

1. The Alkaline Way in Digestive Health	1
R. Jaffe	
1. Dietary Factors in Metabolism	1
2. Glycemic Load as a Tool for Better Cardiovascular Management	7
3. Native Whey-Based Meals and Gastrointestinal Health	9
4. Food Allergies and Sensitivities	9
5. The Role of Specific Nutrients in Digestive Health	19
6. Conclusion	19
2. Functional Assessment of Gastrointestinal Health	23
R. Jaffe	
1. Physiology of Digestion	23
2. Clinical Issues in Digestive Health	24
3. Systemic Influences on GI Health	34
3. Antioxidants in Inflammatory Bowel Disease, Ulcerative Colitis, and Crohn Disease	37
H. Asakura, T. Kitahora	
1. The Pathogenesis of Ulcerative Colitis and Crohn Disease	37
2. ROS in UC and CD	40
3. Oxidants and Antioxidants in the Experimental Colitis	44
4. Antioxidants in Human IBD	50
4. Omega-6 and Omega-3 Polyunsaturated Fatty Acids and Inflammatory Bowel Diseases	55
P.C. Calder	
1. Introduction	55
2. PUFAs: Structure, Nomenclature, Sources, and Interconversion	56
3. Intake of <i>n</i> -6 and <i>n</i> -3 PUFAs and Risk of Developing IBD	58
4. Lipid Mediators: Biosynthesis, Roles in IBD, and the Impact of <i>n</i> -3 PUFAs	59
5. Influence of Marine <i>n</i> -3 Fatty Acids on Inflammatory Cytokines	62
6. Influence of Marine <i>n</i> -3 Fatty Acids on T Cells	64
7. Efficacy of <i>n</i> -3 PUFAs in Animal Models of IBD	65

8. Human Studies of Marine <i>n</i> -3 PUFAs in IBD	68
9. Conclusions	72
5. Alcohol and Gastrointestinal Tract Function	81
S.B. Bhardwaj	
1. Acute and Chronic Ingestion of Alcohol	82
2. Absorption of Alcohol	83
3. Alcohol Consumption and GI Tract	84
4. Consequences of Alcohol Abuse	100
5. Effect of Alcohol on Immune, Cardiovascular, and Skeletal System	107
6. Dangerous Herbal Weight-Loss Supplements	119
A. González-Stuart	
1. Introduction	119
2. The Surge of Herbal Product Use Within Complementary and Alternative Medicine	119
3. Herbal Supplement Identity, Efficacy, and Safety: Chaos in the Cyber Marketplace	120
4. Identity of Herbal Products	121
5. The Internet as a Source of Information About Herbal Weight-Loss Supplements	121
6. Yellow Oleander or 'Codo de Fraile'	121
7. Toxicity of <i>Thevetia</i> spp.	122
8. Safety Issues	123
9. Candle Nut Tree ('Nuez de la India')	123
10. Parts of the Plant Used in Traditional Medicine	123
11. Weight Loss and Other Health Claims Made on the Internet for Candle Nut Tree Seeds	123
12. Safety Issues	124
13. Conclusion	125
7. Milk Bacteria: Role in Treating Gastrointestinal Allergies	127
F. He, Q.-H. Sheng	
1. Introduction	127
2. Colonization and Succession of Human Intestinal Microbiota with Age	128
3. Probiotics as a Practical Way in the Management of Allergy	130
4. Selection and Evaluation of Probiotic for Possibility in Allergic Management	130
8. Nutritional Functions of Polysaccharides from Soy Sauce in the Gastrointestinal Tract	139
M. Kobayashi	
1. Introduction	139
2. Brewing of Japanese Soy Sauce	139

3. Polysaccharides from Soy Sauce	140
4. Iron Absorption	141
5. Lipid Absorption	143
6. Conclusion	145
9. Nutrition, Dietary Fibers, and Cholelithiasis: Cholelithiasis and Lipid Lowering	149
R. Sharma, R.K. Tandon	
1. Introduction	149
2. How Cholelithiasis is Originated and Complicated?	149
3. Symptoms of Cholelithiasis	150
4. Diagnosis of Cholelithiasis	152
5. Pathophysiology	152
6. Role of Diet Therapy and Challenges in Cholelithiasis Treatment	154
7. Cholelithiasis Enzyme Assay Development to Test Diets	162
8. Future Prospectives on Cholelithiasis and Nutrition	165
9. Conclusion	167
Acknowledgments	167
10. Indian Medicinal Plants and Spices in the Prevention and Treatment of Ulcerative Colitis	173
M.S. Baliga, J. Nandhini, F. Emma, M.V. Venkataranganna, P. Venkatesh, R. Fayad	
1. Introduction	174
2. Ayurvedic Plants and IBD	176
3. Phytochemicals and Indian Medicinal Plants with Anti-IBD Effects	177
4. Indian Medicinal Plants with Anti-IBD Effects	179
5. Ayurvedic-Based Polyherbal Formulation	183
6. Conclusion	184
Acknowledgments	184
11. Ginger (<i>Zingiber officinale</i> Roscoe): An Ancient Remedy and Modern Drug in Gastrointestinal Disorders	187
M.S. Baliga, A.R. Shivashankara, R. Haniadka, P.L. Palatty, R. Arora, R. Fayad	
1. Introduction	187
2. Ginger and Health of Gastrointestinal System	188
3. Ginger in Oral Health	189
4. Ginger Prevents Epigastric Discomfort and Dyspepsia	190
5. Ginger is Effective Against Various Gastric Ulcerogens	190
6. Ginger is an Effective Antiemetic Agent	191
7. Ginger Alters Gastrointestinal Motility	193

8. Ginger is Effective on Digestive Enzymes	193
9. Ginger Increases Antioxidant Enzymes in the GIT	194
10. Ginger Alters the Brush-Border Membrane Fluidity and Increases the Surface Area of the Brush-Border Membrane	194
11. Effect of Ginger on the Intestinal Pathogens	194
12. Ginger is Effective in Inflammatory Bowel Diseases	195
13. Ginger Prevents Diarrhea	195
14. Conclusion	196
Acknowledgments	196
12. The Role of Microbiota and Probiotics on the Gastrointestinal Health: Prevention of Pathogen Infections	201
M.C. Collado, Ł. Grześkowiak, S. Salminen	
1. Gastrointestinal Tract and Gut Microbiota	201
2. Gut Microbiota and Health	202
3. Gut Microbiota and Therapeutic Action of Probiotics	203
4. Probiotics and Gastrointestinal Health	204
5. Mechanisms of Action of Probiotic	206
6. Conclusions	211
Acknowledgments	211
13. Probiotics and Irritable Bowel Syndrome	215
I. Qureshi, J.R. Endres	
1. Introduction	215
2. Pathophysiology of IBS	215
3. Evidence of Intestinal Flora Alterations in IBS	216
4. Probiotic Organisms and IBS	217
5. Discussion	223
Glossary	224
14. Antioxidant, Luteolin Exhibits Anti-inflammatory Effect in <i>In Vitro</i> Gut Inflammation Model	227
M. Mizuno, Y. Nishitani	
1. Introduction	227
2. Luteolin Suppresses IL-8 mRNA Expression of Caco-2 Cells in <i>In Vitro</i> Gut Inflammation Model	228
3. Luteolin Suppresses TNF- α Secretion from RAW264.7 Cells in <i>In Vitro</i> Gut Inflammation Model	229
4. Luteolin Suppresses Nuclear Factor-KappaB Translocation into the Nucleus of RAW264.7 Cells in <i>In Vitro</i> Gut Inflammation Model	230

5. Luteolin is Transported Across the Caco-2 Cell Monolayer in <i>In Vitro</i> Gut Inflammation Model	231
6. Discussion	231
15. Human Microbiome and Diseases: A Metagenomic Approach	235
M.C. Collado, G. D'Auria, A. Mira, M.P. Francino	
1. Human Microbiota	235
2. Microbiome and Human Health	238
3. Microbiome and Probiotics	245
4. Conclusions	246
Acknowledgments	246
16. Folate Production by Lactic Acid Bacteria	251
J.E. Laiño, G.S. de Giori, J.G. LeBlanc	
1. Introduction	252
2. Folate Metabolism and Bioavailability	253
3. Folate Deficiency: Implications in Health and Disease	256
4. Folic Acid Fortification and Supplementation	259
5. Folate Biosynthesis and Lactic Acid Bacteria	260
6. Conclusions	267
Acknowledgments	268
17. Probiotics against Digestive Tract Viral Infections	271
J. Rodríguez-Díaz, V. Monedero	
1. Introduction	271
2. Viruses That Infect the Gastrointestinal Tract	272
3. Possible Mechanisms of Probiotics Action Against Intestinal Viruses	274
4. Laboratory Evidence of Probiotics-Conferred Resistance to Gastrointestinal Viral Infections	276
5. Clinical Evidence	280
6. Conclusions and Perspectives	282
18. Probiotic Bacteria as Mucosal Immune System Adjuvants	285
C. Maldonado Galdeano, C.A. Dogi, M.E. Bibas Bonet, A. de Moreno de LeBlanc, G. Perdígón	
1. Introduction	285
2. Effect of Probiotics on the Systemic Immune Response	286
3. Action of Probiotics on the Mucosal Immune Response in Normal or Immunosuppressed Host	287

4. Mechanisms Involved in the Antitumor Activity Exerted by Probiotics and Fermented Milks	291
5. Mechanisms Involved in the Immunostimulation by Probiotic Bacteria	294
Acknowledgments	297
19. Medicinal Plants as Remedies for Gastrointestinal Ailments and Diseases: A Review	301
R. Arora, P. Malhotra, S. Sundriyal, H.S. Yashavanth, R.J. Pai, M.S. Baliga	
1. Introduction	301
2. Herbal Drugs in Gastrointestinal Ailments/Diseases	301
3. Conclusion	309
Acknowledgments	309
20. Review on the Protective Effects of the Indigenous Indian Medicinal Plant, Bael (<i>Aegle marmelos</i> Correa), in Gastrointestinal Disorders	313
M.S. Baliga, P.P. Mane, N. Joseph, R. Jimmy	
1. Introduction	313
2. Medicinal Uses of Bael	314
3. Bael Possesses Gastroprotective Effects	316
4. Bael Prevents Inflammatory Bowel Disease and Irritable Bowel Syndrome	317
5. Bael Possesses Antibacterial Effects on Certain Enteric Bacteria	317
6. Bael Possesses Antiviral Effects on Coxsackieviruses	318
7. Bael Reduces the Chemical-Induced Diarrhea	318
8. Bael Prevents Radiation-Sickness and Gastrointestinal Damage	319
9. Bael Leaf and Fruit Prevent Carbon Tetrachloride and Ethanol-Induced Hepatotoxicity	319
10. Mechanism/s of Action	321
11. Conclusions	322
Acknowledgments	322
21. Gastrointestinal and Hepatoprotective Effects of <i>Ocimum sanctum</i> L. Syn (Holy Basil or Tulsi): Validation of the Ethnomedicinal Observation	325
M.S. Baliga, A.R. Shivashankara, A. Azmidah, V. Sunitha, P.L. Palatty	
1. Introduction	325
2. Traditional Uses	326
3. Tulsi Possesses Hepatoprotective Effects	327
4. Conclusions	333
Acknowledgments	334

22. Turmeric (<i>Curcuma longa</i> L.) the Golden Curry Spice as a Nontoxic Gastroprotective Agent: A Review	337
K. Hegde, R. Haniadka, A. Alva, M.M. Periera-Colaco, M.S. Baliga	
1. Introduction	337
2. Plants as Gastroprotective Agent	338
3. Turmeric the Indian Culinary Gold in Gastroprotection	338
4. Phytochemistry	339
5. Traditional Uses	340
6. Validated Studies	341
7. Conclusions	345
Acknowledgments	346
23. Nutrition, Dietary Fibers, and Cholelithiasis: Apple Pulp, Fibers, Clinical Trials	349
R. Sharma, R.K. Tandon	
1. Introduction	349
2. Present Status of Cholesterol Saturation and Dietary Fibers	353
3. Nutrition Treatment of Cholelithiasis	359
4. Prevalence of Cholelithiasis and Gall Stones in India: A Perspective	362
5. Future Prospectives on Cholelithiasis and Nutrition	362
6. Conclusion	363
24. Gastrointestinal Protective Effects of <i>Eugenia jambolana</i> Lam. (Black Plum) and Its Phytochemicals	369
R.J. Pai, B. Valder, P.L. Palatty, A.R. Shivashankara, M.S. Baliga	
1. Introduction	369
2. Traditional Uses	373
3. Anticariogenic Effects	374
4. Gastroprotective Effects	374
5. Jamun Prevents Gastric Carcinogenesis	376
6. Antidiarrheal Effects	377
7. Antibacterial Activity	377
8. Radioprotective Effects	377
9. Hepatoprotective Effects	378
10. Conclusions	379
Acknowledgments	380
25. Preventing the Epidemic of Non-Communicable Diseases: An Overview	383
A.A. Robson	
1. Introduction to the World's Biggest Problem	383
2. Human Diet	384

3. Epidemic of Non-Communicable Diseases	384
4. Inflammation	387
5. Energy Density and Nutrient Density	389
6. Acid–Base Balance, NaCl Salt, and Fiber Content of the Diet	394
7. Roadmapping the Future	395
8. Conclusion	396
26. Omega 3 Fatty Acids and Bioactive Foods: From Biotechnology to Health Promotion	401
C. Ferreri	
1. Introduction	401
2. Omega-3 Fatty Acids and Health	403
3. Omega-3 Fatty Acids and Biotechnology	409
4. Omega-3 Fatty Acids and Nutraceuticals	412
5. Conclusions	417
Acknowledgments	417
27. Carotenoids: Liver Diseases Prevention	421
M. Sugiura	
1. Oxidative Stress and Carotenoids	421
2. Alcoholic Liver Disease and Carotenoids	422
3. Nonalcoholic Liver Disease and Carotenoids	429
4. Liver Cancer and Carotenoids	433
5. Conclusions	434
28. Omega-3 Fatty Acids and Early Life Nutritional Programming: Lessons from the Avian Model	437
G. Cherian	
1. Essential Omega-3 Fatty Acids	437
2. Omega-3 Fatty Acids: Dietary Supply, Synthesis, and Need	437
3. What Is Early Life Programming?	439
4. Animal Models for Early Life Programming Research	439
5. Avian Model: A Unique Research Tool	440
6. Early Exposure to n-3 Fatty Acids: Studies with the Avian Model	442
7. Research on Avian Model: Extrapolation of Information	445
Acknowledgments	446
29. Prebiotics, Probiotics, and Health Promotion: An Overview	449
B. Duncan	
1. Definitions	449
2. The GIT Ecosystem	450

3. Mechanisms of Beneficial Effects	452
4. Prebiotics	452
5. Probiotics	453
6. Health Benefits	455
7. Summary Statement	461
30. Gastroprotective Effects of Bioactive Foods	465
M. Dey, M. Thomas	
1. Introduction	465
2. Oral Diseases	466
3. Esophageal and Gastric Diseases	469
4. Intestinal Diseases	471
5. GI Cancer	477
6. Conclusion	479
Acknowledgments	480
31. Antioxidant Activity of Anthocyanins in Common Legume Grains	485
I.R.A.P. Jati, V. Vadivel, H.K. Biesalski	
Abbreviations	485
1. Introduction	485
2. Free Radicals and Antioxidants	486
3. Anthocyanins	486
4. Summary	495
32. Antioxidant Capacity of Pomegranate Juice and Its Role in Biological Activities	499
M. Çam, G. Durmaz, A. Çetin, H. Yetim	
1. Introduction	499
2. Pomegranate Juice	501
3. Conclusion	509
33. Dietary Bioactive Functional Polyphenols in Chronic Lung Diseases	513
S. Biswas, I. Rahman	
1. Introduction	513
2. Dietary Polyphenols	514
3. Resveratrol	514
4. Curcumin	516
5. Catechins	519
6. Sulforaphane	520
7. Conclusions	522

34. Antioxidant Capacity of Medicinal Plants	527
A. Aguirre, R. Borneo	
1. Introduction	527
2. Antioxidant Capacity of Medicinal Plants of the North Central Region of Argentina	529
3. Results and Discussion	532
4. Conclusion	534
35. Chinese Herbal Products in the Prevention and Treatment of Liver Disease	537
D. Gyamfi, H.E. Everitt, V.B. Patel	
1. Introduction	537
2. Prevalence of ALD	538
3. Alcoholic Fatty Liver: Metabolic Changes	538
4. Steatohepatitis: Oxidative Stress	539
5. Chinese Medicine in the Prevention of ALD	539
6. Prevalence of NAFLD	541
7. Pathogenesis of NAFLD	542
8. Chinese Herbal Treatment of NAFLD	543
9. Fibrosis and HCC	544
10. Liver Cirrhosis and HCC	545
11. Chinese Medical Treatment of Liver Fibrosis	545
12. Chinese Medical Treatment of HCC	546
13. Liver Toxicity due to Herbal Medicine	547
14. Conclusion	550
Glossary	550
36. Bioactive Foods and Supplements for Protection against Liver Diseases	557
S.K. Shukla, V. Kumar	
1. Introduction	557
2. Hepatoprotective Food Ingredients and Supplements	558
3. Conclusions	565
37. The Role of Prebiotics in Gastrointestinal and Liver Diseases	569
R.A. Hegazi, A. Seth	
1. Definition and Classification of Prebiotics	569
2. Effects of Prebiotics on GI Function	570
3. Prebiotics and Functional Intestinal Disorders	572
4. Prebiotics and Inflammatory GI Diseases	574
5. Prebiotics and Infectious Intestinal Diseases	577
6. Prebiotics and Liver Disease	580

38. The Role of Curcumin in Gastrointestinal and Liver Diseases	585
R.A. Hegazi, A. Seth	
1. Effects of Curcumin on Gastrointestinal Diseases	585
2. Curcumin and Functional Bowel Disorders	586
3. Inflammatory GI Diseases	589
4. Liver Diseases	591
5. GI and Liver Tumors	593
39. Toll-Like Receptors and Intestinal Immune Tolerance	597
M. Comalada, J. Xaus	
1. Introduction	597
2. Intestinal Tolerance	598
3. Bacterial Recognition	600
4. TLRs and Tolerance	604
5. Conclusions and New Perspectives	606
40. Psychological Mechanisms of Dietary Change in Adulthood	611
K. Chapman	
1. Introduction	611
2. Development of Dietary Behavior	611
3. Psychological Mechanisms of Dietary Change in Adulthood	616
4. Conclusion	619
41. Biochemical Mechanisms of Fatty Liver and Bioactive Foods: Fatty Liver, Diagnosis, Nutrition Therapy	623
R. Sharma	
1. Fatty Liver is Health Hazard	623
2. Mechanism of Fatty Liver Disease	624
3. Diagnosis of Fatty Liver Disease	634
4. Differential Diagnosis	637
5. Nutrition Therapy in Hepatic Fibrosis	638
6. Nutrition Elements in Nonalcoholic Liver Disease	642
7. Antihepatotoxicity Properties of Bioactive Foods: Less Known Herbs	645
8. Conclusion	649
Acknowledgments	649
42. Hepatoprotective Effects of <i>Zingiber officinale</i> Roscoe (Ginger): A Review	657
A.R. Shivashankara, R. Haniadka, R. Fayad, P.L. Palatty, R. Arora, M.S. Baliga	
1. Introduction	657
2. Liver Diseases	657

3. Plants as Hepatoprotective Agents	658
4. The Myriad Uses of Ginger	659
5. Ginger as a Hepatoprotective Agent	659
6. Ginger Prevents Liver Cancer	664
7. Ginger Corrects the Hepatic Lipid Metabolism	665
8. Mechanisms Responsible for Hepatoprotective Effects	666
9. Conclusions	668
Acknowledgments	669
43. Betel Leaf (<i>Piper betel</i> Linn): The Wrongly Maligned Medicinal and Recreational Plant Possesses Potent Gastrointestinal and Hepatoprotective Effects	673
M.S. Baliga, F. Fazal, Mishra Rashmi Priya, V.S. Ratnu, M.P. Rai	
1. Introduction	673
2. Phytochemicals	674
3. Traditional Uses	674
4. <i>P. betel</i> and Its Phytochemicals in Various Gastrointestinal Ailments and Diseases	676
5. Mechanisms Responsible for the Protective Effects	681
6. Conclusion	682
Acknowledgments	682
44. Hepatoprotective Effects of Picroliv: The Ethanolic Extract Fraction of the Endangered Indian Medicinal Plant <i>Picrorhiza kurroa</i> Royle ex. Benth	685
K. Hegde, N. Mathew, A.R. Shivashankara, A.N. Prabhu, M.S. Baliga	
1. Introduction	685
2. Conclusions	693
Acknowledgments	694
45. Scientific Validation of the Hepatoprotective Effects of the Indian Gooseberry (<i>Emblica officinalis</i> Gaertn): A Review	697
M.S. Baliga, A.R. Shivashankara, K.R. Thilakchand, M.P. Baliga-Rao, P.L. Palatty	
1. Introduction	697
2. Phytochemicals	698
3. Traditional Uses	698
4. Scientifically Validated Studies	700
5. Effect of Amla on Hepatic Lipid Metabolism and Metabolic Syndrome	700
6. Mechanism of Action/s Responsible for the Hepatoprotective Effects	705
7. Conclusions	706
Acknowledgments	707

46. Biochemical Mechanisms of Fatty Liver and Bioactive Foods: Wild Foods, Bioactive Foods, Clinical Trials in Hepatoprotection	709
R. Sharma	
1. Introduction	709
2. What Are Hepatocellular Protective Bioactive Foods?	711
3. What Remains Still to Solve the Hepatocellular Protection by Bioactive Foods?	712
4. Wild Foods	717
5. Present State of Art	722
6. What Are the Unresolved Challenges?	724
7. Treatment Recommendations for Bioactive Foods in Hepatobiliary Prevention	727
8. Policy on Bioactive Foods and Nutrition Therapy in Hepatobiliary Prevention	728
9. Bioactive Foods and Nutraceuticals in Alcoholic and Nonalcoholic Disease: A Survey	729
10. Challenges, Hypes, Hopes and Futuristic Role of Nutrition Therapy in Hepatocellular Protection	735
11. Conclusion	736
Acknowledgments	737
47. Phytochemicals Are Effective in the Prevention of Ethanol-Induced Hepatotoxicity: Preclinical Observations	743
A.R. Shivashankara, V. Sunitha, H.P. Bhat, P.L. Palatty, M.S. Baliga	
1. Introduction	744
2. Phytochemicals in the Protection of Alcohol-Induced Hepatotoxicity	744
3. Mechanisms	754
4. Conclusions	755
Acknowledgments	755
Index	759