

Index

- β -Carboline alkaloids, 165–166
 β -methylamino-L-alanine (BMAA), 157–161
 α -synuclein, 156
 α -tocopherol. *See* vitamin E
 absinthe, 138–139
 accuracy, 18
 acetone cyanohydrin, 164
 acetylcholine, 90
 acrylamide, 136–137
 acetylcholinesterase, 129
 acute tryptophan depletion (ATD), 100–101
 adenosine, 228
 ADHD
 O₃FA and, 200
 adrenocorticotrophic hormone (ACTH), 115
 age-related cognitive decline
 polyphenols and, 193–195
 aging
 weight loss during, 287–289
 aging and neurodegenerative conditions
 ketogenic diet and, 191–192
 alcohol, 203–204, 248
 acute effects on behaviour, 205–208
 acute effects on brain, 208–210
 foetal brain development and, 223
 chronic usage and dependence, 210–212
 chronic usage, effects of, 212–215
 foetal exposure to, 218–222
 in adolescence, 222–224
 in old age, 224
 metabolism of, 204–205
 alcohol dependence, 215–218
 diagnostic criteria, 211
 alcohol use disorder (AUD), 211, 224
 alcohol-related birth defects (ARBD), 218
 alcohol-related neurodevelopmental disorder (ARND), 218
 alkaloids
 plant and fungal, 129–132
 alpha-lactalbumin, 96
 alpha-linolenic acid, 347
 altered-regulation hypothesis, 31
 aluminium, 175–178
 Alzheimer's disease (AD)
 hypothyroidism and, 337
 low folate levels and, 323
 O₃FA and, 198
 oxidative stress and, 331
 polyphenols and, 195
 vitamin B1 deficiency and, 312
 vitamin B5 deficiency and, 319
 vitamin C deficiency and, 327
 vitamin D deficiency and, 330
 Western-style diet and, 122
 amino acids, 7
 essential, 350–352
 aminoacidopathies, 41–42
 amyotrophic lateral sclerosis (ALS), 157
 oxidative stress and, 331
 anaemia
 megaloblastic, 322
 pernicious, 324
 Ancel Keys Minnesota Starvation Study, 16
 animal data
 inclusion of, 1
 animal models
 problem of, 369
 anisatin, 141
 anorexia nervosa (AN), 283–286
 secondary to cancer and other diseases, 286–287
 anthocyanin, 194–195
 anti-social personality disorder, 216
 anxiety
 MedDiet and, 184–185
 O₃FA and, 199–200
 polyphenols and, 195–196
 appetite regulation
 cognitive processes in, 123–124
 arachidonic acid (AA), 23, 347

- arsenic, 173–174
 ascorbic acid. *See* vitamin C
 ASD. *See* autism spectrum disorder
 ATD. *See* acute tryptophan depletion
 attention deficit disorder, 102
 aubergines, 129
 AUD. *See* alcohol use disorder
 autism spectrum disorder (ASD)
 ketogenic diet and, 192
 O₃FA and, 200
- barley, 129
 bias
 forms of, 369–370
 bilberry leaves, 196
 bingeing
 food insecurity and, 293–294
 biomarkers, 19, 363–364
 Biosphere II, 276–277
 biotin. *See* vitamin B7
 blackberry juice, 196
 blood-brain barrier (BBB), 113
 Western-style diet and, 116–117
 blueberries, 194
 BMAA. *See* β-methylamino-L-alanine
 bovine spongiform encephalitis (BSE), 150–155
 brain development, 21
 brain-derived neurotrophic factor (BDNF), 113
 Western-style diet and, 113
 breakfast, 63–66, 106
 breast-feeding, 62
 brain development and, 28–29
 mental health outcomes and, 28
 cognitive benefits of, 356
 neurobiology of, 22–23
 breast-feeding and cognition
 experimental studies, 25–27
 in preterm infants, 28
 observational studies, 23–25
 brevetoxins, 133
 BSE. *See* bovine spongiform encephalitis
- cachexia, 286–287
 caffeine, 203, 224–226, 248, 360
 abuse, 230–231
 adenosine and, 228
 the brain and, 228–230
 effects of, 226–228
 effects, long-term, 231–232
 principal sources of, 225
 calcitriol. *See* vitamin D
 calcium, 328
 deficiency, 345
 calorie
 definition, 4
 calorie restriction (CR), 361
 cognition and, 302–305
 hunger and, 298–301
 longevity and, 295–298
 psychopathology and, 301–302
 canola oil, 198
 carbohydrates, 4
 carnitine, 327
 cassava, 163–164
 catechin, 194
 catecholamines, 95
 CCK. *See* cholecystokinin
 chaconine, 129
 cherry juice, 195
 chewing noise
 to identify foods, 365
 chlorine
 deficiency, 345
 chlorogenic acid, 196
 chlorophyll, 129
 cholecalciferol. *See* vitamin D
 cholecystokinin (CCK), 9
 cholesterol
 effects on cognition, 112
 choline, 44–45
 deficiency, 332–333
 specific effects from, 105–106
 chromium, 346
 chyme, 9
 ciguatoxins, 133–134
 cinnamon, 195
Claviceps purpurea, 129
 cobalamin. *See* vitamin B12
 cobalt, 346
 cocoa, 194
 codeine, 132
 cognitive decline
 vitamin B12 deficiency and, 325
 vitamin D deficiency and, 329–330
 cognitive performance
 DASH diet and, 186
 MedDiet and, 183
 coherence, 19
 collagen, 327
 compliance, 20
 copper, 59–60
 deficiency, 342–343
 corticotropin-releasing hormones (CRH), 115
 critical period hypothesis, 31
 curcumin, 194–195, 197
 cyanide, 164
- dark chocolate, 195
 depression, 102
 DASH diet and, 187–188

- MedDiet and, 184–185
 O3FA and, 199–200
 polyphenols and, 195–196
 dietary approaches to stop hypertension (DASH)
 diet, 186
 summary of recommendations, 182
 dietary pattern data
 advantages of, 20
 vs single nutrients approach, 357–358
 dietary recording
 improving, 362–365
 dieting, 263–265
 digestive system
 the brain and, 10
 dinner, 68
 docosahexaenoic acid (DHA), 23, 43, 198, 346
 domoic acid, 134
 dopamine, 95

 eating
 preparation for, 68–69
 purpose of, 3
 real-time detection of, 364
 eicosapentaenoic acid (EPA), 43, 198, 346
 electro-encephalography (EEG), 18
 electrolyte disturbances, 345–346
 emotional memory hypothesis, 91–92
 energy metabolism, 6
 energy requirements, 4
 epicatechin, 194
 epilepsy
 ketogenic diet and, 189–190
 epinephrine, 95
 episodic memory, 72
 ergocalciferol. *See* vitamin D
 ergot alkaloids, 129–131

 famine
 neurodevelopmental outcomes and, 34–35
 natural history of, 266–269
 FASD. *See* foetal alcohol spectrum disorder
 fasting, 250
 in lean people, 282–283
 in overweight and obese people, 279–282
 medically supervised, 277–279
 religious, 261–263
 short-term studies, 256–266, 258
 short-term, experimenter instructed, 256–261
 fats, 7–8
 effects on cognition, 92–95
 fDG PET, 18
 fish consumption
 safety of, 172–173
 flavourants, 138–141
 flaxseed oil, 198

 fluorine, 346
 foetal alcohol spectrum disorder (FASD),
 218–222
 foetal alcohol syndrome (FAS), 218
 folate. *See* vitamin B9
 food, 232–233
 food addiction, 233–235, 241, 247–248, 360
 as behavioural use disorder, 235–236
 biological aspects, 244–247
 compulsion to eat, 242–243
 diagnosing, 236–238
 risk factors, 241–242
 food-based images
 collection of, 363–364
 formic acid, 143
 fructose, 5
 effects on cognition, 82
 functional magnetic resonance imaging (fMRI), 18
 funding source, 19

 gambling disorder
 diagnostic criteria, 236
 glioblastoma multiforme (GBM), 190
 gliomas
 malignant, 190
 glucocorticoids, 116
 glucose, 5, 10
 the brain and, 357
 effects on cognition, 70–81
 effects on decision making, 79–81
 effects on learning and memory, 74
 enhancement effect, 84–92, 106
 impact on different cognitive domains, 72
 neuronal usage, 89
 GLUT1 glucose transporter, 87
 glycaemic index (GI), 82
 lower and higher GI foods, 82–84
 glycaemic load (GL), 82
 glycoalkaloids, 129
 glycogen, 5
 goitre, 336
 goitre-belts, 335
 goitrogens, 179
 Goldberger, Dr Joseph, 315
 grape juice, 194
 grape seed, 195
 grapes, 195
 grayanotoxins, 142
 green tea, 195
 polyphenol-epigallocatechin gallate (EGCG),
 196
 grehlin, 10
 gut microbiome, 359
 MedDiet and, 186
 dysregulation, 113

478

Index

- gut-brain axis
 Western-style diet and, 117–119
- Hallervorden-Spatz syndrome, 319
- heterocyclic amines (HCA), 157
- hippocampal dependent learning and memory (HDLM), 72
 Western-style diet and, 108–109
- histamine, 95
 in the brain, 98
- histidine, 95
 depletion, 98
 effects on brain histamine, 101–104
- holocaust survivors
 recovery from starvation and, 289–290
- HPA axis. *See* hypothalamic-pituitary-adrenal axis
- hunger strikes, 270–272
- hyoscyamine, 131
- hypercortisolemia, 284
- hypocalcaemia, 345
- hypochloremia, 345
- hypoglycaemia, 42
 cognitive effects of episodes, 78
- hypokalemia, 345
- hypomagnesemia, 345
- hyponatremia, 345
- hypophosphatemia, 345
- hypothalamic-pituitary-adrenal (HPA) axis
 Western-style diet and, 115–116
- hypothalamus, 10
- imidazoleamines, 95
- impulsivity, 215
- indolamines, 95
- insulin
 peripheral release, 91
- intermittent fasting (IF), 296–297
- iodine, 55–58
 deficiency, 335–337
- iron, 53
- iron deficiency (ID), 337–339
 supplementation during infancy and, 54–55
 supplementation during pregnancy and, 53–54
- isomaltulose
 effects on cognition, 82
- isoquinoline alkaloids, 132
- joule
 definition, 4
- K_{ATP} channels, 91
- ketoacidosis, 202
- ketogenic diet (KD), 188–189
 summary of recommendations, 182
- Konzo, 163–164
- Korsakoff's syndrome (KS), 311–312
- Krebs cycle, 5
- krill oil, 198
- kuru, 148–150
- lactose, 5
- large intestine, 9
- large neutral amino acids (LNAA), 95
- lathyrism, 161–162
- lcPUFAs. *See* long chain polyunsaturated fatty acids
- lead, 166–167
- leptin, 10
- Lewy bodies, 155
- linamarin, 164
- linoleic acid, 347
- LNAA. *See* large neutral amino acids
- long chain polyunsaturated fatty acids (lcPUFAs), 42–44
- longevity
 energy restriction and, 295–305
- lunch, 66–67, 106
- lupanine, 132
- lupin beans, 132
- lychee, 195
- macronutrients, 3
 deficiencies, 353
- mad cow disease. *See* bovine spongiform encephalitis
- magnesium
 deficiency, 345
- magnetic encephalography (MEG), 18
- malnutrition, 30, 62
- maltose, 5
- manganese, 346
- maternal malnutrition
 brain function and, 33
 animal studies, 31–33
 human studies, 33–35
- meals
 impact on cognitive domains, 65
- Mediterranean diet, 359
- Mediterranean diet (MedDiet), 181–183
 cognitive performance and, 183
 summary of recommendations, 182
- Mediterranean-DASH diet intervention for neurodegenerative delay (MIND), 188
- medium-chain triglyceride oil (MCT)
 supplementation, 189
- mental health
 Western-style diet and, 119–120
- mercury
 in food, 167

- mesocortical pathway, 102
 mesolimbic pathway, 102
 methanol, 142–143
 methoxysafrole. *See* myristicin
 methyl mercury
 pathogenesis, 171–172
 poisoning, 168–171
 methylazoxymethanol, 158
 micronutrients, 8, 62
 deficiencies, 353
 lower levels with age, 352
 supplementation, 60–61
 microvilli, 9
 milk sickness, 141
 MIND diet. *See* Mediterranean-DASH diet
 intervention for neurodegenerative delay
 summary of recommendations, 182
 minerals, 8
 Minnesota Starvation Study, 272–276
 Modified Atkins Diet (MAD), 189
 molybdenum, 346
 morphine, 132
 multiple sclerosis (MS)
 ketogenic diet and, 191
 MedDiet and, 186
 O₃FA and, 200
 Western-style diet and, 120–121
 myristicin, 140

 nanoplastics, 179
 neurodegenerative conditions
 DASH diet and, 187
 MedDiet and, 185–186
 O₃FA and, 198–199
 neurodegenerative diseases
 Western-style diet and, 121–122
 neurodevelopmental disorders
 polyphenols and, 196
 neuroinflammation, 113
 MedDiet and, 186
 polyphenols and, 195
 Western-style diet and, 114–115
 neuropsychological tests, 16–18
 neuroticism, 216
 neurotoxic proteins
 infectious, 145–147
 neurotoxins
 acute, 126
 chronic, 145–180
 marine, 132–136
 synergistic effects, 359
 nicotinamide adenine dinucleotide (NAD). *See*
 vitamin B₃
 norepinephrine, 95
 nutraceuticals, 365–367

 nutrigenomics, 367–368
 nutritional remediation, 37–39

 O₃FA. *See* omega-3 fatty acids
 obesity, 358
 dietary restriction and, 279–282
 effects on cognition, 123
 maternal, 39
 vicious cycle model (VCM), 124, 125
 obesity risk
 from maternal malnutrition, 32
 oily fish, 198
 oligomeric procyanidins, 194
 omega-3 fatty acids (O₃FA), 198, 201
 deficiency, 346–350
 omega-6 fatty acids
 deficiency, 347–350
 overnutrition, 39–40, 62
 overweight
 effects on cognition, 123
 oxidative stress, 113
 MedDiet and, 186
 polyphenols and, 195
 vitamin E deficiency and, 331
 Western-style diet and, 115

 Parkinson's dementia complex (PDC), 157
 Parkinson's disease (PD), 102, 155–157
 O₃FA and, 185
 oxidative stress and, 331
 vitamin B₁ deficiency and, 312
 Western-style diet and, 122
 partial foetal alcohol syndrome (pFAS), 218
 PCBs. *See* polychlorobiphenyls
 pellagra, 315
 peristalsis, 9
 pesticides, 178–179
 phenylalanine, 95
 phlorotannin-rich extract, 196
 phosphopantetheine. *See* vitamin B₅
 phosphorus
 deficiency, 345
 phyloquinone. *See* vitamin K
 polychlorobiphenyls (PCBs), 143–144
 polyphenols, 192–193, 197–198, 201
 dietary sources and, 193
 poppy seeds, 132
 potassium
 deficiency, 345
 potatoes, 129
 prebiotics, 365
 prefrontal cortex
 effects of Western-style diet, 109
 pre-registration
 of design and analysis, 371

- prisoners of war
 recovery from starvation and, 290–293
 probiotics, 365
 problem drinking, 216–218
 transition into, 215–216
 protein I
 specific effects from, 95–104
 protein II
 specific effects from, 104–105
 protein malnourishment
 in adult animals, 251–253, 255–256
 proteins, 4–5, *See also* neurotoxic proteins
 effects on cognition, 92–95
 prion, 147–148
 pyridoxal 5'-phosphate. *See* vitamin B6

 quercetin, 196
 quinolizidine alkaloids, 132

 Ramadan, 261–262
 reproducibility problem, 357, 369
 resveratrol, 194, 197
 retinoic acid, 308, *See* vitamin A
 retinol, 308
 riboflavin. *See* vitamin B2
 rye, 129

 saliva, 8
 salt
 effects on cognition, 111–112
 sample size, 19
 problems of, 370–371
 saturated fat (SF)
 effects on cognition, 109
 saxitoxins, 133
 schizophrenia, 102
 scombrotoxins, 136
 scopolamine, 90, 131
 scurvy, 8, 326
 selenium
 deficiency, 343–345
 self reporting of diet data, 11–14
 diet diaries, 11
 interviewer-based recall, 11–12
 serotonin, 95–96
 single nutrient approach
 vs dietary patterns approach, 357–358
 small intestine, 9
 snacks, 67
 soapberries, 138
 sodium
 deficiency, 345
 solamargine, 129
 solanine, 129

 solasonine, 129
 sparteine, 132
 Spencer, P. S., 158
St Anthony's fire, 130
 starch, 5
 starvation, 250, 360
 concoctions during, 268
 effects on morality, 270
 laboratory studies, 272–283
 longer-term studies, 266–289
 recovery from, 287–289
 strawberries, 194
 stunting, 35–37, 62
 sucrose, 5
 effects on cognition, 82
 sugar
 effects on cognition, 110–111
 sulphur, 346
 synbiotics, 365

 TBI. *See* traumatic brain injury
 tetramethylammonium. *See* tetramine
 tetramine, 136
 tetrodotoxin, 135–136
 theobromine, 232
 thiaminases, 144
 thiamine. *See* vitamin B1
 thujone, 126–140
 thyroid stimulating hormone (TSH), 335
 tomatine, 129
 tomatoes, 129
 toxic dystonia, 138
 traumatic brain injury (TBI)
 ketogenic diet and, 191
 O₃FA and, 200
 trematol, 141
 tropane alkaloids, 131
 tropical ataxic neuropathy (TAN), 164–165
 tryptophan, 95–97
 depletion, 96–97, *See also* acute tryptophan
 depletion
 effects on serotonergic system, 98–101
 turmeric, 194
 Type I diabetes
 cognitive impairment profile, 78
 Type II diabetes, 11
 maternal malnutrition and, 32
 cognitive impairment profile, 78
 tyrosine, 95
 depletion, 97–98
 effects on dopaminergic system, 101–104

 undernutrition
 in animals, 253–256

Index

481

- vagus nerve, 10, 156
 variant CJD, 152–155
 VCM. *See* obesity: vicious cycle model
 vitamin A, 45
 deficiency, 308–309
 vitamin B1, 46–47
 deficiency, 309–313
 vitamin B12, 50–51
 deficiency, 324–326
 vitamin B2
 deficiency, 313–314
 vitamin B3
 deficiency, 314–318
 generation of, 315
 vitamin B5
 deficiency, 318–319
 vitamin B6, 48
 deficiency, 319–321
 vitamin B7, 48
 deficiency, 321
 vitamin B9, 48–50
 deficiency, 322–323
 vitamin C, 36–51
 deficiency, 326–328
 vitamin D, 51–52
 deficiency, 328–330
 vitamin E, 52–53
 deficiency, 330–331
 vitamin J. *See* choline
 vitamin K
 deficiency, 333–334
 vitamins, 8
 walnuts, 198
 warfarin, 334
 weaning, 29–30
 Wernicke's encephalopathy (WE),
 309–310
 Caine criteria, 312
 Western-style diet
 consequences of, 114
 models, 107
 wheatgerm oil, 198
 Wilder, R. M., 189
 wine
 red, 195
 white, 195
 World War II
 starvation and, 289–293
 wormwood, 139
 xanthohumol, 196
 Yale Food Addiction Scale (YFAS), 236
 symptom checklist, 236
 zinc, 58–59
 deficiency, 339–342