INDEX

A	Biopolymeric nanostructured particles
	hydrolyzed protein, 194
American Oil Chemists Society (AOCS),	polysaccharides, 194
220, 221	protein–polysaccharide mixtures,
Amylopectin, 12–13	194–195
Amylose, 12	whole proteins, 193
Anaerobic co-digestion, FVW, 104–106	Borohydride, 222–223
Anaerobic digestion, FVW	Bound gossypol (BG), 220, 221, 229, 231, 232
biodegradation waste management,	20 and george (20), 220, 221, 201, 201
103–104	С
choice of temperature, 101	
potential for material recovery, 102	Candida utilis, 71
reaction scheme, 101	Carboxymethylchitin, 91, 92
Apogossypol, 225	Carotenoids, seafood wastes, 91
Apple pomace	Cauliflower, FVW, 83–84
for fatty acid production, 78	Ceratocystis fimbriata, 75
for heteropolysaccharide-7 production, 79	Chemoinformatics
for lactic acid production, 78–79	chemical space exploration, 35–36
Aspergillus niger, 73–74	computational methods, classification
	and definition, 35
В	definitions, 34
T. 111 141 141 141 141	in food chemistry
Bacillus licheniformis, 194	chemical space comparison, 41
Balsamic vinegar. See Traditional balsamic	physicochemical properties
vinegar (TBV)	distribution, comparison, 42
Barrel cask, TBV production process	toxicity, 40
aging	food-related components
definition, 163	molecular docking, 49–52
physical ripening time, 166–168	molecular similarity, 43–47
residence time, 164–166	pharmacophore model, 47–48
configuration, 160	QSAR and QSPR, 48–49
process streams types, 159	molecular databases and chemical space
refilling procedure	Distributed Structure-Searchable
degree of freedom (DOF) analysis, 163	Toxicity (DSSTox), 38
Fickian model, 161–162	DrugBank, 39
mass transfer, 161	generally recognized as safe (GRAS)
vectorial concentration model, 162–163	compounds, 38
residence time (RT), 160–161	MMsINC database, 39
yield, 161	National Cancer Institute (NCI)
Beer brewery waste, 97	database, 39
Beetroot, coloring agents, 86	Protein and Bioactive Peptide
Bioadsorbents for wastewater treatment	Sequences (BIOPEP), 39
dyes adsorption, 97–98	SuperScent, 39
metal ions biosorption, 94–97	molecular descriptors and
Biodiesel production, 107–108	physicochemical properties, 36–37

Chenopodium quinoa, 19 Cotton and cottonseed products, 216–218	fusion methods, 43 G-protein coupled receptor (GPCR), 44
Cyanoborohydride, 223	odor-structure relationships, 45–46
,	OpenEye scientific software
D	(OpenEye), 45
Dainy industry wastes 45 46	stereochemical theory, 45
Dairy wastes	pharmacophore model, 47–48
Dairy wastes aerobic treatment, 111–116	QSAR and QSPR, 48–49
	Food waste processing
anaerobic treatment, 108–111 Differential scanning calorimetry (DSC), 14	FCM, sustainable food system
Differential scanning calorimetry (DSC), 14 Docosahexaenoic acid (DHA), 15	development, 116
Docosanexaenoic acid (DHA), 15	food market focus, 118-119
E	integrated product development and sustainability, 118
Eicosapentaenoic acid (EPA), 15	market-oriented research, 117–118
European Landfill Directive, 60	user-oriented innovation in food
F	sector, 117
1	fruit-and-vegetable wastes (FVWs),
Fermentation industry wastes, 64–65	63–64
Fermentation, TBV production process	multifunctional food ingredient
acetic acid bacteria	production, 82–93
ecological studies, 157–158	recovering added-value products,
oxidation products, 158–159	69–82
scalar fermentation, 154–156	green production processes, development
yeast and alcoholic fermentation product, 157	food production, holistic approach, 61–62
zygosaccharomyces, 156	green production strategy, 62-63
Food chain management (FCM)	waste management hierarchy, 60-61
for sustainable food system development,	problems and opportunities, 58-60
116	anaerobic digestion (AD), 59
food market focus, 118-119	CO ₂ emissions, 59
integrated product development and	low levels of suspended solids and
sustainability, 118	dissolved materials, 59
market-oriented research, 117-118	restrictions on waste, 60
user-oriented innovation in food	sources and characterization
sector, 117	dairy industry, 65–66
Food materials structuring process	fermentation industry, 64–65
electrospraying, 190–191	fruit-and-vegetable wastes (FVWs),
homogenization, 186–188	63–64
microfluidization, 188	meat and poultry industry, 67–68
milling, 186	olive oil industry, 64
rapid expansion of supercritical solution	seafood by-products, 68–69
(RESS), 191–192	using eggshell, 98
ultrasound, 188–190	vegetable residues for wastewater
Food-related components,	treatment
chemoinformatics	dyes adsorption, 97–98
molecular docking	metal ions biosorption, 94–97 waste treatment
Autodock, 49, 52	aerobic treatment of dairy wastes,
improvement areas, 49	111–116
Protein Data Bank, 49	anaerobic treatment of dairy wastes,
QSAR models, 50–51 molecular similarity	108–111

of aqueous food industry waste	plasma cholesterol levels, 248–249
streams, 100	clinical implication, 249–251
biodiesel production, 107–108	cotton and cottonseed products,
bioprocessing of FVWs, 100–107	overview, 216–218
whey, added-value products, 98–100	occurrence, 218
Free gossypol (FG), 221, 229, 231, 233	physiochemical properties, 218
Fruit-and-vegetable wastes (FVWs), 63–64	apogossypol, 225
bioprocessing, 100–107	chemical formula, 219
multifunctional food ingredient	methylation, 224
production, 82	naphthalene rings, 220
coloring agents and antioxidants, 84–86	oxidation, 223
dietary fibers, 83–84	ozonolysis, 223–224
food preservation, 88–89	Schiff base reaction, 221, 222
gelation properties, 87	structure, 219
meat waste derivatives, 89–91	tautomeric forms, 220
oil and meal, 88	G-protein coupled receptor (GPCR), 44
production of biopolymers, films, food	Grape must production, TBV
packaging, 89	chemical changes, 153–154
seafood waste derivatives, 91–93	cooking time effect, 155
recovering added-value products	physical changes, 154
SSF of fruit/vegetable by-products, 70–82	solute concentration, 151–153
	Grape Pomace, 75
vegetable industry challenges, 69–70 Fusarium oxysporum, 73, 74	Grapes, 85–86
1 usurtum oxysporum, 75, 74	Н
G	Hydrogan mothana two-staga
Gelatin, 92–93	Hydrogen-methane two-stage fermentation, 105
Glucosamine, 91–92	5-Hydroxymethyl furfural (HMF), 153
Goldenberry pomace, 88	Hydroxytyrosol, 84
Gongronella butleri, 80	Hypokalemia, 249–250
Gossypol, cotton plant	11) politicinia, 21) 200
agricultural implication	L
antifeeding activity, 228–229	
detoxification, 232–233	Lactic acid bacteria (LAB), 93
insecticidal activity, 228	Lipids and lipidic compound, Quinoa
toxicity, 229–232	docosahexaenoic acid (DHA), 15
analyses, 225	eicosapentaenoic acid (EPA), 15
AOCS methods, 227	fatty acid composition, 15, 17
enzyme-linked immunosorbent assays	polyunsaturated fatty acids (PUFA), 16
(ELISA), 227	squalene and phytosterols, 17
high-performance liquid	Liposomes, 203
chromatography (HPLC) method,	Lycopene, 81
226–227	M
near-infrared reflectance, 226	
biological properties	Meat and poultry industry wastes,
anticancer activity, 237–242	67–68
antifertility activity, 235–237	Melanoidins, 153, 174
antimicrobial activity, 247-248	Molecular databases and chemical space,
antioxidant property, 234–235	chemoinformatics
antiparasitic protozoan activities,	Distributed Structure-Searchable Toxicity
244–247	(DSSTox), 38
antivirus activity, 242–243	DrugBank, 39

Molecular databases and chemical space, chemoinformatics (cont.) generally recognized as safe (GRAS) compounds, 38 MMsINC database, 39 National Cancer Institute (NCI) database, 39 protein and bioactive peptide sequences (BIOPEP), 39 SuperScent, 39 Molecular docking, 49–52 Molecularly imprinted polymer (MIP) techniques, 201 Molecular similarity fusion methods, 43	lipid nanoparticles, 195–196 microencapsulated food components, 204–205 microfluidization effects, 188–189 nanocomposites, 198–199 nanoscale manipulation, 185 nanostructured emulsions double emulsions, 197 microemulsions, 197 simple oil-in-water emulsions, 197 structuring emulsions, functionality, 198 nanotechnology and society, 206 Neurospora crassa, 73, 74
G-protein coupled receptor (GPCR), 44	O
odor-structure relationships, 45–46 OpenEye scientific software (OpenEye), 45 stereochemical theory, 45	Oleuropein, 84 Onion wastes, 85 OpenEye scientific software (OpenEye), 45
N	P
Nanosensors and nanotracers Escherichia coli, 200 molecularly imprinted polymer (MIP) techniques, 201 molecular recognition, 199 Nanostructured materials	Pectin, 87 Pectin methylesterase, 73 Penicillium decumbens, 73, 74 Pharmacophore model, 47–48 Phytosterols, 17 Polyunsaturated fatty acids (PUFA), 16
aggregates disruption, 188–189 biopolymeric nanostructured particles	Q
hydrolyzed protein, 194 polysaccharides, 194 protein–polysaccharide mixtures, 194–195 whole proteins, 193 food materials structuring process	QPs. See Quinoa proteins Quantitative structure–activity relationships (QSARs) models, 35, 48–49 Quantitative structure–property relationships (QSPRs), 48–49 Quinoa
electrospraying, 190–191 homogenization, 186–188 microfluidization, 188 milling, 186	antioxidant capacity, phenolic compounds, and flavonoids, 18 carbohydrates amylopectin, 12–13
rapid expansion of supercritical solution (RESS), 191–192 ultrasound, 188–190	amylose, 12 differential scanning calorimetry (DSC), 14
functionality and applications encapsulated food components, 202–205	gelatinization properties, 14 glucose polymers, 11–12 granule size, 13
food packaging and edible coatings, 201–202	polysaccharides, 12 thermal properties, 14
nanosensors and nanotracers, 199–201 future of, 206–207	chemical, nutritional, and physical properties, 4–6
high-pressure homogenization effects, 188–189	chenopodium species, 2–3 functional properties

quinoa flour, 21–23	antibiotics, 81–82
quinoa protein, 23	apple pomace, 70–71
quinoa starch, 24	aroma compounds production, 74–75
water-holding capacity (WHC), 21	baker's yeast production, 80
water inbibing capacity (WIC), 21	enzymes production, 71–74
9 1 .	
lipids and lipidic compound	ethanol production, 75–78
docosahexaenoic acid (DHA), 15	feed protein, 81
eicosapentaenoic acid (EPA), 15	organic acids production, 78–79
fatty acid composition, 15, 17	pigments production, 80–81
polyunsaturated fatty acids (PUFA), 16	polysaccharides production, 79–80
squalene and phytosterols, 17	Squalene, 17
minerals and vitamins, 19–20	Supercritical fluid anti-solvent (SAS)
proteins	process, 191
active biopeptides, 9	_
chemical and nutritional aspects, 6–9	T
structural aspects, 9–10	Thermophilic bioremediation technology,
pseudocereal, 3	1
saponins, 18–19	111–116 Total coccurred (TC) 221, 222
uses of, 24–25	Total gossypol (TG), 221, 233
Quinoa flour	Traditional balsamic vinegar (TBV)
emulsifying capacity and stability, 22-23	chemical composition
functional properties, 22	characteristics, 169
solubility, 21	composition, 174–175
Quinoa proteins (QPs)	furanic compounds, 173–174
active biopeptides, 9	melanoidins, 174
chemical and nutritional aspects	minor compounds, 171–174
	organic acids, 170–171
amino acids composition, 6–9	phenolic compounds, 172–173
protein efficiency ratio (PER), 7	sugars, 169–170
structural aspects, 9–10	volatile compounds, 171
Quinoa starch	condiments, 139, 141
functional properties, 24	conservative mass balance equation,
structure, 11–15	151–153
	consortia, 138-139
R	features, 142–143
Rapid expansion of supercritical solution	historical note
(RESS), 191–192	comprehensive research, 140–141
	production aspects, 144–145
Residence time (RT), 160–161, 164–166	testimonies, 141–144
Rhizopus oligosporus, 96	5-hydroxymethyl furfural, 153
Rhodopsin, 44	legal aspects, 147–148
	physical properties
S	
Saponins, 18–19	color and spectrum absorbance, 176–177
Seafood by-products wastes, 68–69	
	rheological properties, 176
Seafood wastes, derivatives	production process
carotenoids production, 91	barrel set, 159–168
gelatin production, 92–93	cooking technology, 151–154
glucosamine and carboxymethylchitin	cooking time effect, 155
production, 91–92	fermentation, 154–159
marine peptone production, 93	raw material, 149–151
Solid-state fermentation (SSF),	semitic languages and italian legislation
fruit/vegetable by-products	in European languages, 146

Traditional balsamic vinegar (TBV) (cont.) traditional vs. industrial, 146–147 various forms, 145 sensorial aspects, 148 vinegars, 139–141 Tuna fin gelatin (TFG), 92–93

U

UK's Waste and Resources Action Program (WRAP), 59 User-oriented innovation in food sector, 117

V

Vegetable residues for wastewater treatment dyes adsorption, 97–98 metal ions biosorption, 94–97 Vinegar. *See* Traditional balsamic vinegar (TBV)

W

Waste management strategies, 62–63 Waste recovery, 62 Whey utilization and disposal, 99–100

X

Xanthan gum, 79

 \mathbf{Z}

Zirconium, 96 Zygosaccharomyces, 156