INDEX

Acetobacter spp., vinegar making, 351
Africa
  consumption availability, 480, 481
  introduction of sweet potato, 16
  production levels, 19–20, 21
Afrocarica trichosycha, genetic engineering, 140–2
Agrobacterium rhizogenes, genetic engineering, 140–2
Agrobacterium tumefaciens, genetic engineering, protein improvement, 140–2
alcohol
  ethanol from fermentation residues, 384
  products derived from, 377
  alcoholic beverages, 48, 379–83
  beer brewing, India, 344–5
  distillation, 200, 201, 380–3
Alocasia macrorrhiza, giant taro
  energy provision and nutrient composition, 122
  vitamin content, 149
Aluminium toxicity, 8
Amaranthus
  ascorbic acid, content, and storage, 260
  mineral content, 170
  oxalate content, 170, 177
  protein content, 170
  vitamin content, 175
America, North and Central
  root crops, consumption and availability, 481
  utilization availability, 482
  see also South America; United States of America
amino acid content, 88, 130–3
  cooking, 273
  genetic factors, 92
  processed products, 361–2, 363
  storage, 87, 253, 254, 363
amino acids
  industrial production, 376, 392
  lysine availability, and Maillard reaction, 273, 361, 365
  scores, and age groups, 133–4, 172
  terpenoid formation, 189
  amino acids, vines, 169–72
  sun-dried leaves, 365
  lysine content, and fertilizer usage, 99
Amorphophallus campanulatus, elephant foot yam
  energy provision and nutrient composition, 122
  oxalate content, 62
  amylase, in expressed juice, 297
  α-amylase, 47, 248, 249
  characteristics and activities, 68–70
  cooking, 47, 268
  β-amylase, 246, 249
  characteristics and activities, 68–70
  cooking, 268
  production, 384–5, 393
  amylase activity
    cooking, and eating characteristics, 247–8, 249, 252, 267–8, 269–71
cutting and storage, 248, 252
  genetic factors, 248, 270–1
INDEX

large scale processing, 311
amylopectin, 45–6
degradation, 69–70
amylose, 45–6, 47, 269
degradation, 69–70
anatomy, storage roots, 31–3
pigments, skin and flesh, 32
see also morphology, roots
animal feeds
China, 11, 390, 502
cull roots and vines, 409, 450
dehydration, 413–14
dog food, 365
economics, 410–11, 415
fermented, 454–5, 456–7, 459
fish feed, 454
fungal contamination, 199–200
Peru, 23, 559, 565, 569–70
Philippines, 537–8
processing, production and utilization
promotion, 586–7
processing wastes, 383, 456–7, 458–9, 464
production levels, China and Japan, 390
production percentage, worldwide, 409–10,
411, 414, 481, 482
production trends, Japan, 506
protein digestibility, 419–23, 435, 448, 450,
454, 460–3
rabbit feed, 463
roots and tubers, disadvantages and
remedies, 412–15
trypsin inhibitor activity deactivation,
207–8
trypsin inhibitors, and protein digestion,
203, 204, 419
vines, 11, 23, 411–12, 413, 414–15
see also cattle feeds; goat feeds; pig feeds;
poultry feeds; sheep feeds
anthocyanins, 59–60
chemical structure, 59
extraction methods, 385–6
vines, 95
spices
β-carotene content, 148, 150, 152, 302
nutrient composition, 152, 302
vitamin and mineral content, 152, 302
aquaculture, vine feeds, 454
Argentina
recipes, 610–11, 615
sweet desserts, 330
aroids, consumption availability worldwide,
481
arrowroot Maranta arundinacea, energy
provision and nutrient composition, 122
ascorbic acid, see vitamin C
asexual reproduction, 24
propagation methods, 8, 25–7, 28
see also cultivation management
Asia
cultivation availability, 480, 481
exploitation constraints, 578
recipes, 608
research priorities, 576
root and vine status, 580–2
utilization availability, 482
Apergillus spp.
maltose production, 374–5
spiroplasmas, 203
Apergillus flavus, aflatoxins, 203
Apergillus niger, spirit production, 380,
381
Apergillus oryzae
animal feed fermentation, 455
lipid synthesis, 387
soy sauce preparation, 342, 343, 344
Apergillus sojae, soy sauce preparation, 342,
343, 344
Apergillus terrae, lipid synthesis, 387
Australia, recipe, 608–9, 620
Aspergillus spp., 8
nitrogen fixation, 8, 91
Bacterium spp., vinegar making, 351
bananas
energy provision, 4
production ranking, 3
protein provision, 5, 7
vitamin and mineral content, 152
see also plantain
Bangladesh
improved cultivars introduction, 158
storage, 220, 221, 227, 244
vitamin A deficiency, 146, 147
Barbados, storage in clamps, 235
beef Phasolus vulgaris
amino acid content, 132
in animal feeding trials, 135–6
vitamin content, 150
beancurd
flavonol content, 211
protein provision, 5, 7
biological value, 388
composite flour, 338
bombyx caloricity, 127–8
Borytis ploidae thuriformis, Java black rot,
storage rot, 238
Brassica chinensis Chinese cabbage, vitamin
content, 175
Brazil
anthocyanin extraction, 386
dehydration, and flour production, 306
INDEX

Brazil (cont.)
production levels, 21
vitamin A deficiency, 147
bread, 157, 333–9, 393
dough improvers, 337
flavour, and paste usage, 337
freshness retention, 338
genetic factors, bread making properties, 335, 337
nutritional value, 337–8
Peru, 333–4, 337–8, 572, 573, 618–19
provitamin A provision, 154, 156, 337–8
recipes, 618–20
types of, 334
vitamin content, 150
wheat proportions, and loaf characteristics, 335, 336, 337
wheatless, 339, 619–20
breakfast foods, 341
Brevischizium glutamicum, monosodium glutamate manufacture, 375
brewing adjunct, 344–5
browning, enzymic, see enzymic browning
Burundi, 21

cabbage
ascorbic acid content, and storage, 260
mineral content, 170
oxalate content, 170
protein content, 170
vitamin content, 151
cabbage, savoy, 58
cabbage, Chinese Brevicaulis chinensis, vitamin content, 172, 175
caffeic acid, 56
cakes and pastries, 339–41, 393
calcium content, 44, 82, 83, 85, 151–2, 176, 178–9
absorption, and phylin, 162
availability, and oxalate, 61, 162, 177, 179
cooking, 124, 281–2
dehydrated products, 355
dietary requirements provision, 155, 162, 174
fruits, 152
leaves, 98, 103, 104
pig feeds, 419
processed products, 353, 354, 361
vegetable staples, 122, 151, 170
yices, 170, 176, 177, 419
see also mineral content
Cameroon
chips, for storage, 242, 244
non-alcoholic beverage, 351
storage methods, 226, 227
Candida utilis torula yeast, production on cannavery wastes, 457

on starch wastes, 378
candies
China, 332, 392, 499, 500, 501
nutrient composition, 127
production, Japan, 333–2, 392
protein content, 127, 273
recommended daily allowance contribution, 356
canery wastes
biological oxygen demand and nutrient content, 456, 457
fermentation, and animal feed production, 456–7
pollution, 456
canning, 315–22, 392
ascorbic acid content, 353, 360
β-carotene content, 358–9
flakes, and off-flavours, 313
leaves, and nutritional value, 317, 363–4
nutritional composition, 127, 352–4
procedures, 317, 318
protein and amino acid content, 361–2
recommended daily allowance contribution, 356
retort schedules, 317, 318, 319, 320, 321
root colour improvements, 318, 322
root firmness, 53, 54, 251, 317, 320–2
carbohydrate content, 42–3, 246–52
cooking, 124, 137, 248, 249–50, 251, 252, 267–72
curing and storage, 247–52
dehydrated products, 355
eating characteristics, 246–7, 251, 252
energy factors, 252
irradiation, 251
leaves, and cooking, 272
processed products, 124, 127
root and tuber staples, 122
Caribbean Islands, 19
β-carotene (provitamin A), 44, 145, 148
chemical structure, 74
disease prevention properties, 71, 73
pigment, 6, 95, 385, 444
utilization, and fat intake, 157
see also vitamin A
β-carotene content
bioavailability, 75–6, 101
composite flours, 337–8
cooking, 150, 276
curing and storage, 255–6
daily requirements provision, 150, 153–4, 156
dehydrated products, 354, 355, 356, 357–8, 358–9
fruits, 152
incarbonisation, processed products, 358–9
leaves, 102, 172, 175
INDEX

processed products, 353, 353, 354
vegetable staples, 148, 149, 151, 175
carotenoid content, vines, 95, 101
carotenoids, 77–9, 148, 178
chemical structures, 74
cooking, 279–80
leaves, 98, 102, 172–3, 175
sun drying, 364
carotenoids, 77–9, 148, 178
carotenoid content, 77–8
cooking, and isomerization, 276–7
cooking losses, 274, 275, 276
curing and storage, 254–6
determination, analytical methods, 74–5, 76–7
dietary utilization, 75–6
isomers, 73–4
pigments, 60–1, 95, 385
poultry feed, and egg yolk pigmentation, 444
vitamin A precursors, 71, 73
carrots, 148
mineral content, 151, 170
oxalate content, 170
protein content, 170
Camelina sativa
aminoplast composition, 132
consumption availability worldwide, 481
energy provision, 4, 121, 122, 124, 129
energy provision, poultry feeds, 456, 437
flour, nutrient composition, 124
oxalate content, 170
production ranking, 3
protein provision, 7, 170
vitamin content, 149, 175
cassava, 10, 344, 345, 393
cattle feeds
chips, and beef cattle performances, 446, 448
corn replacement levels, and beef cattle performances, 446
corn replacement levels, and milk yields, 445–6
digestibility, 448, 450, 462
energy provision, 462
starches, and rumen fermentation, 446, 448
vines, and performance, 445, 448–50
vines, stall rearing, 445
vines plus roots, and performance, 450–1
vines plus sugar cane, and performance, 450
ceolodose, 211
cellulose, 42
cooking, 268, 269, 270, 272
curing, 251, 252
dietary fibre, 51, 52, 53, 142–3
vines, 96, 97, 416
Crotalaria juncea black rot, 38, 195
growth inhibition, and ipomeamarone, 191
ipomeamarone production, 68, 189, 191
phenolic esters accumulation, 65
polyphenol susceptibility of, 67
postharvest losses, 222
protein degradation, 253
storage rot, 238
toxins production, 193, 194
chilpeas, 334, 338
energy provision and nutrient composition, 124
recipe, 619
Chromus guina, 560
chickpeas, protein yield, 5, 7
China, 1, 24
agroecological zones and provinces, 489
alcohol manufacture, 379–8, 496–8, 500
animal feeds, 11, 411–15, 502
bacteria, 332, 352, 449, 500, 501
chips, sun drying, 244, 245, 295–7
cucumber production, 325, 326, 328, 499, 501
citric acid manufacture, 375, 496, 497, 498, 500
consumption availability, 480, 481
corn replacement levels, 490
cooking, 263, 264, 266
cooperative food processing, 499–502, 503
crop yields, 5–6, 8, 488
cultivar breeding programmes, 490
dietary role, 491
food products development, 499–502
introduction, and cultivation spread, 16, 487
lactic acid production, 498, 500
marketing, 491–3, 503
medicinal properties of roots, 487–8
monosodium glutamate production, 375–6, 497, 498, 500
noodle making, 371, 493, 494, 496, 498, 499, 500
prices and processing, 492–3, 498
processing, and economic development, 493–4
social status indicator, 487
starch manufacture, 366, 367, 369–70, 391, 393, 493, 494–8
starch, 334, 335
sugar production, 374–5, 497, 498, 500
utilization availability, 481
utilization distribution, 389, 390
China, production levels, 19, 20, 21
constraints, 394–6
and consumption, 484, 486
and crop utilization changes, 488–90, 503
China, storage, 228–33, 395
canopy cells, 231
cork cells, 230
ditch cells, 232
INDEX

China, storage, (cont.)
    pit storage, 228–9
    well cellar, 229–30
chips (crisps), 324–9
    China, 325, 326, 328
darkening, genetic factors, 251
Maillard reaction, 251, 326, 329
production, 324–6, 327–8, 392
quality changes, 326, 329
chips (dried)
    alcohol manufacture, 379
    enzymic browning, prevention, 204
    furanoterpene content and microbial contamination, 199–200
    production, 204, 392
    starch production, 367, 368, 369–70
    for storage, 242, 244–5
    sun-drying, China, 244, 245, 295–7
chips (dried), animal feed
    energy and protein provision, 419, 421, 429, 460–1
    nutrient contents, 419
    popped, and starch availability, 433–4
cholorogenic acids, 65, 66
    antibiotic properties, 67
    chemical structures and precursors, 66
chlorophyll, 95
β-carotene bioavailability, 101
cholesterol levels, dietary fibre, 142, 143–4
chymotrypsin, 203, 204–5
citric acid levels, 61
citric acid production
    from alcohol production residues, experiments, 384
    China, 375, 496, 497, 498, 500
    starch for, 369, 370
Cladopelma cladopehroides, mycoprotein production potential, 389
Clavarium perfringens, bero-toxin production, and gut wall damage, 208–9
Clostridium welchi, 209
cocnut, vitamin and mineral content, 152
coconut, energy provision, poultry feeds, 437
Colocasia antiquorum, 46
Colocasia esculenta taro
    consumption, Japan, 514, 515
    energy provision and nutrient composition, 121, 122
    mineral content, 170
    oxalate content, 61–2, 170, 177
    Papua New Guinea, 119, 539, 540
    protein content, 170
    vitamin content, 149, 175
consumer preferences
    breads, and composite flour, 338
    colourations, 178, 294, 512–13, 577–8
    consumption and utilization, 589, 591–2
    contrasting areas, Japan, 512–16
    fluence, and food low acceptability, 210
    non-alcoholic beverages, 351
    nutritive value and eating qualities, 157–8, 512, 513
    Peru, 504, 572
    Philippines, 528–9
    in promotion and production programmes, need, 474
    quality perception, 246
    root shapes, 580
    sweetness, 578–80, 593
    unacceptable, and production constraints, 395
    vine characteristics, 165–6, 580
see also status preferences;
    consumption levels
    age of household head, 509, 510
    China, 490–1
    household expenditure, 484, 485, 508, 510
    income related, 509–11, 524–5, 528, 563–4, 588
    Japan, 504–5, 507–12
    nutrition survey information, 483
    occupation of household head, 525, 527
    Papua New Guinea, 543, 544
    Peru, 561, 562–3
    Philippines, 522–5
    Rwanda, 551–2
    Uganda, 556–7
consumption typology, 483, 491, 515
consumption and utilization
    availability, worldwide, 480–1, 583
    China, 490–1
    consumer preferences, 589, 591–2
    exploitation constraints, 578
    handling and transport, 584–5
    prices, 587–8
    processing, production and promotion, 586–7
    production constraints, 577
    production and demand, 474
    promotion campaign, need, 594–5
    quality control, 588–9, 590–1
    research priorities, 576, 577, 578, 579
    seasonality of supplies, 583–4
    statistics, collection difficulties, 477, 479–80
    storage facilities, 578, 585–6
    typology of consumption, 475–7
    underexploitation, 473–4
    utilization availability, worldwide, 481–2
    vines, constraints removal need, 595–6
see also status preferences
convolulus, water Ipomoea aquatica
    amino acid composition, 132
    fibre content, 97

626
INDEX

leafy vegetable, 1, 166, 266
vitamin content, 175
Cook Islands, 21, 410, 483
cooking, 220
carbohydrate content, 124, 127, 248, 249–50, 251, 252, 267–72
carotenoid content of leaves, 173
dietary fibre, 124, 127, 272
energy provision, 121, 124, 127, 129
fluctuence factors, 212
furanoepene content, 198–200
Japan, 513–14, 516
lipid content, 124, 127
methods, 262–6
mineral content, 124, 280–2
Papua New Guinea, 542
protein content, 124, 127, 273–4
starch digestibility, 47–8, 70, 271–2
trypsin inhibitor deactivation, 207–8, 209
Uganda, 262, 556
vitamin content, 150, 176, 274–5, 278, 279–80
see also cakes and pastries; candies; eating characteristics; leaves, cooking; Maillard reaction; microwave cooking; recipes
corn, see maize
crayfish, Procambarus clarkii, 454
crips, see chips
cryopreservation, 95
cubes
dehydration, 305–6
defreezing, 323, 393
products from, 298–9
slicer and cuber, 298, 300
for storage, 244
cultivar characteristics, see genetic factors
cultivation management
environmental range, 22, 27, 29
gardens, 166–8
growth cycle and crop number, 36
hydroponics, 167, 168
intercropping, 22–3
mineral content, 84–5
planting distances, and yields, 416, 417
propagation methods, 8, 23–7, 28
protein content, 90, 99
research priority, 576
soils, 6, 8, 29
storage content, 43, 45
topping, 93, 166
vines, 34, 36
vitamin C content, 81
yields, and market competitiveness, 391
see also diseases and pests; harvesting
curing, 223–5
ascorbic acid content, 256–60
carbohydrate content, 247–52
carotenoid content, 254–6
eating characteristics, 246
humidity and temperatures, 37, 224, 225
lipid content, 62–4, 253
natural and artificial, 37, 224, 225
responses, genetic factors, 225, 257
storage life, 224
sun, and storability, 236–7
vitamin content, 254–60
wound healing, 37, 223
cyclodextrin, 48
corous cyclodextrin, 377
production, 373, 374
Cylas formicarius sweet potato weevil, 6, 36, 38
gamma irradiation, 238
infections, and phenolics increase, 67
larval infection, and phytotoxins production, 189
postharvest losses, 222–3
root damage, and bitter flavour, 200
root symptoms, 195
stored root damage, 240
Cyrtosperma chamissonis giant swamp taro energy provision and nutrient composition, 121, 122
ovulate content, 62
vitamin content, 149
Decaytypan dolichoides, mycoprotein production potential, 389
dehydrated products, 204, 393
amino acid content, 361–2, 365
β-carotene content, 384, 355, 356, 357–8, 358–9
energy provision, 127, 354, 355, 356
lipid content, 124, 127, 355
nutrient composition, 124, 127, 302, 354–5, 356
stomates, 242, 244–5, 357–8
vitamin content, 260, 302, 354–6, 359–60, 364–5
see also individual products:
dehydration, large-scale, 308–13
developing countries, schemes for, 307–8
pre-processing operations, 308–10
dehydrated, small-scale, 295–307
animal feed production, 413–14
convection drier, 298, 301
edible leather production, 302–3
high temperature short time pneumatic drier, 305–6
leaves, sun drying, and nutritional value, 313, 363–5
osmotic process, 298
oven drying, 306
solar driers, 297–8, 313
sun drying, 294–7, 305, 306–7

© Cambridge University Press

www.cambridge.org
INDEX

dehydration, small-scale, (cont.)
toasting, 306
desserts, 346, 347, 349–50
see also candies; jam, production
dishes, 42, 69, 70
cooking, 50, 267, 268
cutting and storage, 247–8, 249–51
limit dextrins, 69, 70
pectins, and textural properties, 252
Diospyros batatas, infections, and

transferrin accumulation, 193
Diospyros phaeospernum var. batata dry rot,
storage rot, 238
diets
and cholesterol levels, 143–4
low-protein, and Enteritis morbillae disease, 209
low-salt, 162, 177
Papua New Guinea, 137, 138–9, 541–4
protein intake and nitrogen balance, 137–9
provitamin A carotenoids bioavailability, 75–6
weaning food, 128
diets, recommended intakes, 120
amino acids, 133, 134, 172
energy, 121, 126, 129
minerals, 150, 161, 162, 174
from non-alcoholic beverages, 351
protein, 174
from processed products, 356
trace elements, 162–3
vitamins, 150–6, 159, 160, 161, 173, 174
digestion

gastrointestinal, 416–17, 421, 422
nutrient value, 418–22
proteins, animal feeds, 419–23, 435, 448,
450, 454, 460–3
proteins, and starch contents, 137, 419–20
proteins, and trypsin inhibitor, 87, 203, 204,
419
provitamin A carotenoids, 75–6
rancid fermentation, 446, 448
silage, 435, 453
see also starch digestibility
digestible energy, 421–2, 423
Dioscorea spp., see yams
Diploida tuberculata, infections, and

transferrin accumulation, 193
discolorations
browning, control in puree manufacture, 311
greening, 61, 65, 67
phenolic oxidation, 326
see also enzymic browning; Maillard
reaction; pigments
diseases of animals, 68
β-carotene, and disease prevention, 71, 73
hepatotoxins, 190–1, 193–4, 200–2
lung toxins, 191–3, 194, 196, 198, 200–2
diseases of man
diabetes, and oral rehydration therapy,
163–5
dietary fibre protection against, 51, 142–5
Enteritis morbillae pigbek, 194, 198–9
fluorosis, India, 163
iron deficiency anaemia, 177
medicinal properties of roots, 487–8
oxalic acid poisoning, 61
Papua New Guinea, possible increase, 548
see also toxic factors; vitamin A deficiency
diseases and pests, 6, 37–8
damage, and phytooestrogen production, 67–8,
189
host parasite specificity, and phytoalexins, 191
infections, and oxalic acid concentration, 62
nematodes, 38
pre- and postharvest, and root losses, 222–3
production and utilization constraints, 577, 578
root chilling, and disease susceptibility, 222
virus diseases, 38
see also hardcore; toxic factors; individual
pests
diseases and pests, storage, 238
chips and insect control, 244
chips, and toxin formation, 199–200, 203
control, China, 228
microbial rot prevention measures, 238–40
pathogenic microorganisms, and spoilage,
222–3
rat damage, 223, 226
weevil damage, 240
dryness, see eating characteristics
eating characteristics, 42
cooking, 70, 245–6, 247, 248, 268–71
cutting and storage, 246
firmness, canned products, and pectin
content, 53, 54, 251, 317, 320–2
research priority, 577, 579
sweetness, 248, 267, 268, 270–1
sweetness, consumer preferences, 578–80,
593
vines, 96, 165–6, 512, 580
see also consumer preferences; flavours
eating characteristics, moist/dry, 252
amylase activity, 70, 247, 267–8, 269, 270
carbohydrate content, 246–7
consumer preferences, 513, 578
dextrin content, 70, 247, 267, 268
and pectins, 53, 54, 252, 369
and starch content, 70, 268, 269–70

628
INDEX

and viscosity, 70, 247, 268
edible leather, 302–3
Egypt, cake mixes, 340
EN, see Enteritis muritans
Endophytes flughii, symbiosis process, 457
energy provision, 3–5, 121–8
animal feed, 419–22, 436, 437, 460–3
cooking, 121, 124, 127, 129
dehydrated products, 127, 354, 355, 356
diets, Papua New Guinea, 543, 545
diets, Peru, 565
diets, Rwanda, 552
forms of, 421, 422, 423, 464
poultry feeds, 436, 437
processed products, 127, 356
proteins, 128–9, 139
silage, 435, 453, 462–3
energy value determination, bomb
calorimetry, 127–8
Enteritis muritans (EN) piglet
gut damage by beta toxin, 208–9
and trypsin inhibitors, 204, 209
enzymes, 68–70
bacterial, sugar syrup production, 373–4
cellulase, 384
HMG-CoA reductase, 189, 202
nitrogenase activity, 8, 91
phytoalexin biosynthesis, 189
polyphenol oxidases, 64, 65, 66
production of, 376, 384–5, 500
Rubisco, food potential, 388
see also amylase
enzymic browning, 64–5, 66
control, in industrial processing, 307
genetic factors, 66
inhibition, by sulphurizing, 294, 354
sulphurizing, and thiamin levels, 354
wewil infections, 223
see also discolorations, Maillard reaction
Equatorial Guinea, 21
Esperoma carotinacea, infections, and
furaneol formation, 193
Esperoma chrysanthem, storage rot, 238
Europe
production levels, 20
utilization availability, 482
Escherichia postesthetic scarabeae 38
laval infection, and phytoalexin
production, 189
extrusion cooking, starches, 49
extruded products, 326
snacks, 376
see also noodles
fatty acids, 63–4
see also lipid content
fermentations
amino acid production, 376
animal feed production, 454–5, 456–7, 459
products, China, 500
see also alcohol; numen fermentation; silage
fertilizers, crop response
ascorbic acid content, 81
carotenoid content, 79
fibre content, 55
heavy metal uptake, 85
mineral content, 84–5, 104
protein content, 90–1, 92, 99
toot firmness, 320
starch content, 43
fish, crude, contents, 42, 52
digestibility, 420–1, 454
fertilizer usage, 55
irrigation, 55
pig feeds, 419
vines, 94, 96–7, 415
fish, dietary, content, 44, 52, 53, 142, 179
B-carotenoid bioavailability, 76, 101
components, 51–4, 142
cooking, 124, 127, 272
flavonoids, 211–12
generic factors, 54
protection against diseases, 51, 142–5
protein digestibility, 137
root and tuber staples, 122
serum cholesterol levels, 142, 143–4
vines, 96–7
water holding capacity, and faecal bulking, 142–3
Fiji, 36, 410
consumption levels, 483
cooking, 206
energy provision, 5
fish feed, 454
flax, 345, 392
B-carotenoid content, and storage conditions, 357–8
fortification with supplements, 311–12
large-scale production, 409–11
lipid autoxidation, and off-flavours, 64, 253,
312–13, 363
lipid content, and caroten, 358
marketing, 312
nutrient composition, 127, 354, 355, 356,
361–2, 363
shelf life, 312
Flammulina velutipes edible mushroom,
cultivation on residues, 384
flavonoids, 209–12
animal experiments, 210–11
components, 211–12
food low acceptability, 210, 528, 529, 593
measurers to reduce, 212

629
INDEX

flavour enhancement, see monosodium glutamate
flavours, 55–8
bitter, and phenolic compounds, 65
bitter, and furanoterpenes, 68, 189, 200, 201, 203
bitter, and postharvest handling, 219
bitter, and postharvest microbial damage, 222, 223
bread, and paste usage, 337
curing and cooking, 248–9
genetic factors, 57–8
off-flavours, lipid autoxidation on storage, 64, 253, 312–13, 363
volatile constituents, 55, 57–8
flour
brewing adjunct, 344–5
nutrient composition, 127, 154, 385
for storage, 242, 244, 245
storage, and β-carotene content, 354, 358
flour production
dehydrated, 294, 305
small-scale, 306–7
traditional methods, 242, 244, 245
flours, composite
and bread making, 333–9
cakes and pastries, 339–41
β-carotene content, 337–8
noodles, 342
nutritional value, 337–8
wheat proportions, and loaf characteristics, 335, 336, 337
flowers, 24–5, 31
fluoride content, 163
folate acid content, 71, 72
canned products, 353
daily requirements provision, 155, 160, 174
freezing, 353
fruits, 152
leafy vegetables, 100, 102, 175
root and tuber staples, 149, 160
freezing, 316, 324–4
vegetables, 323, 393
energy provision, 127
casserole, 324
nutritional value, 127, 352–4, 356
paste, and desserts, 349–50
processes, 332–3
French fries, 324
fructose content, 50, 55
cooking, 50
curing and storage, 247, 249
production, 373, 374, 407, 500
fruits, nutrient composition, 148, 151, 152, 302
fungal infections
furanoterpenes production, 189–93, 194, 199–200
phytoalexin production, 67–8
see also diseases and pests; individual fungi
fungi
mushrooms, growth on vines, feedstuff improvement, 415
mycoprotein production, 378, 389, 459
fungicides, 6
storage rot control, 238–9, 242
furanoterpenes, 189–203
bitter flavour, 68, 189, 200, 201
chemical structures, 190, 192
cooking and processing, 198–200
economic losses, 200
low furanoterpenes producing cultivars, need, 202–3
minimization measures, postharvest, 202
phytoalexins, 67–8, 201–2
toxicity, 68, 189, 190–4, 196, 198, 200–2
see also ipomeamarone
furans, 57–8
Fusarium spp., storage decay control, and hot water dipping, 239–40
Fusarium oxysporum infections
lung toxins production, 193
rot diseases, 37
storage rot, 238
Fusarium solani infections, 37–8
furanoterpenes production, 198
phytoalexin production, 189
Fusarium solani javanicum infections, lung toxins production, 192–3
Genetic engineering, protein quality improvement, 140–2
Genetic factors
amylase activity, 248, 270–1
ascorbic acid content, 80–1, 257
bread making properties, 335, 337
carbohydrate content, 252
carotenoid content, 77–8
chip darkening, 351
curing responses, 225, 257
digestibility, 416–17, 421, 422
dry matter, vines, 93–4
crozytic browning, 66
fibre content, 54
flavours, 57–8
leaf, stem and petiole distribution, 93
lipid content, 62
low furanoterpenes production, 202–3
protein content, 87, 89–90, 92, 98, 129–30, 416
protein improvement strategies, 140
sporamin content, 87
starch content, 43, 231, 366
storage suitability, 241–2

© Cambridge University Press  www.cambridge.org
INDEX

I. pomegranate, (cont.)

toxicity, 193–4
ipomeamine, 192, 193

toxicity, 194
1-ipoxestanol, 192

toxicity, 194
4-ipomexanol, 192
lung toxicity, 192, 194, 196
production, and fungal infections, 196
14C-4-ipomexanol, distribution in rat, 196
ipoxestanol, formation in host, 193
Ipomoea spp., 1
Ipomoea aquatica water convolvulus
amino acid composition, 132
fiber content, 97
leafy vegetable, 1, 166, 266
vitamin content, 175
iron content, 44, 83–4, 151, 152, 161–2, 176, 178–9
absorption, and ascorbic acid, 162
absorption, and phytin, 177, 179
cooking, 124, 201–2
dehydrated products, 355, 356
dietary requirements provision, 155, 161–2, 174, 356
fruits, 152
leaves, 103, 104
processed products, 353, 354, 361
vegetable staples, 122, 151, 170
vines, 170, 176, 177
see also mineral content
irradiation
ascorbic acid content, 259
β-carotene content, 256
carbohydrate content, 251
sprouting suppression, 237–8
irrigation, 22
carotenoid levels, 79
protein content, 91
root firmness, 520
isoglucose production, 373, 374
Israel
bread, 338
cakes and pastries, 340
recipes, 614, 616–17
jam production, 10, 392
China, 330, 499
Philippines, 330–1, 332
Japan, 6
animal feeds, 390, 409–10, 435
candies production, 331
grinding and packing, 500
granules, industrial production, 312
introduction, cultivation and spread, 16, 505
mushikiri-boshi, 304, 355
noodles, 342, 371
paste production, 314, 315
pit storage, 226
production and yields, 6, 7, 19, 20, 21
promotion of products, 515–20
shochu production, 48, 200, 201, 380–3
status of sweet potato, 118, 119, 514, 592
sugar syrups production, 374, 392
Japan, consumption levels, 484, 504–5, 507–8, 520
age of household head, 509, 510
and city size, 508–9
consumer preferences in contrasting areas, 512–16
household expenditure, 309, 510
and income level, 509, 511
wholesale marketing, 509, 511–12
Japan, cooking, 262–3, 265, 266, 513
cookery books, 265, 516
recipes, 609, 616
school meals, 154, 156
Japan, processed products, 518–19
dehydration, 303–4, 325
taste in, 346–8, 349–50
successful development, 504
Japan, silage
in pig feeds, 435
production, 452
Japan, starch production, 366, 367, 369, 506, 517–18
price competition, 393, 521
products from, 48, 370, 518
Japan, utilisation availability, 481
distribution, 389, 390
trends, 505–6
Java, 2
cattle feed, 455
consumption levels, 484, 485
cooking, 262, 265
tubes for storage, 244
cultivation, 23, 26–7
Kenya, 23, 479
ketchup, 10, 344, 345, 393
Korea
alcohol manufacture, 379
cooking, 263
crop yield potential, 7
fermented animal feeds, 454–5
noodles, 371
production levels, 21
silage in pig feeds, 435
storage, 227–8
utilization availability, 481
lactic acid production, 496, 500
leaf protein concentrate
amino acid content, 171

632
INDEX

preparation, 387–8, 444–5
leaves
amino acid scores, 132, 133, 172
ascorbic acid levels, 100, 101–2, 175, 176, 300

canning, 317, 363–4

carotenoid content, 98, 102, 172–3, 175
cultivation in pots, 167
fish and crayfish feeds, 454
mineral content, 98, 103–4, 170
morphology, 34, 35, 173

oxidation content, 95–6, 170
postharvest handling, 220–1
sun drying, and nutritional value, 313, 363–5
trace elements, 103, 104
vitamin content, 100, 101, 102, 173, 174, 176
see also protein content, leaves; vines
leaves, cooking, 266


carbohydrate content, 272
protein content, 273–4


carotenoid content, 281–2
vitamin content, 281–2

Lentinus edodes shiitake, cultivation, and starch wastes, 378
Leptospermum spp., 225

lettuce
mineral content, 170
oxidation content, 170
protein content, 170


ginis, 42
dietary fibre, 52, 53
vines, 96, 97, 416

limonene, 58


Lindera benzoin, mycorrhizal production potential, 389

lipid content, 42, 44, 62–4, 419
roasting, 124, 127


commeal, 419
curing and storage, 62–4, 253
dehydrated products, 124, 127, 355


fatty acids, 63–4
flakes, and carotene, 358
geneis factors, 62
processed products, 127
vegetable staples, 122, 124

vines, 419

lipoiautoxidation in stored products, 64, 253, 312–13, 363

β-carotene utilisation, 157
microbial synthesis, 387

Macrophoma phaseoli charcoal rot

fructosocrepoid accumulation, 193
storage rot, 238
Maillard reaction, 251

control, in chip production, 326
control, by diffusion processing, 307
and lysine availability, 273, 361, 365
see also discolouration; enzymic browning

maize (corn), 3, 7
amino acid composition, 132
growth provision, 4, 121, 124, 129
nutrient composition, 124, 150, 419
vitamin content, 150

maize, animal feeds, 464
pigs, 422–7
poultry, 438–40, 442–3
ruminants, 445–6, 448, 454
Malawi, pit storage, 226, 235–7

Malaysia, 1, 410
cooking, 265
edible leathcr, 302–3

introduction of sweet potato, 17
malic hydrazide, sprouting suppression, 238
malty acid, 61
malto-oligosaccharides production, 373, 374
malto, 69, 70
production, 373, 374–5, 497, 500
malto content, 50, 55

cooking, 50, 70

curing and storage, 247, 248, 249, 251

mungoese
β-carotene content, 148, 152, 302

nutrient composition, 152, 302

Manihot esculenta, see cassava
Moranoa graminacea strawroot, energy

 provision and nutrient composition, 122
marketing

China, 491–3, 503
chips, 324–5
competitiveness, and production constraints, 391, 393
Pngua New Guinea, 126, 543, 546–7
Buru, 559, 565, 567–9
Philippines, 530–5
research priority, 576, 578

Rwanda, 553, 554

nontoxic properties, 487–8

Mehlisa spp., 38

Mexico, sweet confections, 332–3
microwave cooking, 265
carbohydrate content, 270
β-carotene content, 358–9

nosematoxime content, 199

millet, 3, 4, 7

mineral content, 44, 151–2, 178–9

absorption, and phyto, 162, 177, 179
cooking, 124, 201–2
curing and storage, 262
dehydrated products, 355, 366
dietary requirements provision, 155, 161–3, 174
distribution within roots, 82, 83

633
INDEX

mineral content, (cont.)
  factors affecting, 83–5
  fruits, 152
  heavy metals, 84, 85
  leaves, 98, 103–4, 170
  peel, 82, 83, 281
  pig feeds, 419
  potassium to sodium ratios, 162, 177
  processed products, 353, 354, 360–1
  vegetable staples, 122, 151, 170
  vines, 104, 170, 176–8, 419
  see also calcium content; iron content;
      phosphorus content; trace elements
Monobacterium infants, 193
monosodium glutamate, 392
  production, 375–6, 497, 498, 500
Moringa spp., horseradish tree
  amino acid content, 132
  mineral content, 170
  oxalate content, 170
  protein content, 170
  vitamin content, 175
morphology, roots, 24
  storage roots, 24, 29, 30, 31–3
  root types and development, 29, 30–1
  see also anatomy, storage root
morphology, vines, 24, 31, 34
  genetic factors, 93
  leaf shapes and sizes, 34, 35, 173
mouthfeel, see eating characteristics
6-methylpore, 190
  toxicity, 193–4
Nepal, vitamin A deficiency, 147
  net protein ratio (NPR), 136
  net protein utilization (NPU), 336n
  composite flour, 338
New Guinea, see Papua New Guinea
New Zealand, storage methods, Maois, 225
  niacin content, 44, 71, 72, 81, 360
  canned products, 353
  cooking, 150, 275, 278, 280
  daily requirements provision, 155, 160, 174
  dehydrated products, 355, 356
  freezing, 255
  fruits, 152, 159–60
  leafy vegetables, 100, 102, 175
  vegetable staples, 149, 151, 159–60
Nigeria
  crop yield potential, 7
  storage, 227
  vitamin A deficiency, 147
  weevil control, stored roots, 240
  nitrogen fixation, 8, 91
Niue, 21, 410
  non-alcoholic beverages, 10, 153, 350–1, 537
  non-protein nitrogen (NPN) content, 86, 92,
      128, 133
  components, 87, 88
  and storage, 136, 253, 254
  noodles, 10, 341–2, 371–3, 392
  nutrient composition, 124
  production, China, 371, 372, 493, 494, 496,
      498, 499, 500
  production, Japan, 342, 371
  quality, and starch properties, 47
NPN, see non-protein nitrogen
NPR (net protein ratio), 136
NPU (net protein utilization), 336
  composite flour, 338
  nutritional values
    promotion need, 594–5
    see also diet; digestion; under individual
        nutrients, processes and products

Oats, 129
  Oca, Oxalis tuberosa, 560
  energy provision and nutrient composition,
      121, 122

Oceania
  consumption availability, 480, 481
  production levels, 20
  recipes, 606–7
  research priorities, 576
  utilization availability, 482
  oka, vitamin and mineral content, 151
  oligosaccharides, 48, 51
  flatulence factors, 51, 211
  melo-oligosaccharides, 373, 374
  Omphidos anomosollis stem borer, 38
Onion
  mineral content, 170
  oxalate content, 170
  protein content, 170
  vitamin and mineral content, 151
  oral rehydration therapy (ORT), 163–5
  Orchard Island, 119, 137–8
  organic acid content, 61–2
  ORT (oral rehydration therapy), 163–5
  osmosol process, 298
  oxalate content, 61–2
  calcium availability, 61, 162, 177, 179
  leaves and vegetables, 95–6, 170, 177
  toxicity, 61
  vines, 95–6, 170, 179
  Oxalis tuberosa oca, 560
  energy provision and nutrient composition,
      121, 122
  pantothenic acid, as vitamin B5
  papaya, vitamin and mineral content, 152

Papua New Guinea
  animal feed, percentage of production, 410
  chips (crisps), 325

© Cambridge University Press  www.cambridge.org
INDEX

chips (dried), 244
cultivar diversity, 540–1
cultivation conditions, 29, 36
dehydration, industrial scheme, 307–8, 547–8
Enteritis necroticans disease, 208–9
harvesting, 220
introduction, cultivation and spread, 18, 539–40
major staple, role in society, 539–40
marketing, 126, 543, 546–7
oral rehydration therapy, 164, 165
production levels, 21
status of sweet potato, 119, 539–40
Papua New Guinea, consumption, 126, 484
and availability, 480
patterns, 544–6
Papua New Guinea, cooking, 262, 542
recipes, 603–4
Papua New Guinea, diets, 137
energy and protein provision, 543, 545
nutrient provision and health, 138–9
serum cholesterol levels, 144
surveys, 541–4
Papua New Guinea, pig keeping, 542–3, 547
expansion, 409, 547
feeding systems, 418, 428
feeds, 429
social prestige, 547
Papua New Guinea, storage in houses, 227
mound storage, 234–5
in pits, 226
peaches
β-carotene content, 148, 150, 152
nutrient composition, 152
pectin content, 42, 385
cooking, 268, 269, 272
curing and storage, 251–2
dietary fibre, 51, 52, 53
peel, extraction potential, 385
protopectin, 53, 54, 321
root firmness, canned products, 53, 54, 251, 317, 320–2
textural changes, 53–4, 251–2, 321
peel
blemished roots, and ipomeaasxône, 199
dietary fibre, 53
lipid content, 62
mineral content, 82, 83, 281
pectin extraction, potential, 385
polyphenolics, 67
protein content, 88–9
wartage, to consumer, 587
pepper, green, vitamin and mineral content, 151
PER (protein efficiency ratio), 135–6
Peru, 23
ancient cultivation, records, 15, 558–9
animal feed, 559, 565
bread making, 333–4, 337–8, 572, 573, 618–19
chips (crisps), 325, 572–3
consumption levels, 486, 559, 561, 574
consumption levels, income related, 563–4, 567, 572, 574, 575
cooking, 262
dehydration, solar drier, 297
generic diversity, 559
International Potato Center, data bases, 625
origin of sweet potato, 15
prices, 587–8
processed products, 157, 572–4
production levels, 559–60
recipes, 617–18
storage, 227
vine forage, and dairy farming, 445
Peru, Cahuí Valley, 575
animal feeds, 569–70
consumer preferences, 564
consumption levels, 567
evolution to market-oriented crop, 558, 560
marketing channels, 565, 567–9
prices and quantity fluctuations, 568
production, 559–60, 561, 566
Peru, Lima
consumer preferences, 564
consumption, 561, 562–4, 574
dog food, 565
marketing, 569
nutritional values, comparisons, 565
Peru, northern highlands
consumer preferences, 572
consumption patterns, 570–2
production, 566
pests, ear diseases and pests
Philippines
animal feeds, 410, 537–8
coles and pastries, 339–40
chips (dried) for storage, 244
consumer demand factors, 525, 528
consumer preferences, 528–9
cooking, 265, 266
crop yield potential, 7
dehydration techniques, and products, 298–302, 308
introduction and cultivation, 16, 521–2
INDEX

Philippines (cont.)
jams, 330–1, 332
non-alcoholic beverages, 350–1, 537
processed products, consumption, 529–30
processed products, development potential, 533–7, 538
production levels, 21, 522
sauce production, 342–4, 345
silage in pig feed, 435
status of sweet potato, 118–19, 528, 529, 592
storage, 227, 235
vitamin A deficiency, 147
weevil infections, and better flavour, 200
Philippines, consumption levels, 521, 522–3, 538
frequency of consumption, 525, 526
household income, 524–5, 538
occupation of household head, 525, 527
regional differences, 523–4
Philippines, marketing, 530–5
inefficient charnelling, prices and quality inconsistencies, 530–3
strategy trials, 533–5
phosphorus content, 44, 82, 83, 85, 151–2, 178
cooking, 124, 282
dehydrated products, 355
dietary requirements provision, 162
fruits, 152
leaves, 98, 103, 104
pig feeds, 419
processed products, 353, 361
starch properties, 45
vegetable staples, 122, 151
see also mineral content
physica, 162, 177, 179
phytoalexins, 67–8, 201–2
biosynthesis, 189
isolation and identification, 189–90
production, initiation agents, 188–90
see also spones marone; furanoterpenes
pickles, 382
pig feeds, 417–36
carcass quality, 430
cooking, digestibility and growth performance, 431
digestibility, 419–23, 460
energy provision, 419–22, 460
feed performance determination, 422–3, 424
high protein sweet potato meal (HPSM), 427, 428, 429
nutrient contents, 418–19
popped chips, and starch availability, 433–4
processing methods, and digestible energy, 421, 423
protein supplement experiments, 423–8
protein type, and pig performance, 429–30
silage, 434–6
starch wastes, 459
whole sweet potato meal, 428
see also Papua New Guinea, pig keeping
pigments, 32
anthocyanins, 59–60, 95, 385–6
carotenoids, 60–1, 63, 95, 385, 444
vines, 94–5
xanthophylls, 95, 385, 444, 445
see also discolorations; enzymic browning;
Maillard reaction
plants, 148
energy provision and nutrient composition, 121, 122
energy provision, poultry feeds, 437
protein energy provision, 129
vitamin content, 147, 150
see also bananas
Pseudomonas, infections, and furanoterpenoid accumulation, 193
polyphenolcs, 64–7
antibiotic activity, 67
antioxidant activity, 67
distribution in tissues, 66–7
flesh darkening, 65, 259
postharvest spoilage, 219
ascorbic acid content, 259
eating characteristics, 243–6
handling and transport, 220–1, 221–2, 259, 584–5
leaves, 220–1
mechanical harvesting damage, 221
minimumization measures, 202, 219
pathogenic microorganisms, 222–3
quality control, need, 588–9, 590–1
research priority, 576
root washing, 238
sun drying, 220, 222
see also storage
potato Solanum tuberosum, 3, 16
amino acid content, 132
consumption, Japan, 514, 515
consumption availability, worldwide, 481
energy provision, 121, 122, 129
nutrient composition, 122
sugar accumulation, 249
vitamin content, 149
poultry feeds
energy provision, 436, 437, 461
leaf protein concentrate, 388
starch wastes, 459
poultry feeds, broilers
corn replacement levels, 436, 438–9
corn replacement, total, 430–40
heat treatments, 440–1
leaves and shoots, 442
pelleting, 441–2
INDEX

- vitamin A supplements, 440
- poultry feeds, layers
- corn replacement levels, 442–3
- leaf protein concentrate, 444–5
- silage inclusion, 444
- vine meal, and egg yolk pigmentation, 444
- Pachyrhizus erosus, 454
- processed products, 10
- advantages, 292–3
- β-carotene content, and isomerization, 358–9
- China, 493–8, 499–502
- commercialization of laboratory technology, 394
- countries of production, 392–3
- dried fruit-like, 11, 299, 302
- economic viability assessments, 293
- edible leather, 302–3
- energy provision, 127, 356
- immense potential, yet production localized, 389
- Japan, 6, 504, 518–19
- nutritional composition, 127, 352–65
- Peru, 157, 572–4
- Philippines, 529–30, 535–7, 538
- production levels, China and Japan, 389, 390
- quality, and postharvest procedures, 246, 249, 251
- quantity estimates, limitations, 479–80
- recommended daily allowances provision, 354, 356
- see also individual processes and products
- processing
- extrusion, 326, 376
- peeler and slicer, 298, 299
- production and utilization promotion, 386–7
- research priority, 576
- slicer and cuber, 298, 300
- see also individual processes
- production
- animal feed percentage, 409–10, 411, 414, 481, 482
- consumer demand, 474
- and crop utilization changes, China, 488–90, 503
- crop yield potentials, 5–6, 7
- localized, yet immense potential, 389
- official estimates, unreliability, 477, 479
- Peru, 559–60
- regional patterns, 19–21
- Rwanda and Uganda, 549
- world ranking, 1, 3
- production constraints, 391, 577
- commercialization of research technology, improvement need, 394
- consumer acceptability, poor, 395
- lack of improved cultivars, 394
- raw material supplies, unreliability, 394–5
- starch manufacture, 391, 393–4
- technology lack, for village processing, 395–6
- protein content, 42, 44, 85–6
- cooking, 124, 127, 273
- determination methods, 86
- diets, Papua New Guinea, 543, 545
- diets, Peru, 565
- diets, Rwanda, 552
- distribution in plants, 86, 87–9
- energy provision, 128–9, 139
- environmental factors, 89–90
- fertilizer usage, 90–1, 92
- genetic factors, 87, 89–90, 92, 98, 129–30, 416
- improvement strategies, 139–42
- irrigation, 91
- pig feeds, 418, 419
- processed products, 124, 127, 354, 355, 356, 361–2
- sporoins, 86–7
- storage, 253
- vegetable staples, 122, 128
- see also amino acids
- protein content, leaves, 94, 97, 98, 169–70
- cooking, 273–4
- dietary requirements provision, 172, 174
- fertilizer usage, 99
- genetic factors, 98
- harvesting time, 99–100, 445
- leaf position on stem, 98–9
- poultry feed concentrate, 388
- protein concentrate preparation, 387–8, 444–5
- Rubisco, 388
- season of growth, 99
- trypsin inhibitor activity, 206–7
- protein efficiency ratio (PER), 135–6
- proteins
- digestibility, animal feeds, 419–23, 435, 448, 450, 454, 460–3
- digestibility, and fibre, 137
- digestion, trypsin inhibitor activity, 87, 203, 204, 419
- digestibility, and starches, 136–7, 419–20
- mycoprotein production, investigations, 378, 389, 459
- provision, by leading crops, 3, 5, 7
- quality, 129–30, 133–4, 134–6
- from stallage wastes, 384, 457–8
- see also net protein ratio; net protein utilization
- Puerto Rico, flour production, 306–7
- pumpkins

637
INDEX

pumpkins (cont.)
  β-carotene content, 148, 151
vitamin and mineral content, 151
paste, 310, 392
preparation, 311, 314, 316
products from, 346–50
pyridines, 57–8
pyridoxine, see vitamin B₆
pyroacemic acid, 497
pyrones, 57–8
Pythium ultimum root rot, postharvest losses, 222
quality factors, see eating characteristics
quinic acid, 66
rabbit feed, 463
raffinose, 51, 211
recipes, 516, 517
bread, 618–19
for children, 603–4
dessert pastes, 615–16
general usage, 604–15
sweet confections, 332–3
see also cooking
reproduction
sexual, 24–5
vegetative propagation, 8, 25–7, 28
retinol, see vitamin A
retinol equivalents, 333a
Rhizopus spp.
  control, and hot water dipping, 239
decay during retailing, 242
Rhizopus stolonifer soft rot
  ascorbic acid content, 81
carotenoid content, 79
furanoeterpenoid accumulation, 193
phenols accumulation, 65
storage rots, 38, 236, 238
riboflavin, see vitamin B₂
rice
  amino acid composition, 132
  energy provision, 4, 121, 124, 129
  nutrient composition, 124
  production ranking, 3
  protein yield, 7
  vitamin content, 150
Rutellum halicacabum, 175
Rubisco, 388
rumen fermentation
  starches, in cattle feeds, 446, 448
  vines and sugar cane, 450
Rwanda, 23, 484
consumption patterns, 551–3, 558
crop management, 550–1, 553, 558
marketing, 553, 554
production levels, 19, 21, 549, 550, 557
Saccharomyces cerevisiae yeast
  production from starch wastes, 378
spirit shochu production, 380, 381
vaccine making, 351
sauces
  catsup/ketchup, 10, 344, 354, 393
soy sauce, 342–4
Scabirulle, see Eutypula gossypii
Scirrhium rolfsii infections, furanoterpenoid accumulation, 193
seeds, 25
  production trends, Japan, 500
  production levels, China and Japan, 390
  utilization, 482
sheep feed, 453–4
  energy provision, 462
  silage digestibility, 453, 462
shelf life
  flaxes, and off-flavour development, 312
  flour, β-carotene content and water activity, 357
vines, investigation need, 168–9
Shiitake Lentinus edodes, cultivation, starch wastes, 378
silage
  digestibility, 453, 453
  energy and protein provision, 435, 453, 462–3
  nutrient preservation, 452
pig feeds, 434–6
poultry feeds, and egg production, 444
production, 451–3
sorghum, cattle feeds, 446
soil conditions
  aluminium levels, and toxicity, 8
  cold wet, and root quality, 222
pH optima, 6, 29
rots in curing process, 225
Solanum tuberosum potato, 3, 16
  amino acid content, 132
  consumption, Japan, 514, 515
consumption availability, worldwide, 481
energy provisions, 121, 122, 129
nutrient composition, 122
sugar accumulation, 294
vitamin content, 149
Solomon Islands, 119
consumption availability, 480
consumption typology, 483
production levels, 19, 21
sorghum
  energy provision, 4, 124, 129
  nutrient composition, 124
production ranking, 3
protein yield, 7
INDEX

storage, (cont.)
research priority, 576, 578, 585–6
root firmness, 320–1
sprouting, 236, 237
sprouting suppression measures, 237–8
stores management, 233–4
suitability, genetic factors, 241–2
time length, and curing, 224
under plastic, 234
vitamin content, 234–61
see also postharvest spoilage
storage, diseases and pests, 238
chips (dried), and insect control, 244
chips (dried), and toxin formation, 199–200, 203
control, China, 228
microbial rot prevention measures, 230–40
pathogenic microorganisms, and spoilage, 222–3
rat damage, 223, 226
weevil damage, 240
storage, dried products
chips, 242, 244–5
cubes, 244
flakes, lipid autoxidation and off-flavours,
64, 253, 312–13, 363
flour, 242, 244, 245
storage methods, traditional, 225–37
canopy cellars, 231
cave cellars, 230
clamps, 235
diach cellars, 232
dwelling houses, 227
indoor, heated houses, 232–3
mounds, 234–5
pit storage, 225–6, 228–9, 235–7
sun curing and ash application, 236–7
well cellars, 229–30
storage roots, see anatomy; morphology
Streptomyces sp., 55, 193
sucinic acid, 61
sugar content, 42, 44, 49–51
cooking, 50, 268–71
curing and storage, 247–52
eating characteristics, 269, 270, 271
sucrose, 50, 55, 247, 249–50
and sweetness, 49, 55, 270–1
vines, 94
see also fractions; glucose
sugar syrup, 375–5, 392
Sumatra, 23
Symba process, 457
Taiwan
animal feed, percentage of production, 410
chips, 244, 325
cooking, 262
noodles, 342
processing procedure, 297
recipe, 610
status of sweet potato, 592
taraxacum "Tamarindae" spp.
amino acid composition, 132
vitamin content, 175
taro Colocasia esculenta
consumption, Japan, 514, 515
ergy provision and nutrient composition, 121, 122
mineral content, 170
oxalate content, 61–2, 170, 177
Papua New Guinea, 119, 339, 540
protein content, 122, 170
vitamin content, 149, 175
taro, giant Alocasia macrorrhiza
ergy provision and nutrient composition, 122
vitamin content, 149
taro, giant swamp Cyperus perrieri charoucinis
energy provision and nutrient composition, 121, 122
oxalate content, 62
vitamin content, 149
texture, see eating characteristics
Thailand
animal feed, percentage of production, 410
cooking, 263
recipe, 613
thiamin, see vitamin B1
TIA, or trypsin inhibitor activity
Tilapia spp., 454
tocopherol, see vitamin E
tomatoes, 148
carotenoid content, 148, 151
oxalate content, 170
production ranking, 3
protein content, 170
vitamin and mineral content, 151, 170
Tonga, 410
consumption availability, 480
cooking, 266
production levels, 19, 21
recipe, 604
status of sweet potato, 118, 119
tops, see vines
toxic factors, 188
alkaloids, 203
aluminium in soils, 8
beta-toxin, and Leptospermum scoparium disease, 206–9
furanosterpenes, 68, 189, 190–4, 196, 198, 200–2
minimization measures, postharvest, 202
oxalates, 61
trace elements, 82, 84

640
INDEX

canned products, 360–1
daily requirements provision, 162–3
leaves, 103, 104
*Trichoderma sacale*, cellulase production, 384
trypsin inhibitor activity (TIA), 87, 203–9
crop range, 205
deactivation, and heat treatments, 207–8, 209, 440–1, 431, 432–3
distribution in roots, 205–6
and dry matter content, 207
elimination in popped chips, 433
*Enterobacter aerogenes* disease, 206, 209
genetic factors, 206, 207
measurement, 205
pig performance, 431, 432
protein content, 206–7
protein digestion, 87, 203, 204, 419
tryptin inhibitors, isolation and characteristics, 204–5
Tuvalu, chips marketing, 325
Uganda, 22
consumption levels, 549, 557–7, 558
cooking, 262, 556
cultivation, longstanding and widespread, 553, 555
harvesting, 220
market conditions, 588
production levels, 19, 21, 549, 557
recipe, 609
*Ullucus tuberosus* (ucluca, energy provision and nutrient composition, 121, 122
United Kingdom, 478
United States of America, 7
β-amylase production, 385
canning industry, 315
chips (crisps) production, 325–6
cooking, 265
cutting, 37
desserts, puddings and pies, 549, 350
doughnuts, 340–1
edible leather, 302–3
flakes production, 311–12
furanoaptenes in roots for consumption, 197, 198
production levels, 19, 20
puréeing, 310, 311, 314, 316
recipe, 612–13
status of sweet potato, 118
storage, 221, 234
see also *America, North and Central; South America*
USSR, consumption availability, 481
utilization, see consumption and utilization
vermiculose, 51, 211
Vietnam
noodle making, 371, 373
production levels, 19, 21
starch manufacture, 369
vines, 351–2
cultivation in pots for urban slam dwellers, 167
defoliation, root yields and composition, 415–16, 417
dry matter composition, 93–4
dry matter digestibility, genetic factors, 93–4
eating characteristics, 96, 165–6, 512, 580
environmental adaptability and tolerance, 166–7
growth and development, 29, 31, 34
hydroponics, 167, 168
lipid content, 419
mineral content, 104, 170, 176–8, 419
oxalate content, 95–6, 170, 179
pigments, 94–5
protein content, 419, see also leaves, protein content
shelf life, investigation need, 168–9
stillage making, 451–3
status perception, 165, 580, 581–2, 595
trypsin inhibitor activity, 431, 432
vitamin content, 100–2, 172–6
widespread availability, 166
see also leaves; morphology, vines
vines, animal feed, 11
cattle feeds, 445, 448–51, 455
China, 411–12, 413, 414–15
energy and protein provisions, 419, 460–3
fish and crayfish, 454
nutrient digestibility, 418–22
Pern, 569–70
pig feeds, 425, 428
poultry, and egg yolk pigmentation, 444
vines, consumption, 9, 92–3
China, 491
Japan, 512–13, 515
utilization, 595–6
virus diseases, 38
vitamin A (retinol)
chemical structure, 74
formation in animals, 73
retinol equivalents, 76
storage in liver, 156–7
vitamin A content
canned products, 353
daily requirement provision, 150, 174
freezing, 353
vitamin A deficiency, 71, 145, 178
prevention, 148–58
symptoms, 146
world prevalence, 147–8
INDEX

vitamin A deficiency, (cont.)
  xerophthalmia, 146, 147–8
vitamin A precursor, see β-carotene
vitamin B1 (thiamin) content, 44, 71, 72, 81, 360
canned products, 353
  cooking, 150, 275, 278, 280
daily requirement provision, 155, 160, 174
derhydrated products, 355, 356
fruits, 152, 159–60
leaves vegetables, 100, 102, 175
storage, 260–1
and sulphurizing, 354
vegetable staples, 149, 151, 159–60
vitamin B2 (riboflavin) content, 44, 71, 72, 81, 360
canned products, 353, 354
  cooking, 150, 275, 278–9, 280
daily requirement provision, 155, 160, 174
derhydrated products, 355, 356
freezing, 355
fruits, 152, 159–60
leaves vegetables, 100, 101, 102, 173, 175
storage, 260–1
sun drying, 364–5
vegetable staples, 149, 151, 159–60
vitamin B3 (pantothenic acid) content, 71, 72, 360
canned products, 353
  cooking, 275, 279
curing, 260
freezing, 353
fruits, 152
vegetable staples, 149, 151
vitamin B6 (pyridoxine) content, 71, 72, 81–2
canned products, 353, 354
  cooking, 275, 279
daily requirement provision, 155, 160
freezing, 353, 354
fruits, 152
leaves vegetables, 100, 102, 175
vegetable staples, 149, 151, 160
vitamin C (ascorbic acid)
dehydrated ascorbic acid, 79–80
titan absorption, 162
root darkening inhibition, 65
structural changes, 79–80
vitamin C content, 71, 72
canned products, 353, 354, 360
  cooking, 150, 275, 277, 280
freezing, 260–60
  daily requirement provision, 155, 159, 174, 356
dehydrated products, 260, 354–6, 359–60, 364–5, 302
  factors affecting, 80–1
freezing, 353, 354
fruits, 152
generic factors, 80–1, 257
iron absorption enhancement, 162
leaves vegetables, 100, 101–2, 175, 176, 260
sun drying, 364
vegetable staples, 149, 151, 158
vitamin E (tocopherol) content, 71, 72, 82, 145, 160
cooking, 275, 279
daily requirement provision, 161
raw foods, 160–1
storage, 261
vitamin content, 42, 44, 71, 72, 79–82, 145–61, 178
cooking, 150, 176, 274–5, 278, 279–80
curing and storage, 254–61
daily requirement provision, 150, 153–5, 174
derhydrated products, 260, 302, 354–6, 359–60, 364–5
fruits, 152, 159–60
leaves vegetables, 100–2, 172–6
vegetable staples, 149, 151, 159–60
see also folic acid; macin
wastes and residues, by-products
  animal feeds, 383, 456–7, 458–9, 464
cellulase production, 384
citrin acid production, experiments, 383, 384
citric acid production, 384
citrus fruits, 383
edible mushrooms cultivation, 378, 384
filter cakes, composition, 384, 458–9
fuel production, potential, 378, 384
mucopolysaccharides production, 378, 389, 459
pectin extraction potential, from peel, 365
protein food supplement, development, 384, 457–8
yeast Candida utilis production, 378, 457
yeast Saccharomyces cerevisiae production, 378
water activity
  ascorbic acid stability, 360
  β-carotene content, 357
weevils, sweet potato, Cylas formicarius, 6, 36, 38
gamma irradiation, 238
infections, and phenolics increase, 67
larval infection, and phytotoxic production, 189
postharvest losses, 222–3
root damage, and bitter flavour, 200
root symptoms, 195
stored root damage, 240
wheat
  composite flours, 333–9
  energy provision, 124, 129
  production, ranking, 3
  products, nutrient content, 124
  wound healing, 37, 223

© Cambridge University Press
www.cambridge.org
<table>
<thead>
<tr>
<th>INDEX</th>
</tr>
</thead>
</table>
| xanthophylls, 385  
poultry feed, and yolk pigmentation, 444–5  
vines, 95  
Xanthosoma spp., yautia, 118  
energy provision and nutrient composition, 122  
vitamin content, 149  
Xanthosoma sagittifolium, starch, 46  
xerophthalmia, 146  
world prevalence, 147–8  
yam, Chinese Dioscorea esculenta, energy provision and nutrient composition, 122  
yam, elephant foot Amorphophallus campanulatus  
energy provision and nutrient composition, 122  
oxalate content, 62  
yam, winged Dioscorea alata, energy provision and nutrient composition, 122  
yams Dioscorea spp.  
amino acid composition, 132  
consumption availability, 481  
energy provision, 4, 121, 122, 129, 437  
protein provision, 5, 7  
starch properties, 46  
vitamin content, 149  
yeast Saccharomyces cerevisiae  
production from starch wastes, 378  
spirit shochu production, 380, 381  
vinegar making, 351  
yeast, fungi Candida utilis, production on canny wastes, 457  
on starch wastes, 378  
yoghurt, 349  
Zimbabwe, pit storage, 225–6 |