants and Exercise 236 Supplements for Infants 236

Common Nutritional Problems and Concerns 237

Failure to Thrive 237 Nutrition Intervention for Failure to Thrive 237 Colic 238 Iron-Deficiency Anemia 238 Diarrhea and Constipation 239 Prevention of Baby-Bottle Caries and Ear Infections 239 Food Allergies and Intolerances 239 Lactose Intolerance 240

Cross-Cultural Considerations 240

Vegetarian Diets 240

Nutrition Intervention for Risk Reduction 241

Model Program: Newborn Screening and Expanded Newborn Screening 241

Chapter 9 Infant Nutrition

Conditions and Interventions

Introduction 246

Infants at Risk 246

Families of Infants with Special Health Care Needs 247

Energy and Nutrient Needs 247

Energy Needs 247 Protein Requirements 248 Fats . 248 Vitamins and Minerals 248

Growth 249

Growth in Preterm Infants 249 Does Intrauterine Growth Predict Growth Outside? 250 Interpretation of Growth 251

Nutrition for Infants with Special Health Care Needs 251

Nutrition Risks to Development 252

Severe Preterm Birth and Nutrition 253

How Sick Babies Are Fed 253 What to Feed Preterm Infants 254 Preterm Infants and Feeding 254

Infants with Congenital Anomalies and Chronic Illness 256

Infants with Genetic Disorders 257

Feeding Problems 258

Nutrition Interventions 260

Nutrition Services 260

Chapter 10

Toddler and Preschooler 265 Nutrition

Introduction 266

Definitions of the Life-Cycle Stage 266 Importance of Nutrition 266

Tracking Toddler and Preschooler Health 266 Healthy People 2010 266

Normal Growth and Development 266

The 2000 CDC Growth Charts 267 Common Problems with Measuring and Plotting Growth Data 268

Physiological and Cognitive Development 268

Toddlers 268 Preschool-Age Children 271

trition Time Line



1913

First vitamin discovered (vitamin A)

1914

Goldberger identifies the cause of pellagra (niacin deficiency) in poor children to be a missing component of the diet rather than a germ as others believed

245

1916

First dietary guidance material produced for the public was released. It was titled "Food for Young Children."

1917

First food groups published. The Five Food Groups: Milk and Meat; Vegetables and Fruits; Cereals; Fats and Fat Foods; Sugars and Sugary Foods

Temperament Differences 273
Food Preference Development, Appetite, and
Satiety 273

Energy and Nutrient Needs 275

Energy Needs 275
Protein 275
Vitamins and Minerals 275

Common Nutrition Problems 276

Iron-Deficiency Anemia 276
Dental Caries 277
Constipation 278
Lead Poisoning 278
Food Security 278
Food Safety 279

Prevention of Nutrition-Related Disorders 279

Overweight and Obesity in Toddlers and
Preschoolers 279
Prevention and Treatment of Overweight and
Obesity 280
Nutrition and Prevention of Cardiovascular Disease
in Toddlers and Preschoolers 280
Vitamin and Mineral Supplements 281
Herbal Supplements 281

Dietary and Physical Activity Recommendations 282

Dietary Guidelines 282
Food Guide Pyramid 282
Recommendations for Intake of Iron, Fiber, Fat, and Calcium 283
Fluids 285
Recommended versus Actual Food Intake 285
Cross-Cultural Considerations 286
Vegetarian Diets 286
Child Care Nutrition Standards 286
Physical Activity Recommendations 287

Nutrition Intervention for Risk Reduction 287 Model Program 287

Public Food and Nutrition Programs 288 WIC 288 WIC's Farmers' Market Nutrition Program 288 Head Start and Early Head Start 288 Food Stamps 288

Chapter 11

Toddler and Preschooler Nutrition

293

Conditions and Interventions

Introduction 294

Who Are Children with Special Health Care Needs? 294

Nutrition Needs of Toddlers and Preschoolers with Chronic Conditions 295

Growth Assessment 295

Feeding Problems 296

Behavioral Feeding Problems 297
Excessive Fluid Intake 297
Feeding Problems and Food Safety 298
Feeding Problems from Disabilities Involving
Neuromuscular Control 298

Nutrition-Related Conditions 299

Failure to Thrive 299
Toddler Diarrhea and Celiac Disease 299
Autism 300
Muscle Coordination Problems and Cerebral Palsy 300
Pulmonary Problems 301
Developmental Delay and Evaluations 302

Food Allergies and Intolerance 303

Dietary Supplements and Herbal Remedies 303

Sources of Nutrition Services 303

Chapter 12 Child and Preadolescent Nutrition

Introduction 308

Definitions of the Life Cycle Stage 308 Importance of Nutrition 308

Tracking Child and Preadolescent Health 308 Healthy People 2010 308

Nutrition Time Line

1921

First fortified food produced: lodized salt. It was needed to prevent widespread iodine deficiency goiter in many parts of the United States



1928

American Society for Nutritional Sciences and the Journal of Nutrition founded



identified



307

335

Normal Growth and Developm	ient	309
The 2000 CDC Growth Charts	309	

Physiological and Cognitive Development of School-Age Children 310

Physiological Development 310
Cognitive Development 311
Development of Feeding Skills 311

Energy and Nutrient Needs of School-Age Children 313

Energy Needs 313 Protein 314 Vitamins and Minerals 314

Common Nutrition Problems 314

Iron Deficiency 314 Dental Caries 314

Prevention of Nutrition-Related Disorders in School-Age Children 314

Overweight and Obesity in School-Age Children 315
Prevention of Overweight and Obesity 316
Nutrition and Prevention of Cardiovascular Disease
in School-Age Children 318
Dietary Supplements 319

Dietary Recommendations 319

Recommendations for Intake of Iron, Fiber, Fat, and Calcium 319
Recommended versus Actual Food Intake 321
Cross-Cultural Considerations 322
Vegetarian Diets 322

Physical Activity Recommendations 322

Recommendations versus Actual Activity 323
Determinants of Physical Activity 323
Organized Sports 324

Nutrition Intervention for Risk Reduction 324

Nutrition Education 324 Nutrition Integrity in Schools 324 Model Programs 325 Model Program: High 5 Alabama 326

Public Food and Nutrition Programs 327

The National School Lunch Program 327 School Breakfast Program 328 Summer Food Service Program 329 Team Nutrition 329

Chapter 13 Child and Preadolescent Nutrition

Conditions and Interventions

Introduction 336

"Children Are Children First"—What Does That Mean? 336

Nutritional Requirements of Children with Special Health Care Needs 337

Energy Needs 337 Protein Needs 337 Other Nutrients 337

Growth Assessment 338

Growth Assessment and Interpretation in Children with Chronic Conditions 338

Body Composition and Growth 338

Nutrition Recommendations 339

Methods of Meeting Nutritional Requirements 340 Fluids 342

Eating and Feeding Problems in Children with Special Health Care Needs 342

Specific Disorders 342

Dietary Supplements and Herbal Remedies 347

Sources of Nutrition Services 348

USDA Child Nutrition Program 348

Maternal and Child Health Block Program
of the U.S. Department of Health and
Human Services (HHS) 348

Public School Regulations: 504 Accommodation
and IDEA 348

Nutrition Intervention Model Program 349

Chapter 14 Adolescent Nutrition

353

Introduction 354

Nutritional Needs in a Time of Change 354

Nutrition Time Line

1930s

Vitamin C identified in 1932, followed by pantothenic acid and riboflavin in 1933, and vitamin K in 1934



1937

Pellagra found to be due to a deficiency of niacin

1941

First refined grain-enrichment standards developed

Normal Physical Growth and Development 355

Changes in Weight, Body Composition, and Skeletal Mass 356

Normal Psychosocial Development 357

Health and Eating-Related Behaviors during Adolescence 358

Vegetarian Diets 360

Dietary Intake and Adequacy Among Adolescents 362

Energy and Nutrient Requirements of Adolescents 362

Energy 365
Protein 365
Carbohydrates 366
Dietary Fiber 366
Fat 366
Calcium 366
Iron 367

Zinc 368 Folate 368 Vitamin A 369 Vitamin E 369

Vitamin C 369

Nutrition Screening, Assessment, and Intervention 369

Nutrition Education and Counseling 374

Physical Activity and Sports 375

Factors Affecting Physical Activity 375

Promoting Healthy Eating and Physical Activity Behaviors 377

Effective Nutrition Messages for Youth 377

Parent Involvement 377

School Programs 377

Community Involvement in Nutritionally Supportive Environments 380

Chapter 15
Adolescent Nutrition

Conditions and Interventions

Introduction 384

Overweight and Obesity 384

Health Implications of Adolescent Overweight 385

Supplement Use 387

Vitamin–Mineral Supplements 387 Herbal Remedies 390

Ergogenic Supplements Used by Teens 390

Nutrition for Adolescent Athletes 391

Fluids and Hydration 391 Special Dietary Practices 391

Substance Use 392

Iron-Deficiency Anemia 392

Cardiovascular Disease 393

Hypertension 393 Hyperlipidemia 394

Disordered Eating, Dieting, and Eating Disorders 395

The Continuum of Eating Concerns and Disorders 395

Prevalence of Eating Disorders 395

Anorexia Nervosa 395 Bulimia Nervosa 396 Binge-Eating Disorder 397

Disordered Eating Behaviors 398

Dieting Behaviors 398
Body Dissatisfaction 399
Etiology of Eating Disorders 400
Treating Eating Disorders 400

Preventing Eating Disorders 401

Eating Disorders among Adolescents: Summing Things Up 402 Children and Adolescents with Chronic Health Conditions 402

Chapter 16
Adult Nutrition

407

Introduction 408

Definition of Adulthood in the Lifecycle 408 Importance of Nutrition 408

Healthy People 2010 Objectives 408

Physiological Changes of Adulthood 408

Sensory Changes 409
Hormonal Changes 409
Physiological Changes in Males: Climacteric 409
Physiological Changes in Females: Menopause 410

Nutrition Time Line

1941

First Recommended Dietary Allowances (RDAs) announced by President Franklin Roosevelt on radio



1946

383

National School Lunch Act passed



1947

Vitamin B₁₂ identified

Maintaining a Healthy Body 412

Energy for Weight Management 412
Determining Energy Needs 412
Energy for Weight Change 413
Actual Energy Intake 413
Fad Diets 414

Dietary Recommendations 415

Dietary Recommendations to Combat Nutritional
Concerns 415
Food Advice 416
MyPyramid 417
Food Advice Reflects Cultural Food Patterns 417
Alcohol: Food, Drug, and Nutrient 417
Water and Other Fluids 419
Diuretic Effects of Caffeine and Alcohol 420
International Guidance Related to Fluids 420

Nutrient Recommendations 420

Nutrients of Public Health Concern 420
Actual Intake of Food 422
Supplements: Vitamins and Minerals 424
Supplements and CAM (Complementary and Alternative Medicine) 424
Cross-Cultural Considerations 424
Cross-Cultural Dietary Guidance 426
Vegetarian Diets 426

Physical Activity Recommendations 428

Nutrition Intervention for Risk Reduction 430

A Model Health-Promotion Program 430
Public Food and Nutrition Programs 430
Nutrition and Health Promotion 431

Chapter 17

Adult Nutrition

Conditions and Interventions

Introduction 438

Cancer 438

Definition 438 Prevalence/Etiology 438 Risk Factors 438 Nutrition Intervention 439

Alternative Medicine and Cancer Treatment 439

Cardiovascular Disease: Coronary Heart Disease 439

Definition 440
Prevalence 440
Etiology 440
Effects of CHD 441
Risk Factors 441
Nutrition Interventions 441
Dietary Supplements and Heart Disease 443

Overweight and Obesity 444

Definition 444
Prevalence 445
Etiology 445
Effects of Obesity 445
Nutrition Interventions 446
Bariatric Surgery and Role of the RD 447

Diabetes Mellitus 447

Prevalence 447
Etiology 448
Insulin Resistance 448
Effects of Diabetes 448
Risk Factors 448
Nutrition Interventions for Type 2 Diabetes 448
Glucophage and Statins 449
Metabolic Syndrome 450

HIV/AIDS 450

Definition 450
Prevalence 450
Etiology 450
Effects of HIV/AIDS 452
Nutrition Interventions 452

437 Chapter 18

Nutrition and Older Adults

Introduction 456

What Counts As Old? 456
Food Matters: Nutrition Contributes to a Long and Healthy Life 456

Nutrition Time Line

1953

Double helix structure of DNA discovered



1965

Food Stamp Act passed, Food Stamp program established

1966

Child Nutrition Act added school breakfast to the National School Lunch Program



1968

First national nutrition survey in United States launched (the Ten State Nutrition Survey)

455

A Picture of the Aging Population: Vital Statistics 457

Global Population Trends: Life Expectancy and Life Span 457

Nutrition: A Component of Health Objectives for the Older Adult Population 458

Theories of Aging 458

Programmed Aging 459

Wear-and-Tear Theories of Aging 459 Calorie Restriction and Longevity 459

Physiological Changes 460

Body Composition Changes 460

Changing Sensual Awareness: Taste and Smell, Chewing and Swallowing, Appetite and Thirst 461

Nutritional Risk Factors 462

Dietary Recommendations 465

Food-Based Guidance: MyPyramid 465 Actual Food Group Intake 466 Eating Occasions 466

Nutrient Recommendations 467

Estimating Energy Needs 467

Nutrient Recommendations: Macro- and Micronutrients of Concern 467

Recommendations for Fluid 470

Age-Associated Changes in Metabolism: Nutrients

of Concern 470

Low Dietary Intake: Nutrients of Concern 472 Nutrient Supplements: Why, When, Who, What,

and How Much? 473

Dietary Supplements, Functional Foods, Nutraceuticals:

Special Interest for Older Adults 475

Nutrient Recommendations: Using the Food Label 475

Cross-Cultural Considerations in Making Dietary Recommendations 477

Food Safety Recommendations 477

Physical Activity Recommendations 478

Exercise Guidelines 478

Nutrition Policy and Intervention for Risk Reduction 479

Nutrition Education 479

Model Programs Exemplify Intervention Goals 480

Community Food and Nutrition Programs 481

Elderly Nutrition Programs 481
Senior Nutrition Program 481
The Promise of Prevention: Health Promotion 482

Chapter 19 Nutrition and Older Adults

487

Conditions and Interventions

Introduction: The Importance of Nutrition 488

Nutrition and Health 488

Heart Disease/Cardiovascular Disease 489

Prevalence 489 Risk Factors 489

Nutritional Remedies for Cardiovascular Diseases 489

Stroke 489

Definition 489
Prevalence 489
Etiology 489
Effects of Stroke 489
Risk Factors 490
Nutritional Remedies 491

Hypertension 491

Definition 491
Prevalence 492
Etiology 492
Effects of Hypertension 492
Risk Factors 492
Nutritional Remedies 492

Cancer 492

Prevalence of Cancer 492
Etiology and Effects of Cancer 492
Risk Factors 493
Nutritional Remedies for Cancer 493

Diabetes 494

Effects of Diabetes 494
Risk Factors 494
Nutritional Interventions 495

Nutrition Time Line

1970

First Canadian national nutrition survey launched (Nutrition Canada National Survey) 1972

Special Supplemental Food and Nutrition Program for Women, Infants, and Children (WIC) established 1977

Dietary Goals for the United States issued 1978

First Health Objectives for the Nation released 1989

First national scientific consensus report on diet and chronic disease published

Obesity 496	Medications and Polypharmacy 508	
Definition 496 Prevalence 496 Etiology/Effects/Risk Factors of Obesity 496 Nutritional Remedies 496	Low Body Weight/Underweight 509 Etiology 510 Nutrition Interventions 510	
Osteoporosis 497 Definition 497 Prevalence 497 Etiology 497 Inadequate Bone Mass 497 Increased Bone Loss 498 Effects of Osteoporosis 498 Risk Factors 498	Dehydration 511 Etiology 512 Effects of Dehydration 512 Nutritional Interventions 512 Rehydrate Slowly 513 Dehydration at End-of-Life 513 Bereavement 513	
Nutritional Remedies 498 Other Issues Impacting Nutritional Remedes 500 Oral Health 500	Appendix A CDC Growth Charts	A-1
Gastrointestinal Diseases 501 Gastroesophageal Reflux Disease (GERD) 501		17-1
Changes in Nutrient Availability: Vitamin B ₁₂ Deficiency 502 Pernicious Anemia 502 Food-bound Vitmain B ₁₂ Malabsorption 503	Appendix B Nutrient Intakes of Adults Aged 70 and Older	A-9
Constipation 504 Inflammatory Diseases: Osteoarthritis 504 Definition 504 Etiology 505 Effects of Osteoarthritis 505	Appendix C Measurement Abbreviations and Equivalents	A-11
Risk Factors 505 Nutritional Remedies 505 Cognitive Disorders: Alzheimer's	Appendix D Body Mass Index (BMI)	A-13
Disease 506 Prevalence of Dementia 507 Etiology of Complete Disease 507	Glossary G-1	71 13

Prevalence of Dementia 507

Etiology of Cognitive Disorders 507

Effects of Cognitive Disorders 507

Nutrition Interventions for Cognitive Disorders 507

Nutrition Time Line

1997

RDAs expanded to Dietary Reference Intakes (DRIs) 1998

Folic acid fortification of refined grain products begins



2003

Index I-1

Sequencing of DNA in the human genome completed. Marks beginning of new era of research innutrient—gene interactions

2006

Obestity and diabetes become global epidemics