
Contents

Preface.....	xxi
Acknowledgment	xxiii
Author	xxv
Chapter 1 Basic Facts about Antioxidants	1
Introduction	1
Evolution of the Antioxidant System.....	1
History of the Discovery of Antioxidants	1
Sources and Forms of Vitamins.....	2
Solubility of Antioxidants	3
Distribution of Antioxidants in the Body.....	3
Storage of Antioxidants.....	5
Can Antioxidants Be Degraded during Cooking?	5
Absorption of Antioxidants and Its Significance	6
Functions of Individual Antioxidants.....	6
Antioxidant Defense Systems.....	7
Group A Antioxidants	7
Group B Antioxidants	7
Group C Antioxidants	8
Known Functions of Antioxidants	8
Current Controversies about Antioxidants.....	8
Misuse of Antioxidants in Clinical Studies	8
Conclusions	11
References	11
Chapter 2 Basic Facts about Oxidative Stress, Inflammation, and the Immune System.....	13
Introduction	13
Oxidative Stress.....	14
What Are Free Radicals?.....	14
Types of Free Radicals	14
Formation of Free Radicals Derived from Oxygen and Nitrogen.....	14
Oxidation and Reduction Processes	16
What Is Inflammation?.....	16
Types of Inflammatory Reactions	17
Products of Inflammatory Reactions.....	17
Cytokines.....	17
Complement Proteins	18
AA Metabolites	18
Endothelial/Leukocyte Adhesion Molecules	18
Immune System.....	18
What Is the Immune System?.....	19
Innate Immunity.....	19
Adaptive Immunity	20
Conclusions	20
References	21

Chapter 3	Scientific Rationale of Current Trends in Clinical Studies of Micronutrients for Prevention of Chronic Diseases	23
	Introduction	23
	Levels of Oxidative Stress and Chronic Inflammation in High-Risk Populations	24
	High-Risk Populations for Cancer.....	24
	High-Risk Populations of CAD.....	24
	High-Risk Populations of AD and PD	24
	Biology of Antioxidants	24
	Results of Clinical Trials with a Single Antioxidant.....	26
	Cancer.....	26
	Coronary Artery Disease	26
	Alzheimer's Disease and Parkinson's Disease	27
	Reasons the Use of a Single Antioxidant Produced Inconsistent Results.....	28
	Results of Clinical Studies with Multiple Dietary Antioxidants in Cancer	28
	Results of Clinical Studies with Fat and Fiber.....	29
	Using Multiple Micronutrients with a Low-Fat, High-Fiber Diet to Reduce the Risk and Progression of Chronic Diseases	30
	Recommended Micronutrients for Reducing the Risk and Progression of Chronic Diseases.....	30
	Conclusions	31
	References	31
Chapter 4	Micronutrients in Healthy Aging	35
	Introduction	35
	Oxidative Stress during Aging.....	36
	Sources of Oxidative Stress.....	36
	Influence of Environmental, Dietary, Metabolic, and Lifestyle-Related Stressors on Oxidative Stress	36
	Oxidative Stress Influences Mitochondria, Lysosome, and Proteasome Function during Aging	37
	Mitochondrial Dysfunction	37
	Impairment of Proteasome and Lysosomal-Mediated Proteolytic Activities.....	38
	Oxidative Stress Influences the Length of Telomere during Aging.....	38
	Chronic Inflammation during Aging	39
	Aging Influences Immune Function.....	39
	Aging Influencing Antioxidant Defense Systems	40
	Antioxidant Enzymes	40
	Changes in Antioxidant Enzyme Activities in Animals	40
	Changes in Antioxidant Enzyme Activities in Humans.....	40
	Dietary and Endogenous Antioxidants Levels	41
	Vitamin C	42
	Glutathione	42
	Vitamin E.....	42
	Coenzyme Q ₁₀	42
	Antioxidant Supplementation Influences Age-Related Functional Deficits.....	43
	Vitamin E	43
	Coenzyme Q ₁₀	43

Carotenoids.....	44
Melatonin.....	44
Flavonoids.....	44
Glutathione and <i>N</i> -Acetylcysteine.....	44
Alpha-Lipoic Acid.....	44
Multiple Dietary Antioxidants.....	44
Rationale for Not Using a Single Dietary Antioxidant to Reduce Age-Related Functional Deficits	45
Rationale for Recommending Multiple Micronutrients to Reduce the Rate of Aging.....	45
Recommended Micronutrients for Adults and Children.....	46
Changes in Diet and Lifestyle	46
Conclusions	47
References	47

Chapter 5 Role of Micronutrients in the Prevention of Coronary Artery Disease and Improvement of the Standard Therapy.....	55
Introduction	55
Incidence and Cost	55
Primary Risk Factors and Involvement of Oxidative Stress and Inflammation in CAD	56
Consequences of Increased Oxidative Stress and Chronic Inflammation	56
Low-Dose Aspirin in CAD	57
Role of Antioxidants in CAD.....	57
Animal Studies after Treatment with Antioxidants	57
Epidemiologic Studies with Antioxidants	57
Intervention Human Studies after Treatment with One or More Dietary Antioxidants	58
Vitamin E Alone Producing Beneficial Effects	59
Vitamin C Alone Producing Beneficial Effects	60
Dietary Antioxidants Producing No Effects or Adverse Effects.....	60
Endogenous Antioxidants Producing No Effect or Beneficial Effects.....	62
Dietary and Endogenous Antioxidants with Cholesterol-Lowering Drugs.....	63
Multiple Dietary Antioxidants with Cholesterol-Lowering Drugs	63
Resveratrol and Omega-3 Fatty Acids.....	65
Resveratrol	65
Omega-3 Fatty Acids	65
Intervention Studies with B-Vitamins to Lower Homocysteine Levels.....	66
Scientific Rationale for Using Multiple Micronutrients Including Dietary and Endogenous Antioxidants in Prevention and Improved Treatment of CAD.....	67
Proposed Multiple Micronutrient Preparation	68
Importance of Dose Schedule	68
Antioxidants and Aspirin Resistance.....	69
Scientific Rationale for Using Multiple Micronutrient Preparations in Combination with Cholesterol-Lowering Drugs and Aspirin for Reducing the Progression of CAD	69
Modifications in Diet and Lifestyle.....	69
Conclusions	69
References	70

Chapter 6	Micronutrients for the Prevention of Diabetes and Improvement of the Standard Therapy.....	77
	Introduction.....	77
	Incidence and Cost.....	77
	Types of Diabetes.....	78
	Type 1 Diabetes.....	78
	Type 2 Diabetes.....	78
	Gestational Diabetes.....	78
	Other Types of Diabetes.....	78
	Prediabetes and Metabolic Syndrome.....	78
	Complications of Diabetes.....	79
	Evidence for Increased Oxidative Stress in Diabetes.....	79
	Type 1 Diabetes.....	79
	Type 2 Diabetes.....	80
	Metabolic Syndrome.....	80
	Evidence for Increased Chronic Inflammation in Diabetes.....	80
	Beneficial Effects of Antioxidants and Other Nutrients in Diabetes.....	81
	Vitamin A.....	81
	Vitamin C.....	81
	Vitamin D.....	82
	Vitamin E.....	82
	Alpha-Lipoic Acid.....	83
	<i>N</i> -Acetylcysteine.....	83
	L-Carnitine.....	84
	Coenzyme Q ₁₀	85
	Antioxidant Mixtures.....	86
	Vitamin A and Insulin.....	86
	Folic Acid and Thiamine.....	86
	Chromium.....	87
	Antioxidants in Combination with Diabetic/Cardiovascular Drugs and/or Insulin.....	87
	Omega-3 Fatty Acids.....	88
	Animal Studies.....	88
	Human Epidemiologic Studies with Omega-3 Fatty Acids.....	88
	Human Intervention Studies with Omega-3 Fatty Acids Alone.....	88
	Human Studies with Omega-3 Fatty Acids, Antidiabetic Drugs and Heart Medications.....	89
	Treatments of Diabetes.....	89
	Standard Treatments.....	89
	Aspirin.....	90
	Aspirin Resistance.....	90
	Animal Studies with Aspirin.....	90
	Problems Associated with Using a Single Agent in Diabetic Patients.....	91
	Rationale for Using Multiple Micronutrients in Diabetic Patients.....	91
	Recommended Micronutrient Supplement for the Prevention of Diabetes in High-Risk Populations.....	92
	Recommended Micronutrient Supplement in Combination with Standard Therapy in Diabetic Patients.....	93
	Diet and Lifestyle Recommendations for Prediabetic Individuals and Diabetic Patients.....	93

Conclusions	93
References	94
Chapter 7 Micronutrients in Cancer Prevention	103
Introduction	103
Cancer Incidence, Mortality, and Cost.....	103
Proposed Stages of Human Carcinogenesis.....	104
Diagrammatic Representation of the Proposed Stages of Human Carcinogenesis.....	105
Some Examples of Tumor Initiators and Tumor Promoters.....	106
Contribution of Environmental, Dietary, and Lifestyle-Related Factors	106
Some Examples of Lifestyle-Related Carcinogens	107
Some Examples of Environment-Related Carcinogens.....	108
Some Examples of Diet-Related Carcinogens.....	108
Some Examples of Diet-Related Cancer Protective Agents.....	109
Functions of Antioxidants Relevant to Cancer Prevention	109
Analysis of Cell Cultures after Treatment with Antioxidants.....	110
Analysis of Cancer Prevention Studies in Animals after Treatment with Antioxidants	110
Analysis of Epidemiologic Studies on Antioxidants and Cancer Prevention	112
Analysis of Intervention Studies on Antioxidants and Cancer Prevention	114
Cancer Risk in Heavy Tobacco Smokers after Treatment with a Single Dietary Antioxidant.....	114
Other Cancer Risks after Treatment with a Single Dietary Antioxidant	115
Cancer Risk after Treatment with Multiple Dietary Antioxidants.....	116
Cancer Risk after Treatment with Vitamin D and Calcium.....	117
Cancer Risk after Treatment with Folate and B-Vitamins.....	117
Cancer Risk after Treatment with Fat and Fiber	118
Cancer Risk after Treatment with NSAIDs	119
Proposed Cancer Prevention Strategies	119
Recommendations for Cancer-Free Normal Individuals	119
Recommendations for Cancer-Free High-Risk Individuals	120
Recommendations for Cancer Survivors.....	121
Diet and Lifestyle Recommendations for Individuals of High-Risk Populations	121
Rationale for Using Multiple Micronutrients in Proposed Cancer Preventive Strategy	121
Unique Features of Proposed Micronutrient Formulation	122
Toxicity of Micronutrients.....	123
Conclusions	123
References	123
Chapter 8 Micronutrients for Improvement of the Standard Therapy in Cancer	133
Introduction	133
Preventive and Therapeutic Dose Ranges of Antioxidants.....	134
Recommendation by Oncologists and Use of Antioxidants by Their Patients	135
Effects of Therapeutic Doses of Individual Antioxidants on Growth of Cancer and Normal Cells	136
Vitamin E and Its Derivatives	136

Vitamin C	137
Combination of Vitamin C or Vitamin E with Other Agents	138
Vitamin A and Carotenoids.....	138
Selenium	138
Mixture of Dietary Antioxidants.....	139
NAC and Alpha-Lipoic Acid.....	139
Coenzyme Q ₁₀	140
Antioxidant Enzymes	140
Treatment Schedules	140
Effects of Therapeutic Doses of Individual Antioxidants on Gene Expression Profiles in Cancer Cells.....	140
Effects of Preventive Doses of Individual Antioxidants on Cancer Cell Growth	141
Effects of Therapeutic Doses of Individual Antioxidants on Radiation-Induced Damage in Cancer Cells and Normal Cells	141
Cell Culture Studies	141
Animal Studies	142
Clinical Studies	144
Effects of Therapeutic Doses of Individual Antioxidants on Chemotherapeutic Agent-Induced Damage in Cancer Cells and Normal Cells	144
Cell Culture Studies	144
Animal Studies	147
Clinical Studies	147
Glutathione-Elevating Agents (NAC and Alpha-Lipoic Acid).....	148
Coenzyme Q ₁₀	148
Vitamin E.....	149
Selenium	149
Glutamine	149
Mechanisms of Enhancing the Efficacy of Standard Therapy on Cancer Cells by Therapeutic Doses of Individual Antioxidants	150
Clinical Studies with Multiple Dietary Antioxidants	150
Rationale for Using Multiple Micronutrients.....	151
Rationale for Not Recommending Antioxidant Supplements during Standard Therapy.....	152
Preventive Doses of Individual Antioxidants Reduce the Efficacy of Cancer Therapeutic Agents.....	152
Utilization of Data Obtained from the Use of Preventive Doses of Individual Antioxidants in High-Risk Populations	152
Utilization of Data Obtained from the Use of Antioxidant Deficiency in Combination with Therapeutic Agents on Cancer Cells.....	153
Effects of Therapeutic Doses of Individual Antioxidants in Combination with Experimental Cancer Therapies on Cancer Cells	154
Hyperthermia.....	154
Sodium Butyrate and Interferon-Alpha2b.....	155
Cellular Vaccine	156
Gene Therapy	156
Proposed Micronutrient Protocols	156
AMTP Using Therapeutic Doses of Multiple Antioxidants.....	156
Preventive Micronutrient Protocol Using Preventive Doses of Multiple Antioxidants	157
Recommendations for Diet and Lifestyle Modifications	157

Conclusions	157
References	158
Chapter 9 Micronutrients in the Prevention and Improvement of the Standard Therapy for Alzheimer's Disease	167
Introduction	167
Incidence and Cost	168
Etiology of AD	168
Neuropathology of AD	168
Increased Oxidative Stress in AD	168
Sources of Free Radicals in Normal Brain.....	168
Formation of Free Radicals Derived from Oxygen and Nitrogen	169
Oxidative Stress-Induced Mitochondrial Damage in AD	171
Beta-Amyloid Mediates Its Neurotoxic Effects through Free Radicals in AD...	172
Cholesterol-Induced Generation of Beta-Amyloid.....	172
Proteasome Inhibition Induced Neurodegeneration in AD.....	173
Genetic Defects in Idiopathic AD	173
Mutated Genes Mediate their Effects through Increased Production of Beta-Amyloid in Familial AD	174
Increased Levels of Markers of Chronic Inflammation in AD	174
Neuroglobin in AD.....	176
Current Treatments of AD	176
Laboratory and Clinical Studies with Antioxidants in AD	176
Alpha-Lipoic Acid	177
Coenzyme Q ₁₀ and Melatonin	177
Nicotinamide, Nicotinamide Adenine Dinucleotide (NAD ⁺), and Nicotinamide Adenine Dinucleotide Dehydrogenase (NADH).....	178
Vitamin A, Vitamin E, and Vitamin C	178
Serum Levels of Dietary Antioxidants.....	179
B-Vitamins.....	179
Resveratrol.....	179
<i>Ginkgo biloba</i> and Omega-3 Fatty Acids	180
Green Tea Epigallocatechin-3-Gallate and Caffeine	180
Problems with Using a Single Nutrient in AD	180
Rationale for Using Multiple Micronutrients in AD	181
Rationale for Using NSAIDs in AD Prevention.....	182
Recommended Micronutrients in Combination with Low-Doses of NSAIDs for Prevention of AD in High-Risk Populations	183
Rationale for Using Acetylcholinesterase Inhibitors in the Treatment of AD.....	183
Recommended Micronutrients and Low-Dose NSAIDs with Standard Therapy in Patients with Dementia	183
Diet and Lifestyle Recommendations for AD.....	184
Conclusions	184
References	184
Chapter 10 Micronutrients for the Prevention and Improvement of the Standard Therapy for Parkinson's Disease	197
Introduction	197
Incidence and Cost	198

Etiology	198
Neuropathology and Symptoms	198
Genetics of PD	199
DJ-1 Gene	199
Alpha-Synuclein Gene	200
PTEN-Induced Putative Kinase 1	201
Increased Oxidative Stress in PD	201
Increased Inflammation in PD	203
Mitochondrial Dysfunction in PD	203
Laboratory and Human Studies in PD with Antioxidants	204
In Vitro Studies	204
Studies in Animal Models of PD	204
Studies in Human PD	205
Problems of Using a Single Antioxidant in PD	207
Rationale for Using Multiple Micronutrients in PD	207
Rationale for Using an NSAID in PD Prevention	209
Recommended Micronutrient Supplement for Use in Combination with a Low-Dose NSAID for the Prevention of PD in High-Risk Populations	209
Recommended Micronutrient Supplement for Use in Combination with a Low-Dose NSAID for Reducing the Rate of Progression of PD in Early-Stage Patients	209
Current Treatments of PD	210
Rationale for Using a Micronutrient Supplement and an NSAID in Combination with Standard Therapy in PD Patients	210
Recommended Micronutrient Supplement and Low-Dose NSAID in Combination with Standard Therapy in PD Patients	210
Diet and Lifestyle Recommendations for PD	211
Conclusions	211
References	211
Chapter 11 Micronutrients in Prevention and Improvement of the Standard Therapy in Hearing Disorders	221
Introduction	221
Incidence and Cost	221
Types of Hearing Disorders	222
Conductive Hearing Loss	222
Sensorineural Hearing Loss	222
Tinnitus	222
Meniere's Disease	222
Agents or Conditions Causing Hearing Disorders	223
Measurements of Hearing Loss	223
Current Prevention and Treatment Strategies	223
Involvement of Oxidative Stress in Hearing Disorders	224
Involvement of Inflammation in Hearing Disorders	225
Beneficial Effects of Antioxidants in Hearing Disorders	225
Animal Studies	225
Human Studies	226
Rationale for Using Multiple Micronutrients in Hearing Disorders	226
Proposed Micronutrient Recommendation for Prevention and Improved Treatment of Hearing Disorders	229

Conclusions	229
References	230
Chapter 12 Micronutrients in Improvement of the Standard Therapy in Posttraumatic Stress Disorder	235
Introduction	235
Incidence and Cost of PTSD	235
Symptoms of PTSD.....	236
Biochemical Events in PTSD	236
Increased Oxidative Stress in PTSD	237
Chronic Inflammation in PTSD	237
Release of Glutamate in PTSD.....	238
Standard Therapy in PTSD	238
Rationale for Using Micronutrients in PTSD.....	239
Problems of Using a Single Micronutrient in PTSD.....	240
Rationale for Recommending Multiple Micronutrients Including Dietary and Endogenous Antioxidants in PTSD.....	240
Recommended Micronutrients for Reducing the Risk of PTSD in High-Risk Populations	242
Recommended Micronutrients in Combination with Standard Therapy in PTSD.....	243
Diet and Lifestyle Recommendations for PTSD.....	243
Conclusions	243
References	244
Chapter 13 Micronutrients in Improvement of the Standard Therapy in Traumatic Brain Injury	249
Introduction	249
Causes of TBI.....	249
Incidence and Cost of TBI.....	250
U.S. Troops	250
U.S. Civilians.....	250
Symptoms and Consequences of TBI	250
Symptoms and Consequences of Concussive Injury	250
Risk of Posttraumatic Disorder Associated with TBI	251
Biochemical Events that Contribute to the Progression of Damage Following TBI.....	251
Evidence for Increased Oxidative Stress in TBI	251
Mitochondrial Dysfunction in TBI.....	252
Evidence for Increased Levels of Markers of Inflammation in TBI	253
Evidence for Increased Release of Glutamate in TBI	254
Role of Matrix Metalloproteinases in TBI.....	255
Treatments of TBI	255
Treatments of Sports-Related Concussive Injury	255
Treatments of TBI with Antioxidants.....	256
Antioxidants Reduce Glutamate Release	256
Problems of Using a Single Agent in TBI.....	257
Rationale for Using Multiple Micronutrients in TBI.....	257

Recommended Micronutrients for Reducing the Late Adverse Effects in High-Risk Populations	259
Recommended Micronutrient Supplement in Combination with Standard Therapy in TBI Patients with Penetrating Head Injury.....	260
Diet and Lifestyle Recommendations for TBI	260
Conclusions	260
References	261
Chapter 14 Micronutrients in Prevention and Improvement of the Standard Therapy in HIV/AIDS	269
Introduction	269
History, Incidence, and Cost of HIV/AIDS.....	270
Role of Immune Function in HIV Infection.....	270
Micronutrient Deficiency Impairs Immune Function	270
Illicit Drugs Impair Immune Function.....	271
Increased Oxidative Stress and Inflammation Enhance the Risk and Progression of HIV Infection	271
Current and Proposed Prevention Strategies for HIV Infection	272
Primary Prevention.....	272
Secondary Prevention.....	273
Evidence for Micronutrients Reducing Progression of HIV Infection	273
Current Treatments of HIV/AIDS	274
Role of Micronutrients in Combination with Antiviral Drugs.....	275
Rationale for Using Multiple Micronutrients in Primary and Secondary Prevention of HIV Infection.....	275
Recommended Micronutrients for Primary and Secondary Prevention of HIV Infection	277
Recommended Micronutrients for Improving the Efficacy of Antiviral Therapy.....	277
Diet and Lifestyle Recommendations	278
Conclusions	278
References	278
Chapter 15 Micronutrients in Protecting Against Late Adverse Health Effects of Diagnostic Radiation Doses	285
Introduction	285
Probable Biochemical and Genetic Steps Involved in Radiation-Induced Carcinogenesis	286
Interactions between Radiation and Chemical and Biological Carcinogens and Tumor Promoters	287
Risk Estimates of Radiation-Induced Cancer	287
Risk of Low-Dose Radiation-Induced Non-Neoplastic Diseases	289
Current Recommendations for Radiation Protection.....	290
Evidence for a Micronutrient Strategy for Biological Protection against Radiation Damage.....	290
Radioprotective Studies with Antioxidants in Cell Culture.....	290
Radioprotective Studies with Antioxidants in Animals.....	290
Radioprotective Studies with Antioxidants in Humans	291

Recommended Micronutrient Preparations for Biological Protection against Low Doses of Radiation	291
Individuals Receiving Diagnostic Radiation Procedures and Frequent Flyers	292
Radiation Workers, and Pilots and Flight Attendants	292
Toxicity of Antioxidants	293
Conclusions	293
References	293
Chapter 16 Micronutrients in Protecting Against Lethal Doses of Ionizing Radiation	297
Introduction	297
Radiation Damage Caused by High Doses of Ionizing Radiation	298
Bone Marrow Syndrome	298
GI Syndrome	299
CNS Syndrome	299
High-Dose Radiation-Induced Damage to Organs	300
Late Effects of High Doses of Radiation on Cancer Incidence.....	300
Late Effects of High Doses of Radiation on the Risk of Non-Neoplastic Diseases	300
Brief History and Description of Radiation Protection Studies.....	301
Radiation Protection Studies with Antioxidants in Cell Culture Models	301
Radiation Protection Studies with Antioxidants in Animal Models.....	302
Radiation Protection Studies with Antioxidants in Humans.....	303
Scientific Rationale for Using Multiple Antioxidants in Radiation Protection	303
Scientific Basis for Using Antioxidants Orally before and after Irradiation for an Optimal Radioprotective Efficacy.....	304
Radiation Protection Study with a Mixture of Multiple Antioxidants Administered Orally before and after Irradiation in Sheep	304
Radiation Protection Study with a Mixture of Multiple Antioxidants Administered Orally before and after Irradiation in Rabbits.....	305
Radiation Protection Study with a Mixture of Multiple Antioxidants Administered Orally before Irradiation in Mice	305
Radiation Protection Study with a Mixture of Multiple Antioxidants Administered Orally before and after Irradiation in <i>Drosophila melanogaster</i>	307
Studies with Radiation Therapeutic Agents or Procedures.....	307
Chemical Agents	308
Biological Agents.....	309
Recommended Multiple Micronutrients for Radiation Protection in Humans	310
Combination of a Multiple-Micronutrient Preparation with Replacement Therapy.....	311
Conclusions	311
References	312
Chapter 17 Micronutrients in Prevention and Improvement of the Standard Therapy in Arthritis.....	319
Introduction	319
Incidence and Cost	319

Types of Arthritis	320
Rheumatoid Arthritis	320
Osteoarthritis	320
Juvenile Rheumatoid Arthritis	321
Evidence for the Role of Oxidative Stress	321
Evidence for the Role of Inflammation	322
Role of Antioxidants in Arthritis	323
Animal Studies	323
Human Studies	324
Current Prevention Strategies	325
Current Treatment Strategies	325
Low-Dose MTX	325
Anticytokines Therapy	326
Toxicity of Standard Therapy	327
Glucosamine and Chondroitin	327
Nonsteroidal Anti-Inflammatory Drugs	328
Complementary Medicine	328
Proposed Micronutrient Strategies for Prevention in High-Risk Populations	328
Problems of Using a Single Agent	328
Rationale for Using Multiple Micronutrients	329
Recommended Micronutrient Supplement for High-Risk Populations	330
Recommended Micronutrient Supplement in Combination with Standard Therapy for RA Patients	330
Diet and Lifestyle Recommendations for High-Risk Populations and RA Patients	331
Conclusions	331
References	331
Chapter 18 Myths and Misconceptions about Antioxidants and Health	339
Introduction	339
Misconception 1	339
Misconception 2	339
Misconception 3	339
Misconception 4	340
Misconception 5	340
Misconception 6	340
Misconception 7	340
Misconception 8	340
Misconception 9	341
Misconception 10	341
Misconception 11	341
Misconception 12	341
Misconception 13	341
Misconception 14	342
Misconception 15	342
Misconception 16	342
Conclusions	342

Chapter 19 Dietary Reference Intakes of Selected Micronutrients 343

 Introduction 343

 DRI (Dietary Reference Intakes) 343

 Adequate Intake (AI)..... 343

 Tolerable Upper Intake Level (UL) 343

 DRI Values for Antioxidants, Vitamins, Micronutrients, and Minerals..... 344

 Conclusions 355

Index 357