Subject Index

Angiotensin-converting enzyme (ACE) inhibitors, fermented milk products 237, 238

Anthropometric deviation, see Malnutrition

Atopic eczema, prebiotic/probiotic prevention 111, 112, 118, 119

Bifidobacterium, breastfeeding response 83, 84, 89, 90, 120

Birth weight, later obesity relationship 26

Blood pressure
  breastfeeding effects in later life 32, 33
  cow’s milk effects in later life 211, 212
  hypotensive peptides in fermented milk products 237, 238, 247

Breast milk
  cognitive development benefits 36, 37, 40–42, 252
  human immunodeficiency virus transmission 181
  iron levels 222, 223
  long-chain polyunsaturated acids 137
  protective effects
    Bifidobacterium response 83, 84, 89, 90, 120
    blood pressure 32, 33
    cardiovascular disease 34, 41
    celiac disease 34, 35, 143–146, 252
    diabetes 25, 252
    inflammatory bowel disease 35, 40–42
    lipid metabolism 33, 34, 39, 40
    obesity protection
      growth acceleration hypothesis 20–24
      mechanisms 20, 252
      study design 17–20
    zinc 222, 223

Calcium, iron absorption inhibition 189, 190, 199

Cancer, breastfeeding effects in later life 35, 36

Cardiovascular disease
  breastfeeding effects in later life 34, 41
  growth acceleration hypothesis 21

Celiac disease
  breastfeeding effects in later life 34, 35, 143–146, 252
  gluten introduction and risks 142–148, 154
  oat safety 154
  prevalence 154
  rotavirus and susceptibility 152

Cellular animal protein, see Meat

Cereal fortification
  costs 103

259
Subject Index

Cereal fortification (continued)
folate 95
functional component fortification
etiology and impact of benefits 117, 118
interpretation of studies 114
long-chain polyunsaturated acids 113
milk fat globule membranes 113, 114
overview 108
prebiotics/probiotics 108–112
iron 96–98, 101
targeted programs 97, 98
toxicity 104
vitamin A 93, 96, 101, 104, 105
Cesarean delivery, gut microbiota effects
87, 88
Chemical contaminants, see Contaminants
Chicken liver, complementary feeding
11
Cognitive function, breastfeeding effects
36, 37, 40–42, 252
Complementary foods, see also specific foods
energy density and feeding frequency 4–6, 10, 12, 13
energy/nutrient requirements 4
fortification 95–97
problem micronutrients 6–8
supplementation prevalence 132
traditional food dietary diversification
interventional trials 48, 51–57
Contaminants
classification 65
identification 66–69
issue management 71–75
Nestlé Early Warning System 68
pathogens 66, 82
prevention 69–71
Cow's milk
age of introduction 202, 203, 218, 219, 257
blood pressure in later life 211, 212
composition of energy and nutrients 204
fat quality 205–207, 213
fermentation, see Fermented milk
growth response 212, 213
intake in infancy 203, 204
iron deficiency
absorption inhibition 189, 190, 197–199
epidemiology 186, 204, 205
formula feeding comparison 186
fortification 197
iron content 186, 187
occult intestinal blood loss 187–189, 197
low-fat milk recommendations 207, 208, 214
obesity risks 198, 209–211, 217
potential renal solute load
calculation 191, 192
epidemiology studies 194
overview 190, 191
relation to urine osmolality and water balance 192–194
upper limit recommendations 194, 195
water balance 192
protein intake 205
sterilization 197
ultra-high-temperature processing 197, 198
volume recommendations 208, 209
Crohn's disease, see Inflammatory bowel disease
Diabetes mellitus
breastfeeding effects in later life 35, 252
gluten introduction and risks 141, 142, 151, 152, 154, 155
maternal diabetes and obesity in later life 26
Diarrhea
fermented milk in prevention and treatment
bacterial diarrhea 239
viral diarrhea 239, 240, 247
milk fat globule membranes and prevention 115
prebiotics/probiotics
diarrhea etiology and impact of benefits 117, 118
prevention 109, 110, 239, 240
treatment 110, 111
Docosahexaenoic acid (DHA)
breast milk 137
cow's milk 206, 207, 213
fetal transfer 137
supplementation 135, 137

260
Energy density, complementary foods
4–6, 10, 12, 13
Enterobacter sakazakii, pathogenicity 82
Exclusion diets
balanced diet
fatty acids 163, 164
overview 162, 163
probiotics 164, 165, 167, 168
vitamin A 164
growth effects 162
Exclusive breastfeeding
adequacy 222, 223
appropriate duration 3
complementary food types 223, 224
definition 2
Fermented cereal, benefits and promotion 250
Fermented milk
antimicrobial activity 238
diarrhea prevention and treatment
bacterial diarrhea 239
viral diarrhea 239, 240, 247
ethanol content 249
food allergy management 243, 244, 249
gluten digestion 242, 248
Helicobacter pylori colonization
effects 241, 242
hypotensive peptides 237, 238, 247
inflammatory bowel disease studies 243
lactic acid bacteria 236
lactose intolerance utilization 242, 243, 258
lipid metabolism effects 244, 245
metabolite composition 236, 237, 248
probiotics 258
starter cultures 248, 249
Folate, cereal fortification 95
Food allergy
exclusion diets, see Exclusion diets
fermented milk in management 243, 244, 249
gluten introduction and risks 140, 141
growth effects 158–162
gut barrier function
antigen elimination 160
barrier promotion 161
gut microbiota 244
hygiene hypothesis 158, 168
inflammatory response and growth 161
onset 160
Food safety, see Contaminants
Gluten
celiac disease risks 142–148
diabetes mellitus risks 141, 142, 151, 152, 154, 155
digestion by fermentation bacteria 242, 248
food allergy risks 140, 141
introduction in diet 140, 149
Growth acceleration hypothesis
breastfeeding protection 23, 24
cardiovascular outcomes 21
mechanisms 23
obesity risks 21–23
overview 20, 21
Gut
barrier function in food allergy
antigen elimination 160
barrier promotion 161
colonization 80–82, 87, 88, 241, 242, 253
immune system development 80
infant microbiota composition and infant-specific pathogens 82
microbiota management and microbiological risk reduction
bifidobacteria 83, 84, 89, 90
intervention studies 85, 86
preterm infants 85
pH 80
Hazard Analysis and Critical Control Points (HACCP), contaminant risk management 66, 69, 70
Helicobacter pylori, fermented milk effects on colonization 241, 242
Human immunodeficiency virus (HIV)
breast milk transmission 181
formula feeding 181
infection-related growth retardation
practical considerations in complementary feeding 177, 178
theory 177
Hygiene hypothesis, allergy 158, 168
Inflammatory bowel disease (IBD)
breastfeeding effects in later life 35, 40–42
fermented milk studies 243
Insulin-like growth factor-1 (IGF-1)
cow’s milk effects 212, 213, 217, 257
nutritional programming 32, 209
Subject Index

Iron
adverse effects 136, 137
biological markers 125
breast milk 222, 223
cereal fortification 96–98, 101
complementary food supplementation
developed countries 126–128
developing countries 125
cow’s milk and deficiency
absorption inhibition 189, 190, 197–199
epidemiology 186, 204, 205
formula feeding comparison 186
fortification 197
iron content 186, 187
occult intestinal blood loss 187–189, 197
deficiency effects 126
manufactured baby foods 62
meat 229, 230, 232
optimal levels 136
Sprinkle supplements 7, 8, 97, 98
Isopropyl thioxanthone (ITX), food contamination 76, 77

Lactose intolerance, fermented milk utilization 242, 243, 258
Linoleic acid, cow’s milk 206
Lipid metabolism
breastfeeding effects in later life 33, 34, 39, 40
fermented milk effects 244, 245
Liver, see Chicken liver
Long-chain polyunsaturated fatty acids (LCPUFAs)
cow’s milk 206, 207, 213
fetal transfer 137
immune modulation 158
supplementation 113, 128–131, 135, 137

Malnutrition
complementary feeding guidelines
anthropometric deviation
practical considerations 176, 177
theory 175, 176
infection-related growth retardation
practical considerations 177, 178
theory 177
research agenda elements 178
developing countries 92, 93

ecological and environmental factors 174
pathological factors 173, 174
prescriptive growth 180–184
risks by life stages 98, 99
severe protein–energy malnutrition 173
weaning, see Weaning
Manufactured baby foods
consumption 61
country distribution of use 44, 45
education effects on use 61
growth outcomes 62
interventional trials 48–50
nutrient density and dietary adequacy 45–47
safety 57, 58
Meat
acceptability and safety as complementary food 227, 228
cellular animal protein benefits
evidence 224, 225
overview 223, 224
iron absorption 229, 230, 232
macronutrient intakes versus plant-based complementary foods 225, 226
zinc 230
Microbiota, see Gut
Milk, see Breast milk; Cow’s milk; Fermented milk
Milk fat globule membranes (MFGM)
diarrhea prevention 115
supplementation 113, 114
Millennium Development Goals 93, 94
Nestlé Early Warning System 68
Obesity
birth weight relationship 26
breastfeeding protection in later life
  growth acceleration hypothesis 20–24
  mechanisms 20, 252
  study design 17–20
cow’s milk risks 198, 209–211, 217
critical windows of nutrition 27
epidemiology 15
infants of diabetic mothers 26
nutritional programming 16, 17, 20–23
protein intake in infancy 26
Occult intestinal blood loss, cow's milk association 187–189, 197

Phenylketonuria, breastfeeding benefits 39
Potential renal solute load (PRSL) calculation 191, 192
epidemiology studies of cow's milk 194
overview 190, 191
relation to urine osmolality and water balance 192–194
upper limit recommendations 194, 195
water balance 192

Prebiotics
atopic eczema prevention 111, 112, 118, 119
complementary food supplementation 131
diarrhea prevention 109, 110, 119
treatment 110, 111
overview 109
stool consistency effects 112, 113, 120

Preterm infants
catch-up growth and later obesity 25, 28
gut microbiota management and microbiological risk reduction 85

Probiotics
atopic eczema prevention 111, 112, 118, 119
complementary food supplementation 131
diarrhea etiology and impact of benefits 117, 118
prevention 109, 110, 119, 239, 240
treatment 110, 111
exclusion diet supplementation 164, 165, 167, 168
fermented foods, see Fermented milk
microbiota management and microbiological risk reduction bifidobacteria 83, 84, 89, 90
intervention studies 85, 86
preterm infants 85

overview 108, 109
safety 248

Prominent breastfeeding, definition 2

Raw materials, contaminants 66–71
Renal solute load, see Potential renal solute load

Semicarbazide (SEM), issue management 73–75
Sprinkle, iron supplements 7, 8, 97, 98
Sugar formula composition 219
harmful effects in diet 226
upper limits in formula 77

Vegetarian diet, infant supplementation 233
Vitamin A cereal fortification 93, 96, 101, 104, 105
exclusion diet supplementation 164
toxicity 104

Weaning complementary feeding guidelines in malnutrition anthropometric deviation practical considerations 176, 177
treatment 175, 176
infection-related growth retardation practical considerations 177, 178
treatment 177
research agenda elements 178
malnourished infants classification 173, 174
definition 172
ecological and environmental factors 174
pathological factors 173, 174

Zinc breast milk 222, 223
complementary food supplementation 131
meat 230
upper limits in supplementation 11, 12