

INDEX

A

- Acetazolamide, 302
- N-Acetyl- β -D-glucoaminidase as
 - endpoint cooking temperature indicator, 171
- Acid phosphatase test, 170
 - endpoint cooking temperature indicator, 172
- Acids, age-related taste threshold, 257, 259
- Acyclovir, 300
- Adenosine, 303
- Ageusia, 249
 - elderly people, 256
 - see also* Taste perception
- Albuterol sulfate, 301
- Aldesleukin, 293
- Aldolase as endpoint cooking temperature indicator, 171
- Alfalfa phytoestrogens, 197, 203
 - coumestans, 211
 - isoflavones, 203, 207
- Allicin, 321
- Allopurinol, 314
- α -amylase, as time-temperature integrator, 180–181
- Alprazolam, 310
- Alzheimer's disease, smell/taste
 - perception changes, 280–282
- Amebicides, taste sensation effects, 286
- Amiloride, 303
- Amino acids, age-related taste thresholds, 257, 260
- Amiodarone, 303, 320
- Amitriptyline, 310, 312, 323
- Amlodipine, 303
- Amoxapine, 310
- Amphetamine, 313, 323
- Amphotericin B, 289
- Ampicillin, 289
- Amygdala, 255
- Analgesic–antipyretic agents
 - smell sensation effects, 320
 - taste sensation effects, 294–297
- Anesthetics
 - smell sensation effects, 320
 - taste sensation effects, 287
- Anhydrosecoisolaricresinol, 199
- Anosmia, 249
 - see also* Smell perception
- Anti-inflammatory agents
 - smell sensation effects, 321
 - taste sensation effects, 294–297
- Anti-Parkinson's disease drugs, taste
 - sensation effects, 309–310
- Antiarrhythmic/antifibrillatory agents
 - smell sensation effects, 320–321
 - taste sensation effects, 302–307
- Antiarthritic agents, taste sensation effects, 294–297
- Antiasthmatic drugs, taste sensation
 - effects, 301–302
- Anticholesteremic/antilipidemic agents
 - smell sensation effects, 320
 - taste sensation effects, 287–288
- Anticoagulants, taste sensation effects, 287–288

- Antiepileptic agents, taste sensation effects, 310–313
- Anthelmintics, taste sensation effects, 286
- Antihemophilic factor, 315
- Antihistamines, taste sensation effects, 288–289
- Antihypertensive agents
 buckwheat, 408
 smell sensation effects, 320–321
- Antimicrobial agents
 smell sensation effects, 321–322
 taste sensation effects, 289–293
- Antioxidants
 multicomponent edible film carriage, 384
 phytoestrogens, 225–226
- Antirheumatic agents, taste sensation effects, 294–297
- Antiseptics, taste sensation effects, 298
- Antispasmodics, taste sensation effects, 298
- Antithrombin III, 315
- Antithyroid agents
 smell sensation effects, 322
 taste sensation effects, 298–299
- Antulcerative agents, taste sensation effects, 299–300
- Antiviral agents, taste sensation effects, 300
- Apiginein, 197
- APIZYM enzyme system, 170
- Apois americana Medicus*, 202
- Apoptotic pathways, taste bud cells, 251
- Apple cider, pulsed electric field (PEF)
 processing
 flavor, 21
 shelf-life, 16
- Apple juice, pulsed electric field (PEF)
 processing, 26, 27
 flavor/vitamin C content retention, 20–21
 microbial inactivation, 13–14
 shelf-life, 16
- L-Aspartate-2-oxoglutarate
 aminotransferase as endpoint
 cooking temperature indicator, 171
- Aspergillus*, 213
- Atomic force microscopy, fat crystal networks, 66–75
- Atovaquone, 289
- Auranofin, 294
- Aurothioglucose, 294
- Australian buckwheat products, 415
- Azathioprine, 293
- Aztreonam, 289
- ## B
- Bacillus amyloliquefaciens* α -amylase, 181, 182
- Bacillus licheniformis* α -amylase, 180–181
- Bacillus subtilis* α -amylase, 182
- Baclofen, 309
- Bamifylline, 314
- Bax, 251
- Beclomethasone dipropionate, 301, 321
- Benazepril, 303
- Benzamphetamine, 313
- Benzocaine, 287
- Benzoxaprofen, 294
- Bepidil, 315
- Betaxolol, 303
- Biochanin A, 197
 sources, 203, 207
- Bisoprolol, 303
- Bitolterol mesylate, 301, 322
- Bitter taste, age-related threshold, 257, 259
- Blackberry (*Rubus fruticosus*), 207, 211
- Bleomycin, 289
- Blueberry (*Vaccinium corymbosum*), 211
- Bone, phytoestrogen health protective effects, 227–229
- Bovine Catalase test, 170
 endpoint cooking temperature indicator, 171–172
- Box-counting dimension, 86–88
- Bradyrhizobium japonicum*, 200
- Brevibacterium epidermidis*, 213
- Bronchodilators
 smell sensation effects, 322
 taste sensation effects, 301–302
- Buckwheat, 395–419
 allergy, 408–409
 breeding programmes, 397
 component studies, 409–410
 culture of utilization, 399–400
 flour composition, 402–408
 carbohydrate, 405–406
 dietary fiber, 406

- enzymes/enzyme inhibitors, 405
 - lipid, 406–407
 - minerals, 407–408
 - protein, 403–405
 - rutin, 408
 - vitamins, 408
 - flour fractions, 402, 416–417
 - mechanical properties of products, 416–417
 - milling, 402
 - molecular basis of palatability, 416–418
 - processing, 410–416
 - China, 413–414
 - Europe, 414–415
 - groats, 413, 414
 - Japan, 412–413, 417
 - Korea, 414
 - noodle technology, 410–411
 - North America, 415–416
 - Russia, 414–415
 - quality characteristics, 398
 - research approaches, 418–419
 - storage-related changes, 417–418
 - taxonomic/phylogenetic studies, 397
 - varieties, 396–398
 - worldwide cultivation, 398–399
 - worldwide names, 401–402
 - Buspirone, 310, 323
 - Butorphanol, 294
- C**
- Calcitonin, 315
 - Campylobacter coli*, 162
 - Campylobacter fetus*, 162
 - Campylobacter* foodborne illness, 152, 162
 - Campylobacter jejuni*, 162
 - Cancer patients
 - flavor-enhanced food preferences, 330
 - learned food aversions, 280
 - smell/taste perception changes, 275–280
 - Cancer protective effects, phytoestrogens, 229–232
 - lignans, 230–231
 - soy bean isoflavones, 229–230
 - Capillary zone electrophoresis, phytoestrogens, 202
 - Capsaicin, age-related taste threshold, 257–260
 - Captopril, 304
 - Carbamazepine, 310
 - Carbenicillin, 289
 - Carbimazole, 298, 322
 - Carboplatin, 293
 - Cardiovascular protective effects, phytoestrogens, 232–234
 - Carmustine, 293
 - Casein-lipid films, 372–373
 - Cefamandole, 289
 - Cefpodoxime, 290
 - Ceftriaxone, 290
 - Cefuroxime, 290
 - Chao-mai* see Buckwheat
 - Chemesthesis, taste perception relationship, 253
 - Chemical time-temperature integrators, 182–183
 - Chemically interesterified (CIE) lard, 38
 - rheological analysis, 57
 - Chemically interesterified (CIE) milkfat
 - fractal dimensions, 56, 57
 - macroscopic hardness indicators, 38–41, 57
 - rheological analysis, 56–57
 - scanning electron microscopy, 61, 63, 64
 - Chemically interesterified (CIE) palmoil, 38
 - rheological analysis, 57
 - Chemotherapy, smell/taste perception changes, 275, 277, 278, 279, 293–294
 - Chickpea phytoestrogens, 197
 - isoflavones, 203
 - Chinese buckwheat products, 413–414, 416
 - Chitosan-lipid edible films, 358
 - Chlordiazepoxide, 310
 - Chlorhexidine digluconate, 301
 - Chlormezanone, 309
 - Chlorpheniramine, 288
 - Cholestrol-lowering effects
 - soy protein/soy isoflavones, 232–234
 - Tartary buckwheat, 409
 - Cholestyramine, 287
 - Choline magnesium trisilicate, 295
 - Chromatography, meat endpoint temperature monitoring, 175
 - Ciprofloxacin, 290, 321
 - Circumvallate papillae, 251, 252, 253

- Cisplatin, 293
 Clarithromycin, 290
 Clavulanate, 293, 322
 Clidinium bromide, 299
 Clindamycin, 290
 Clofazimine, 290
 Clofibrate, 288
 Clomipramine, 310, 323
 Clonidine, 304
Clostridium botulinum spores, thermal
 inactivation, 181, 182
 Clover phytoestrogens, 197
 coumestans, 211
 isoflavones, 203, 207
 lignans, 207
 Clozapine, 311
 Coagulation test, 170
 Cocaine, 320
 Codeine, 323
 Coffee lignans, 207
 Colchicine, 295
 Colloidal gels, 45–54
 elastic properties, 48–54
 fractal nature, 45–47
 scaling relationships, 49–54
 Common buckwheat (*Fagopyrum
 esculentum*), 396, 397
 Confocal laser scanning microscopy, fat
 crystal networks, 38, 63–65, 66, 67
 Conoxacin, 290
 Cooking, meat/poultry products *see*
 Thermal processing
 Corn zein protein composite films, 382
 Corn zein-lipid films
 applications, 381
 water barrier properties, 375–376
 Coumestans, 196, 197
 analytical methods, 201
 bioavailability/metabolism, 221
 chemistry, 198
 sources, 211–212, 214
 Coumestrol, 198, 199, 221
 anticancer activity, 232
 antioxidant activity, 225
 estrogen receptor interactions, 222, 223
 in vitro effects, 223
 in vivo estrogenic effects, 224–225
 sources, 211–212
 Cranberry juice, pulsed electric field
 (PEF) processing
 flavor/color impact, 21, 22
 microbial inactivation, 14–15
 electrical conductivity influence,
 22–23
 shelf-life, 16
 Cranberry (*Vaccinium oxycoccos*) lignans,
 211
 Creatine phosphotransferase as endpoint
 cooking temperature indicator, 171
 Cromolyn sodium, 301
 Cyclobenzaprine, 309
- D**
- D* values, 152
Campylobacter jejuni, 162
 enzymatic time-temperature integrators,
 180
Escherichia coli O157:H7, 158, 159,
 160, 161, 163, 165
Listeria monocytogenes, 160
 microbiological time-temperature
 integrators, 179
Salmonella, 153, 154, 155, 156, 157,
 158, 163, 164, 165
 Daidzein, 197, 221
 anticancer activity, 232
 antioxidant activity, 225
 assay methods, 201, 202, 203
 effects of processing, 213, 214
 estrogen receptor interactions, 222, 223
 fungal/bacterial fermentation, 213
 in vitro effects, 223
 metabolism, 220
 pharmacokinetics, 218
 sources, 203, 205
 toxicity, 226
 Daidzin
 pharmacokinetics, 218
 sources, 205
 Dantrolene sodium, 309
 Dapsone, 290
 Dental hygiene agents, taste sensation
 effects, 300–301
 Desipramine, 311
 Dexamethasone, 295, 321
 Dextroamphetamine, 313
 Diazoxide, 304, 307
 Dibucaine, 287
 Diclofenac, 295
 Dicyclomine, 298

Didanosine, 285
 Differential scanning calorimetry
 enzymatic time-temperature integrators,
 181, 182
 fat crystal network fractal dimensions,
 115–118
 meat endpoint temperature monitoring,
 175
 Diffusion-limited aggregation, 45, 47
 Diltiazem, 304, 320
 Dimethyl sulfoxide, 295
 Dipyrindamole, 314
 Diuretics, taste sensation effects, 302–307
 Doxazosin, 304
 Doxepin, 311
 Doxorubicin, 293
 Dysgeusia, 249
 elderly people, 256
 see also Taste perception
 Dysosmia, 249
 see also Smell perception

E

Edible coatings/films, 347–389
 barrier properties, 348, 349–351
 carrier functions, 348
 antioxidants incorporation, 384
 coating formation technique, 351
 definition, 348
 emulsion formation technique, 351
 gas permeability, 349, 350
 polysaccharide-lipid *see*
 Polysaccharide-lipid edible films
 polysaccharide-polysaccharide, 382
 polysaccharide-protein, 382
 polysaccharide-protein with food
 additives, 382
 protein-lipid *see* Protein-lipid edible
 films
 protein-protein, 382–384
 solute permeability, 349
 volatile permeability, 349
 water vapor permeability, 349, 350
 Elderly people, chemosensory losses,
 247–331
 disease-related *see* Smell perception;
 Taste perception
 flavor enhancement compensation *see*
 Flavor enhancement
 medication effects *see* Medication
 smell perception, 262–264
 suprathreshold perceptual losses,
 263–264
 threshold detection elevation, 263
 trigeminal stimulants, 264
 taste perception, 256–262
 suprathreshold perceptual losses,
 260–262
 threshold recognition/detection
 elevation, 256–260
 trigeminal stimulants, 257–258
 Electron microscopy, fat crystal network
 microstructure, 38
 Electrophoretic separation, meat endpoint
 temperature monitoring, 175
 Enalapril, 305, 320
 Endocrine disease
 smell perception effects, 272
 taste perception effects, 267
 Endpoint cooking temperature indicators,
 meat/poultry products, 169–176
 enzymatic methods, 170–173
 immunoassays, 173–175
 physical methods, 175–176
 USDA tests, 170
 Endpoint procedure (quantal response),
 179
 Enoxacin, 290
Enterococcus faecium, thermal
 inactivation, 165
 Enterodiol, 199, 207
 antioxidant activity, 226
 metabolism, 221–222
 toxicity, 226
 Enterolactone, 199, 207
 anticancer activity, 232
 antioxidant activity, 226
 cardiovascular health protective effects,
 234
 metabolism, 221–222
 toxicity, 226
 Enzymatic time-temperature integrators,
 180–182
 Enzymatically interesterified (EIE)
 milkfat, 38
 Enzyme-linked immunosorbent assay
 (ELISA)
 endpoint cooking temperature
 indication, 174–175
 phytoestrogens, 203

Ephedrine, 302
 Equol, 202, 203, 221
 antioxidant activity, 225
 metabolism, 220
Escherichia coli, pulsed electric field (PEF) inactivation, 11, 13
Escherichia coli O157:H7
 foodborne illness, 152
 undercooked meat, 148, 149
 pulsed electric field (PEF) inactivation, 13, 14
 thermal inactivation, 163
 kinetics, 158–159, 160, 161
 mathematical models, 165
 sample variables, 166
 USA meat processor regulations, 150
Escherichia coli 8739, pulsed electric field (PEF) inactivation, 13
 Esmolol, 305
 Estazolam, 307
 Estrogen receptor binding assay, 196
 Estrogen receptor-dependent
 transcriptional assay, 196–197
 Estrogen receptors, phytoestrogen effects, 222–223
 Estrogen-related phytoestrogen effects
 in vitro neoplastic cell growth, 223
 in vivo, 224–225
 Ethacrynic acid, 305
 Ethambutol, 291
 Etidronate, 315
 Etodolac, 295
 Etreinate, 315
 Euprocine, 287
 European buckwheat products, 414–415

F

Fagopyrum cymosum (perennial buckwheat), 396, 397
Fagopyrum esculentum (common buckwheat), 396, 397
Fagopyrum esculentum spp. *ancestrale*, 399
Fagopyrum homotropicum, 397
Fagopyrum tartaricum see Tartary buckwheat
 Famotidine, 299
 Fat crystal networks, 33–141
 atomic force microscopy, 66–75, 88

confocal laser scanning microscopy, 63–65, 66, 67, 88
 formation process
 crystallization observations, 80, 81, 82
 microstructural elements, 83
 microstructure clusters, 83
 particle nomenclature, 82–83
 fractal dimensions
 calculation from rheology, 104–106, 108
 crystallization conditions influence, 113–118, 119–120
 density/order of packing relationship, 109–113
 elastic constant influences, 107–109
 physical significance, 107
 fractal nature, 84–85, 94–100, 123–124
 use of thresholding methodology, 93, 94, 96–100
 hardness, 36, 37
 macroscopic indicators, 38–41, 57
 processing conditions dependence, 140
 solid fat content dependence, 133
 mechanical model at low deformations, 121–140
 mechanical strength modeling, 35
 microscopic characterization, 61–82
 self-similarity, 71, 72, 73, 74
 microstructure, 35, 36, 38–42
 structural model, 82–84
 weak link theory, 100–103, 121–122, 124, 132
 network models, 58–60, 123, 124–129
 forces between microstructures, 125–129
 particle volume fraction/solid fat
 content relationship, 103–104, 122
 polarized light microscopy, 61–63, 65, 75–80, 88
 fractal dimensions calculation, 88–94
 rheological analysis, 41–42, 55, 56–57, 104–106
 scaling theory, 55–58
 scanning electron microscopy, 61, 63, 64, 88
 sensory impressions of fat-containing foods, 35–36, 37
 storage modulus, 36, 122–123, 129–131, 133–134

- processing conditions influence, 136–139
 - structural hierarchy, 35, 36, 83, 84
 - Felbamate, 311
 - Fenbutrazate, 324
 - Fenfluramine, 313
 - Fenoprofen, 295
 - Fermentation, soy products, 213–214
 - Filiform papillae, 251
 - Flavonoids, 196, 197
 - Flavor enhancement, effects in elderly people, 325–330
 - cancer patients, 330
 - lymphocyte count response, 326–328
 - nutritional parameters improvement, 329
 - salivary flow/IgA content improvement, 328–329
 - sodium intake effects, 329–330
 - Flaxseed lignans, 207, 211
 - antiestrogenic effects, 225
 - cancer protective effects, 231
 - effects of processing, 217–218
 - metabolism, 221–222
 - Flecainide, 305
 - Flunisolide, 302, 321
 - Fluorouracil, 294
 - Fluoxetine, 311
 - Flurazepam, 307
 - Flurbiprofen, 295, 321
 - Fluvastatin, 288
 - Foliate papillae, 251, 252
 - Food Code, FDA meat products cooking recommendations, 149
 - Foodborne illness
 - bacterial pathogens, 152
 - Campylobacter*, 162
 - Salmonella*, 153
 - undercooked meat, 148
 - Formononetin, 197, 203, 221
 - sources, 203, 207
 - Foscarnet sodium, 300
 - Fosinopril, 305
 - Fractal dimensions, 45
 - box-counting dimension calculation, 86–88
 - determination methods, 85–88
 - fat crystal networks, 84–85, 94–100
 - calculation from rheology, 104–106, 108
 - crystallization conditions influence, 113–118, 119–120
 - density/order of packing relationship, 109–113
 - elastic constant influences, 107–109
 - physical significance, 107
 - Fractal geometry, 42–45
 - colloidal aggregates, 45–46
 - Fractional dimensions, 43–44
 - Fragaria ananassa* (strawberry), 207
 - French buckwheat products, 415
 - Fruit juices, pulsed electric field (PEF)
 - processing, 26
 - microbial inactivation, 12–15
 - quality impact, 16–21
 - color changes, 17
 - flavor, 16–17
 - nutritional aspects, 17
 - shelf-life, 15–16
 - Fruit ripening retardation, polysaccharide-lipid edible films, 370
 - Fungiform papillae, 251
 - Fusaria* mycotoxins, 196
- G**
- Gadodiamide, 316
 - Garbanzo beans *see* Chickpeas
 - Gas chromatography-mass spectrometry, phytoestrogens, 201
 - Gelatin-lipid films, 372–373
 - Gemfibrozil, 288
 - Genistein, 197
 - anticancer activity, 232
 - antioxidant activity, 225
 - assay methods, 201, 202
 - cancer treatment, 230
 - effects of processing, 214
 - estrogen receptor interactions, 222, 223
 - in vitro* effects, 223
 - pharmacokinetics, 218, 219, 220
 - sources, 203, 205
 - toxicity, 226
 - Genistin, 218
 - Germine monoacetate, 316
 - Glipizide, 307
 - Glutamate salts, age-related taste thresholds, 257, 261
 - Glutamic oxalacetic transaminase as endpoint cooking temperature indicator, 171

Glutamic pyruvic transaminase as
 endpoint cooking temperature
 indicator, 171
Gluten-keratin multicomponent films, 382
Glycitein, 197, 202
 fungal/bacterial fermentation, 213
 sources, 203, 205, 207
Glycopyrrolate, 299
Gold, 296
Granisetron, 316
Griseofulvin, 291
Guanfacine, 305
Gut microbial metabolism
 isoflavones, 218–220
 lignans, 199, 207, 221

H

HACCP program of meat processors, 148
Hexitidine, 298
Histamine phosphate, 316
HIV-therapeutic drugs
 smell sensation effects, 320
 taste sensation effects, 285–286
HPLC-mass spectrometry, phytoestrogens,
 201, 202
Hydrobromide, 298
Hydrochlorothiazide, 305, 307
Hydrocortisone, 296
Hydromorphone, 296, 323
Hydroxypropyl methylcellulose-based
 composite edible films, 351,
 352–356, 358
 applications, 370
 gas permeability, 365
 relative humidity effects, 363
 solute barrier properties, 368, 369
 temperature effects, 364, 369
Hyoscamine, 298, 299
Hyperglycemic agents, taste sensation
 effects, 307
Hypnotics, taste sensation effects,
 307–308
Hypogeusia, 249
 elderly people, 256
 see also Taste perception
Hypoglycemic agents, taste sensation
 effects, 307
Hyposmia, 249
 see also Smell perception

I

Ibuprofen, 296
Idoxuridine, 300
Imipenem-cilastatin, 291
Imipramine, 311
Immunoassays, meat/poultry endpoint
 cooking temperature indicators,
 173–175
Immunosuppressive agents, taste sensation
 effects, 293–294
Indanyl sodium, 289
Indinavir, 285
Interferons, 294, 300
Iohexol, 316
Ipriflavone, 228
Iron sorbitex, 316
Isethionate, 292
Isocitric dehydrogenase as endpoint
 cooking temperature indicator, 171
Isoflavones, 196, 197
 analytical methods, 201, 202
 antioxidant activity, 225–226
 bioavailability/metabolism, 218–220
 chemistry, 197
 effects of processing, 212–217
 fungal/bacterial fermentation, 213
 gut microbial metabolism, 218–220
 health protective effects
 bone, 227–228, 229
 cancer, 229–230
 cardiovascular, 232–234
 role in plants, 200
 sources, 203–207
 database, 205–207
Isosorbide mononitrate, 314
Italian buckwheat products, 414–415

J

Japanese buckwheat noodles, 412–413,
 416, 417

K

Kaempferol, 197
Ketoprofen, 296
Ketorolac, 296
Konjak, 407, 408
Korean buckwheat products, 414
Kudzu root isoflavones, 205

L

- Labetolol, 306
- Lactate dehydrogenase
 - endpoint cooking temperature indicator, 171, 172
 - immunoassay (ELISA), 174–175
- Lactobacillus brevis*, pulsed electric field (PEF) inactivation, 11
- Lamivudine, 285
- Lentil lignans, 207
- Leucine aminopeptidase as endpoint cooking temperature indicator, 170
- Leuprolide acetate, 316
- Levamisole, 294, 324
- Levodopa, 309
- Lidocaine, 287
- Light microscopy, fat crystal network microstructure, 38
- Lignans, 196, 197
 - analytical methods, 201
 - antioxidant activity, 226
 - bioavailability/metabolism, 221–222
 - cancer protective effects, 230–231
 - chemistry, 199
 - effects of processing, 217–218
 - gut microbial metabolism, 199, 207, 221
 - in vivo* antiestrogenic effects, 225
 - role in plants, 200
 - sources, 207–211
 - structure, 208
- Lignins, 200
- Limbic system, 255
- Lincomycin, 291
- Lingonberry (*Vaccinium vitusidea*), 207, 211
- Listeria*
 - pulsed electric field (PEF) inactivation, 11, 13
 - thermal inactivation kinetics, 159–160, 162
- Listeria monocytogenes*
 - thermal inactivation kinetics, 159–160, 162
 - USA meat processor regulations, 150
- Lithium carbonate, 311
- Lomefloxacin, 291
- Loratadine, 289
- Lovastatin, 288

M

- Malate dehydrogenase as endpoint cooking temperature indicator, 171
- Maprotiline, 312
- Mass fractal dimension, 45
- Mazindol, 313
- Meat processors, USA time/temperature protocol regulations, 149–152
- Meat products, thermal processing *see* Thermal processing
- Meat thermometers, cooking adequacy verification, 166–167
- Medication
 - hyposalivary side effects, 319, 325
 - smell perception effects, 283–284, 319, 320–324
 - taste perception effects, 283–284, 285–318, 319
- Membrane pore formation, microbial inactivation by pulsed electric field (PEF), 10
- Mesalamine, 299
- Mesna, 317
- Metabolic disease, smell perception effects, 271
- Metairesinol, 199, 207, 218
 - metabolism, 221
- Metaproterenol, 302
- Methamphetamine, 313
- Methazolamide, 317
- Methimazole, 298, 322
- Methocarbamol, 309
- Methotrexate, 293
- Methylcellulose-based composite edible films, 351, 352–355
 - applications, 370
 - gas permeability, 365
 - relative humidity effects, 363, 369
 - solute barrier properties, 368–369
 - temperature effects, 364, 369
- Methylergonovine, 317
- Methylthiouracil, 299, 322
- Metolazone, 306
- Metronidazole, 286
- Mexiletine, 306
- Mezocillin, 291
- Microbacterium aborescens*, 213
- Microbial inactivation
 - heat, 147–186

- Microbial inactivation – *contd*
see also Thermal processing,
 meat/poultry products
 pulsed electric field (PEF) processing,
 10–15
 determinant factors, 11–12
 high acid liquid foods (fruit juices),
 12–15
 temperature, 11, 12
 Microbiological time-temperature
 integrators, 179–180
 endpoint procedure (quantal response),
 179
Micrococcus luteus, 213
 Microcrystalline cellulose/corn starch
 composite films, 384
 Midazolam, 308
 Milk-based composite films, 383
 Miso isoflavones, 213
 Misoprostol, 299
 Moricizine, 306
 Morphine, 296, 323
 Multiple photon microscopy (MPM), fat
 crystal network microstructure, 38
 Muscle relaxants, taste sensation effects,
 309–310
 Myoglobin denaturation, cooked meat
 color change, 167, 168, 169

N

- Nabumetone, 296
 Nalbuphine, 296
 Naringenin, 197
 Near infrared spectroscopy, meat endpoint
 temperature monitoring, 175
 Nedocromil, 302
 Nelfinavir, 286
 Nervous disease
 smell perception effects, 270–271
 taste perception effects, 265
 Nevirapine, 285
 Niclosamide, 286
 Nicotine, 317
 Nifedipine, 306, 320
 Niridazole, 286
 Nitroglycerin patch, 314
 Noodles
 Chinese buckwheat, 413
 Japanese buckwheat, 412–413
 technology, 410–411

- Norfloxacin, 291
 North America buckwheat products, 415
 Nortriptyline, 312
 Nuclear magnetic resonance, meat
 endpoint temperature monitoring,
 175, 176
 Nucleus of the solitary tract, 252, 253
 Nutritional disease
 smell perception effects, 271
 taste perception effects, 266

O

- Ofloxacin, 291, 322
 Oleoresin, multicomponent film
 incorporation, 385
 Olfactory bulb, 254, 255
 Olfactory mucosa, 253–254, 255
 Olfactory receptor cells, 253, 254
 Omeprazole, 299
 Opiates
 smell sensation effects, 323
 taste sensation effects, 296
 Orange juice, pulsed electric field (PEF)
 processing, 26, 27
 flavor/vitamin C content retention,
 17–20
 packaging materials influence, 18–20
 microbial inactivation, 12–13
 shelf-life, 15–16
 Osteoporosis, phytoestrogen health
 protective effects, 227–229
 Oxaprozin, 297
 Oxybutynin, 298
 Oxyfedrine, 314

P

- p53, 251
 Packaging materials, PEF treated orange
 juice flavor/vitamin C retention,
 18–20
 Paroxetine, 312
 Pasta-making, 411
 buckwheat products, 415
 D-Penicillamine, 297
 Pentamidine, 292, 322
 Pentazocine, 297
 Pentoxifylline, 317
 Perennial buckwheat (*Fagopyrum*
cymosum), 396, 397
 Pergolide mesylate, 310

- Peroxidase time-temperature indicator, 180, 181
- Perphenazine, 312
- Phendimetrazine, 314
- Phenformin, 307
- Phenindione, 288
- Phenmetrazine theovalate, 324
- Phenobarbital, 298
- Phenolic acids, 196
- Phentermine, 314
- Phenylbutazone, 297
- Phenytoin, 312
- Phloretin, 197
- Phosphoglycerate mutase as endpoint cooking temperature indicator, 172
- Phytoerythrin as time-temperature integrator, 184–185
- Phytoestrogens, 195–234
- analytical methods, 201–203
 - antioxidant activity, 225–226
 - assays, 196
 - bioavailability/metabolism, 218–222
 - chemistry, 197–199
 - definition, 196–197
 - effects of processing, 212–218
 - estrogen receptor actions, 222–223
 - estrogen-related effects
 - in vitro*, 223
 - in vivo*, 224–225
 - health protective effects, 227–234
 - bone, 227–229
 - cancer, 229–232
 - cardiovascular, 232–234
 - metabolism prior to absorption, 199, 207
 - physiological effects, 222–227
 - role in plants, 200
 - sources, 203–212
 - structural aspects, 197, 198
 - toxicity, 226–227
- Phytosterols, 196
- Pimozide, 312
- Piperacillin, 292
- Pirbuterol acetate, 302, 322
- Piroxicam, 297
- Polarized light microscopy
- anhydrous milkfat, 61, 65
 - fat crystal network microstructure, 75–80
 - crystallization process, 80, 81, 82
 - palm oil, 62–63, 65
- Polyacrylamide gel electrophoresis, meat endpoint temperature monitoring, 175
- Polysaccharide-lipid edible films, 351–371
- applications, 369–371
 - fruit ripening retardation, 370
 - oxygen barrier properties, 364–365, 366–367
 - relative humidity effects, 365
 - temperature effects, 365, 368
 - solute barrier properties, 368–369
 - relative humidity effects, 369
 - temperature effects, 369
 - water barrier properties, 351–359, 360–362
 - relative humidity effects, 363–364
 - surfactant effects, 359, 363
 - temperature effects, 364
- Potassium iodine, 317
- Poultry products, thermal processing see Thermal processing
- Pravastatin, 288
- Prepyriform cortex, 255
- ProbucoI, 288, 320
- Procainamide, 306
- Procaine, 287
- Prochlorperazine, 308
- Promethazine, 308
- Propafenone, 306, 321
- Propantheline bromide, 299
- Propofol, 287
- Propranolol, 306
- Propylthiouracil, 299, 322
- Protein solubility measurement, meat endpoint temperature monitoring, 175
- Protein-lipid edible films, 371–382
- applications, 381–382
 - oxygen barrier properties, 378
 - water barrier properties, 372–378, 379–380
 - relative humidity effects, 381
- Protein-propyleneglycol alginate composite films, 383
- Protriptyline, 312
- Pseudoephedrine, 289
- Psilocybin, 312
- Psychopharmacologic agents
- smell sensation effects, 323
 - taste sensation effects, 310–313

- Puerarin, 205
 Pulse generator, 2–3
 bench-top scale, 4, 5
 plant scale system diagram, 3, 4
 Pulsed electric field (PEF) Consortium for Technology Commercialization, 25, 26
 Pulsed electric field (PEF) processing, 1–28
 current flow, 10
 electric field strength, 10, 11
 engineering aspects, 2–10
 fluid handling system, 6, 8–10
 high acid liquid foods *see* Fruit juices
 microbial inactivation, 10–15
 determinant factors, 11–12
 physical properties of processed products, 21–25
 density, 24
 electrical conductivity, 22–23
 specific heat, 24
 viscosity, 23
 pulse generator, 2–3
 system diagrams, 3, 4, 5
 system components, 2, 3
 temperature control, 11, 12, 22, 23, 24, 25
 total treatment time, 10, 11
 treatment chambers, 4–6
 co-axial, 5
 co-field, 5, 7
 treatment parameters, 10
 Pyrimethamine, 292
 Pyruvate kinase as endpoint cooking temperature indicator, 171

Q

- Quantal response (endpoint procedure), 179
 Quazepam, 308

R

- Radioimmunoassay, phytoestrogens, 202–203
 Radiotherapy, smell/taste perception changes, 275, 276, 277, 278, 279, 323
 Raloxifene, 223
 Ramipril, 307
 Reverse phase HPLC/UV absorbance detection, phytoestrogens, 201, 202

- Rhizopus*, 213
 Rifabutin, 292
 Rimantadine, 300
 Risperidone, 312
 Ritonavir, 286
Rubus fruticosus (blackberry), 207, 211
 Russian buckwheat products, 414–415
 Rutin, 408

S

- Saccharomyces cerevisiae*, pulsed electric field (PEF) inactivation, 13
 Salicylates, 297
Salmonella
 foodborne illness, 153
 pulsed electric field (PEF) inactivation, 12
 thermal inactivation
 kinetics, 153–158, 163, 164
 mathematical models, 165
 sample variables, 166
 time-temperature integrator, 177–178
 USA meat processor regulations, 150, 151, 152
 Saquinavir, 286
 Scale-invariance, 45
 Scaling theory
 colloidal gels, 45–54
 fat crystal networks, 55–58
 Scanning electron microscopy
 anhydrous milkfat, 61, 62
 chemically interesterified milkfat, 61, 63, 64
 polysaccharide-lipid edible films, 357
 Scopolamine, 298
 Secoisolariciresinol, 199, 201, 207, 218
 antioxidant activity, 226
 in vivo antiestrogenic effects, 225
 metabolism, 221
 toxicity, 226
 Sedatives, taste sensation effects, 307–308
 Selegiline, 310
 Self-similarity, 43, 44, 71
 fat crystal network microstructure, 71, 72, 73, 74
 Semperfresh, 370
 Sermorelin, 318
 Sertraline, 312
 Shoanin, 207
 Simvastatin, 288

- Slovenian buckwheat products, 414
- Smell perception
- disease-related losses, 264, 270–274
 - Alzheimer's disease, 280–282
 - cancer, 275–280
 - endocrine disease, 272
 - head trauma, 275
 - local conditions, 273
 - nervous disease, 270–271
 - nutritional/metabolic disease, 271
 - viral infections, 274, 275
 - elderly people, 248–249, 262–264
 - suprathreshold perceptual losses, 263–264
 - threshold detection elevation, 263
 - trigeminal stimulants, 264
 - learned associations, 248
 - medication effects, 248, 249, 283–284, 319, 320–324
 - neural pathway, 254–255
 - physiology, 253–256
 - age-related changes, 255–256
 - role in food intake/digestion, 248
 - transduction pathways, 254
- Soba* see Buckwheat
- Sodium fluoride, 300
- Sodium lauryl sulfate, 301
- Sodium salts, age-related taste threshold, 257, 258
- Soy protein composite films, 382
 - protein-lipid water barrier properties, 374–375
 - protein-propyleneglycol alginate, 383

Soy sauce, 214

Soybean phytoestrogens, 197, 200
 - coumestans, 211, 214
 - health protective effects, 227
 - bone, 228–229
 - cancer, 229–230
 - cardiovascular, 232–234
 - isoflavones, 203, 205
 - assays, 202, 203
 - effects of processing, 212–217
 - low-fat products, 215–217

Soymilk
 - edible films, 374
 - isoflavones, 212, 213, 216

Spironolactone, 307

Stavudine, 285

Strawberry (*Fragaria x ananassa*), 207

Streptomycin, 322

Strychnine, 324

Succimer, 318

Sulfamethoxazole, 292

Sulfasalazine, 300

Sulindac, 297

Sumatriptan, 297, 320

Sweetness, age-related taste threshold, 257, 258

Sympathomimetic drugs
 - smell sensation effects, 323–324
 - taste sensation effects, 313–314

T

TAL Pro-long, 370

Tartary buckwheat (*Fagopyrum tartaricum*), 396, 397, 406
 - nutritional function, 409
 - processing, 414

Taste buds, 250, 251

Taste cells, 250, 251
 - apoptotic pathways, 251
 - neural connections, 252–253

Taste perception
 - chemesthesis relationship, 253
 - disease-related losses, 264, 265–269
 - Alzheimer's disease, 280–282
 - cancer, 275–280
 - endocrine disease, 267
 - local conditions, 268
 - nervous disease, 265
 - nutritional disease, 266
 - elderly people, 248–249, 256–262
 - suprathreshold perceptual losses, 260–262
 - taste bud/tongue papillae changes, 252
 - threshold recognition/detection elevation, 256–260
 - trigeminal stimulants, 257–258
 - learned associations, 248
 - medication effects, 248, 249, 283–284, 285–318, 319
 - neural pathway, 252–253
 - physiology, 250–253
 - age-related changes, 252
 - role in food intake/digestion, 248
 - thermal taste, 253
 - transduction pathways, 252

Tazobactam, 292

- Tea lignans, 207
 - Tempeh
 - fermentation organisms, 213
 - isoflavones, 212, 213
 - Terbinafine, 283, 318
 - Terbutaline, 302
 - Terfenadine, 289, 319
 - Tetracaine, 320
 - Tetracyclines, 292
 - Textured vegetable protein (TVP),
 - isoflavone content, 214–215
 - Thermal death time (F value), 177
 - Thermal processing, meat/poultry products, 147–186
 - current USA regulations, 148–152
 - food service/retail operations, 149
 - home cooking, 149
 - meat processors, 149–152
 - endpoint cooking temperature indicators, 169–176
 - enzymatic methods, 170–173
 - immunoassays, 173–175
 - physical methods, 175–176
 - USDA tests, 170
 - microbial pathogens inactivation, 152
 - D values, 152
 - kinetic parameters determination, 163–166
 - kinetics, 153–162
 - mathematical models, 164–165
 - microbial survival curves, 163–164
 - sample parameters, 166
 - z values, 152
 - time-temperature integrators, 176–185
 - verification of adequacy, 166–185
 - color determination, 167–169
 - thermocouples, 166–167
 - thermometers, 166–167
 - Thermal taste, 253
 - Thermometers/thermocouple probes, meat
 - cooking adequacy, 166–167
 - 5-Thiopyridoxine, 297
 - Thiouracil, 299
 - Ticarcillin, 293, 322
 - Time-temperature integrators
 - chemical, 182–183
 - definition, 177
 - enzymatic, 180–182
 - ideal properties, 177
 - meat/poultry products thermal processing adequacy evaluation, 176–185
 - microbiological, 179–180
 - phycoerythrin, 184–185
 - physical, 182–183
 - theoretical aspects, 176–179
 - thermal death time (F value), 177
 - triose phosphate isomerase, 183–184
 - types, 179
 - To-fu-pi, 374
 - Tocainide, 307, 321
 - Tocopherols, multicomponent film
 - incorporation, 384
 - Tofu isoflavones, 212, 213, 215
 - low-fat products, 216–217
 - Tongue, sensory papillae, 251
 - age-related changes, 252
 - Transduction pathways
 - smell perception, 254
 - taste perception, 252
 - Trazodone, 312
 - Triamterene, 307
 - Triazolam, 308
 - Trifluoperazine, 312
 - Trimethamine, 296
 - Trimethoprim, 292
 - Triose phosphate isomerase
 - endpoint cooking temperature indicator, 172
 - time-temperature integrator, 183–184
 - Tripipramine maleate, 313
 - Tropacocaine, 287
 - Tyrothricin, 293, 322
- U**
- Ursodiol, 318
 - Uterotrophic assay, 197
- V**
- Vaccinium corymbosum* (blueberry), 211
 - Vaccinium oxycoccos* see Cranberry
 - Vaccinium vitis-idaea* (lingonberry), 207, 211
 - Vaginal cornification assay, 197
 - Vasodilators, taste sensation effects, 314
 - Venlafaxine, 313
 - Vincristine, 294
 - Viral infections, smell perception effects, 274, 275
 - Vitamin C, pulsed electric field (PEF)
 - processed fruit juice
 - apple, 20–21
 - orange, 17–20

Vitamin D/calcitriol, 318

Vitamin K¹/phytonadione, 318

W

Wheat gluten-lipid films

oxygen barrier properties, 378

relative humidity effects, 381

water barrier properties, 373–374

Whey protein isolate-lipid films

applications, 382

oxygen barrier properties, 378

water barrier properties, 376–378

relative humidity effects, 381

Y

Yeast inactivation, pulsed electric field
(PEF) processing, 13, 14–15

Yuba, 374

Z

Z*Coat, 381

z values, 152

Escherichia coli O157:H7, 158, 159,
160, 161, 163, 165

Listeria monocytogenes, 160

Salmonella, 153, 154, 155, 156, 157,
163, 164, 165

time-temperature integrators

chemical, 182

peroxidase, 180

phycoerythrin, 185

triose phosphate isomerase, 183

Zalcitabine, 285, 320

Zearalenones, 196

Zidovudine, 285

Zolpidem, 308

Zoplicone, 308