

Contents

Contributors	xvii	Mediterranean Diet, Western Diet, and Nutritional Adequacy	16
Preface	xxiii	Mediterranean Diet in Children and Nutritional Adequacy	18
		Summary Points	19
		References	20
Section 1			
The Mediterranean Diet: Concepts and General Aspects			
1. On the Origins and Evolution of the Mediterranean Diet	3	3. Agricultural Practices in the Mediterranean: A Case Study in Southern Spain	23
<i>Yardena Arnoni and Elliot M. Berry</i>		<i>J. Jesús Casas, Santiago Bonachela, Francisco J. Moyano, Encarnación Fenoy and Joaquín Hernández</i>	
Introduction	3	Introduction	23
Geographic and Evolutionary History	3	Environmental and Cultural Drivers Shaping Traditional Agricultural Landscapes	24
Origins of the Mediterranean Diet and the Biblical Diet	4	Recent Trends in Agricultural Practices: Intensification Versus Extensification	25
Mediterranean Lifestyle	5	The Extensive Iberian Pig Production in <i>Dehesa</i> Agro-Sylvo-Pastoral Systems	26
Components of the Original Mediterranean Diet	5	The Olive Grove System	28
The Biblical Seven Species	5	The Greenhouse Vegetable Agro Industry	30
Grains	7	Summary Points	34
Olives	7	Acknowledgments	34
Dates	7	References	34
Pomegranates	8		
Figs	8	4. The Mediterranean Diet as an Intangible and Sustainable Food Culture	37
Grapes	8	<i>Lluís Serra-Majem and F. Xavier Medina</i>	
Additional Biblical Foods	9	Introduction	37
Carob	9	MD: An Intangible Cultural Heritage	37
Nuts	9	MD and Health	39
Conclusion	9	MD and Sustainable Environment	40
Summary Points	9	The New MD Pyramid	41
Acknowledgment	10	Cultural and Lifestyle Aspects	42
References	10	Final Considerations	44
		Summary Points	44
2. Nutritional Adequacy of the Mediterranean Diet	13	References	45
<i>Itandehui Castro-Quezada, Blanca Román-Viñas and Lluís Serra-Majem</i>			
Introduction	13		
Nutritional Adequacy and Public Health	13		
Methods of Assessing Nutritional Adequacy	14		

5. The Mediterranean Diet and Mortality	47	Health-Related Quality of Life and the Relationship with the MD	78
<i>Genevieve Buckland and Antonio Agudo</i>		Summary Points	78
Introduction	47	References	79
A Systematic Review Process to Uncover the Link Between Diet and Mortality	47	8. The Influence of the Mediterranean Diet on Cognitive Health	81
Assessing Level of Adherence to the MD	48	<i>Helen Macpherson, Jaime Lee, Lorena Villalon, Matthew Pase, Andrew Pipingas and Andrew Scholey</i>	
The Relationship Between the MD and Mortality	48	Introduction	81
The Magnitude of the Protective Effect	48	Characteristics and Assessment of the Mediterranean Diet	81
Cause-Specific Mortality	53	The Relationship Between Dementia, Cognitive Decline, and the Mediterranean Diet	82
The Benefits of the MD in Non-Mediterranean Populations	55	Cardiovascular Mechanisms of the Mediterranean Diet	83
Relative Importance of Individual Components of the MD on Mortality	55	Olive Oil	85
Methodological Considerations when Investigating the Link Between the MD and Mortality	58	Dietary Effects on Oxidative Stress and Inflammation	85
Final Comments	58	Additional Benefits of Exercise	85
Summary Points	59	Mediterranean Diet in Younger Adults	86
References	59	Conclusions and Future Directions	87
6. Mediterranean Diet and Quality of Life	61	Summary Points	87
<i>Patricia Henríquez-Sánchez, Jorge Doreste-Alonso, Cristina Ruano, Lluís Serra-Majem, Miguel Ángel Martínez-González and Almudena Sánchez-Villegas</i>		References	87
Introduction	61	9. Mediterranean Diet and Cardiovascular Disease: An Overview of Recent Evidence	91
Quality of Life	61	<i>Dimitra Karageorgou, Renata Micha and Antonis Zampelas</i>	
Quality of Life Measurement	61	Introduction	91
Mediterranean Diet	63	The Mediterranean Diet	92
Mediterranean Diet and Quality of Life	63	The Mediterranean Diet and CVD	93
Summary Points	67	Total CVD	93
References	67	Coronary Heart Disease	98
7. Mediterranean Diet in Children and Adolescents	69	Stroke	100
<i>Paul Farajian and Antonis Zampelas</i>		Potential Underlying Mechanisms	101
Introduction	69	Overall	102
MD Indices and Adherence Rates in Children and Adolescents	69	Summary Points	103
MD and Nutritional Adequacy in Children and Adolescents	74	References	103
The Relationship of the MD with Childhood Obesity	75	10. Genomic Determinants of Mediterranean Diet Success	105
Health Effects of the MD in Children and Adolescents	76	<i>Keith Grimaldi and Antonio Paoli</i>	
Influence of the MD on Asthma in Children	76	Introduction	105
The Association of the MD with BP Levels and Cardiovascular System Risk Factors	77	Nutrigenetics, Nutrigenomics, and Diet	106
		Nutrigenetics: Use of the MD to Neutralize Potentially Negative Effects of Some Common Genetic Variants	106

Nutrigenetics: Individual Differences in Response to the MD	108	From Olive to Olive Oil	135
Nutrigenomics: Investigating the Effect of the MD on Gene Expression	109	Olive Oil Production and Consumption	137
Conclusions	110	Olive Oil Variety and Composition	138
Summary Points	111	Conclusions	140
References	111	Summary Points	141
		References	141
11. The Mediterranean Diet Quality Index (KIDMED) and Nutrition Knowledge	115	14. Moderate Red Wine Consumption in Cardiovascular Disease: Ethanol Versus Polyphenols	143
<i>Semra Akar Sahingoz</i>		<i>Marcello Iriti and Elena M. Varoni</i>	
Introduction	115	Introduction	143
The Importance of Nutritional Education and the MD	116	Interventional Studies	143
Summary Points	120	Observational Studies	148
References	121	Conclusions	149
		Summary Points	149
		References	150
12. Socioeconomic Factors Affecting Adherence to the Mediterranean Diet in North Africa	123	15. Beer: Beneficial Aspects and Contribution to the Mediterranean Diet	153
<i>Karima El Rhazi, Vanessa Garcia-Larsen and Chakib Nejari</i>		<i>Sara Arranz, Gemma Chiva-Blanch, Palmira Valderas-Martinez, Rosa Casas and Ramon Estruch</i>	
Introduction	123	Mediterranean Diet	153
What Is the Association Between Adherence to the MD and Socioeconomic Status?	123	Definition of the Mediterranean Diet	153
Objective	124	The MD as a Dietary Pattern in Health Promotion: Clinical Evidence	154
Demographic and Socioeconomic Profile of the Southern Mediterranean Region	124	Wine and Beer in the MD	155
Patterns of Food Consumption in NA Countries	125	Beer Consumption and Contribution to the Health Benefits of the MD	156
Socioeconomic Determinants of Adherence to the MD in NA	129	Bioactive Compounds and Mechanisms of Action	156
Others Related Factors to Changes in Dietary Habits	130	Consumption of Beer in Mediterranean Countries and Overall Morbidity/Mortality	158
Conclusion	130	Beer in the PREDIMED Clinical Trial	159
Summary Points	131	Conclusions	161
Acknowledgments	131	Summary Points	161
References	131	Acknowledgments	162
		References	162
Section 2		16. The Contribution of Fish to the Mediterranean Diet	165
Components of the Mediterranean Diet		<i>Ermelinda Prato and Francesca Biandolino</i>	
13. Olive Oil	135	Introduction	165
<i>Nadia Calabriso, Egeria Scoditti, Mariangela Pellegrino and Maria Annunziata Carluccio</i>		Biochemical Composition of Fish	165
Introduction	135	The Importance of Omega 3 Fatty Acids for Human Health	166
Olive Tree	135		

Fatty Acids of Commercially Important Fish Species	168	Biological Significance of Melatonin in Plant Foods	202
Fat Composition of Farmed Fish	168	Conclusions	203
Fish Contamination and Health Risks to Consumers	171	Summary Points	203
Summary Points	172	References	203
References	172		
17. Contribution of Nuts to the Mediterranean Diet	175	20. Hydroxytyrosol as a Component of the Mediterranean Diet and Its Role in Disease Prevention	205
<i>Emilio Ros</i>		<i>M^a del Carmen Ramírez-Tortose, Mario Pulido-Moran, Sergio Granados, José J. Gaforio and José L. Quiles</i>	
Introduction	175	Introduction	205
Nuts in the Mediterranean Diet	176	What Is the Origin of HT?	206
Nutrient Content of Mediterranean Nuts	176	HT Through the Body: What are its Absorption, Distribution, Metabolism, and Elimination Processes?	207
Nut Consumption and Health Outcomes	178	Chemical Characteristics	207
Epidemiological Studies	178	From Food to Blood: The Absorption Process	207
Randomized Clinical Trials	179	Transport in the Body: The Distribution Process	207
Health Effects of Mediterranean Nuts in the PREDIMED Trial	180	Transformations: What are the Metabolic Processes?	208
Conclusion	181	Elimination	209
Summary Points	182	Does HT Have Side Effects?	209
Acknowledgments	183	Acute/Subchronic Toxicity	209
References	183	Establishing a Dose	210
18. The Mediterranean Diet and Mineral Composition	185	Role of HT in Different Diseases: HT Against Them and as Protector of Life	210
<i>Marta Mesías, Isabel Seiquer and M. Pilar Navarro</i>		Antimicrobial Effect of HT	210
Introduction	185	How Can HT Protect the Skin?	210
Mineral Intake in the MD	185	Antiatherogenic and Cardioprotective Factor	211
Calcium	185	Does HT Have Anti-Inflammatory and Antiplatelet Actions?	211
Phosphorus	189	Cancer Studies	212
Magnesium	189	Summary Points	213
Iron	190	References	214
Zinc	190		
Sodium and Potassium	191	21. Frying: A Cultural Way of Cooking in the Mediterranean Diet	217
Other Micronutrients	192	<i>Sara Bastida and Francisco J. Sánchez-Muniz</i>	
Mineral Content in Typical Mediterranean Menus	192	Introduction: Cultural and Gastronomic Importance of Frying in the Mediterranean Diet	217
Mineral Bioavailability	194	Culinary Oils: Frying Procedure	218
Conclusions	196	Oil Types, Selection, and Uses	218
Summary Points	196	Oil as a Mediator During Frying	220
References	196	Frying Technique	221
19. Melatonin: A New Perspective on the Mediterranean Diet	199		
<i>Marcello Iriti and Elena M. Varoni</i>			
Introduction	199		
Melatonin in the Mediterranean Diet	199		
Melatonin in Grape Products	201		

Changes That Occur During Frying	221	Summary and Conclusions	245
Advantages and Disadvantages of Frying		Summary Points	246
Versus Other Cooking Procedures	223	References	246
Advantages of Frying with Olive Oils	225		
Oil Composition	225		
Frying Temperature	226		
Crust Formation	226		
Resistance to Thermal Oxidation of Olive Oil			
During Frying or at Frying Temperatures	226		
Obtaining more Cardio-Healthy Food	228		
Fried Food Consumption and Health	229		
Effects on Body Weight	231		
Effects on Mortality and Degenerative			
Diseases	232		
Conclusions	232		
Summary Points	232		
Acknowledgments	233		
References	233		
Section 3			
Health and Nutritional Aspects			
of the Mediterranean Diet			
Metabolism			
22. The Mediterranean Diet and			
Obesity from a Nutrigenetic			
and Epigenetics Perspective	237		
<i>Marta Garaulet</i>			
Introduction	237		
The Mediterranean Diet in the Treatment			
of Obesity	237		
Dealing with Obesity: A Complex Disease	239		
Nutrigenetics: The Knowledge			
Transition	239		
Genetics of Obesity and Weight Loss	239		
Gene–Diet Interactions for Obesity in the			
Context of a Mediterranean Diet	240		
Peroxisome Proliferator-Activated			
Receptor Genes and the			
Mediterranean Diet	240		
<i>FTO</i> and the Mediterranean Diet	241		
<i>CLOCK</i> Gene, Obesity, and the			
Mediterranean Diet	242		
Other Components in Addition to			
MUFAs	243		
SNPs and Obesogenic Behaviors in the			
Context of a Mediterranean Diet	243		
Epigenetics in the Internal Clock and the			
Mediterranean Diet	244		
Epigenetics and Circadian Rhythms	245		
		23. Mediterranean Diet: Antioxidant	
		Nutritional Status	249
		<i>Elena Azzini and Giuseppe Maiani</i>	
		Introduction	249
		Antioxidant Defenses and Oxidative Stress	249
		Mediterranean Diet	250
		Human Antioxidant Status	252
		Human Studies	253
		Conclusion	255
		Summary Points	255
		References	256
		24. The Mediterranean Diet and Body	
		Iron Stores	259
		<i>Luca Mascitelli, Mark R. Goldstein and</i>	
		<i>Leo R. Zacharski</i>	
		Introduction	259
		Overview of Iron Metabolism	259
		Dietary Sources of Iron	260
		Inhibitors of Iron Absorption	260
		Enhancers of Iron Absorption	261
		Iron Status	262
		Mediterranean Dietary Pattern and Reduced	
		Body Iron Stores	262
		Mediterranean Diet and Iron Homeostasis	
		in the Metabolic Syndrome and Diabetes	265
		Mediterranean Diet, Lower Iron Stores, and	
		Cardiovascular Prevention	265
		Mediterranean Diet, Iron, and Cancer	265
		Conclusions	267
		Summary Points	267
		References	267
		25. The Ketogenic Mediterranean	
		Diet	271
		<i>Antonio Paoli and Gerardo Bosco</i>	
		Introduction	271
		KDs: A Summary View	271
		What Is Ketosis?	272
		The Mediterranean Diet	274
		Diets Compared	274
		Conclusion	278
		Summary Points	278
		References	278

26. Molecular Aspects of Squalene and Implications for Olive Oil and the Mediterranean Diet	281	Dietary Intervention Studies with the Mediterranean Diet	307
<i>José J. Gaforio, Cristina Sánchez-Quesada, Alicia López-Biedma, M^a del Carmen Ramírez-Tortose and Fernando Warleta</i>		Some Factors Involved in Adiposity Trends in the Mediterranean Area	308
Mediterranean Diet	281	Summary Points	310
Virgin Olive Oil	281	References	311
Squalene in Virgin Olive Oil	282	29. The Mediterranean Diet and Metabolic Syndrome	313
Squalene in Humans	282	<i>Evanthia Gouveri and Emmanuel J. Diamantopoulos</i>	
Biological Activities of Squalene	283	Introduction	313
Skin and Eyes	283	Definition of Metabolic Syndrome	314
Serum Cholesterol Concentration	285	Pathophysiology of MetS	315
Cardiovascular Disease	285	Definition of the Mediterranean Diet	316
Cancer	286	Mediterranean Diet and Metabolic Syndrome	317
Summary Points	287	Conclusions	320
References	288	Summary Points	321
27. Mediterranean Diet Polyphenols	291	References	321
<i>Maria Annunziata Carluccio, Nadia Calabriso, Egeria Scoditti, Marika Massaro and Raffaele De Caterina</i>		30. Impact of the Mediterranean Diet on Features of Metabolic Syndrome: Is Weight Loss Required?	325
Introduction	291	<i>Caroline Richard, Patrick Couture and Benoît Lamarche</i>	
Polyphenols in the Context of the MD	292	Introduction	325
Polyphenols from Olives and Olive Oil:		Metabolic Syndrome	326
The Mediterranean Trait	293	Weight Loss	326
OOPs and Cardiovascular Protection	295	MedDiet and Plasma Lipids, Blood Pressure, and Glucose Homeostasis	326
OOPs Exhibit Antioxidant Properties	295	MedDiet and Inflammation	328
Anti-inflammatory Properties of OOPs	296	MedDiet and Endothelial Function	329
Pleiotropic Effects of OOPs Are Mediated by the Redox-Sensitive Transcription Factor NF-κB	297	MedDiet and Atherogenic Properties of LDL Particles	332
OOPs Exhibit Nutrigenomic Effects	298	MedDiet and Cholesterol Homeostasis	333
Conclusions	298	Conclusions	333
Summary Points	298	Summary Points	333
References	299	References	334
Metabolic Syndrome, Obesity, and Diabetes		31. The Mediterranean Diet to Prevent Type 2 Diabetes and its Complications	337
28. The Mediterranean Diet and Adiposity	303	<i>Michel de Lorgeril and Patricia Salen</i>	
<i>Denis Lairon</i>		Introduction	337
Introduction	303	The Mediterranean Diet Concept	338
Current Overweight and Obesity in Mediterranean Countries	303	The Mediterranean Diet and T2D	340
Mediterranean Diet and Adiposity: A First Set of Studies	305	Conclusions and Prospects	340
Observational Studies on Adherence to the Mediterranean Diet Pattern and Adiposity	305	Summary Points	341
		References	341

Cardiovascular Disease

32. A Mediterranean Diet in Relation to Subclinical Vascular Conditions 345

Hannah Gardener and Clinton B. Wright

Introduction	345
White Matter Hyperintensity Volume	346
Subclinical Brain Infarcts	348
Carotid Atherosclerosis	349
Conclusions	353
Summary Points	353
References	354

33. The Mediterranean Diet Versus a Low-Fat Diet, Cardiovascular Risk Factors, and Obesity 357

Maria Luz Fernandez

Introduction	357
Epidemiological Data Mediterranean Diet and Low Fat Diets	358
Clinical Trials Mediterranean Diet and Low Fat Diets	359
Effects on Cardiovascular Risk Factors	359
Effects on Weight and Parameters of MetS	360
Effects on Inflammatory Markers	361
Conclusion	362
Summary Points	363
References	363

34. Gene Expression: Atherogenesis, and the Mediterranean Diet 367

Lina Badimon, Guiomar Mendieta and Gemma Vilahur

Atherogenesis	367
Initial Changes in the Vascular Wall	367
Mononuclear Cell Recruitment and Maturation to Foam Cells	369
Progression of Vascular Lesions	370
Effect of the Mediterranean Diet on Atherosclerosis	370
Protective Effects of Mediterranean Fatty Acids on Atherosclerosis	372
Wine Polyphenols and Atherosclerosis	374
Summary and Future Perspectives	374
Summary Points	376
Acknowledgments	376
References	376

35. Mediterranean Diet and the Postprandial State: A Focus on Lipemia, Glycemia, and Thrombosis 379

Paraskevi Detopoulou, Elizabeth Fragopoulou, Tzortzis Nomikos and Smaragdi Antonopoulou

Introduction	379
Postprandial State	379
Postprandial Hyperglycemia	379
Postprandial Lipidemia	380
Postprandial Hemostasis	380
MD and the Postprandial State	381
Macronutrient Profile of the MD	381
Characteristic Mediterranean Foods and the Postprandial State	383
Long-Term Consumption of MD and the Postprandial State	387
Summary Points	387
References	389

Cancer

36. The Mediterranean Diet in Cancer Prevention 393

Niki Kontou

Introduction	393
Selection and Summary Presentation of Studies	393
The Seven Countries Study	396
The HALE Study	396
The Lyon Diet Heart Study	401
European Trial for the Risk of Colorectal Adenoma Reoccurrence	401
The European Prospective Investigation into Cancer and Nutrition Study	401
Mediterranean Diet and Risk of Cancers in Italian Cohorts	402
The Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial	402
The NIH-AARP Diet and Health Study	402
The San Francisco Bay Area Study	402
The ARCAGE Study	403
Nurses' Health Study Cohort and Health Professionals Follow-Up Study	403
Greek Case-Control Study on Colorectal Cancer	403
Protective Mechanisms of the Mediterranean Diet in Relation to Cancer Risk	403
Summary Points	404
References	405

37. The Mediterranean Diet and Breast Cancer Risk	407	Discussion	432
<i>Christiana A. Demetriou, Andreas Hadjisavvas, Maria A. Loizidou, Paolo Vineis and Kyriacos Kyriacou</i>		Mediterranean Diet Effect on OSAHS Severity	432
Introduction	407	Mediterranean Diet Effect on Lipid Peroxidation	434
The Mediterranean Dietary Pattern and Breast Cancer Risk: Epidemiological Evidence	407	Mechanisms Linking the Mediterranean Diet to Weight Loss	435
Components of the Mediterranean Diet and Breast Cancer Risk: Epidemiological Evidence	410	Future Directions	436
The Protective Effect of the Mediterranean Diet: Mechanistic Evidence	411	Conclusion	437
Investigating the Mediterranean Diet: Concepts, Challenges, and Benefits	412	Summary Points	437
Conclusions	414	References	437
Summary Points	414	40. Molecular Aspects of the Mediterranean Diet: Adiponectin, Brain Amyloid Precursor Protein, Apolipoprotein E and Caspase-3 mRNA	441
References	414	<i>Sahar Elsayed El-Swefy and Hebatallah Hussein Atteia</i>	
38. The Mediterranean Diet and Gastric Cancer	417	Introduction	441
<i>Carlos A. González and Genevieve Buckland</i>		Mediterranean Diet and Brain Amyloid Precursor Protein	441
Introduction: Gastric Cancer	417	Mediterranean Diet and ApoE	443
Dietary Intake of Foods That Are Components of the Mediterranean Diet and Gastric Cancer Risk	417	Mediterranean Diet and Brain Caspase-3	444
High Adherence to the Mediterranean Diet Score and the Risk of Certain Cancers	419	Summary Points	446
High Adherence to the Mediterranean Diet Score and the Risk of Gastric Cancer	419	References	447
The EPIC-Eurogast Study	419	Immunology	
Dietary Data	420	41. Reducing Proinflammatory States with the Mediterranean Diet: Possible Mechanism for Cancer Prevention	451
Follow-Up	420	<i>Zora Djuric</i>	
Determination of the Mediterranean Diet Score	420	Introduction	451
Statistical Analysis	420	Proinflammatory States and Cancer Markers of Proinflammatory States	453
Study Sample	421	Anti-inflammatory Effects of a Mediterranean Diet and its Components	455
Main Results	421	Anti-inflammatory Effects of Fruits and Vegetables	455
Interpretation of Results	422	Dietary Fats	455
Summary Points	423	Energy Balance	457
References	423	Summary Points	457
		References	458
Brain and Behavior		42. The Mediterranean Diet and Arthritis	461
39. The Mediterranean Diet and Obstructive Sleep Apnoea/Hypopnoea Syndrome	429	<i>Francesca Oliviero, Paolo Sfriso, Paolo Spinella and Leonardo Punzi</i>	
<i>Christopher Papandreou</i>		Introduction	461
Introduction	429	The Inflammatory Process and Comorbidities in Arthritis	463
Overview of Studies Investigating the Role of the Mediterranean Diet in OSAHS	431		

The Role of Diet in the Pathogenesis of Arthritis	465	Life Stages, Organs and Applications	
Characteristics of the Traditional Mediterranean Dietary Lifestyle	466	44. Mediterranean Diet and Pregnancy	491
Effects of Nutritive and Non-nutritive Components of the MD in the Modulation of Inflammation	466	<i>Eva Gesteiro, Francisco J. Sánchez-Muniz, Manuel Espárrago Rodilla, Beatriz Rodríguez Bernal and Sara Bastida</i>	
Findings from Clinical Studies	467	Introduction	491
Immunomodulatory Effect of Mediterranean Dietary Components	468	Nutrition During Gestation	493
Clinical Trials on the Mediterranean Diet Interventions in Arthritis Patients	468	General Nutrition Remarks During Pregnancy	493
Clinical Trial on Mediterranean Diet Components Supplementation in Arthritis	469	Mediterranean Dietary Pattern	494
Conclusion	470	Mediterranean Diet, a Dietary Way for Decreasing Malnutrition or Subnutrition During Gestation?	496
Summary Points	470	Mediterranean Diet and Gestational Diabetes and Gestational Glucose Intolerance	497
Acknowledgment	471	Maternal Mediterranean Diet and Fetal/Neonatal Insulin Sensitivity	497
References	471	Pregnancy, Lipoproteins, and Other Coronary Heart Disease Risk	498
43. Mediterranean Diet and Nutrition for the Primary Prevention of Allergy and Asthma	473	Maternal Mediterranean Diet and Neonatal Lipoprotein Profile	500
<i>Dean A. Sewell and Aziz Sheikh</i>		Future Remarks	501
Introduction	473	Summary Points	501
Basic Allergy Concepts	474	Conflicts of Interest	501
Common Type I Allergies	474	Acknowledgments	501
Atopic Eczema/Dermatitis	474	References	501
Food Allergy	475	45. Olive Oil and the Senescent Bone	505
Allergic Rhino-Conjunctivitis	475	<i>Gemma Xifra Villarroya, José María Moreno-Navarrete and José Manuel Fernández-Real</i>	
Asthma	476	Introduction	505
Prevalence and Disease Burden of Allergy and Asthma	476	Physiology of Aging Bone	506
Risk Factors for the Development of Allergic Disorders	476	When Diet Interacts with Bone Formation	509
Geographical Variation and Relationships Between Diet and Allergy	477	Extra Virgin Olive Oil and Bone Health	509
Potential Mechanisms of Action of the Mediterranean Diet on Allergy Prevention	478	Olive Oil and Cellular Senescence	510
Allergy Prevention Through Diet	479	Conclusions and Future Perspectives	511
Primary Prevention	479	Summary Points	511
The Mediterranean Diet and Allergy Prevention	480	References	511
Dietary Intervention in Infancy and Childhood	482	46. Mediterranean Diet and Fitness	513
Secondary and Tertiary Prevention	483	<i>F. Fuentes-Jimenez, J.M. Fernandez and D. Rosado-Alvarez</i>	
Conclusions	483	The Mediterranean Diet as a Healthy Eating Paradigm	513
Summary Points	484	Exercise and Cardiovascular Health	513
References	484	MD and Exercise	514
		Summary Points	517
		References	517

47. The Mediterranean Diet Adequacy Index in Sports Participants	519	Cadmium	554
<i>José L. Sánchez Benito, Eva Sánchez Soriano, Colin R. Martin and Victor R. Preedy</i>		Mercury	555
Performance in Aerobic Sports	519	Lead	557
Adherence to MD	520	Health Risk Assessment of Fish Dietary Intake	558
The MD Health Benefits	520	Summary Points	560
The Mediterranean Diet Adequacy Index	520	References	560
Case Evaluation of Adherence to the MD of Spanish Young Cyclists	521	50. Risks Related to the Presence of Fungal Species and Mycotoxins in Grapes, Wines and Other Derived Products in the Mediterranean Area	563
Specific Nutritional Requirements of Sport Participants	525	<i>Lorenzo Covarelli, Laura Tosi and Giovanni Beccari</i>	
Energy Requirements	526	Introduction	563
Carbohydrate Requirements	526	Mycotoxigenic Fungal Species in Grapes in the Mediterranean Area	564
Protein Requirements	527	Mycotoxins in Grapes and Grape-Derived Products in the Mediterranean Area	567
Lipid Requirements	527	Control Measures to Reduce GBA Occurrence and OTA Contamination in Grapes, Wines, and Grape-Derived Products	571
Vitamins and Mineral Requirements	528	Conclusions	573
Summary Points	529	Summary Points	573
References	529	References	573
48. The Association Between Diet and Acne: The Specific Protective Value Derived from the Mediterranean Dietary Pattern Adherence	533	Methods for Interventions With or Adherence to the Mediterranean Diet	
<i>Rosella Saulle, Leda Semyonov, Nevena Skroza, Sara Zuber, Concetta Potenza and Giuseppe La Torre</i>		51. Dietary Patterns in a Circumpolar Context: A Cultural Approach to the Interpretation of Three Studies on Mediterranean, Traditional Sami, and Low-Carbohydrate Dietary Pattern Scores in Northernmost Sweden	579
Introduction	533	<i>Lena Maria Nilsson</i>	
The Main Findings in the Research Field on the Association Between Acne and Westernized Diet	534	Introduction	579
High-Glycemic Load Consumption	535	Culturally Defined Dietary Patterns	579
Dairy Food Consumption	536	A Climate and Food Culture Far from Greece	580
Obesity and Body Mass Index Correlation	537	Nutritional Transitions in History and Modern Times	581
Other Foods Consumption: Fats, <i>n</i> –3 Fatty Acids, Vegetables, and Fruits	537	The Västerbotten Population of Today	582
Comprehensive Dietary Pattern	537	The Healthy Indigenous Subpopulation	583
The State of Art	538	Dietary Score Methodology	583
The Specific Protective Role of Mediterranean Diet on Acne Disease	538	Results from Three Dietary Score Models	585
Summary Points	541	Is the Circumpolar Area Moving South?	585
References	541	Summary Points	586
Adverse Aspects		Acknowledgments	587
49. Heavy Metals in Fish from the Mediterranean Sea: Potential Impact on Diet	547	References	587
<i>Chiara Copat, Gea Oliveri Conti, Roberto Fallico, Salvatore Sciacca and Margherita Ferrante</i>			
Introduction	547		
Arsenic	554		

52. Information, Culture and Socioeconomics as Determinants of Adherence to Mediterranean Diet	589	Anti-inflammatory and Chemopreventive Properties of Mediterranean Plants and Their Role in Apoptosis	613
<i>Marialaura Bonaccio, Americo Bonanni, Maria Benedetta Donati, Giovanni de Gaetano and Licia Iacoviello</i>		Saffron	614
Diet is Not Equal for All	589	Garlic	615
The Poorer You are the Worse You Behave (and Eat)	589	Onion	616
The Global Economic Crisis: A Global Dietary Threat	590	Capsicum Species	617
A Role for Knowledge	592	Mistletoe	617
The Media and the Mediterranean Diet	593	Rue	618
Summary Points	595	Myrtle	618
References	595	Lavender	618
		Conclusions	619
		Summary Points	619
		References	619
Section 4		55. Mediterranean Hawthorn Fruit (<i>Crataegus</i>) Species and Potential Usage	621
Novel Nutraceuticals and Edible Plants Used in the Mediterranean Region		<i>Oguzhan Caliskan</i>	
53. Genetic Diversity of Plants Used for Food in the Mediterranean	601	Introduction	621
<i>Marisa Alarcón and Juan José Aldasoro</i>		Mediterranean Hawthorn Fruit (<i>Crataegus</i>) Species	621
Introduction	601	Traditional Use	622
Centers of Origin	601	Antioxidant Properties of Hawthorn	622
Genetic Diversity in Mediterranean Crops and Wild Relatives	606	Pharmacological Characteristics of Hawthorn	624
The Domestication Process	606	Summary Points	626
Crops Originated by Allopolyploidy:		References	627
Wheat and Oilseed Rape	607		
Wheat	607	56. Mediterranean Figs (<i>Ficus carica</i> L.) Functional Food Properties	629
Oilseed Rape	607	<i>Oguzhan Caliskan</i>	
Gene Flow from Wild to Cultivated Plants	607	Introduction	629
Trends in Diversity Across Cultivated Plants and the Importance of Relatives	608	Functional Food Characteristics of Figs	630
Summary Points	608	Nutritional Properties	630
References	608	Phytochemical Properties of Figs	631
		Functional Food Properties of Figs	635
		Summary Points	636
		References	636
54. Apoptotic Activities of Mediterranean Plant Species	611	57. Potential of <i>Cupressus sempervirens</i> (Mediterranean Cypress) in Health	639
<i>José-Luis Ríos</i>		<i>Ilkay Erdogan Orhan and Ibrahim Tumen</i>	
Introduction	611	Introduction	639
Apoptosis and Its Implications on Inflammation and Cancer	611	Phytochemistry of <i>Cupressus sempervirens</i>	640
Antioxidant Properties and Apoptosis	612		
Apoptosis, Inflammation, and Cancer	613		

Use of <i>Cupressus sempervirens</i> in Folk Medicine	640	58. Essential Oils from Mediterranean Aromatic Plants	649
Biological Activities of <i>Cupressus sempervirens</i>	640	<i>Laura De Martino, Filomena Nazzaro, Emilia Mancini and Vincenzo De Feo</i>	
Antimicrobial and Antiviral Activity	640	Introduction	649
Antiprotozoal Activity	642	Aromatic Plants in the Mediterranean Diet	649
Insecticidal Activity	642	Antimicrobial Activity	650
Antihyperlipidemic Effect	643	Cytotoxic Activity	656
Anticancer and Cytotoxic Effect	643	Antioxidant Activity	657
Antioxidant Effect	643	Other Activities	658
Antiplatelet and Anticoagulant Activity	643	Use of Essential Oils in Agriculture	659
Hepatoprotective Activity	643	Summary Points	659
Wound Healing and Anti-inflammatory Activity	644	References	660
Neurobiological Activity	644		
Conclusion	645		
Summary Points	645		
References	645	Index	663