

# Index

## A

Accel, 85

Accelerated solvent extractor (ASE®),  
avocado oil and, 85–87

### Acyl lipids

avocado oil, 99–100

barley oil and, 461–463

berry seed/grapeseed oils and,  
222–225

BO/EPO/FUO/BCO and, 240–241

camellia/tea oils and, 328–330

corn kernel oil/corn fiber oil and,  
417–418

flax/perilla/camelina seed oils and,  
156–157

nigella (black cumin) seed oil and,  
302–303

niger seed oil

acyl lipids, 287

fatty acids, 286–287

fractionation, 287

glycolipids, 288–289

neutral lipids, 288

oat oil and, 439–441

olive oil

chemical composition, 45

lipid biosynthesis, 43–44

triacylglycerols (TGs) as FA  
glycerol esters, 45–46

rice bran oil and, 388–389

of sesame seed oil, 269

tree nut oils and, 133–135

wheat germ oil and, 364–366

### Adulteration as authenticity issue

avocado oil and, 114–118

butter/butter oil/ghee and, 552

camellia/tea oils and, 337–338

corn kernel oil/corn fiber oil and,  
427–428

of hempseed oil, 206–207

oat oil and, 447

olive oil and, 65–66

pumpkin seed oil and, 352–353

tree nut oils and, 141

### Agriculture

algal oils and, 491

hempseed oil and, 197–198

ALA metabolism, flax/perilla/camelina  
seed oils and, 160–164

Alfa-Laval and butter oil, 534

### Algal oils

components/health-promoting  
properties of, 9

composition of, 495–498

health benefits of, 499–504

historical aspects of, 491

nonedible applications of, 506–507

photographs, 30

- production
    - biomass production, 492–493
    - extraction/purification, 493–495
  - safety/legal aspects of, 504–506
  - stability of, 498–499
  - as storage form of energy, 5
  - toxic compounds and, 504–506
- Allergic/toxic compounds
- avocado oil
    - dienes, 111
    - formal studies, 112
    - latex allergens, 110–111
  - barley oil and, 471
  - berry seed/grapeseed oils and, 230
  - camellia/tea oils and, 327
  - corn kernel oil/corn fiber oil and, 425
  - flax/perilla/camelina seed oils and, 170
  - general information, 11–12
  - hempseed oil, 185, 197, 199
  - nigella (black cumin) seed oil and, 308
  - oat oil and, 444
  - olive oil and, 59
  - rice bran oil and, 397–398
  - tree nut oils and, 140–141
- Almonds, 7, 127, 131, 136, 138. *See also* Tree nut oils
- $\alpha$ -linolenic acid (ALA)
- berry seed/grapeseed oils and, 225
  - BO/EPO/FUO/BCO and, 240–241
  - and conversion of essential FAs, 6
  - dietary sources of, 5–6
  - extraction/processing
    - flax/perilla/camelina seed oils, 152–155
  - flax/perilla/camelina seed oils
    - ALA metabolism, 160–164
    - allergic/toxic compounds, 170
    - cancer, 167–168
    - cardiovascular disease (CVD), 164–167
    - edible/nonedible applications, 155–156
    - FA/acyl lipid composition, 156–157
    - nonacylglycerol constituents, 157–158
    - omega-6/omega-3 ratio, 168–170
    - oxidative stability, 158–159
    - structure of, 238
  - $\alpha$ -tocopherol. *See also* Tocopherols
    - authenticity/adulteration and, 11
    - avocado oil and, 102
    - olive oil and, 40
  - Alzheimer's disease, olive oil and, 65
  - Amino acids, camellia/tea oils and, 326
  - Anhydrous milk fat. *See* Ghee
  - Animal fats. *See also* Butter oil
    - worldwide production/composition of, 2
  - Antioxidants
    - algal oils and, 491
    - avocado oil and, 98
    - berry seed/grapeseed oils and, 219–220
    - BO/EPO/FUO/BCO and, 249, 251
    - carrot seed oil and, 486
    - corn kernel oil/corn fiber oil and, 427
    - oat oil and, 446
    - olive oil and, 61–63, 65
    - onion seed oil and, 487–488
    - parsley seed oil and, 479–484
    - rice bran oil and, 401–402
    - wheat germ oil and, 369–371
  - Applications of oils (edible/nonedible)
    - algal oils, 506–507
    - barley oil and, 461
    - berry seed/grapeseed oils and, 220–222
    - BO/EPO/FUO/BCO and, 240
    - camellia/tea oils and, 324–328

- corn kernel oil/corn fiber oil and, 417
- fish oils and, 521
- flax/perilla/camelina seed oils and, 155–156
- hempseed oil, 195–198
- niger seed oil, 286
- oat oil and, 437–438
- olive oil and, 41–43
- rice bran oil and, 387–388
- tree nut oils and, 132–133
- Aquaculture. *See* Fish oils
- Arachidonic acid (AA), and conversion of essential FAs, 6
- Aroma. *See* Flavor/aroma
- Atherosclerosis
  - barley oil and, 472
  - BO/EPO/FUO/BCO and, 246
  - flax/perilla/camelina seed oils and, 165
- $\alpha$ -tocopherol
  - health benefits
    - avocado oil, 112
- Authenticity
  - avocado oil and, 114–118
  - corn kernel oil/corn fiber oil and, 427–428
  - oat oil and, 447
  - olive oil and, 65–67
  - pumpkin seed oil and, 352–353
  - tree nut oils and, 141
- Avocado oil
  - acyl lipids and, 99–100
  - allergic/toxic compounds
    - dienes, 111
    - formal studies, 112
    - latex allergens, 110–111
  - applications
    - cosmetic, 74
    - culinary, 75
  - authenticity/adulteration and, 114–118
  - cold-pressed
    - extraction, 82
    - refining, 83
    - typical yields, 83
    - waste streams, 84
  - components/health-promoting properties of, 7
  - economics, 75
  - extraction, 79–81
  - FA composition during development/commercial maturity, 99–101
  - flavor/aroma compounds
    - aroma compounds, 107–110
    - sensory analysis, 105–108
  - fruit physiology
    - growth/harvest, 76–78
    - postharvest ripening, 78–79
    - tissue types/proportions of Hass, 79
  - health benefits
    - $\alpha$ -tocopherol, 112
    - fruit, 113–114
    - monounsaturated fatty acids (MUFAs), 112
    - plant pigments, 113
    - skin health, 113
    - sterols, 113
  - historical aspects of, 73–74
  - laboratory-based extraction
    - technique overview, 84–85
    - use of accelerated solvent extractor (ASE<sup>®</sup>), 86–87
  - nonacyl (unsaponifiable) components
    - pigments, 103–104
    - polyphenols, 104–105
    - sterols, 103
    - tocopherols/tocotrienols, 102–103
  - oil yield
    - fruit quality factors (cold-pressed), 93–95
    - fruit storage factors (cold-pressed),

- 95–97
- maturity factors (cold-pressed), 93–94
- orchard/region/country/seasonal maturity differences, 89–91
- postharvest factor of ripeness, 91
- preharvest factor of dry matter/oil accumulation, 88–89, 91–92
- preharvest factor of maturity, 87–88
- processing condition factors (cold-pressed), 96, 98
- ripening factors (cold-pressed), 93–94
- oxidative stability of, 98–99
- photographs, 18
- plant establishments for, 75–76
- refining, 81–82

Avocado-soybean unsaponifiables (ASUs), 114

## B

### Barley oil

- acyl lipids/FA composition, 461–463
- allergic/toxic compounds and, 471
- carotenoids/chlorophylls/pigments in, 467
- ceramides of, 470
- components/health-promoting properties of, 9
- edible/nonedible applications, 461
- endogenous hydrolytic enzymes and, 459, 461
- extraction of, 458–459
- flavor/aroma compounds, 471
- health benefits, 456, 471–473
- historical aspects of, 455–456
- milling/fractionation of, 456–458
- oil yields of, 459–460
- phenols in, 470–471
- phytosterols of, 462, 464–465

- plant photographs, 29
- starch lipids of, 470
- tocopherols/tocotrienols in, 464, 466–469

- Baudouin test, olive oil and, 11
- Beefsteak plant. *See* Perilla oil
- Benign prostate hyperplasia (BPH), 354
- Berry seed/grapeseed oils
  - acyl lipids/FA composition, 222–225
  - allergic/toxic compounds and, 230
  - applications
    - cosmetic, 221–222
    - food/dietary supplements, 220–221
  - carotenoids in, 228–229
  - factors affecting quality of, 218–220
  - general information/global production of, 215–218
  - health benefits, 231
  - phenols in, 230
  - phytosterols in, 229–230
  - tocopherols/tocotrienols in, 226–228
- $\beta$ -carotene, niger seed oil and, 292–293
- Biomass production, algal oils and, 492–493
- Black cumint oil/black cumint seed oil. *See* Nigella (black cumint) seed oil
- Black current oil (BCO), 249. *See also* Berry seed/grapeseed oils
  - acyl lipids/FA composition of, 240–241
  - allergic/toxic compounds and, 242
  - components/health-promoting properties of, 8
  - economy of, 239–240
  - edible/nonedible applications, 240
  - FA composition of, 241
  - flavor/aroma compounds of, 242
  - health benefits of dietary GLA/ALA
    - blood pressure control, 250
    - dermatitis, 243–248

- evidence for/against, 242–243
  - miscellaneous properties, 250–254
  - plasma lipid profiles, 248–249
  - platelet aggregation, 246–248
  - rheumatoid arthritis, 245–246
  - minor compounds of, 241
  - oil cake of, 237, 239
  - oil content of, 237
  - oil extraction methods for, 240
  - processing of, 240
  - structures of precursor FA to, 237–238
- Bleaching. *See* Refining, bleaching, and deodorizing (RBD)
- Blood pressure
- BO/EPO/FUO/BCO and, 250
  - olive oil and, 63–64
- Borage oil (BO)
- acyl lipids/FA composition of, 240–241
  - allergic/toxic compounds and, 242
  - components/health-promoting properties of, 8
  - economy of, 239–240
  - edible/nonedible applications, 240
  - FA composition of, 241
  - flavor/aroma compounds of, 242
  - health benefits of dietary GLA/ALA
    - blood pressure control, 250
    - dermatitis, 243–248
    - evidence for/against, 242–243
    - miscellaneous properties, 250–254
    - plasma lipid profiles, 248–249
    - platelet aggregation, 246–248
    - rheumatoid arthritis, 245–246
  - minor compounds of, 241
  - oil cake of, 237, 239
  - oil content of, 237
  - oil extraction methods for, 240
  - processing of, 240
  - structures of precursor FA to, 237–238
- Brazil nuts/Brazil nut oils, 127–128, 131. *See also* Tree nut oils
- components/health-promoting properties of, 7
  - plant photographs, 19
- Butter
- adulteration and, 552
  - chemical aspects of, 543–544
  - defects in, 537–539
  - flavor compounds in, 545
  - and lipids of milk fat, 539–543
  - processing
    - butter color, 530–531
    - churning, 531–532
    - continuous, 533–534
    - cream ripening, 530
    - draining of buttermilk, 532
    - flow chart, 528–530
    - moisture content, 533
    - salting of butter, 533
    - washing of butter, 533
  - as storage form of energy, 5
- Butter oil
- adulteration and, 552
  - chemical aspects of, 543–544
  - components/health-promoting properties of, 9
  - defects in, 539
  - flavor compounds in, 545
  - and lipids of milk fat, 539–543
  - processing, 534–535, 537
  - as storage form of energy, 5
- C**
- Camellia oil
- acyl lipids, 328–330
  - adulteration and, 337–338
  - ALA metabolism and, 160–164
  - allergic/toxic compounds and, 170, 327

- components/health-promoting properties of, 7–8
  - edible/nonedible applications, 324–328
  - edible/nonedible applications of, 155–156
  - extraction/processing of, 152–155
  - FA/acyl lipid composition of, 156–157
  - flavor/aroma compounds, 333–335
  - global production of, 314–315
  - gross properties of, 315–317
  - health benefits, 335–337
    - cancer, 167–168
    - cardiovascular disease (CVD), 164–167
    - omega-6/omega-3 ratio, 168–170
  - historical aspects of, 151–152, 313–314
  - minor compounds, 330–333
  - nonacylglycerol constituents of, 157–158
  - oxidative stability of, 158–159
  - plant photographs, 25–26
  - processing
    - cooking, 318
    - cracking/flaking, 318
    - dehulling, 316, 318
    - extraction, 318–322
    - harvest, 316
    - refining, 322–324
    - utilization of defatted cake, 324–325
  - as source of ALA, 5, 10
  - taste/flavor of, 159–160
  - unsaponifiable components of, 10
- Cancer
- barley oil and, 472–473
  - BO/EPO/FUO/BCO and, 250, 252–253
  - evening primrose oil (EPO) and, 239
  - flax/perilla/camelina seed oils and, 167–168
  - and health benefits (general) of omega-3 FA, 5
  - olive oil and, 64–65
  - pumpkin seed oil and, 354
  - rice bran oil and, 402
- Cannabis sativa*. *See* Hempseed oil
- Canola oil. *See* Rape/canola oil
- Cardiovascular disease (CVD)
  - butter/butter oil/ghee and, 549–550
  - flax/perilla/camelina seed oils and, 164–167
- Carotenoids
  - algal oils and, 491
  - avocado oil and, 102–103
  - barley oil and, 467
  - berry seed/grapeseed oils and, 228–229
  - corn kernel oil/corn fiber oil and, 425
  - parsley seed oil and, 479–482
- Carrot seed oil
  - components/health-promoting properties of, 9
  - general information, 484–487
  - plant photographs, 30
- Cashew nuts, 127–129, 131. *See also* Tree nut oils
  - components/health-promoting properties of, 7
- Centrifugation systems
  - as authenticity issue, 66
  - avocado oil extraction and, 81
  - olive oil and, 33, 35, 39
- Ceramides, barley oil and, 470
- Chinese basi. *See* Perilla oil
- Chloroform/methanol (C/M), avocado oil extraction and, 79
- Chlorophyll. *See also* Pigments
  - avocado oil and, 102–104
  - barley oil and, 467

- corn kernel oil/corn fiber oil and, 421–423
  - effect of, 3
  - flax/perilla/camelina seed oils and, 153, 157–158
  - nigella (black cumin) seed oil and, 306
  - olive oil and, 40
  - pumpkin seed oil and, 350–351
- Cholesterol
- algal oils and, 499–500
  - avocado oil and, 103
  - barley oil and, 472
  - pumpkin seed oil and, 355
  - rice bran oil and, 398–401
  - sesame seed oil and, 273–275
  - tree nut oils and, 139
  - wheat germ oil and, 369
- Coconut oil, 2
- Cold-pressed oils
- authenticity issues and, 66
  - avocado oil
    - extraction, 82
    - refining, 83
    - typical yields, 83
    - waste streams, 84
  - defined, 3
  - flax/perilla/camelina seed oils and, 170
  - hempseed oil and, 190–191
  - tree nut oils and, 131–132
- Commodity oils
- and authenticity/adulteration of gourmet oils, 11
  - varieties of, 1
- Composition. *See also* Processing
- of algal oils, 495–498
  - of oat oil and, 434–435
- Conjugated linoleic acid (CLA), butter/butter oil/ghee and, 542–543, 550–551
- COPE (corn oil and protein extraction), 411
- Corn kernel oil/corn fiber oil
- acyl lipids/FA composition and, 417–418
  - allergic/toxic compounds and, 425
  - authenticity/adulteration and, 427–428
  - carotenoids/chlorophylls/pigments in, 421–423
  - components/health-promoting properties of, 8
  - edible/nonedible applications, 417
  - endogenous hydrolytic enzymes and, 416–417
  - extraction of, 416
  - flavor/aroma compounds in, 425
  - health benefits, 425
  - milling/fractionation of, 412–415
  - oil yields of, 414–416
  - phenols in, 421, 426
  - phytosterols of, 418–419
  - properties/composition of, 409–411
  - tocopherols/tocotrienols in, 419–421, 424–425
  - unsaponifiable components of, 10
  - wet milling process and, 409–410
- Corn oil
- FA profile of, 187
  - plant photographs, 28
  - worldwide production/composition of, 2
- Coronary heart disease (CHD)
- algal oils and, 500–505
  - barley oil and, 456
  - butter/butter oil/ghee and, 549–550
  - flax/perilla/camelina seed oils and, 164–167
  - Greenland Eskimos and, 5
  - rice bran oil and, 398
  - sesame seed oil and, 273–274

- tree nut oils and, 138
- Cosmetic applications
  - avocado oil and, 74, 79, 81
  - oat oil and, 439
- Cottonseed, 2
- Cranberry oil. *See also* Berry seed/  
grapeseed oils
  - plant photographs, 22
- Crohn's disease, and health benefits  
(general) of omega-3 FA, 5
- Cyclolinopeptides, flaxseed oil and,  
160–161
- Cyclooxygenase, and conversion of  
essential FAs, 6
- Cytokines
  - BO/EPO/FUO/BCO and, 251
  - flax/perilla/camelina seed oils and,  
165
- D**
- Daily intake recommendations for EPA/  
DHA, 10
- Deodorizing. *See* Refining, bleaching,  
and deodorizing (RBD)
- Depression, and health benefits (general)  
of omega-3 FA, 5
- Dermatitis, BO/EPO/FUO/BCO and,  
243–248, 250
- Diabetes
  - and health benefits (general) of  
omega-3 FA, 5
  - pumpkin seed oil and, 355
  - rice bran oil and, 401
- Dienes, avocado oil and, 111
- Diet. *See* Mediterranean diet
- Dihomo-gamma-linoleic acid  
(DHGLA), and conversion of essential  
FAs, 6
- Dioxin, fish oil and, 12
- Docosahexaenoic acid (DHA)
  - algal oils and, 499–501, 505
  - flax/perilla/camelina seed oils and,  
161–162
  - health benefits (general) of, 5
  - intake recommendations for, 10
  - oxidative stability of, 10–11
  - SDA and production of, 5
- Docosapentaenoic acid (DPA)
  - flax/perilla/camelina seed oils and,  
161–162
- Dry matter content, avocado oil and,  
87–90, 94
- Dynamic head space (DHS),  
authenticity issues and, 66
- E**
- Economics
  - fish/soy oils and, 516–517
  - hempseed oil and, 193–195
  - niger seed oil and, 285
- Edestin, hempseed oil and, 192
- Edible/nonedible applications. *See*  
Applications of oils (edible/nonedible)
- Edinburgh Artery Study, flax/perilla/  
camelina seed oils and, 164–165
- Eicosanoids
  - BO/EPO/FUO/BCO and, 250–254
  - flax/perilla/camelina seed oils and,  
163, 165
- Eicosapentaenoic acid (EPA)
  - and conversion of essential FAs, 6
  - health benefits (general) of, 5
  - intake recommendations for, 10
  - oxidative stability of, 10–11
  - SDA and production of, 5
- Emulsification process of butter-making,  
534
- Endogenous hydrolytic enzymes
  - barley oil and, 459, 461
  - corn kernel oil/corn fiber oil and,  
416–417
- Endothelial dysfunction, flax/perilla/



- camelina seed oils and, 165
  - E-nose, 338
  - Enzymes/stability. *See also* Stability
  - Enzymes/stability, oat oil and, 437
  - Erucic acid, adulteration and, 352
  - Essential fatty acids (EFAs). *See also*
    - Fatty acids (FAs)
    - hempseed oil and, 185, 190
  - Evening primrose oil (EPO)
    - acyl lipids/FA composition of, 240–241
    - allergic/toxic compounds and, 242
    - components/health-promoting properties of, 8
    - economy of, 239–240
    - edible/nonedible applications, 240
    - FA composition of, 241
    - FA profile of, 187
    - flavor/aroma compounds of, 242
    - health benefits of dietary GLA/ALA
      - blood pressure control, 250
      - dermatitis, 243–248
      - evidence for/against, 242–243
      - miscellaneous properties, 250–254
      - plasma lipid profiles, 248–249
      - platelet aggregation, 246–248
      - rheumatoid arthritis, 245–246
    - minor compounds of, 241
    - oil cake of, 237, 239
    - oil content of, 237
    - oil extraction methods for, 240
    - plant photographs, 22
    - processing of, 240
    - structures of precursor FA to, 237–238
  - Expeller-pressing, tree nut oils and, 132
  - Extinction coefficient, sesame seed oil
    - lignans and, 271
  - Extraction. *See also* Processing
    - algal oils and, 493–495
    - avocado oil, 79–82, 84–87
    - barley oil and, 458–459
    - camellia/tea oils and, 318–322
    - corn kernel oil/corn fiber oil and, 416
    - fish oils and, 519
    - flax/perilla/camelina seed oils and, 152–155
    - nigella (black cumin) seed oil and, 300–302
    - pumpkin seed oil and, 346–347
    - rice bran oil
      - extraction developments, 379–381
      - overview, 378
      - refining, 381–383
      - refining developments, 383–387
    - of sesame seed oil, 268–269
    - and system as authenticity issue, 66, 103–104
    - tree nut oils and, 130–132
    - wheat germ oil and, 360–363
- F**
- False flax. *See* Camelina/camelina oil
  - Family Heart Study, ALA intake and, 167
  - Fatty acids (FAs)
    - algal oils and, 491, 494–498, 501
    - avocado oil
      - authenticity/adulteration, 99–101
      - global, 100
    - barley oil and, 461–463
    - BO/EPO/FUO/BCO and, 242–243
    - butter/butter oil/ghee and, 541–542, 544–545
    - camellia/tea oils
      - acyl lipids/FA composition, 328–330
    - fish oils and, 519–520
    - flax/perilla/camelina seed oils and, 156–157
    - hempseed oil and, 187
    - nigella (black cumin) seed oil and,

- 302–303
  - niger seed oil
    - acyl lipids, 287
    - fatty acids, 286–287
    - glycolipids, 288–289
    - neutral lipids, 288
  - niger seed oil and, 286–287
  - oat oil and, 439–441
  - olive oil
    - chemical composition, 45
    - lipid biosynthesis, 43–44
    - triacylglycerols (TGs) as FA glycerol esters, 45–46
  - parsley seed oil and, 479–480
  - pumpkin seed oil and, 347–349
  - rice bran oil and, 388–389
  - of sesame seed oil, 269
  - tree nut oils and, 133–135
  - wheat germ oil and, 364–366
- Fatty alcohols, olive oil and, 47, 49
- Fish oils
- components/health-promoting properties of, 9
  - edible/nonedible applications, 521
  - extraction/processing of, 519
  - FA composition of, 519–520
  - fish feed design and, 516–519
  - general information/global production of, 515–516
  - genetically modified organisms (GMOs) and, 523
  - global production of, 517
  - health benefits, 521–523
  - and microbial sources of DHA/EPA, 519
  - oxidative stability of, 520–521
  - photographs, 31
  - quality and, 520–521
  - as storage form of energy, 5
  - toxic compounds and, 523
  - toxic compounds in, 12
- Flavor/aroma
- avocado oil
    - aroma compounds, 107–110
    - sensory analysis, 105–108
  - barley oil and, 471
  - butter/butter oil/ghee and, 530, 537–538, 545–549
  - camellia/tea oils and, 333–335
  - corn kernel oil/corn fiber oil and, 425
  - flax/perilla/camelina seed oils and, 159–160
  - of hempseed oil, 198
  - nigella (black cumin) seed oil and, 305–306
  - oat oil and, 444–445
  - olive oil
    - importance of lipoxygenase, 53–54
    - qualification of VOO volatiles, 58
    - quantification of VOO volatiles, 53–56
    - rancidity, 57–59
    - Statistical Sensory Wheel (SSW), 56–57
  - rice bran oil and, 397
  - of sesame seed oil, 272
  - tree nut oils and, 138
- Flaxseed oil
- ALA metabolism and, 160–164
  - allergic/toxic compounds and, 170
  - components/health-promoting properties of, 7
  - edible/nonedible applications of, 155–156
  - extraction/processing of, 152–155
  - FA/acyl lipid composition of, 156–157
  - health benefits
    - cancer, 167–168
    - cardiovascular disease (CVD), 164–167
    - omega-6/omega-3 ratio, 168–170

- historical aspects of, 151–152
  - hull removal and recovery of, 154–155
  - nonacylglycerol constituents of, 157–158
  - oxidative stability of, 158–159
  - plant photographs, 19–20
  - as source of ALA, 5, 10
  - taste/flavor of, 159–160
  - worldwide production/composition of, 2
- Food and Agriculture Organization (FAO), 515
- Free fatty acids (FFAs). *See also* Fatty acids (FAs)
- avocado oil and, 82
  - camellia/tea oils and, 323, 327
  - wheat germ oil and, 361
- Fritz process of butter-making, 534
- Fruit
- avocado storage/rot, 95–97
- Fruit physiology
- avocado oil
    - growth/harvest, 76–78
    - postharvest ripening, 78–79
    - tissue types/proportions of Hass, 79
- Fuerte cultivar of avocado, 91
- Fujikawa cultivar of avocado, 91
- Fungal oil (FUO)
- acyl lipids/FA composition of, 240–241
  - allergic/toxic compounds and, 242
  - components/health-promoting properties of, 8
  - economy of, 239–240
  - edible/nonedible applications, 240
  - FA composition of, 241
  - flavor/aroma compounds of, 242
  - health benefits of dietary GLA/ALA
    - blood pressure control, 250
    - dermatitis, 243–248
    - evidence for/against, 242–243
    - miscellaneous properties, 250–254
    - plasma lipid profiles, 248–249
    - platelet aggregation, 246–248
    - rheumatoid arthritis, 245–246
  - minor compounds of, 241
  - oil cake of, 237, 239
  - oil content of, 237
  - oil extraction methods for, 240
  - processing of, 240
  - as storage form of energy, 5
  - structures of precursor FA to, 237–238
- G**
- $\gamma$ -tocopherol. *See* Tocopherols
- $\gamma$ -linolenic acid (GLA)
- and conversion of essential FAs, 6
  - oxidative stability of, 11
  - structure of, 238
- $\gamma$ -oryzanol, rice bran oil and, 393–395
- Gas, 110–111
- Gas chromatography (GC)
- authenticity issues and, 66
  - avocado oil and, 110
- Gender, ALA conversion and, 163–164
- General Descriptive Analysis, avocado oil and, 105–106
- Genetically modified organisms (GMOs), fish oils and, 523
- Geographical origin as authenticity issue, 66–67
- Gerber method of analysis, avocado oil and, 85
- German Competent Authority, 505–506
- Ghee
- adulteration and, 552
  - chemical aspects of, 544–545
  - defects in, 539

- flavor compounds in, 546–549
  - and lipids of milk fat, 539–543
  - photographs, 32
  - processing, 528, 535–537
    - as storage form of energy, 5
  - GLA, BO/EPO/FUO/BCO and, 240–241, 243–244, 248–249, 251–252
  - Glycolipids, niger seed oil and, 288–289
  - Gold of pleasure. *See* Camelina/camelina oil
  - Gooseberry oil, components/health-promoting properties of, 8
  - Gourmet specialty oils. *See also specific oil, i.e. Wheat germ oil (WGO)*
    - allergic/toxic compounds and, 11–12
    - authenticity/adulteration of, 11
    - components/health-promoting properties of, 3, 5, 8–9
    - defined, 1, 3, 5
    - extraction processes for, 3–4
    - oxidative stability of, 10–11
    - worldwide production/composition of, 1–2
  - Graham, Joseph, 33
  - Grapeseed oil
    - acyl lipids/FA composition, 222–225
    - allergic/toxic compounds and, 230
    - applications
      - cosmetic, 221–222
      - food/dietary supplements, 220–221
    - carotenoids in, 228–229
    - components/health-promoting properties of, 7
    - factors affecting quality of, 218–220
    - general information/global production of, 215–218
    - health benefits, 231
    - phenols in, 230
    - phytosterols in, 229–230
    - tocopherols/tocotrienols in, 226–228
    - unsaponifiable components of, 10
- ## H
- Hass cultivar of avocado. *See also* Avocado oil
    - attributes of, 106–108
    - dry matter/oil accumulation for, 88–90
    - free fatty acids (FFAs) and, 95–96
    - global production of, 74
    - lipid/dry matter content of, 77, 80
    - tissue types/proportions of, 79
  - Hayes cultivar of avocado, 91
  - Hazelnuts/hazelnut oil, 127–129, 131.
    - See also* Tree nut oils
    - components/health-promoting properties of, 7
    - health benefits and, 139–140
    - oxidative stability of, 136, 138
  - Health benefits
    - of algal oils, 499–504
    - avocado oil
      - $\alpha$ -tocopherol, 112
      - fruit, 113–114
      - monounsaturated fatty acids (MUFAs), 112
      - plant pigments, 113
      - skin health, 113
      - sterols, 113
    - barley oil and, 456, 471–473
    - berry seed/grapeseed oils and, 231
    - butter/butter oil/ghee and, 549–551
    - camellia/tea oils and, 335–337
    - corn kernel oil/corn fiber oil and, 425
    - fatty acids and, 5–6, 10
    - fish oils and, 521–523
    - flax/perilla/camelina seed oils
      - cancer, 167–168
      - cardiovascular disease (CVD), 164–167

- omega-6/omega-3 ratio, 168–170
  - gender and ALA conversion, 163–164
  - of hempseed oil, 199–203
  - nigella (black cumin) seed oil and, 307–308
  - oat oil and, 446–447
  - olive oil
    - Alzheimer's disease, 65
    - antioxidant/anti-inflammatory, 61–63, 65
    - blood pressure, 63–64
    - cancer, 64–65
    - Mediterranean diet, 59–61
    - Parkinson's disease, 65
  - pumpkin seed oil and, 354–355
  - rice bran oil and, 398–402
  - tree nut oils and, 138–140
  - wheat germ oil and, 369–371
- Heat. *See* Temperature
- Heavy metals, fish oil and, 12
- Hempseed oil
  - adulteration of, 206–207
  - allergic/toxic compounds and, 185, 197, 199
  - applications
    - current, 195–196
    - hempseed/hempseed meal, 197–198
    - nonedible, 196
  - components/health-promoting properties of, 7
  - composition of, 190–192
  - economy of, 193–195
  - FA profile of, 187
  - flavor/aroma components of, 198
  - general information/nutritional composition of, 185–186, 188
  - global production of, 194–195
  - health benefits of, 199–203
  - historical aspects of, 188–189
  - plant photographs, 21
  - processing of, 189–190
  - protein by-products of, 192–193
  - as source of ALA, 5, 10
  - stability of, 203–206
  - trans*-FA and, 3
  - whole/de-hulled hempseed, 206- Hexane and WGO extraction, 360–361
- Highly unsaturated fatty acids (HUFAs), fish oils and, 515–516
- High-performance liquid chromatography (HPLC), avocado oil and, 104
- Historical aspects
  - of algal oils, 491
  - of avocado oil, 73–74
  - of barley oil, 455–456
  - of flax/perilla/camelina seed oils, 151–152
  - of hempseed oil, 188–189
  - of nigella (black cumin) seed oil, 299–300
  - of niger seed oil, 283
  - of oat oil, 433–435
  - of olive oil, 33–34
  - of sesame seed oil, 267–268, 273
  - of tree nut oils, 127–130
  - of wheat germ oil, 359
- Hull removal and oil recovery, flaxseed oil and, 154–155
- Hydrocarbons, olive oil and, 49
- Hyperlipidemia, BO/EPO/FUO/BCO and, 247
- Hypertension, pumpkin seed oil and, 355

## I

Immune functions
  - barley oil and, 472–473
  - BO/EPO/FUO/BCO and, 250
  - health benefits (general) of omega-3

- FA, 5
  - pumpkin seed oil and, 355
- Inductive coupled plasma (ICP), authenticity issues and, 66
- Inflammation
  - BO/EPO/FUO/BCO and, 250, 253–254
  - fish oils and, 518–519
  - flax/perilla/camelina seed oils and, 165
  - and health benefits (general) of
    - omega-3 FA, 5
  - pumpkin seed oil and, 355
  - sesame seed oil and, 275–276
  - wheat germ oil and, 369–370
- International Olive Council (IOC)
  - authenticity/adulteration and, 11
  - avocado oil and, 105
  - marketing and, 33–34
  - purity/quality and, 65
- Inversion process of butter-making, 534
- J**
- Journal of the American Oil Chemists' Society*, 378
- K**
- Krill, 518
- L**
- Labeling, as authenticity issue, 66
- Laboratory-based extraction
  - avocado oil
    - technique overview, 84–85
    - use of accelerated solvent extractor (ASE®), 85–87
- Latex allergens, avocado oil and, 110–111
- Lignan secoisolariciresinol diglucoside (SDG), 152
- Lignans
  - fish oils and, 522
  - flaxseed and, 152
  - lignan secoisolariciresinol diglucoside (SDG) in flaxseed, 152
  - pumpkin seed oil and, 352
  - sesame seed, 268, 271–273, 276
  - unsaponifiable components and, 10
- Linoleic acid (LA). *See also* Fatty acids (FAs)
  - berry seed/grapeseed oils and, 223, 225
  - and conversion of essential FAs, 6
  - dietary sources of, 5–6
  - fish oils and, 517
  - pumpkin seed oil and, 347–349, 353–354
  - structure of, 238
  - wheat germ oil and, 364–365
- Linseed oil. *See also* Flaxseed oil
  - historical aspects of, 151
  - worldwide production/composition of, 2
- Lipoxygenase (LOX)
  - and conversion of essential FAs, 6
  - flax/perilla/camelina seed oils and, 153
  - olive oil flavor/aroma and, 53–54
- Liquid chromatography (LC), authenticity issues and, 66
- Liver enzymes and nigella seed oil, 307–308
- Low-density lipoprotein (LDL)
  - berry seed/grapeseed oils and, 231
  - tree nut oils and, 139
- M**
- Macadamia nut oil, 7, 127–129, 131.  
*See also* Tree nut oils
- Makkhan, 528
- Mass spectrometry (MS), authenticity issues and, 66–67

- Mediterranean diet, 59–61
- Mental health, algal oils and, 500–501
- Mercury, fish oil and, 12
- Mesocarp, 3
- Metabolic syndrome, and health benefits (general) of omega-3 FA, 5
- Microalgae. *See* Algal oils
- Milk fat. *See* Butter oil
- Monosaturated fatty acids (MUFAs)
- camellia/tea oils and, 335–336
  - carrot seed oil and, 489
  - parsley seed oil and, 489
- Monounsaturated fatty acids (MUFAs), avocado oil and, 112
- Multiple Risk Factor Intervention Trial (MRFIT), 165
- Myocardial infarction (MI), flax/perilla/camelina seed oils and, 164, 167–168
- N**
- n*-alkanols, wheat germ oil and, 367–368
- Neutral lipids (NLs)
- flax/perilla/camelina seed oils and, 156–157
  - niger seed oil and, 288
- Nigella (black cumin) seed oil
- acyl lipids/FA composition in, 302–303
  - allergic/toxic compounds and, 308
  - components/health-promoting properties of, 8
  - extraction/processing of, 300–302
  - FA composition of, 304
  - flavor/aroma compounds of, 305–306
  - health benefits of, 307–308
  - historical aspects of, 299–300
  - nonacylglycerol constituents in, 303–305
  - oxidative stability of, 306–307
- Niger seed oil
- acyl lipids/FA composition
    - acyl lipids, 287
    - fatty acids, 286–287
    - glycolipids, 288–289
    - neutral lipids, 288  - components/health-promoting properties of, 8
  - economy of, 285
  - edible/nonedible applications, 286
  - historical aspects of, 283
  - minor compounds
    - sterols, 291–292
    - tocopherols, 290–291
    - vitamin K<sub>1</sub>/β-carotene, 292–293  - oil content of, 284
  - plant photographs, 24
  - processing of, 285
  - protein/protein by-products of, 284–285
- Nonacyl (unsaponifiable) components, 271
- avocado oil
    - pigments, 103–104
    - polyphenols, 104–105
    - sterols, 103
    - tocopherols/tocotrienols, 102–103  - flax/perilla/camelina seed oils and, 157–158
- Nonacylglycerol constituents
- flax/perilla/camelina seed oils and, 157–158
  - nigella (black cumin) seed oil and, 303–305
  - sesame seed oil and, 270–272
  - tree nut oils and, 136–137
  - wheat germ oil and, 366–369
- Nonedible applications. *See* Applications of oils (edible/nonedible)
- Norm of the Codex Alimentarius, 65
- Nuclear magnetic resonance (NMR),

avocado oil and, 104–105  
Nurse's Health Study, ALA intake and, 167

## O

### Oat oil

acyl lipids/FA composition and, 439–441  
allergic/toxic compounds and, 444  
authenticity/adulteration and, 447  
components/health-promoting properties of, 8  
composition of, 434–435  
cosmetics and, 439  
edible/nonedible applications, 437–438  
enzymes/stability of, 437  
flavor/aroma compounds of, 444–445  
health benefits of, 446–447  
historical aspects of, 433–435  
minor compounds of, 441–443  
plant photographs, 29  
processing of, 435–436  
unsaponifiable components of, 10

Obesity, BO/EPO/FUO/BCO and, 254

### Oil yields

#### avocado oil

fruit quality factors (cold-pressed), 93–95  
fruit storage factors (cold-pressed), 95–97  
maturity factors (cold-pressed), 93–94  
orchard/region/country/seasonal maturity differences, 89–91  
postharvest factor of ripeness, 91  
preharvest factor of dry matter/oil accumulation, 88–89, 91–92  
preharvest factor of maturity, 87–88

processing condition factors (cold-pressed), 96, 98  
ripening factors (cold-pressed), 93–94

barley oil and, 459–460

corn kernel oil/corn fiber oil and, 414–416

Oleic acid. *See* Fatty acids (FAs)

Olive mill wastewater (OMW), 40

### Olive oil

acyl lipids/FA composition  
chemical composition, 45  
lipid biosynthesis, 43–44  
triacylglycerols (TGs) as FA glycerol esters, 45–46  
allergic/toxic compounds and, 59  
authenticity/adulteration and, 11  
components/health-promoting properties of, 7  
edible/nonedible applications, 41–43  
FA profile of, 187  
flavor/aroma compounds  
importance of lipoxygenase, 53–54  
qualification of VOO volatiles, 58  
quantification of VOO volatiles, 53–56  
rancidity, 57–59  
Statistical Sensory Wheel (SSW), 56–57

#### health benefits

Alzheimer's disease, 65  
antioxidant/anti-inflammatory, 61–63, 65  
blood pressure, 63–64  
cancer, 64–65  
Mediterranean diet, 59–61  
Parkinson's disease, 65

historical aspects of, 33–34

#### minor compounds

fatty alcohols, 47, 49  
hydrocarbons, 49



- origin, 46–47
  - phenols, 50–51
  - phospholipids, 52
  - pigments, 50–52
  - sterols, 47
  - tocopherols, 49–50
  - waxes, 52
  - photographs, 17–18
  - processing
    - automatic centrifugation system, 33, 35, 39
    - crushing, 35, 38
    - defects in VOO extraction, 35, 38
    - olive picking/harvesting, 34–35
    - standards/regulations, 36–37
    - temperature, 38–39
    - three-phase/two-phase decanters, 39–40
  - purity/authenticity/traceability, 65–67
  - as refined virgin oil, 3
  - worldwide production/composition of, 1–2
- Olive-pomace, 40
- Omega-3 fatty acids. *See also* Fish oils;
- Polyunsaturated fatty acid (PUFA)
- algal oils and, 501–505
  - BO/EPO/FUO/BCO and, 239
  - flax/perilla/camelina seed oils
    - conversion pathways, 161–162
  - flax/perilla/camelina seed oils and ratio to omega-6 FA, 168–170
  - health benefits (general) of, 5
  - hempseed oil
    - ratio to omega-6 FA, 190–191
- Omega-6 fatty acids, 5
- BO/EPO/FUO/BCO and, 239
  - flax/perilla/camelina seed oils
    - conversion pathways, 161–162
  - flax/perilla/camelina seed oils and ratio to omega-3 FA, 168–170
  - hempseed oil
    - ratio to omega-3 FA, 190–191
- Onion seed oil, 9, 487–489
- Osteoporosis, BO/EPO/FUO/BCO and, 250, 253
- Oxidation
- algal oils and, 498–499
  - berry seed/grapeseed oils and, 218–220
  - flax/perilla/camelina seed oils and, 159
  - hempseed oil and, 189, 204–205
- Oxidative stability. *See also* Stability
- of avocado oil, 98–99
  - fish oils and, 520–521
  - flax/perilla/camelina seed oils and, 158–159
  - of hempseed oil, 203–206
  - nigella (black cumin) seed oil and, 306–307
  - of sesame seed oil, 272–273
  - tree nut oils and, 136, 138
- P**
- Palm kernel, 2
- Palm oil, 2
- Parasites, pumpkin seed oil and, 355
- Parkinson's disease, olive oil and, 65
- Parsley seed oil
- components/health-promoting properties of, 9
  - general information/global production of, 479–484
  - physical properties of, 486
  - unsaponifiable components of, 10
- PCBs, fish oil and, 12
- Peanuts/peanut oil
- allergic/toxic compounds and, 140–141
  - oxidative stability of, 136, 138
  - worldwide production/composition

- of, 2
- Pecan nut oil, 7
- Pecans, 127–129, 131. *See also* Tree nut oils
- Percolation, as authenticity issue, 66
- Perilla oil
  - ALA metabolism and, 160–164
  - allergic/toxic compounds and, 170
  - components/health-promoting properties of, 7
  - edible/nonedible applications of, 155–156
  - extraction/processing of, 152–155
  - FA/acyl lipid composition of, 156–157
  - health benefits
    - cancer, 167–168
    - cardiovascular disease (CVD), 164–167
    - omega-6/omega-3 ratio, 168–170
  - historical aspects of, 151–152
  - nonacylglycerol constituents of, 157–158
  - oxidative stability of, 158–159
  - as source of ALA, 5, 10
  - taste/ flavor of, 159–160
- Peroxide value (PV)
  - avocado oil and, 82
  - and oxidative stability of flaxseed oils, 158–159
- Peroxisome proliferator-activated receptors (PPARs), fish oils and, 522–523
- Phenols
  - barley oil and, 470–471
  - berry seed/grapeseed oils and, 230
  - camellia/tea oils and, 332–333
  - corn kernel oil/corn fiber oil and, 421, 426
  - olive oil and, 50–51
- Phosphatidic acid, tree nut oils and, 133
- Phosphatidylcholine, tree nut oils and, 133
- Phosphatidylinositol, tree nut oils and, 133
- Phosphatidylserine, tree nut oils and, 133
- Phospholipids, olive oil and, 52
- Phytosterols
  - barley oil and, 462, 464–465
  - berry seed/grapeseed oils and, 229–230
  - corn kernel oil/corn fiber oil and, 418–419, 426
  - rice bran oil and, 391–393, 399–400
  - sesame seed oil and, 272
  - wheat germ oil and, 368
- Pigments. *See also* Chlorophyll
  - avocado oil and, 103–104, 113
  - barley oil and, 467
  - corn kernel oil/corn fiber oil and, 421–423
  - olive oil and, 50–52
  - pumpkin seed oil and, 350–351
- Pine nut oil, 127–131. *See also* Tree nut oils
  - components/health-promoting properties of, 7
  - health benefits and, 140
- Pistachio nut oil. *See also* Tree nut oils
  - components/health-promoting properties of, 7
  - general information/global production of, 127–128, 130–131
  - oxidative stability of, 136, 138
- Plant sterols. *See* Phytosterols; Sterols
- Plasma lipid profiles, BO/EPO/FUO/BCO and, 248–249
- Platelet aggregation, BO/EPO/FUO/BCO and, 246–248
- Policosanol
  - rice bran oil and, 396

- wheat germ oil and, 367–368, 370
  - Polyphenols, avocado oil and, 104–105
  - Polyunsaturated fatty acid (PUFA). *See also* Fatty acids (FAs)
    - algal oils and, 492–498, 504, 506
    - butter/butter oil/ghee and, 541, 550
    - fish oils and, 515, 520
    - wheat germ oil and, 364
  - Pressing systems and olive oil. *See* Olive oil
  - Prices of gourmet oil, 11. *See also* Economics
  - Processing. *See also* Extraction
    - algal oils, 492–495
    - avocado oil
      - condition factors (cold-pressed), 96, 98
    - barley oil and, 456–458
    - BO/EPO/FUO/BCO and, 240
    - camellia/tea oils and, 316–325
    - fish oils and, 504–506
    - hempseed oil and, 189–190
    - nigella (black cumin) seed oil and, 300–302
    - niger seed oil and, 285
    - oat oil and, 435–436
    - olive oil
      - authenticity issues, 66
      - automatic centrifugation system, 33, 35, 39
      - crushing, 35, 38
      - defects in VOO extraction, 35, 38
      - olive picking/harvesting, 34–35
      - standards/regulations, 36–37
      - temperature, 38–39
      - three-phase/two-phase decanters, 39–40
    - pumpkin seed oil and, 346–347
    - of sesame seed oil, 268–269
    - tree nut oils and, 130–132
  - Prostaglandin E2 (PGE-2), and
    - conversion of essential FAs, 6
    - Prostaglandin E3 (PGE-3), and
      - conversion of essential FAs, 6
    - Prostate cancer, pumpkin seed oil and, 354
    - Protected geographical indication (PGI), pumpkin seed oil and, 355
    - Pumpkin press cake, 352
    - Pumpkin seed oil
      - authenticity/adulteration and, 352–353
      - components/health-promoting properties of, 8
      - extraction/processing of, 346–347
      - fatty acid composition of, 347–349
      - global production of, 345
      - health benefits, 354–355
      - lignans of, 352
      - new variety development of, 345–346
      - oil stability and, 353
      - pigments of, 350–351
      - plant photographs, 27
      - pumpkin press cake composition, 352
      - sterols of, 349–350
  - Purity
    - algal oils and, 493–495
    - olive oil and, 65–67
  - Purple mint. *See* Perilla oil
- ## Q
- Quality
    - avocado oil and, 108–110
    - camellia/tea oils and, 315–317
    - fish oils and, 520–521
    - flax/perilla/camelina seed oils and, 153
- ## R
- Rancidity. *See also* Flavor/aroma;  
Oxidation

- avocado oil and, 103
- butter/butter oil/ghee and, 551
- olive oil flavor/aroma and, 57–59
- pumpkin seed oil and, 354
- Rape/canola oil, 2
- Raspberry oil. *See* Berry seed/grapeseed oils
- Red currant oil, 8
- Reed cultivar of avocado, 91
- Refining, bleaching, and deodorizing (RBD). *See also* Processing
  - algal oils and, 493–494
  - aroma/taste and, 1
  - avocado oil and, 81–83
  - camellia/tea oils and, 322–324
  - corn kernel oil/corn fiber oil and, 425
  - processing and, 41
  - rice bran oil and, 382
  - typical process, 386
  - wheat germ oil and, 361–362
- Refractometric method of analysis, avocado oil and, 85
- Rheumatoid arthritis, BO/EPO/FUO/BCO and, 245–246
- Rice bran oil
  - allergic/toxic compounds and, 397–398
  - components
    - gamma-oryzanol, 393–395
    - major lipid classes/FA, 388–389
    - phytosterols, 391–393
    - policosanols, 396
    - tocols, 390–391
    - waxes, 395–396
  - components/health-promoting properties of, 8
  - edible/nonedible applications, 387–388
  - extraction/processing
    - extraction developments, 379–381
    - overview, 378
    - refining, 381–383
    - refining developments, 383–387
    - flavor/aroma compounds, 397
    - health benefits, 398–402
    - plant photographs, 28
    - as underutilized oil, 377–378
    - unsaponifiable components of, 10
- Rice: Chemistry and Technology* (Godber and Juliano), 386
- S**
- Salad oil, 352
- Saponins, camellia/tea oils and, 324–325, 332, 336–337
- Secoisolaricresinol, 352. *See also* Lignans
- Seed oils. *See specific oil, i.e. Carrot seed oil*
- Sensory assessment. *See also* Flavor/aroma
- Sensory assessment, olive oil and, 40
- Sesame seed oil
  - acyl lipids/FA composition of, 269
  - allergic/toxic compounds and, 277
  - components/health-promoting properties of, 8
  - extraction/processing of, 268–269
  - flavor/aroma compounds of, 272
  - health benefits
    - lipid metabolism/inflammatory response effect, 275–276
    - reduction of serum cholesterol, 273–274
    - vitamin E enhancement, 274–275
  - historical aspects of, 267–268, 273
  - nonacylglycerol constituents in, 270–272
  - oxidative stability of, 272–273
  - plant photographs, 23
  - as refined virgin oil, 3
  - unsaponifiable components of, 10

- worldwide production/composition of, 2
  - SEXIA™, 66–67
  - Skin care
    - avocado oil and, 113
    - camellia/tea oils and, 327–328
    - and health benefits (general) of omega-3 FA, 5
  - Soxhlet method of analysis, avocado oil and, 85
  - Soybean oil
    - and adulteration of camellia oil, 337
    - FA profile of, 187
    - worldwide production/composition of, 2
  - Specialty oils. *See* Gourmet specialty oils
  - Sphingolipids, tree nut oils and, 133
  - Stability. *See also* Oxidation; Oxidative stability
    - of algal oils, 498–499
    - algal oils and, 498–499
    - butter/butter oil/ghee and, 539
    - carrot seed oil and, 485
    - onion seed oil and, 485
    - parsley seed oil and, 479–481
    - pumpkin seed oil and, 353
  - Starch lipids, barley oil and, 470
  - Statistical Sensory Wheel (SSW), olive oil and, 56–57
  - Stearidonic acid (SDA)
    - and conversion of essential FAs, 6
    - and EPA/DHA production, 10
    - hempseed oil and, 202
    - oxidative stability of, 11
  - Sterols
    - avocado oil and, 102–103
    - camellia/tea oils and, 330–333
    - flax/perilla/camelina seed oils and, 158
    - health benefits
      - avocado oil, 113
      - nigella (black cumin) seed oil and, 304
      - niger seed oil and, 291–292
      - oat oil and, 446
      - olive oil and, 47
      - pumpkin seed oil and, 349–350
      - sesame seed oil and, 272
      - tree nut oils and, 133
  - Sterylglycosides, flax/perilla/camelina seed oils and, 156–157
  - Stroke, flax/perilla/camelina seed oils and, 164, 167–168
  - Styrian pumpkin seed oil. *See* Pumpkin seed oil
  - Sunflower oil
    - FA profile of, 187
    - worldwide production/composition of, 2
  - Supercritical CO<sub>2</sub>
    - camellia/tea oils and, 319, 321
    - wheat germ oil and, 362–363
  - Supercritical fluid extraction (SFE)
    - flax/perilla/camelina seed oils and, 155
    - oat oil and, 436
    - rice bran oil and, 380–381
    - tree nut oils and, 132
- T**
- Taste/flavor. *See* Flavor/aroma
  - Tea oil
    - acyl lipids, 328–330
    - adulteration and, 337–338
    - edible/nonedible applications, 324–328
    - flavor/aroma compounds, 333–335
    - global production of, 314–315
    - gross properties of, 315–317
    - health benefits, 335–337
    - historical aspects of, 313–314
    - minor compounds, 330–333

- processing
    - cooking, 318
    - cracking/flaking, 318
    - dehulling, 316, 318
    - extraction, 318–322
    - harvest, 316
    - refining, 322–324
    - utilization of defatted cake, 324–325
  - Temperature
    - avocado oil extraction and, 87
    - camellia/tea oils and, 319–320
    - pumpkin seed oil and, 346–347
    - virgin oils and, 3
    - and winterization of rice bran oil, 384
  - Tocopherols. *See also* Vitamin E
    - algal oils and, 491
    - avocado oil and, 102–103
    - barley oil and, 464, 466–469
    - berry seed/grapeseed oils and, 226–228
    - camellia/tea oils and, 330–333
    - corn kernel oil/corn fiber oil and, 419–421, 424–425
    - flaxseed oil and, 157
    - niger seed oil and, 290–291
    - olive oil and, 49–50
    - onion seed oil and, 487–488
    - parsley seed oil and, 479–481
    - pumpkin seed oil and, 349–350
    - rice bran oil and, 390–391
    - wheat germ oil and, 367
  - Tocotrienols
    - avocado oil and, 102–103
    - barley oil and, 464, 466–469
    - berry seed/grapeseed oils and, 226–228
    - corn kernel oil/corn fiber oil and, 424–425
    - oat oil and, 446
  - rice bran oil and, 390–391, 399–400, 402
  - Toxic compounds and oils, 12
    - algal oils, 504–506
    - avocado oil
      - dienes, 111
      - formal studies, 112
      - latex allergens, 110–111
    - fish oils, 504–506
  - Traceability, olive oil and, 65–67
  - Tree nut oils
    - allergenicity of, 140–141
    - authenticity/adulteration and, 141
    - edible/nonedible applications, 132–133
    - extraction/processing of, 130–132
    - FA/acyl lipid composition of, 133–135
    - flavor/taste and, 138
    - health benefits, 138–140
    - historical aspects of, 127–130
    - nonacylglycerol constituents, 136–137
    - oxidative stability of, 136, 138
  - Triacylglycerols (TAG)
    - flax/perilla/camelina seed oils and, 156
    - hempseed oil and, 200
    - tree nut oils and, 133, 135
  - Triterpenoids
    - camellia/tea oils and, 332–333
    - wheat germ oil and, 368–369
- ## U
- Unsaponifiables. *See also* Nonacyl (unsaponifiable) components
    - avocado-soybean unsaponifiables (ASUs), 114
    - butter/butter oil/ghee and, 540
    - rice bran oil and, 399
    - tree nut oils and, 136–137

wheat germ oil and, 368

## V

Very low density lipoprotein (VLDL)

algal oils and, 499

tree nut oils and, 140

Villavecchia test, olive oil and, 11

Virgin oils. *See also* Olive oil

defined, 3

olive oil

extraction defects, 35, 38

International Olive Council  
standards, 33–34

three-phase/two-phase decanters,  
39–40

volatiles and flavor/aroma, 53–56,  
58

Vitamin E. *See also* Tocopherols

Parkinson's disease and, 65

pumpkin seed oil and, 349–350, 354

Vitamin K<sub>1</sub>, niger seed oil and, 292–293

Vitamins/minerals

hempseed oil and, 188

pumpkin seed oil and, 349–350, 354

sesame seed oil and, 274–275

Volatiles, olive oil flavor/aroma and,  
53–56, 58

## W

Walnuts/walnut oil. *See also* Tree nut oils

components/health-promoting  
properties of, 7

general information/global

production of, 127–128, 130–131

health benefits and, 140

oxidative stability of, 136, 138

as source of ALA, 5, 10

Waste streams, avocado oil and, 84

Wastewater, olive oil and, 40

Waxes

olive oil and, 52

rice bran oil and, 395–396

Westfalia and butter oil, 535

Wheat germ oil (WGO)

acyl lipids/FA composition, 364–366

components/health-promoting

properties of, 8

content of, 363

extraction/processing, 360–363

FA profile of, 187

health benefits, 369–371

historical aspects of, 359

nonacylglycerol constituents in,  
366–369

plant photographs, 27

properties of, 363–364

unsaponifiable components of, 10

utilization of, 360

World Conference on Oilseeds and

Edible Oil Processing, 378

## X

X-M process of rice bran oil extraction,  
379

## Z

Zucchini yellow mosaic virus (ZYMV),  
346