# **Subject Index**

## (Page number of erratum in italics)

Acknowledgment of reviewers, v

Alkaline cooking, amaranth grain by extrusion (Vargas-López et al), 610 Amaranth, physicochemical properties of extrusion-cooked (Vargas-López et

Amino acids, metabolism, consumption and release by lactic acid bacteria (Collar et al), 66

α-Amylase

from germinating maize (Warner et al), 383

- -inhibitors from rice; from insects, mammals, and bacteria (Feng et al), 516
- -mammalian, separation of wheat proteinaceous inhibitors of, by RP-HPLC (Feng et al), 95
- -removal of sprouted red spring wheat kernels with specific gravity table (Tkachuk et al), 390
- -segregation of sprouted durum wheat kernels on specific gravity table (Dexter et al), 401
- Amylose, two models for predicting concentration by spectrophotometric assay (Landers et al), 545
- Antibodies, polyclonal, raised against high molecular weight subunits of glutenin (Curioni et al), 200

Antibody-based test, for dough strength (Skerritt), 467, 475

#### **Baking**

- alternative fat and sweetener systems (Pong et al), 552
- bread, differences in gas retention, rheological properties between flour of different quality (He and Hoseney), 526
- frozen dough; frozen storage and freeze-thaw cycle effect on (Inoue and
- -gas retention of bread dough (He and Hoseney), 521
- properties of red spring wheat fractions removed from specific gravity table (Tkachuk et al), 390
- -qualities of soft white wheats; cookie diameter, cake volume related to constituents (Kaldy et al), 508
- -quality; differences in rate of protein solubility (He et al), 641
- -quality attribute association of soft wheat cultivars (Gaines), 56
- use of electric resistance oven (He and Hoseney), 151
- of various cereal flours (He and Hoseney), 334

#### Barley

- -contaminated, chemical and spectral quantification of mold in (Roberts et al), 272
- -high-amylose, starch isolation and fractionation (Szczodrak and Pomeranz),
- hulless, relation of total and acid-soluble,  $\beta$ -glucan content to acid-extract viscosity (Bhatty et al), 221
- -lipidemic responses, in rat study (Ranhotra et al), 548

Beans, bean grade effect on navy bean proteins, effect on rheological parameters and microstructure of wheat (Lorimer et al), 636

## Bran

- -cereal, effect on metabolism of trace elements in rats (Shah et al), 190
- -dietary cereal, effect on body weight and blood lipids in rats (Mongeau
- wheat, in yeast-raised breads (Rasco et al), 295

# Bread and breadmaking

- -baked and steamed bread, lipid binding and fatty acid distribution in (Addo and Pomeranz), 570
- -balady bread, fortification with tomato seed meal (Yaseen et al), 159 -bread volume measured with volumeter (Vanhamel et al), 170
- -bromate and sugar relation (Figueroa and Khan), 284
- -cassava bread (Defloor et al), 323
- -date paste functionality (Yousif et al), 43
- -effect of rye and wheat pentosans (Delcour et al), 72
- -effects of wheat proteins (MacRitchie et al), 122
- -flat bread, use of samah in production of (Amr), 155
- -French bread dough, preparation of frozen (Neyreneuf and Van Der Plaat), 60
- -frozen bread dough, ultrastructure (Berglund et al), 105
- -mechanism of bread firming (Martin et al), 498
- role of starch hydrolyzing enzyming on bread firming (Martin and Hoseney), 503
- steamed bread: lipid role (Pomeranz et al), 353; protein content and strength (Addo et al), 39
- -veast-raised breads, evaluation of enzyme and chemically treated wheat bran ingredients in (Rasco et al), 295

Breading and batters, seafood, composition of (Grodner et al), 162

Breakage test, Tangential Abrasive Dehulling Device and Stein Breakage Tester for breakage susceptibility of lentils (Tang et al), 647

# Buckwheat

- -fatty acid composition by fluorometric HPLC (Tsuzuki et al), 365
- -protein digestibility in, endogenous factors (Ikeda et al), 424

- -alternative fat and sweetener systems (Pong et al), 552
- -baking; glycine derivatives as source of CO<sub>2</sub> (Delcour et al), 369
- bovine plasma as egg white substitute in, processing and usual level effects on (Lee et al), 100
- quality attribute association of soft wheat cultivars (Gaines), 56
- Calorimetry, differential flux, starch gelatinization in pasta cooking (Riva

Carbohydrate sources, ogi for weaning diets in Nigeria (Adewusi et al), 165 Carbon dioxide, use of glycine derivatives as source in cake baking (Delcour et al), 369

Cassava, bread from (Defloor et al), 323

Cereal, \(\beta\)-glucan molecular weight (Wood et al), 530

Chalkiness of rice, factors (Raju and Srinivas), 210

Cholesterol, effect of soft vs. hard wheat bran fed male rats (Mongeau et al), 448

Chromatography, size-exclusion, for molecular characterization of cereal \( \beta \)glucans (Wood et al), 530

Color measurement, in flour (Symons and Dexter), 454

#### Cookies

- -high-fiber white flour for (Ranhotra et al), 432
- quality attribute association of soft wheat cultivars (Gaines), 56

Cooking, lime, procedure (Almeida-Dominguez et al), 25

Corn (see also Maize)

- -bran; modification of soluble and insoluble fiber contents in (Ning et al), 632
- —grain vitreousness and endosperm texture (Louis-Alexandre et al), 614
- -hardness related to milling yields (Wu and Bergquist), 542
- -nixtamalized flour, starch characterization of (Gomez et al), 578
- -popcorn, effect of kernel size and genotype on popping volume and number of unpopped kernels (Song et al), 464
- stillage; soluble and insoluble fraction yield and composition from (Lee et al), 659
- wet milling with enzymes (Ling and Jackson), 205

#### Cornmeal

- -characteristics of extruded mixtures of (Camire et al), 419
- extrusion cooking of (Lue et al), 227
- Cornstarch, complex with poly(ethylene-co-acrylic acid), paste viscosity and gel rheology (Fanta and Christianson), 300
- Cottonseed flour, characteristics of extruded mixtures of (Camire et al), 419 Cowpeas, effect of hard-to-cook defect on nutritional quality (Tuan and Phillips), 413

Cultivar, effect on quality of spring wheat (Lukow and McVetty), 597

Date paste, as sugar replacer in breadmaking (Yousif et al), 43

Dielectric properties, of chemically modified starches (Miller et al), 441 Dietary fiber

- in baked and extruded materials (Camire and Flint), 645
- -from corn and wheat stillages (Lee et al), 659
- -effects on iron and zinc in weanling rats (Ali and Harland), 234
- -modification through chemical treatments and twin-screen extrusion (Ning et al), 632
- separation of wheat distillers' grains into (Sosulski et al), 562

#### Differential scanning calorimetry

- —of barley starch (Szczodrak and Pomeranz), 589
- -to measure amylose-lipid complex recrystallization (Marshall and Normand), 606

#### Dough

- -baking in electric resistance oven (He and Hoseney), 151
- bean grade effect on navy bean proteins, effect on rheological parameters and microstructure of wheat (Lorimer et al), 636
- -bread, gas retention during baking (He and Hoseney), 521
- —fermentation; level of amino acids during (Collar et al), 66
  —frozen bread, frozen storage and freeze-thaw cycle effect on: baking and rheological properties (Inoue and Bushuk), 627; ultrastructure (Berglund et al), 105
- -frozen French bread preparation (Neyreneuf and Van Der Plaat), 60
- navy bean protein and globulins in composite flours, rheology, chemical bonding, microstructure (Lorimer et al), 213
- -pentosan effects on (Michniewicz et al), 252
- -properties; prediction on basis of glutenin composition (Gupta et al), 328
- strength; predictive test (Skerritt), 467, 475
- -sulfur-rich protein effect on dough formation (Kobrehel et al), 1

# Drying

- effect on enzymatic activities and rheological properties of stored rice (Dhaliwal et al), 18
- -model for estimating loss of wheat seed viability (Giner et al), 77
- -temperature; effect of, on starch yield of corn grits (Eckhoff and Tso), 319

#### Electrophoresis

- -electroblotting of wheat prolamins (Curioni et al), 200
- -of glutenin subunits in relation to dough strength (Primard et al), 305

- -PAGE-SDS and IEF of sulfur-rich proteins of wheats (Kobrehel et al),
- -quantitation of proteins in fractions from wheat by (MacRitchie et al). 122

Emulsifiers, in bread from cassava (Defloor et al), 323

Endosperm, maize,  $\alpha$ -amylases from (Warner et al), 383

Endosperm mutants, in rice, gene expression in japonica and indica (Kaushik and Khush), 487

Environment

- -effect on dough strength, antibody-based test for (Skerritt), 475
- effect on quality of spring wheat (Lukow and McVetty), 597

Enzymes

- $-\alpha$ -amylases from germinating maize (Warner et al), 383
- -amylolytic, proteolytic, lipolytic, and lipoxygenase changes in stored rice (Dhaliwal et al), 18

Erratum, Zhuge et al (vol. 68, no. 4), 558

Ethanol extraction, for stabilizing brown rice products (Champagne et al),

Extruders, twin-screw extrusion preparation of starch encapsulated herbicides (Carr et al), 262

Extrusion cooking

- of amaranth under alkaline conditions, physicochemical properties (Vargas-López et al), 610
- -of cornmeal and glandless cottonseed flour (Camire et al), 419
- of cornmeal and sugar beet fiber (Lue et al), 227
- -effects on corn meal, oat meal, and potato peels (Camire and Flint), 645

Fat substitutes, alternative fat systems in cake (Pong et al), 552

Fecal bulk, effect of whole grain flour from selected grains (Ranhotra et al), 556

Fermentation of wheat doughs, level of amino acids during (Collar et al), 66

Fiber

- -soluble, in corn bran, chemical treatments and extrusion processing for increased levels (Ning et al), 632
- -water-soluble, metabolic effects on lean men with type II diabetes (Anderson et al), 291

Flavonoids, processing effect on, in millet flour (Akingbala), 180

Flour

- -bromate and sugar relation (Figueroa and Khan), 284
- -cereal, gas retention in doughs of (He and Hoseney), 334
- corn, in rigid polyurethane foams (Cunningham et al), 258
- -high-fiber white, use in cookie products (Ranhotra et al), 432 -soft white wheat, analysis for pentosan, sugars, amylose, and nonstarch
- polysaccharides (Kaldy et al), 508
- -sorghum-peanut composite, functional properties of (Singh and Singh), 460
- -wheat, electrophoretic study of HMW proteins of acetic acid-insoluble residue of (Sievert et al), 512
- -whole grain, fecal bulking effect of (Ranhotra et al), 556

Fluorescence imaging, quantitative measurement of (Symons and Dexter), 454

Fluorometry, for determination of uric acid in grain (Lamkin et al), 81 Foams, effects of corn flour in urethane (Cunningham et al), 258 Fractionation, of rice proteins (Feng et al), 516

Gas retention

- -in bread dough during baking (He and Hoseney), 521
- differences between flour of different quality during baking (He and Hoseney), 526

Gelatinization kinetics, in pasta cooking (Riva et al), 622

Gliadins

- -immunochemical relationships with high molecular weight subunits of glutenin (Curioni et al), 200
- in relation to dough strength (Primard et al), 305

- -cereal, size-exclusion chromatography (Wood et al), 530
- enrichment in brans, analysis in oats (Wood et al), 48
- in rolled oats, microwave and conventional cooking effects compared (Yiu et al), 372
- -structure of, in cereals (Wood et al), 31

Gluten

- -from ground, pearled wheat (Zhuge et al), 336, 558
- -pentosan effect on (Michniewicz et al), 252
- ultrastructural variation related to sample preparation techniques (Freeman et al), 492

Glutenin

- -high and low molecular weight subunits (Primard et al), 305
- immunological reactions of x-type and y-type high molecular weight subunits of (Curioni et al), 200
- -LMW and HMW subunits, relationship with dough properties (Gupta et al), 328
- -structure; model, HMW subunits (Ng et al), 321

Glycerolipids, analysis of molecular species of (Mano et al), 280

- -perennial, structure and nutrient distribution in caryopses using SEM and LM (Irving et al), 376
- -uric acid in (Lamkin et al), 81

#### Hardness

- -of corn; relation to milling yields (Wu and Bergquist), 542
- -of wheat; relating to grinding time and speed reduction in micro hammercutter mill (Wu and Nelsen), 343

Herbicides, starch encapsulation by extrusion processing (Carr et al), 262 **HPLC** 

- —for analysis and structural characteristics of cereal  $\beta$ -glucans (Wood et al), 31
- -determination of 1BL/1RS translocations from wheat flour (Lookhart et al), 312
- -fluorometric, for fatty acid composition of buckwheat (Tsuzuki et al), 365

-of gliadin proteins (Primard et al), 305

-reversed-phase discrimination of rice pollen protein (Chen), 91

Hydration capacity, effects of baking and extrusion on (Camire and Flint),

IEF, of rice pollen protein for cultivar identification (Chen), 91 Image analysis

- -application to flour fluorescence (Symons and Dexter), 454
- of wheat; classification (Thomson and Pomeranz), 357

Immunocytochemistry

- -localization of wheat storage proteins (Bechtel), 573
- of wheat storage proteins, effect of particle size of protein A-gold on labeling intensity (Krishnan et al), 108

Insects

- detection with wheat radiographs (Keagy and Schatzki), 339
- -grain infestation or contamination (Lamkin et al), 81
- -separation of wheat proteinaceous inhibitors of, by RP-HPLC (Feng et al), 95

Instructions to authors, iii

Instruments and instrumentation

- -near-infrared transmittance, for determining protein and moisture in cereal grains (Williams), 112
- volumeter for measurement of breads (Vanhamel et al), 170

Iron

- -bioavailability in rats fed soy protein isolate and beef, alone or combined (Zhang et al), 194
- -reducing capability of soybean hull (Laszlo), 21

Lactic acid, addition of, when steeping in corn wet milling (Eckhoff and Tso), 248

Legumes

- breakage susceptibility of lentils (Tang et al), 647
- -navy bean protein and globulins in composite flours, dough rheology, chemical bonding, microstructure (Lorimer et al), 213

Lentil, breakage susceptibility (Tang et al), 647

Lipidemic responses, in rats fed barley and oat meals and their fractions (Ranhotra et al), 548

Lipids

- -complexing, effect on enzyme-resistant starch (Czuchajowska et al), 537
- -steamed bread role (Pomeranz et al), 353
- Lipoxygenase isozymes, purification and enzymatic properties (Shiiba et al),

Maize (see also Corn)

- -alcohol-soluble proteins (Paulis et al), 361
- $-\alpha$ -amylases from, germinating (Warner et al), 383
- changes in dry matter and protein fractions during kernel development (Ortega et al), 482
- continuous countercurrent steeping of (Steinke et al), 12
- -kernel endosperm; γ-zein in (Paiva et al), 276
- proximate analysis, physical properties, vitreousness, density (Mestres et al), 51
- quality factors; relations (Dorsey-Redding et al), 602
- -static batchwise steeping of (Steinke and Johnson), 7

Method

- -low temperature scanning electron microscopy (Berglund et al), 105
- to measure wheat hardness, in micro hammer-cutter mill (Wu and Nelsen), 343
- -nuclear magnetic resonance, <sup>17</sup>O, <sup>13</sup>C, and <sup>23</sup>Na during starch gelatinization (Chinachoti et al), 238

  170 NMR of water in starch (Chinachoti et al), 245

- -flour; effect of processing on flavonoids in (Akingbala), 180
- -pearl, semiwet milling to reduce goitrogenicity (Klopfenstein et al), 177 Milling
- -ball-milled wheat starch, moisture adsorption characteristics (Mok and Dick), 405
- -of brown rice; nutrient content and retention during (Villareal et al), 437
- -characterization of flour refinement by image analysis, flour ash, grade color,

- and tristimulus color measurements (Symons and Dexter), 454
- -dry-milling correlation with chemical and physical analyses of whole corn kernel (Mestres et al), 51
- properties of red spring wheat fractions removed for specific gravity table (Tkachuk et al), 390
- -semiwet process to reduce goitrogenicity of pearl millet (Klopfenstein et al), 177
- -wheat class; response of starch to ball milling (Mok and Dick), 409
- Moisture, determination of breakage susceptibility of lentils (Tang et al), 647
- in contaminated barley; chemical and spectral quantification of (Roberts et al), 272
- ergosterol and colony-forming units (Schnürer), 434

Molecular species, of glycerolipids from rye by RP-HPLC (Mano et al), 280 Mycotoxins, reduction in Fusarium-infected wheat with specific gravity table (Tkachuk et al), 428

Nixtamalization, corn flours, characterization (Gomez et al), 578

Oat bran, small-scale milling and enrichment in  $\beta$ -glucan (Wood et al), 48

- -avenalumic acids, from groats and hull phenolics (Collins et al), 184
- -β-glucan content in milling fractions (Wood et al), 48
- -β-glucan structure, comparison with other cereals (Wood et al), 31
- fiber; insoluble, metabolic effects on lean men with type II diabetes (Anderson et al), 291
- -lipidemic responses, in rat study (Ranhotra et al), 548
- —rolled, starch and  $\beta$ -glucan in, microwave and conventional cooking compared (Yiu et al), 372

Oscillatory rheometry, of starch-water system (Hansen et al), 347 Oxidative gelation, rye water-soluble pentosans (Vinkx et al), 617

- -cooking; starch gelatinzation in (Riva et al), 622
- -spaghetti-quality of durum wheat gravity table fractions (Dexter et al), 401 Pentosans
- -effect on dough and gluten (Michniewicz et al), 252
- -effect of gamma radiation on (Grant and D'Appolonia), 651
- -physical properties of, from wheat (Izydorczyk et al), 145
- physicochemical and functional properties of rye and wheat in breadmaking (Delcour et al), 72
- from rye, oxidative gelation (Vinkx et al), 617
- in soft white wheat, negative influence on baking quality (cake volume, cookie diameter) (Kaldy et al), 508
- water-soluble, structure, composition (Izydorczyk et al), 139
- Phenolic acids, NMR, MS, structure from oats (Collins et al), 184
- Physicochemical properties, of alkaline-extruded amaranth (Vargas-López et al), 610
- Phytate, in sorghum flour, effects on iron and zinc in weanling rats (Ali and Harland), 234
- Polydextrose, use in cake (Pong et al), 552
- Polysaccharides, effects of gamma radiation on (Grant and D'Appolonia),
- Popcorn, effect of kernel size and genotype on popping volume and number of unpopped kernels (Song et al), 464

Protease, in corn grits steeping, treatment of (Eckhoff and Tso), 319 Protein

- -analysis of prolamins; determination of putative rye proteins (Lookhart et al), 312
- -content and strength of steamed bread (Addo et al), 39
- -from corn and wheat stillages (Lee et al), 659
- -digestibility: in buckwheat, endogenous factors affecting (Ikeda et al), 424; in stored cowpeas (Tuan and Phillips), 413
- -effect of various solvents and environment on identification of rice varieties by RP-HPLC (Lookhart et al), 396
- extraction from brown rice, phytate interference (Juliano et al), 317
- -fractions in common and quality protein maize (Ortega et al), 482
- -Osborne fractions and sugar levels (Figueroa and Khan), 284
- -pollen, as taxonomic characteristics of rice cultivars (Chen), 91
- -rate of solubility of flours varying in baking quality (He et al), 641
- -rice, on PAGE and RP-HPLC (Huebner et al), 583
- -separation of wheat distillers' grains into (Sosulski et al), 562
- -solubility fractions, electrophoresis of (MacRitchie et al), 122
- -sulfur-rich, of wheats (Kobrehel et al), 1
- -tomato seed meal for fortification of balady bread (Yaseen et al), 159
- -wheat storage, immunocytochemistry of, effect of particle size of protein A-gold on labeling intensity (Krishnan et al), 108
- -zein and alcohol-soluble glutelins (Paulis et al), 361

Rheological properties, differences between flours of different quality during baking (He and Hoseney), 526

#### Rheology

-bean grade effect on navy bean protein, effect on rheological parameters and microstructure of wheat (Lorimer et al), 636

- -frozen dough; frozen storage and freeze-thaw cycle effect on (Inoue and Bushuk), 627
- gel, formed by complexing cornstarch with poly(ethylene-co-acrylic acid) (Fanta and Christianson), 300
- -rice, gelatinization temperature, peak temperature, and peak viscosity of stored rice (Dhaliwal et al), 18

#### Rice

- -acetic acid-soluble proteins, PAGE and RP-HPLC (Huebner et al), 583
- $-\alpha$ -amylase inhibitors (Feng et al), 516
- -amylose concentration as predicted by two models using spectrophotometric assay (Landers et al), 545
- -amylose-lipid complexes in milled and milled flour (Marshall and Normand).
- -brown: aqueous ethanol extraction for stabilization (Champagne et al), 267; nutrient content and retention during milling (Villareal et al), 437; phytate interference with protein extraction from (Juliano et al), 317
- -chalkiness; factors (Raju and Srinivas), 210
- -endosperm mutants; gene expression in japonica and indica (Kaushik and Khush), 487
- -high and low protein, comparative biochemistry of (Nanda et al), 351
- -pollen protein of cultivars, discrimination by IEF and HPLC (Chen), 91
- -proteins extracted by various solvents (Lookhart et al), 396
- stored, enzymatic activities and rheological properties of (Dhaliwal et al), 18

#### RP-HPLC

- -of amino acids; quantitative determination by (Collar et al), 66
- -analysis of molecular species of glycerolipids from rye (Mano et al), 280
- -changes in chromatographic patterns of rice proteins extracted from five varieties with different solvents and from different locations (Lookhart et
- -discrimination of sister-line IR rices by protein patterns (Huebner et al), 583
- -separation of wheat proteinaceous inhibitors of insect and mammalian  $\alpha$ amylases (Feng et al), 95
- of zein and alcohol-soluble high-lysine corn proteins (Paulis et al), 361
- Rye -analysis of molecular species of glycerolipids by RP-HPLC (Mano et al), 280
- pentosans; physicochemical and functional properties in breadmaking (Delcour et al), 72
- -starch; properties of (Gudmundsson and Eliasson), 172

Samah, characterization and use in flat bread production (Amr), 155 Scanning electron microscopy

- of carvopses of perennial grains (Irving et al), 376
- -for examination of ultrastructure (Berglund et al), 105
- of navy bean protein wheat composite and globulin-starch-wheat flour doughs (Lorimer et al), 213

#### SDS-PAGE

- -analysis: of fractions isolated by SE-HPLC (Batey et al), 207; of putative rye proteins collected from HPLC analysis, comparison with secalins (Lookhart et al), 312; of rice  $\alpha$ -amylase inhibitors (Feng et al), 516
- —of HMW subunits of glutenin (Curioni et al), 200
- -separation of LMW glutenin subunits by two-step electrophoresis (Gupta et al), 328
- -study of HMW proteins of acetic acid-insoluble residue of wheat flours (Sievert et al), 512

SE-HPLC, improved separation of flour proteins (Batey et al), 207

Shortening, effect on bread firming (Martin et al), 498 Sorghum

- -flour; fiber and phytate effects on iron and zinc in rats (Ali and Harland),
- -grains; properties of (Almeida-Dominguez et al), 25
- Sorghum-peanut composite flour; functional properties of (Singh and Singh),

Soy protein isolate, iron bioavailability in rats fed (Zhang et al), 194 Soybean hull, iron-reducing capability of (Laszlo), 21

- -effect of date paste on firming of bread (Yousif et al), 43
- -mechanism of bread firming, starch swelling effect (Martin et al), 498
- -role of starch hydrolyzing enzyme on bread (Martin and Hoseney), 503 Starch
- -analysis in oat milling fractions (Wood et al), 48
- -chemically modified, dielectric and thermal transition properties of (Miller et al), 441
- -digestibility in stored cowpeas (Tuan and Phillips), 413
- -enzyme-resistant: from barley (Szczodrak and Pomeranz), 589; complexing lipid effects (Czuchajowska et al), 537; X-ray diffraction of (Sievert et al),
- extruded, in bread from cassava (Defloor et al), 323
- -gelatinization molecular dynamics in solutes, by <sup>17</sup>O, <sup>13</sup>C, <sup>23</sup>Na NMR (Chinachoti et al), 238
- gelatinization temperature as related to water mobility by 170 NMR, in solutes (Chinachoti et al), 245

- -from ground, pearled wheat (Zhuge et al), 336, 558
- -nixtamalized corn flours, characterization (Gomez et al), 578
- preparation of starch encapsulated herbicides by twin-screw extrusion (Carr et al), 262
- -resistant, effect on intestinal responses (Ranhotra et al), 130
- in rolled oats, microwave and conventional cooking effects compared (Yiu et al), 372
- -rye, thermal and viscous properties of (Gudmundsson and Eliasson), 172 wheat; granule damage by ball milling, moisture adsorption characteristics (Mok and Dick), 405
- wheat class; influence of granule damage by ball milling on wheat hardness damage (Mok and Dick), 409
- yield of, corn wet milling, steeping with SO<sub>2</sub> gas and lactic acid (Eckhoff and Tso), 248

Starch-water system; concentration and temperature (Hansen et al), 347 Steeping

- -added protease during, for corn grits dried at different temperatures (Eckhoff and Tso), 319
- -continuous countercurrent steeping of maize (Steinke et al), 12
- -with SO<sub>2</sub> gas and lactic acid in corn wet milling (Eckhoff and Tso), 248 -static batchwise, of maize (Steinke and Johnson), 7
- Storage of rice, effect on enzymatic activities and rheological properties (Dhaliwal et al), 18

Sugar, relationship with bromate and loaf volume (Figueroa and Khan), 284 Sugar substitutes, alternative sweetener systems in cake (Pong et al), 552

Sulfur dioxide, gaseous treatment of, steeping in corn wet milling (Eckhoff and Tso), 248

Thermal transitions, exotherms produced by recrystallization of amylose-lipid complexes in milled rice and milled rice flour (Marshall and Normand),

#### **Tortillas**

- -corn, effect of lime treatment on calcium availability in diets of, rat growth and balance studies (Serna-Saldivar et al), 565
- -sorghum and corn, characteristics (Almeida-Dominguez et al), 25
- Trace elements, effect of wheat, oat, corn bran on metabolism in rats (Shah et al), 190
- Trichothecenes, reduction in Fusarium-infected wheat with specific gravity table (Tkachuk et al), 428

Ultrastructure, of wheat gluten related to sample preparation (Freeman et al), 492

#### Viscosity

- -acid-extract, relation to total and acid-soluble  $\beta$ -glucan content of hulless barley (Bhatty et al), 221
- paste, influence of poly(ethylene-co-acrylic acid) on (Fanta and Christianson), 300

# Wet milling

- -of corn: steeping with SO<sub>2</sub> gas and lactic acid (Eckhoff and Tso), 248; with enzymes (Ling and Jackson), 205
- of steeped corn grits, drying temperature and added commercial protease

- effect (Eckhoff and Tso), 319
- -of wheat distillers' grains into dietary fiber and protein fractions (Sosulski et al), 562

#### Wheat

- classes in relation to sugar and bromate requirement (Figueroa and Khan), 284
- classification, using three-dimensional image analysis (Thomson and Pomeranz), 357
- comparison of structure and composition of water-soluble pentosans (Izydorczyk et al), 139
- -cultivar and environment effect on quality (Lukow and McVetty), 597
- durum, fractionation with specific gravity table (Dexter et al), 401
- endosperm protein bodies; immunocytochemical localization of (Bechtel et al), 573
- gamma radiation, effects on water-soluble nonstarch polysaccarides (Grant and D'Appolonia), 651
- germ; purification and characterization of lipoxygenase isozymes from (Shiiba et al), 115
- gluten ultrastructure as influenced by sample preparation (Freeman et al), 492
- -ground, pearled, isolation of gluten and starch from, comparison to flour isolation (Zhuge et al), 336, 558
- hard red winter, breeding for wheat quality enhancement (Primard et al),
- -hardness measured by grinding time and speed reduction in micro hammercutter mill (Wu and Nelsen), 343
- hardness prediction, by near-infrared transmittance (Williams), 112
- infected with Fusarium head blight, removal of tombstone kernels and trichothecenes with specific gravity table (Tkachuk et al), 428
- insect detection in radiographs (Keagy and Schatzki), 339-
- -physical properties of water-soluble pentosans from (Izydorczyk et al), 145
- proteinaceous inhibitors of insect and mammalian α-amylases, RP-HPLC separation of (Feng et al), 95
- proteins in relation to quality (MacRitchie et al), 122
- quality affected by frost and immaturity (Preston et al), 133
- quality attribute association of soft wheat cultivars (Gaines), 56
- -removal of sprouted red spring wheat kernels with specific gravity table (Tkachuk et al), 390
- starch; moisture adsorption characteristics of ball-mill damaged granules (Mok and Dick), 405
- -starch damage by ball milling with respect to kernel hardness (Mok and Dick), 409
- -stillage; soluble and insoluble fraction yield and composition from (Lee et al), 659
- -sulfur-rich proteins of durum and bread wheats (Kobrehel et al), 1
- -viability loss during hot-air drying (Giner et al), 77
- Wheat bran, fungal contamination (Schnürer), 434
- Wheat distillers' grain, wet milling and separation of, into dietary fiber and protein fractions (Sosulski et al), 562

X-ray diffraction, of enzyme-resistant starch (Sievert et al), 86

γ-Zein, in maize kernel endosperm (Paiva et al), 276