

## Glossary

Like a foreign language, terms unique to food science can be baffling to the newcomer. Individuals traveling to a foreign country to do business are expected to know the language of the country. The same is true for the individual wanting to learn about food science. Indeed, the term “glossary” means obscure or foreign words of a field. Successful individuals use the glossary and learn the language. Words not found in the glossary may be defined within a chapter of the book.

### A

**absorption** - (1) Penetration of liquid into a solid that has a porous structure; (2) adherence of molecules of liquid, gas, or solid to the surface of a solid.

**acidulants** - Make a food acid or sour; added to foods primarily to change the taste and to control microbial growth.

**activated carbon** - An absorbent, formed by the heating of carbon materials at very high temperatures to expose large internal surface areas; often used to decolorize materials such as sugar liquors.

**active dry yeast** - Tiny dehydrated granules of yeast that are in a dormant phase until they are exposed to water.

**adipose tissue** - Fat.

**aerobic** - A process that requires atmospheric oxygen.

**aftertaste** - A taste that remains in the mouth after a food has been swallowed.

**agar** - A hydrocolloid made from marine algae; often used as a bacterial culture medium.

**agglomeration** - Gathering into a cluster, mass, or ball.

**agglutination** - Sticking together as with glue.

**aggregation** - Clumping together.

**aging** - Holding of beef in a cooler or beef in the refrigerator is commonly referred to as the “aging period”; process tenderizes meat.

**agitating retort** - See retort.

**air cell** - Empty space between the white and shell at the large end of the egg.

**albumen** - Also known as egg white; contains about 75 calories (kcal) of energy; provides humans with a high-quality protein containing all the essential amino acids.

**alcohol by weight** - A measurement (weight per volume) of the alcohol content of a solution in terms of the percentage weight of alcohol per volume of beer.

**alcohols** - Chemical compounds characterized by an OH group.

**aldehyde** - Class of organic compounds characterized by the presence of the unsaturated carbonyl group ( $\text{H}-\text{C}=\text{O}$ ) and a hydrogen atom attached to the carbon represented by ( $\text{R}-\text{C}=\text{O}$ ).

**aleurone layer** - Outer layer of the endosperm of certain seeds; contains protein bodies that store enzymes concerned with the breakdown of storage material in the endosperm.

**algorithm** - A set of rules used to perform operations or calculations; can be used by food-processing equipment to perform its controller operation.

**alkaline** - Basic pH.

**alkaloid** - Nitrogenous heterocyclic compounds product of plant metabolism many of which are poisonous.

**alkane** - A class of saturated hydrocarbons containing only single bonds represented by the formula  $\text{C}_n\text{H}_{2n+2}$ .

**alkene** - A class of unsaturated aliphatic hydro-carbons containing one double bond represented by  $\text{C}_n\text{H}_{2n}$ .

**all-grain beer** - A beer made entirely from malt as opposed to one made from malt extract, or from malt extract and malted barley.

**all-purpose flour** - A blend of soft and hard wheat flours with a medium amount of gluten, suitable for most baking purposes including conventional handmade yeast breads.

**allied industry** - Supporting industry associated with food.

**alpha-tocopherol** - A chemical with vitamin E activity represented by  $\text{C}_{29}\text{H}_{50}\text{O}_2$ .

**amaranth** - A seed that can be crushed or ground to flour and added to breads; does not have significant amounts of gluten.

**ameliorate** - To improve.

**amide** - A class of compound that contains an acyl group:  $\text{R}-\text{C}-\text{NH}_2$ .

**amino acid** - A basic building block of protein containing at least one amino group ( $\text{NH}_2$ ) and at least one carboxyl group ( $-\text{COOH}$ ) or acid group of small molecules, each having both an organic acid group ( $-\text{COOH}$ ) and an amino acid group ( $-\text{NH}_2$ ), that are the building units for protein molecules.

**amino group** - A chemical group ( $\text{NH}_2$ ) characteristic of all amino acids.

**amorphous** - Has no crystalline structure.

**amphophilic** - Liking or being attracted to both water and fat.

**amphoteric** - Elements or compounds that act either as an acid or base (gain or lose electrons) depending upon the medium they are in.

**amylase** - An enzyme that hydrolyzes starch to produce dextrans, maltose, and glucose.

**amylopectin** - Long-chain branched fraction of starch.

**amylose** - Long-chain or linear fraction of starch.

**anabolism** - Reactions involving the synthesis of compounds.

**anaerobic** - Without atmospheric oxygen.

**anhydrous** - A solid containing no water bound to the molecule as in a hydrate or not water of crystallization.

**anion** - A negative ion.

**antagonism** - Competitive or inhibiting effect of one substance upon another of similar molecular structure.

**antemortem** - Before slaughter or death.

**anthocyanins** - Purple, blue, and red color pigments.

**anthoxanthins** - Color pigments ranging from white to yellow.

**antibiotic** - A substance that inhibits the growth of bacteria.

**anticaking** - An additive used to inhibit or prevent caking of dry materials.

**antimicrobial agents** - Substances that prevent or inhibit the growth of microorganisms.

**antioxidant** - A substance that can stop an oxidation reaction; a substance that slows down or interferes with the deterioration of fats through oxidation.

**AOAC** - Abbreviation for Association of Official Analytical Chemists.

**aquaculture** - Art, science, and business of cultivating plants and animals in water.

**aroma** - An odor detected by the olfactory sense.

**aromatic compounds** - Compounds that have an aroma or odor.

**ascorbic acid** - Vitamin C.

**aseptic packaging** - Filling a container previously sterilized without re-contaminating either the product or the container.

**aseptically** - Free from disease-producing micro-organisms.

**ash** - Residue remaining after total combustion of a solution or mixture; used as a measure of the inorganic (mineral) components of a food.

**aspartame** - A high-intensity alternative sweetener with the trade name NutraSweet®; approximately 180 times sweeter than sucrose; essentially calorie free as small quantities are used. If bought at the grocery stores as Equal®, it is mixed with dextrose and maltodextrin.

**astringency** - Puckering, drawing, or shrinking sensation produced by certain compounds in food.

**atmospheric pressure** - Force per unit area exerted against a surface by the weight of the air above that surface.

**atomic number** - An experimentally determined number typical of a chemical element that represents the number of protons in the nucleus, which in a neutral atom equals the number of electrons outside the nucleus, and that determines the place of the element in the periodic table.

**ATP (adenosine triphosphate)** - A compound containing high-energy phosphate bonds in which the body cell traps energy from the metabolism of carbohydrate, fat, or protein; the energy in ATP is then used to do mechanical or chemical work in the body.

**Aw** - Vapor pressure of food product at a specified temperature.

## **B**

**bacteria** - Microorganisms usually consisting of a single cell composed of proteinaceous substances; some cause disease, others are used in food processing.

**bacteriophage** - An organism that surrounds and gradually disintegrates the bacterial cell and thus inhibits the growth.

**bagasse** - Crushed plant fiber remaining after the extraction of the sugar-containing juice from sugarcane; high in cellulose and used as fuel.

**bagel** - A traditional, doughnut-shaped roll with a characteristic dense texture achieved by a short rise, followed by boiling and then baking the product.

**bake** - To cook covered or uncovered in an oven usually by dry heat; usually done in an oven but occasionally under coals, in ashes, or on heated stones or metals.

**baker's sugar** - A refined specialty product that has an average crystal size smaller than that of normal table sugar.

**baker's yeast** - Yeast used for raising bread, typically from the taxonomic group *Saccharomyces cerevisiae*.

**bar** - International unit of pressure equal to 29.531 in. of mercury at 32°F.

**barley** - A cereal of the genus *Hordeum*, a member of the *Gramineae* or grass family of plants. The two varieties of barley are and six-rowed barley.

**barrel** - (1) A large cylindrical container of greater length than breadth and with bulging sides once made of wood coated with tar (pitch) to prevent infection, now made of aluminum or stainless steel; (2) A standard liquid measure: in the United States, 31 ½ gallons (119.2369 liters).

**baste** - To pour liquid composed of drippings, fat, and water, or sugar and water over a food while cooking.

**batch** - Amount of material prepared or required for one operation.

**beading** - Appearance of tiny droplets of syrup on the surface of a baked meringue as it stands.

**beat** - To mix with an over-and-over motion to smooth a mixture and to introduce air; also accomplished by a rotary beater or electric mixer.

**beer** - A generic name for alcoholic beverages produced by fermenting a cereal or a mixture of cereals.

**beet sugar** - Sugar (sucrose) processed from the sugar beet plant.

**beta-amylase** - An enzyme that hydrolyzes starch by breaking off two glucose units at a time, thus producing maltose.

**betalains** - Red color pigments.

**BHA** - Antioxidant butylated hydroxyanisole.

**BHT** - Antioxidant butylated hydroxytoluene.

**bioavailability** - In a form that can be used by the body.

**biofilms** - Films formed by organisms.

**bioproducts** - Designates a wide variety of corn-refining products made from natural, renewable raw materials that replace products made from nonrenewable resources; items that are produced by chemical synthesis.

**biosensors** - Devices sensitive to a physical or chemical stimulus, such as heat or an ion, that transmit information about a life process.

**biotechnology** - Collection of industrial processes or tools that involve the use of biological systems, such as plants, animals, and microorganisms.

**biotin** - A water-soluble vitamin; functions in fatty acid synthesis.

**birefringence** - Ability of a substance to refract light in two slightly different directions to form two rays; this produces a dark cross on each starch granule when viewed with a polarizing microscope.

**bitterness** - Quality or state of being bitter; in beer, the bitter flavor and aroma are caused by the tannins and the isohumulones of hops.

**black tea** - After rolling, lumps of tea are broken and spread in a fermentation room to oxidize, which turns the leaves to a copper color. The leaves are finally hot-air dried in a process that stops fermentation and turns the leaves black.

**blackstrap molasses** - A type of molasses that are generally used as animal feed or biological (fermentation) feed stock; the by-product of sugar extraction from sugar-containing liquors.

**blanc mange** - A thickened milk-based dessert.

**blanching** - Pretreating with steam or boiling water (a) to partially inactivate enzymes and shrink food before canning, freezing, or drying, by heating with steam or boiling water; (b) to aid in removal of skins from nuts and fruits by dipping into boiling water from 1 to 5 minutes; (c) to reduce strong flavor or set color of food by plunging into boiling water.

**bleached** - Flour processed with a “bleaching agent.” Fresh ground wheat flour does not result in consistently good products. Over time, flour ages and whitens, and within several months it produces a better product. To hasten the improvement process, modern flour mills bleach and age flour chemically through the addition of a bleaching agent.

**bleaching** - To make whiter or lighter especially by physical or chemical removal of color.

**blend** - To mix two or more ingredients until they are well combined.

**blood spot** - Also called meat spots; occasionally found on an egg yolk.

**bloom** - Refers to the way the top of bread opens during baking along the cuts made in the top crust.

**BOD** - Biological Oxygen Demand, a measure of water quality.

**boil** - To cook in boiling liquid. A liquid is boiling when bubbles are breaking on the surface and steam is being released; in a slowly boiling liquid, bubbles are small; in a rapidly boiling liquid, bubbles are large; as boiling changes from slow to rapid, more steam is formed but there is no increase in temperature. Boiling temperature of water at sea level is 100°C or 212°F. It is reduced by rise above sea level, approximately 1°C for every 970 feet of elevation. It is increased by solution of solids in the water and by pressure of enclosed steam as in a pressure saucepan.

**boiling point** - Temperature at which a liquid vaporizes.

**bomb calorimeter** - Instrument for measuring the energy content of food.

**botulinum toxin** - A very potent toxin produced by *Clostridium botulinum* bacteria; in a low-acid environment, the high temperatures achieved in a pressure canner are required for complete destruction of the spores of this microbe.

**bound water** - Water that is held so tightly by another molecule (usually a large molecule such as a protein) that it no longer has the properties of free water; water that is not easily removed from the food.

**braise** - To cook in a covered utensil with a small amount of liquid; a moist heat method of cooking.

**bran** - Outer layers of a wheat kernel proper.

**bread flour** - A special flour, higher in gluten, that can be used for making yeast breads by hand; recommended for use in a bread machine.

**breaded** - Coated with bread crumbs or similar flour product.

**brew** - Infusion and boiling stages of tea-making or the beer-making process.

**brewer's yeast** - An inactive yeast product that is a by-product of beer-making and is specially processed to be a nutritional supplement for humans.

**brewing** - Process of making beer, ale, or other similar cereal beverages that are fermented but not distilled.

**brine** - A salt solution.

**brix** - A hydrometer used for testing the sugar concentration of syrups.

**broiling** - A dry-heat method of cooking usually by radiation, otherwise, direct exposure to heat source; to cook by direct heat.

**bromelin** - A proteolytic enzyme found in pineapple; used in meat tenderization.

**brown sugar** - A finished sugar product consisting of sugar crystals and darker non-sucrose materials. Soft brown sugars are brown sugars crystallized directly by specialized crystallization processes. Brown sugars can also be made by blending white crystallized sugar and dark syrups.

**buckwheat** - A seed of a small plant, ground into light or dark (greater fiber, stronger flavor) flour.

**buffer** - A mixture of compounds that protects solutions from a substantial change in pH; a substance that resists change in acidity or alkalinity.

**bulk density** - Weight per unit volume of a large mass of material; comparative for the conditions that apply; reported as pounds per cubic foot (lb./ft.<sup>3</sup>) for solids and pounds per gallon (lb./gal.) for liquids.

**bulking agent** - A substance used in relatively small amounts to affect the texture and body of some manufactured foods made without sugar or with reduced amounts.

**bumping** - A phenomenon whereby a viscous product “bumps” or “burps” when heated. In a microwave oven this occurs due to entrapped steam pockets that will “suddenly” bump. In a thickened pudding it may occur as the starch gelatinizes and steam builds up if heated through direct heat.

**butterfat (BF)** - Fatty portion of milk.

**buttermilk** - Liquid by-product of butter making. Churning breaks the fat globule membrane so the emulsion breaks, fat coalesces, and water (buttermilk) escapes.

**butyric acid** - A saturated fatty acid with four carbon atoms that is found in relatively large amounts in butter.

**BV** - biological value.

**by-products** - secondary or incidental products from a manufacturing process.

## C

**caffeine** - Stimulant that is a plant alkaloid in coffee, tea, and selected carbonated beverages.

**caking** - Formed into a crust or compact mass.

**calorie** - A unit of heat measurement; the small calorie used in chemistry. The kilocalorie is used in nutrition. One kilocalorie is equal to 1,000 small calories.

**cane sugar** - A sugar (sucrose) product processed from sugarcane.

**canners sugar** - A refined, granulated specialty product that meets exacting standards for microbiological quality.

**capon** - A male chicken castrated when young.

**caramel** - A product formed by sugar decomposition due to heating of sucrose, or it may also be made to be a confectionery product due to the Maillard reaction.

**caramelization** - Sucrose heated past the molten point so that it dehydrates and decomposes; the development of brown color and caramel flavor as dry sugar is heated to a high temperature and chemical decomposition occurs in the sugar.

**carbohydrate** - A category of organic compounds with carbon, hydrogen, and oxygen; in sugars, the ratio is an approximate C:H:O [1:2:1] ratio.

**carbon dioxide (CO<sub>2</sub>)** - Leavening agent produced by chemical or biological means for baked products.

**carbonate** - A salt or ester of carbonic acid.

**carbonated** - Having carbon dioxide gas injected or dissolved in a liquid, creating an effervescence of pleasant taste and texture.

**carbonator** - Used to add carbon dioxide to a liquid.

**carbonyl group** - A ketone (–C=O) or an aldehyde (HC=O) group.

**carcinogen** - A cancer-causing substance.

**carotenoids** - Fat-soluble, yellow-orange pigments that are produced by plants; may be stored in the fatty tissues of animals.

**case hardening** - During the drying process, food cooks on the outside before it dries on the inside.

**casein** - A major protein found in milk.

**caseinate** - A protein salt derived from milk.

**casings** - Tubular intestinal membrane of sheep, cattle, or hogs, or a synthetic facsimile used for sausage, salami, and the like.

**catabolism** - Breaking down of complex substances into simpler ones with the release of energy; the opposite of anabolism.

**catalase** - An enzyme that breaks down hydrogen peroxide to water and oxygen.

**catalyst** - A substance that changes the rate of a chemical reaction without being used up in the reaction; enzymes are catalysts.

**catalyze** - To make a reaction occur at a more rapid rate by the addition of a substance called a catalyst, which itself undergoes no permanent chemical change.

**catechin** - A specific tannin; closely related to anthocyanins and anthoxanthins.

**cation** - A positive ion.

**caustic** - Capable of destroying living tissue.

**caviar** - Sturgeon roe preserved in brine.

**cellulose** - A plant carbohydrate of long chains of glucose; indigestible to humans.

**centrifuge** - Equipment that uses centrifugal force to separate solids and liquids; different spinning speeds used depend upon separation needs.

**certificate** - A document providing evidence of status of qualifications.

**chalaza** - Ropey strands of egg white that anchor the yolk in place in the center of the thick white.

**chelating agent** - Substance that binds strongly to multivalent cations, by virtue of a number of anionic groups acting like pincers, for example, EDTA (ethylene diamine tetraacetic acid).

**chicory** - A plant whose root is roasted and ground for use as a coffee substitute.

**chitin** - A water-insoluble polysaccharide containing amine groups; exoskeleton of insects and crustaceans.

**chlorophyll** - Green color pigment.

**choice** - One of the quality grades.

**cholecalciferol** - Active form of vitamin D; vitamin D<sub>3</sub>

**cholesterol** - A sterol with the formula C<sub>27</sub>H<sub>46</sub>O abundant in animal fat, brain and nervous tissue, and eggs; functions in the body as a part of membranes, as a precursor of steroid hormones and bile acids.

**choline** - A dietary component of many foods, is part of several major phospholipids that are critical for normal membrane structure and function; used by the kidney to maintain water balance and by the liver; used to produce the important neurotransmitter acetylcholine.

**chroma** - Intensity or purity of a color.

**chromatography** - A process in which a chemical mixture carried by a liquid or gas is separated into components because of differential distribution of the solutes as they flow around or over a stationary liquid or solid phase.

**churning** - Process that breaks the fat globule membrane so the emulsion breaks, fat coalesces, and water (buttermilk) escapes.

**cis** - Configuration has the hydrogen atoms on the same side of the double bond, particularly with unsaturated fatty acids.

**clarifier** - A material or piece of equipment that will remove suspended solids or colloidal materials from a liquid.

**clarify** - To make clear a cloudy liquid such as heated soup stock by adding raw egg white and/or egg shell; as the proteins coagulate, they trap tiny particles from the liquid that can then be strained out.

**Clean-in-Place (CIP)** - A method of cleaning the interior surfaces of equipment without disassembly.

**cleaning** - Complete removal of food soil.

**climacteric** - Fruits that produce ethylene gas during ripening; are ethylene sensitive.

**coagulate** - To form a clot, a semisolid mass, or a gel, after initial denaturation of a protein; to produce a firm mass or gel by denaturation of protein molecules followed by formation of new crosslinks.

**coagulation** - Aggregation of protein macromolecules into clumps or aggregates of semi-solid material.

**coalesce** - To grow together or to unite into a whole.

**cobalamin** - Vitamin B<sub>12</sub>

**cocoa** - Finely pulverized, defatted, and roasted cacao kernels.

**Coenzyme** - Nonprotein compound that aids to form the active portion of an enzyme system.

**cold process** - A process that does not increase the temperature or change the physical or sensory characteristics of most foods.

**cold shortening** - A carcass that is chilled too rapidly; causes subsequent toughness.

**coliform** - Relating to, resembling, or being *E. coli*.

**collagen** - A fibrous type of protein molecule found in the connective tissue of animals; produces gelatin when it is partially hydrolyzed.

**colloidal** - Dispersion state of subdivision of dispersed particles; intermediate between very small particles in true solution and large particles in suspension.

**colloids** - A homogeneous, non-crystalline substance consisting of large molecules or ultramicroscopic particles of one substance dispersed through a second substance. Colloids include gels, sols, and emulsions; the particles do not settle and cannot be separated out by ordinary filtering or centrifuging like those in a suspension.

**color** - Property of a material in which specific visual wavelengths of the electromagnetic spectrum are absorbed and/or reflected.

**commercial item descriptions (CID)** - Product descriptions that concisely describe the most important characteristics of a commercial product.

**commercial sterility** - Condition where all pathogenic and toxin-forming organisms have been destroyed, as well as other organisms capable of growth and spoilage under normal handling and storage conditions.

**comminute** - To reduce to small fine particles.

**competencies** - Abilities or capabilities of employees.

**complex carbohydrates** - Carbohydrates made up of many small sugar units joined together—for example, starch and cellulose.

**compliance** - Conformity in fulfilling official requirements.

**composite** - Containers made up of several parts or elements.

**compressed yeast** - Fresh (not dried) yeast that is extruded and cut into a cake form. It must always be refrigerated and has a relatively short shelf life of 4 to 6 weeks.

**concentration** - Reducing the weight and volume of a product.

**conching** - A flavor development process that puts the chocolate through a “kneading” action and takes its name from the shell-like shape of the containers originally employed.

**conduction** - Heating transfers heat by direct contact of the heated molecules to those at a lower energy level.

**conductivity** - Measurement of the electrical conductance or the heat energy in a substance. Conductance and conductivity ash refers to solutions and is influenced by inorganic salts in many food-processing industries.

**confectioners' sugar** - A refined sugar product whose granule sizes range from coarse to powdered.

**congealing** - A liquid oil becomes solid at a certain temperature.

**conglomerate** - Multiple crystals or particles cemented together.

**consumer** - Person or organization that purchases or uses a service or commodity.

**controlled atmosphere storage** - Monitoring and controlling of content of gases in the storage warehouse atmosphere; a low oxygen content slows down plant respiration and delays senescence (aging).

**convection** - Air currents aid in distributing heat throughout. As liquids and gases are heated, they become lighter (less dense) and rise, whereas cooler molecules of the liquid or gas move to the bottom of a container or closed compartment.

**convection oven** - A built in fan circulates the air and cooks the food more evenly than conventional ovens.

**cool storage** - Is considered any temperature from 68° to 28°F (16° to –2°C).

**copolymer** - Product of chemical reaction in which two molecules combine to form larger molecules that contain repeating structural units.

**COP** - Clean-out-of-place.

**corn sugar** - Processed sugar products from acid or enzyme hydrolyzed cornstarch.

**corn syrup** - (1) A syrup made by partial hydrolysis of cornstarch to dextrose, maltose, and dextrans; (2) purified concentrated aqueous solution of nutritive saccharides obtained from edible starch.

**cotyledon** - Part of the embryo in seeds, acting either as a storage organ or in absorbing food reserves from the endosperm. Dicotyledonous plants have two cotyledons, and monocotyledonous plants have one.

**couche** - A large piece of linen or canvas used to wrap dough for rising; seasoned by dusting it with flour.

**covalent bond** - A strong chemical bond that joins two atoms together.

**cracklings** - Adipose tissue residue left from rendered pork fat that has had the lard extracted.

**cream of tartar** - Potassium acid tartrate, the partial salt of tartaric acid, an organic acid; a weak acid substance commonly added to fondant to produce variable amounts of invert sugar from the hydrolysis of sucrose.

**cream** - (1) Butterfat of milk; (2) To work one or more foods until soft and creamy. The hands, a spoon, electric mixer, or other implements may be used.

**creative thinking** - Ability to generate new ideas by making nonlinear or unusual connections or by changing or reshaping goals to imagine new possibilities; using imagination freely, combining ideas and information in new ways.

**crepe** - A thin pancake.

**critical control point** - Any point in the process where loss of control may result in a health risk.

**critical limits** - A maximum and/or minimum value to which a biological, chemical, or physical parameter must be controlled at a critical control point to prevent food safety hazards.

**critical temperature** - Temperature above which a gas can exist only as a gas, regardless of the pressure, because the motion of the molecules is so violent.

**croissant** - A French classic roll, crescent shaped and made from buttered layers of yeast dough much like a puff pastry.

**cross-contamination** - Contamination of one substance by another; for example, cooked chicken is contaminated with salmonella organisms when it is cut on the same board used for cutting the raw chicken.

**cross cutting** - Cutting against the grain.

**crustaceans** - Shellfish with a segmented, crust shell and jointed appendages.

**cryogenic** - Being or relating to very low temperatures.

**cryoprotectants** - Substances that offer protection to such sensitive molecules as proteins during freezing and frozen storage.

**crystalline** - Aggregation of molecules of a substance in a set, ordered pattern, forming individual crystals.

**crystallization** - Formation of crystals from the solidification of dispersed elements in a precise orderly structure.

**crystallize** - To form crystals from the solidification of dispersed elements in a precise orderly structure.

**cubeb** - An essential oil used in flavorings.

**cuisine** - A style of cooking or manner of preparing food.

**cultural diversity** - Term to describe the American workplace representing people from different backgrounds.

**curd** - Substance consisting mainly of casein, obtained by coagulation of milk and used as food or made into cheese.

**curing** - A preservative method; more often used for flavor and color enhancement.

**cut** - (1) To divide food material with knife or scissors; (2) to incorporate fat into dry ingredients with a pastry blender or two knives, with the least possible amount of blending.

**cut and fold** - A combination of two motions—to cut vertically through mixture and to turn over by sliding tool across bottom of mixing bowl at each turn; proper folding prevents loss of air.

**cyclamate** - Any group of nonnutritive sweeteners with general formula  $C_6H_{11}NHSO_4$ ; an artificial sweetener.

**Cytoplasm** - Pertaining to the protoplasm of a cell, exclusive of the nucleus.

## D

**D value** - Time in minutes at a specified temperature to reduce the number of microorganisms by one log cycle.

**D.E.** - A measure of the total reducing sugars, expressed as dextrose (glucose).

**daily reference value (DRV)** - A set of numerical quantities developed for by the U.S. FDA the dietary intake of energy-containing macronutrients.

**dark rye flour** - A coarse rye flour ground from the whole rye grain.

**data sheet** - Similar to a résumé; contains pertinent information about potential employees.

**deboning** - Removal of bone from meat.

**decolorization** - Process of removing colored impurities from sugar solutions by absorption with activated carbon, bone char, and/or ion-exchange resin.

**degumming** - First step in the oil refining process, oils are mixed with water, which removes valuable emulsifiers such as lecithin; enhanced by adding phosphoric or citric acid or silica gel.

**dehydrated food** - A food dried by artificial means to less than 5 percent moisture.

**dehydration** - Almost complete removal of water from a product.

**dehydrofrozen** - A product held in frozen form during dehydration.

**dehydrogenase** - An enzyme that catalyzes a chemical reaction in which hydrogen is removed; similar to an oxidation reaction.

**dehydrogenation** - Removal of hydrogen from a compound.

**Delaney clause** - Government action enforced by the FDA that basically says the food industry cannot add any substance to food if it induces cancer when ingested by man or animal.

**demographic** - Having to do with vital and social statistics.

**denature** - A change in the molecular structure from the native structure of a protein.

**density/mass** - Weight per unit volume; potatoes with higher density or specific gravity are heavier for their size; the weight (in vacuum) per unit volume at a specific temperature.

**deodorization** - Removal of odor or smell.

**dermal** - A layer of protective tissue.

**developing country** - Not yet highly industrialized.

**dextrinization** - Addition of various water-soluble gummy polysaccharides obtained from starch by the action of heat, acids, or enzymes and used as adhesives, as sizes for paper and textiles, as thickening agents, and in beer.

**dextrins** - Polysaccharides composed of many glucose units; produced at the beginning stages of starch hydrolysis (breakdown); somewhat smaller than starch molecules.

**dextrose** - An alternate name for glucose, a monosaccharide having the chemical formula  $C_6H_{12}O_6$ .

**diacetyl** - Flavoring agent in butter; chemical formula:  $CH_3COCOCH_3$ .

**dielectric** - A substance that is a poor conductor of electricity, but an efficient supporter of electrostatic fields.

**diffusion** - Movement of a substance from an area of higher concentration to an area of lower concentration.

**digestion** - Process that breaks down food into molecules small enough to absorb.

**diglyceride** - Glycerol combined with two fatty acids.

**disaccharide** - A sugar composed of two simple sugars or monosaccharides; two monosaccharides linked together; simple sugars with two basic units.

**dissolve** - To break into parts or to pass into solution.

**distribution** - Division and classification; deals with those aspects favorable to product sales, including product form, weight and bulk, storage requirements, and storage stability.

**disulfide** - A bond between two sulfur atoms ( $-S-S-$ ), each of which is also joined to another chemical group; these bonds often tie protein chains together; sometime called disulfide linkages.

**double bonds** - Two bonds between atoms; in food science typically, carbon atoms ( $-C=C-$ ).

**downgraded** - Reduced quality.

**draft beer** - Beer drawn from casks or kegs rather than canned or bottled.

**drawn fish** - Fish sold with only the entrails removed.

**dressed fish** - Scaled and eviscerated fish with the head, tail, and fins usually removed.

**DRI** - Dietary Reference Intakes.

**dried** - A food product from which most of the water has been removed.

**dried corn syrup** - Corn syrup from which the water has been partially removed.

**dry cleanup** - A cleanup strategy in which all non-liquid waste is captured and prevented from entering the wastewater.

**durum wheat** - A wheat with high gluten content used to make pasta.

**Dutch-processed** - A mild alkali treatment of chocolate to change and darken color and improve flavor.

## E

**eating quality** - A function of the combined effects of appearance, texture, and flavor.

**effervescence** - Bubbling-up or fizz in drinks caused by dissolved carbon dioxide gas.

**eggs** - Ova or female reproductive cell of chickens or other birds.

**electrical stimulation** - Brief exposure to high voltage electrical current to improve tenderness of many cuts of the beef carcass; used before slaughter of animals to render unconscious.

**electrode** - An electronic conductor, often a metal plate, used to collect or emit electrons; often used in pH meters and batteries.

**electromagnetic energy** - Energy that has an electric and a magnetic component; for example, microwaves are electromagnetic energy.

**electron** - Chemical properties of an element are determined by the number of electrons in the outermost energy level of an atom; in its elemental state, the number of electrons of an atom equals the number of protons and the atom is electrically neutral. Electrons travel around the nucleus at very high speed.

**electron transfer** - Also called oxidation-reduction reactions; chemical reactions such as rusting and photography.

**electronegativity** - Assumed negative potential when in contact with a dissimilar substance.

**element** - One of a limited number of substances, such as hydrogen and carbon; composed of atoms; listed in the Periodic Table of Elements.

**emulsifier** - A substance that acts as a bridge at the interface between two immiscible liquids and allows the formation of an emulsion; a substance that aids in producing a fine division of fat globules; in ice cream, it also stabilizes the dispersion of air in the foam structure. Eggs contain the natural emulsifier lecithin.

**emulsion** - A system consisting of a liquid dispersed in an immiscible liquid usually in droplets of larger than colloidal size—for example, fat in milk.

**encapsulate** - To enclose in a capsule. Flavoring materials may be combined with substances such as gum acacia or modified starch to provide an encapsulation matrix and then spray-dried. Salt, sodium chloride, is encapsulated with partially hydrogenated vegetable oil to keep the salt out of solution so it will not interfere with the swelling of gums such as carrageenan.

**endoplasm** - Inner portion of the cytoplasm of a cell.

**endosperm** - Seed tissue surrounding the embryo, containing food reserves.

**energy** - Ability to do work; in foods measured in term of calories.

**enhancers** - Substances that supplement, increase, or modify the original flavor or nutrient content of a food.

**enriched flours** - Flour with added niacin, thiamin, riboflavin, folic acid, and iron to compensate for some of the nutrients lost during the milling process.

**enrober** - Covers and surrounds each candy center (nuts, nougats, fruit, and so on) with a blanket of chocolate.

**entrepreneur** - One who starts and conducts a business assuming full control and risk.

**enzymatic browning** - Coloring of food caused by enzymes and prevented by blanching a food before drying.

**enzymatic reactions** - Those catalyzed by enzymes, special proteins produced by living cells.

**enzyme** - Organic catalyst produced by living cells that changes the rate of a reaction without being used up in the reaction.

**epidemiology** - Study of causes and control of diseases prevalent in a human population group.

**essential amino acid** - One that is required in the diet.

**essential oils** - Concentrated flavoring oils extracted from food substances, such as oil of orange or oil of peppermint.

**ester** - A type of chemical compound that results from combination of an organic acid ( $-\text{COOH}$ ) with an alcohol ( $-\text{OH}$ ) with the removal of one molecule of water.

**ethylene** - A small gaseous molecule ( $\text{C}_2\text{H}_4$ ) produced by fruits and vegetables as an initiator of the ripening process.

**evaporation** - Removal of water. Generally, it is removed as a vapor either due to boiling temperatures or at lower temperatures in a vacuum chamber.

**eviscerated** - Removal of the internal organs.

**expenditures** - Expenses of money, time, or energy.

**extraction** - Drawing out, pulling out, or removing.

**extratrics** - Chemical interaction of packaging materials with foods.

**extrusion** - Shaping through force.

## F

**facultative** - Microorganisms that are both aerobic and anaerobic.

**Fahrenheit** - A thermometer scale in which the freezing point of water is  $32^\circ\text{F}$  and the boiling point is  $212^\circ\text{F}$ .

**famine** - A great shortage of food.

**fat substitute** - A food product with the same functions and characteristics as fat but with fewer calories.

**fats** - An ester of glycerol and three fatty acids. Fats add richness, tenderness, calories, and flavor to many products.

**fatty acid** - A chemical molecule consisting of carbon and hydrogen atoms bonded in a chainlike structure; combined through its acid group ( $-\text{COOH}$ ) with the alcohol glycerol to form triglycerides.

**fermentation** - Enzymatic decomposition of carbohydrates under anaerobic conditions.

**ferrous** - Iron-containing.

**fiber** - Indigestible substances including cellulose, hemicelluloses, and pectin (all polysaccharides); also lignin, which is a non-carbohydrate material found particularly in woody parts of a vegetable.

**ficin** - Used as a meat tenderizer.

**filtration** - Process of separating a solid from a liquid by applying a force to move the liquid through a barrier while retaining the solid. The force may be gravity.

**fine sugar (fine granulated)** - Refined sugar product of sugar crystals whose average size and distribution are within the range of normal table sugar. Some producers call this extra-fine granulated sugar.

**fire point** - Temperature at which decomposition products are evolved in such quantity and at such a rate that they will support continued combustion.

**fish protein concentrate (FPC)** - Fish flour produced from dehydrated and defatted fish.

**flash point** - Temperature at which the decomposition products are evolved in such quantity as to be capable of ignition but not continued combustion.

**flavonoid pigments** - Phenolic compounds related to flavones. They have hydroxyl, methoxyl, or sugar groups substituted for some of the hydrogen atoms of the flavone; a group of plant pigments with similar chemical structures; they include both anthoxanthins, which are white, and anthocyanins, which are red-blue.

**flavor** - A blend of taste, smell, and general touch sensations evoked by the presence of a substance in the mouth.

**floc** - A precipitate that remains suspended in a solution.

**flocculation** - Aggregation into a mass.

**foam** - Dispersion of a gas in a liquid, such as a beaten egg-white mixture.

**fondant** - A creamy preparation of fine sugar crystals used in after-dinner mints and other candies; usually prepared from a super-saturated solution; also a type of powdered sugar.

**food additive** - A substance, other than usual ingredients, that is added to a food product for a specific purpose, for example, flavoring, preserving, stabilizing, thickening.

**Food and Agricultural Organization (FAO)** - An agency of the United Nations that conducts research, provides technical assistance, conducts education programs, maintains statistics on world food, and publishes reports with the World Health Organization.

**food concentration** - Reducing the weight and volume of a food by removing water.

**Food, Drug, and Cosmetic Act** - Regulates the labeling for all foods other than meat and poultry.

**food infection** - Illness produced by the presence and growth of pathogenic microorganisms in the gastrointestinal tract; they are often, but not necessarily, present in large numbers.

**food intoxication** - Illness produced by microbial toxin production in a food product that is consumed; the toxin produces the illness.

**food labeling** - Labels have the product name, the manufacturer's name and address, the amount of the product in the package, and the product ingredients.

**food safety** - A judgment of the acceptability of the risk involved in eating a food; if risk is relatively low, a food substance may be considered.

**food security** - When all people, always, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life.

**food soil** - Unwanted matter on food-contact surfaces.

**foreign aid** - Large quantities of food, supplies, and money sent to people in need in many foreign countries.

**form-fill-seal** - When containers are formed in the production line just ahead of the filling operation and then sealed later down the production line.

**FPC** - Fish protein concentrate.

**freeze-drying** - A drying process that involves first freezing the product and then placing it in a vacuum chamber, the ice sublimates (goes from solid to vapor phase without going through the liquid phase). The dried food is more flavorful and fresher in appearance because it does not become hot in the drying process.

**freezer burn** - Drying out while stored in a freezer.

**freezing mixtures** - Mixtures of crushed ice and salt that become very cold, below the freezing point of plain water, because of the rapid melting of the ice by the salt and the attempt of the system to reach equilibrium; freezing mixtures are used to freeze ice creams in ice cream freezers.

**fructose** - A sugar sometimes called levulose or fruit sugar; a monosaccharide with the chemical formula  $C_6H_{12}O_6$ .

**fry** - To cook in fat deep enough to float the food; also called "deep-fat fry" or "French-fry;" to cook in small amount of hot fat or drippings; also called "pan-fry" or "sauté."

**fumigant** - An organic compound that is a gas at low temperatures; it is used for insect and disease control.

## **G**

**gastroenteritis** - Inflammation of the gastrointestinal tract.

**gel** - A colloidal dispersion that shows some rigidity and will, when unmolded, keep the shape of the container in which it had been placed; a semirigid structure at room temperature.

**gelatinization** - Changes that occur in the first stages of heating starch granules in a moist environment; includes swelling of granules as water is absorbed and disruption of the organized granule structure.

**gelation** - Process of gelling.

**generation time** - Time it takes for microorganisms to reproduce.

**germ** - Small structure at the lower end of the kernel; rich in fat, protein, and mineral and contains most of the riboflavin content of the kernel.

**germinal disc** - Channel sperm takes that leads to the center of the yolk.

**germination** - Sprouting of a seed.

**glazing** - Dipping a fish in cold water and then freezing a layer before dipping the fish again.

**gliadin** - One of the wheat proteins that makes up one portion of gluten, the primary structural component.

**globulins** - Simple proteins that are soluble in dilute salt solutions.

**glucoamylase** - An enzyme that hydrolyzes starch by breaking off one glucose unit at a time, thus producing glucose immediately.

**glucose** - A sugar sometimes called dextrose or blood sugar; a monosaccharide with the chemical formula  $C_6H_{12}O_6$ . This is the basic building block of starch.

**glucose isomerase** - An enzyme that changes glucose to fructose.

**gluten** - A protein in wheat and a limited number of other cereals that is formed when water is added to flour and, with kneading, gives structure to baked products.

**glycerol** - Colorless liquid with chemical formula  $C_3H_8O_3$ ; used as sweetener and preservative.

**glycogen** - A complex carbohydrate—a polysaccharide—used for carbohydrate storage in the liver and muscles of the body; sometimes called animal starch.

**GMP** - Good Manufacturing Practices guidelines that a company uses to evaluate the design and construction of food processing plants and equipment.

**grades** Positions in a scale of ranks or qualities.

**grain mills** - Machine designed to grind wheat and other grains to make flour.

**granulated sugar** - White crystalline sugar or sucrose; the sugar referred to in most recipes that call for "sugar."

**GRAS** - List of food additives that are "Generally Recognized As Safe" by a panel of experts; list is maintained and periodically reevaluated by the FDA.

**gravity flow** - Movement of a liquid pulled by gravity.

**green tea** - Leaf is heated before rolling to destroy the enzymes, and the leaf then remains green throughout processing; unfermented tea.

**grill** - To cook by direct heat.

**grind** - To put through a food chopper.

**gum** - Any of several colloidal polysaccharide substances of plant origin that are gelatinous when moist but harden on drying and are salts of complex organic acids.

## H

**HACCP** - Hazard Analysis and Critical Control Point; a preventative food safety system.

**hard water** - Water that contains calcium, magnesium, and iron bicarbonates or sulfates.

**hard wheat** - Generally grown in northern climates; especially suited to bread making because of a high level of the gluten-forming wheat protein; a specific genus of wheat.

**hazard** - A source of danger, long- or short-term, such as microbial food poisoning, cancer, birth defects, and so on.

**headspace** - Volume above a liquid or solid in a container.

**heat capacity** - Amount of energy required to raise a unit mass of a material one degree.

**heat exchanges** - See heat transfer

**heat transfer** - Process by which energy in the form of heat is exchanged between two bodies.

**hens** - Female turkeys and chickens.

**hepatitis** - Inflammation of the liver.

**hermetically** - Made airtight by fusion or sealing.

**hexose** - A simple sugar or monosaccharide with six carbon atoms.

**HFCS** - High-Fructose Corn Syrup.

**homebrewing** - Art of making beer at home. In the United States, homebrewing was legalized by President Carter on February 1, 1979, by an act of Congress introduced by Senator Alan Cranston. The Cranston Bill allows a single person to brew up to 100 gallons of beer annually for personal enjoyment and up to 200 gallons in a household of two persons or more aged 18 and older.

**homeostasis** - Tendency of a system or organism to maintain internal stability.

**homogenization** - A process in which whole milk is forced, under pressure, through very small openings, dividing the fat globules into very tiny particles.

**homogenize** - To subdivide particles, usually fat globules, into very small uniform-sized pieces.

**hops** - Dried ripe cones of the female flowers of this plant used in brewing and medicine.

**hot-fill** - See hot-pack.

**hot-pack** - Filling unsterilized containers with sterilized food that is still hot enough to render the package commercially sterile.

**HPLC** - High-performance liquid chromatography; form of column chromatography in which a liquid medium passes over a solid phase, usually at high pressure.

**HTST** - High temperature, short time; a method of pasteurization.

**hue** - Property of light by which an object is classified in reference to the color spectrum— red, blue, green, or yellow.

**humectant** - A substance that can absorb moisture easily; a substance that retains moisture.

**hunger** - Lack of food; desire or need for food.

**HVAC** - Heating, ventilation, and air-conditioning systems.

**hydrates** - A substance that contains water or its constituent elements.

**hydration capacity** - Ability of a substance, such as flour, to absorb water.

**hydrocolloid** - A substance with particles of colloidal size that is greatly attracted to water and absorbs it readily; colloidal materials such as vegetable gums, that bind water and have thickening and/or gelling properties; large molecules, such as those that make up vegetable gums, that form colloidal dispersions, hold water, and often serve as thickeners and stabilizers in processed foods.

**hydrocooling** - Cooling with water.

**hydrogen bond** - Relatively weak chemical bond that forms between a hydrogen atom and another atom with a slight negative charge, such as an oxygen or a nitrogen atom; each atom in this case is already covalently bonded to other atoms in the molecule of which it is part.

**hydrogenation** - Addition of hydrogen to oil; a selective process that can be controlled to produce various levels of hardening, from very slight to almost solids.

**hydrologic cycle** - Water cycle; Involves evaporation, condensation, precipitation, and other processes.

**hydrolysates** - Products of hydrolysis, the chemical process of decomposition involving the splitting of a bond and the addition of the hydrogen cation and the hydroxide anion of water.

**hydrolysis** - A chemical reaction in which a linkage between subunits of a large molecule is broken; a molecule of water enters the reaction and becomes part of the end products.

**hydrolytes** - Products of hydrolysis.

**hydrolyze** - To break a molecular linkage utilizing a molecule of water; to break chemical linkages, by the addition of water, to yield smaller molecules.

**hydrometer** - A device for measuring specific gravity. The hydrometer is placed in a solution and the relative displacement within the solution is compared to that within pure water.

**hydrophilic** - Attracts water.

**hydrophobic** - Repels water.

**hydrophobic force or bond** - Force arising from the tendency of hydrophobic molecules to aggregate in a hydrophilic environment, thus maximizing the number of hydrogen bonds between water molecules, and hence giving the lowest energy.

**hydrostatic retort** - A still steam retort, operated at a constant temperature through which the containers are conveyed by a continuous carrier chain, at a constant rate designed to provide the correct process time-see **retort**.

**hygroscopic** - Absorbing or attracting moisture from the air.

**hypobaric** - Pressure is reduced along with temperatures and humidity for cold storage.

**immersion freezing** - Intimate contact occurs between the food or package and the refrigerant.

**immiscible** - Describing substances that cannot be mixed or blended.

**impeller** - A rotor for transmitting motion.

**indicators of potential** - Are used to indicate the potential presence of unsafe pathogens in food.

**Infant Health Formula Act** - Provides that manufactured formulas contain the known essential nutrients at the correct levels.

**inoculation** - Introducing a microorganism into surroundings suited to its growth.

**insoluble** - Does not readily dissolve in water.

**insoluble fiber** - Portion of plants that cannot be digested by the human digestive tract.

**inspection** - Examining of food products or processes carefully and critically in order to assure proper sanitary practices, labeling, and/or safety for the consumer. Organizing of food products and classifying them according to quality, such as grade A, B, or C; based on defined standards.

**instant yeast** - Instant yeast is a specially processed form of active dry yeast that can be mixed into a dough dry (rather than dissolved) and reduces rising time up to 50 percent.

**integrated** - A system in which the components are interconnected to perform a function.

**Integrated pest management (IPM)** - Control of one or more pests by a broad spectrum of techniques ranging from biological means to pesticides.

**interesterification** - Process of moving a fatty acid from one triglyceride molecule to another.

**interfering agent** - Hinders formation or reaction.

**international unit** - A standard unit of potency for a vitamin.

**inversion** - Reaction of the hydrolysis of sucrose to yield an equal mixture of glucose and fructose.

**invert sugar** - Result of the hydrolysis of sucrose to yield an equal mixture of glucose and fructose.

**invertase** - Enzyme that catalyzes reaction of the hydrolysis of sucrose to yield an equal mixture of glucose and fructose.

**invisible fat** - Occurs naturally in food products such as meats, dairy products, nuts, and seeds.

**iodine value** - Chemical tests to determine the degree of unsaturation of the fatty acids in a fat; the test is based on the amount of iodine absorbed by a fat on a per 100 grams basis. The higher the iodine value, the greater the degree of unsaturation.

**ion-exchange** - A process that uses specially fabricated porous beads that are chemically modified to exchange one ion for another as a solution is passed through them. Different types of ion-exchange columns exist.

**ionization** - Converted into ions.

**ionizing radiation** - Radiation that removes an electron (ionizes) from an atom or molecule.

**ionomer** - Type of plastic material formed by ionic bonds.

**irradiation** - Energy moving through space in invisible waves.

**ISM** - Electromagnetic spectrum frequency bands allocated for industrial, scientific, and medical purposes.

**isomerization** - A molecular change resulting in a molecule containing the same elements in the same proportions but having a slightly different structure and, hence, different properties. For example, in carotenoids, heat causes a change in the position of the double bonds between carbon atoms.

## **J**

**juice** - Fluid expressed from a food product. In sugar it is the juice with dissolved sucrose pressed out of sugar beet root or sugarcane stalk.

**Julian date** - A number—1 through 365—indicating day of the year.

## **K**

**ketones** - Chemical compounds characterized by a  $\text{-C=O}$  group.

**kilocalorie** - One kilocalorie is equal to 1,000 small calories; the small calorie is used in chemistry, whereas the kilocalorie is used in nutrition.

**kinetic motion** - Very rapid vibration and movement of tiny molecules or ions dispersed in true solution.

**knead** - Action used to manipulate bread dough that forms the gluten network in dough.

## **L**

**labile** - Unstable.

**lactalbumin** - A whey protein that regulates the production of lactose in milk.

**lactoglobulin** - Major whey protein of cow milk.

**levulose** - Another name for fructose in the confectionery industry.

**lagering** - Brewing by slow fermentation and maturing under refrigeration

**lag time** - Amount of time required for an organism to reach the log growth phase.

**lakes** - Any of various usually bright clear organic pigments composed basically of a soluble dye absorbed on or combined with an inorganic carrier.

**laminar** - Particles of fluid move in parallel or adjacent layers; each layer has a constant velocity but relative to neighboring layers.

**landfilling** - Disposing food-processing wastes in a landfill.

**latent heat** - Heat or energy required to change the state of a substance, that is, from liquid to gas, without changing the temperature of the substance.

**leavening** - Making baked products lighter by helping them rise; yeast, baking powder, and baking soda are common leavening agents.

**lecithin** - Best-known phospholipid; an essential fat

**legume** - Any of a large family of plants characterized by true pods enclosing seeds; for example, dried beans and peas.

**levulose** - Is also called fructose or fruit sugar; a monosaccharide with the chemical formula  $C_6H_{12}O_6$ .

**lignin** - A woody, fibrous, non-carbohydrate material produced in mature plants; component of the fiber complex.

**limiting amino acid** - Required in the diet; the amino acid that is present in the lowest quantity compared to need.

**linoleic acid** - A polyunsaturated fatty acid with 18 carbon atoms and 2 double bonds.

**linolenic acid** - A polyunsaturated fatty acid with 18 carbon atoms and 3 double bonds between carbon atoms; omega-3 fatty acid.

**lipase** - An enzyme that catalyzes the hydrolysis of triglycerides to yield glycerol and fatty acids.

**lipids** - A broad group of fatlike substances with similar properties.

**lipolysis** - Breakdown of lipids.

**lipoproteins** - Proteins combined with lipid or fatty material such as phospholipids.

**liquid** - Ingredient that has flow or viscosity; may be milk, water, juices or other liquids; will dissolve and disperse ingredients.

**liquid sugars** - A finished sugar product sold in the liquid state; a concentrated solution of sugar products and water.

**liquor** - A liquid off the top of a mixture of liquid and solids. In sugar-containing solutions, a high-Brix, solution recovered at various stages of the refining process.

**logarithmic** - Expression of numbers using exponents.

**LTLT** - Low-Temperature Longer Time pasteurization; heating to 145°F for at least 30 minutes.

**lycopene** - A reddish, fat-soluble pigment of the carotenoid type.

## **M**

**macromineral** - Minerals in the diet that are used in larger amounts; includes calcium, phosphorus, potassium, sodium, chloride, magnesium, and sulfur.

**magma** - A mixture of sugar crystals and liquid that forms a thick slurry.

**Maillard reaction** - A special type of browning reaction involving a combination of proteins and sugars as a first step; may occur in relatively dry foods on long storage as well as in foods heated to high temperatures; the reaction between the amino group of an amino acid and protein and the reducing sugar to cause a brown color.

**malnutrition** - A person eats but does not receive the amounts of nutrients needed to keep the body healthy.

**malt** - Processed barley steeped in water, germinated on malting floors or in germination boxes or drums and later dried in kilns for the purpose of converting the insoluble starch in barley to the soluble substances and sugars in malt.

**maltase** - An enzyme that hydrolyzes maltose to glucose.

**maltodextrin** - A mixture of small molecules resulting from starch hydrolysis.

**maltose** - A double sugar or disaccharide made up of two glucose units.

**manufacturing** - Converts raw agricultural products to more refined or finished products.

**marbling** - Distribution of fat throughout the muscles of meat animals.

**marinating** - Soaking in a prepared liquid (oil and acid mixture) for a time; tenderizes and seasons.

**marketing** - Selling of foods, which involves wholesale, retail, institutions, restaurants, and the consumer.

**mash** - A mixture of ground malt and previously boiled malt adjuncts at a set temperature.

**mashing** - One of the steps of brewing; the infusion of malt, water, and crushed cereal grains at temperatures that encourage the complete conversion of the cereal starch into sugars.

**materials handling** - How food products are handled during each stage of production

**maturing agent** - A substance that brings about some oxidative changes in white flour and improves its baking properties.

**meat** - Skeletal muscle from the carcasses of animals.

**Meat Inspection Act** - Federal act authorized in 1906 and administered by the Food Safety and Inspection Service (FSIS) of the Department of Agriculture (USDA).

**meat spots** - Blood spots on the egg yolk caused by a ruptured blood vessel.

**mechanically separated** - Separation of bone from meat using automated equipment.

**melt** - To liquefy by heat.

**melting point** - Temperature at which a solid fat becomes a liquid oil.

**mesophilic microorganisms** - Bacteria that grow best at moderate temperatures.

**metabolic** - Having to do with any of the chemical changes that occur in living cell.

**metabolism** - A general term used to refer to all the chemical reactions that occur in a living system. Metabolism can be divided into two processes: (1) anabolism, or reactions involving the synthesis of compounds, and (2) catabolism, or reactions involving the breakdown of compounds.

**microfiltration** - A membrane process that filters out or separates particles of very small size (0.02 to 2.00 microns), including starch, emulsified oils, and bacteria.

**microminerals** - Minerals in the diet that are used in smaller amounts; includes chromium, cobalt, copper, fluorine, iodine, iron, manganese, molybdenum, nickel, selenium, silicon, tin, vanadium, and zinc.

**micron** - One millionth of a meter.

**microprocessor or chip** - Small semiconductor circuit containing numerous electronic devices, such as transistors, that perform complex calculations or operations. Used mainly in computers or/and automated instruments. The entire algorithm for a microwave oven controller can be incorporated into one single chip.

**microsensors** - Miniaturized, and possibly biological, indicators capable of accurately measuring the physiological state of plants, indicating temperature-abuse for refrigerated foods, or monitoring shelf-life of food.

**microwaves** - Electromagnetic energy that has an electric and a magnetic component.

**middlings** - Inner portion of the kernel.

**mill** - (1) To beat; best done with a rotary beater; for example, milk dishes, such as cocoa, are milled to remove scum formed during heating; (2) refers to grinding of grain to produce flour.

**mill starch** - A starch-gluten suspension in the process of germ separation.

**millet** - A small yellow seed that lends texture and flavor to breads.

**milling** - Separating of the bran covering, germ, and endosperm to the extent desired.

**mince** - To cut or chop into very small pieces.

**mitochondria** - Microscopic sausage-shaped bodies in the cell cytoplasm that contain the enzymes necessary for energy metabolism.

**mixograph** - A graphic chart that provides supplementary baking data on dough mixes from various wheats.

**modified atmosphere** - Modifying the composition of the internal atmosphere in which a food product is stored.

**modified starches** - Natural starches that have been treated chemically to create some specific change in chemical structure, such as linking parts of the molecules together or adding some new chemical groups to the molecules; the chemical changes create new physical properties that improve starches in food preparation.

**molasses** - A sugar product extracted directly from sorghum or a by-product of the sugar extraction; a relative impure sugar syrup.

**molecule** - Molecules are the smallest identifiable unit into which a pure substance can be divided and still retain the composition and chemical properties of that substance.

**mollusks** - An invertebrate with a calcareous shell that is one or more pieces enclosing a soft, unsegmented body.

**monoglyceride** - Glycerol combined with only one fatty acid

**monosaccharide** - A simple sugar unit, such as glucose, fructose, and galactose; a simple sugar with a single basic unit.

**monounsaturated fat** - Lacking a hydrogen bond on the carbon chain.

**mucoprotein** - A complex or conjugated protein containing a carbohydrate substance combined with a protein.

**muscle pigments** - Pigments in muscle including myoglobin and hemoglobin (affect meat color).

**mycotoxins** - Toxins produced by molds.

**myoglobin** - Name of the protein that is the primary color pigment of meat.

## **N**

**neutron** - Particle found in atomic nuclei having no charge.

**niacin** - One of the B vitamins.

**nib** - Roasted ground kernel of the cacao bean.

**nitrogen base** - A molecule with a nitrogen-containing chemical group that makes the molecule alkaline.

**nitrogen packed** - Packed in a nitrogen gas filled bag to avoid the effect that oxygen has on the product.

**nonclimacteric** - Fruits not producing ethylene gas during ripening.

**noncrystalline** - Types of sugar candy that includes hard candies, brittles, chewy candies, and gummy candies.

**non-ionizing radiation** - Radiation that does not ionize (remove an electron from) atoms or molecules.

**nonnutritive** - Used to describe a sweet product that contains little, if any, nutritive value; also called artificial sweetener.

**nonreducing end** - In a polysaccharide or oligosaccharide chain, the end(s) that does not act as a reducing agent. Branched chains have more than one non-reducing end.

**nonvolatile** - Lacking the ability to readily change to a vapor or to evaporate; not able to vaporize or form a gas at ordinary temperatures.

**NPU** - Net protein utilization.

**nutrition labeling** - Expression of the nutrient and caloric content of food products.

**Nutrition Labeling and Education Act** - Protects consumers against partial truths, mixed messages, and fraud regarding nutrition information.

**nutritionally enhanced** - Processed foods with added nutrient or nutrients such as vitamin C, B vitamins, iodine, iron, and so forth.

**nutritive sweetener** - A sweetener that has a caloric value.

**nutritive value** - Amount of essential nutrients a food contains and how much of them are digested and absorbed into the body.

## O

**objective** - Evaluation having to do with a known object as distinguished from existing in the mind; in food science, measurement of the characteristics of food with a laboratory instrument such as pH meter to indicate acidity or a viscometer to measure viscosity or consistency.

**obligative** - Restricted to a condition such as organisms that can only survive in the absence of oxygen.

**offal** - All parts of a carcass that are considered by-products, such as feet, tongue, hide, and so on.

**ohmic heating** - Heating of a food product by using an alternating current flowing between two electrodes.

**oil** - Fats that are liquid at room temperature.

**olfactory** - Having to do with the sense of smell.

**oligosaccharide** - General term for sugars composed of a few—often between three and ten—simple sugars or monosaccharides; a carbohydrate containing 2 to 20 sugar residues (the upper limit is not well-defined); intermediate-size molecules containing approximately ten or fewer basic units.

**oolong** - Type of tea that begins like black tea; when the leaf is fired or dried, a coppery color forms around the edge of the leaf while the center remains green; the oolong flavor is fruity and pungent.

**organic acid** - An acid containing carbon atoms; for example, citric acid and acetic acid, generally weak acids characterized by a carboxyl (–COOH) group.

**organic compound** - A compound that has carbon included into the chemical formula; can be natural or human-made material.

**organic foods** - Foods grown and/or produced under conditions that supposedly replenish and maintain soil fertility, use only nationally approved materials in their production, and have verifiable records of the production system.

**organoleptic** - Perceived by any sense organ.

**osmosis** - Movement of water through a semi-permeable membrane into a solution where the solvent concentration is higher thus equalizing the concentration on either side of the membrane.

**osmotic pressure** - Force that a dissolved substance exerts on a semipermeable membrane.

**ovalbumin** - A major protein found in egg white.

**ovary** - Part of the seed-bearing organ of a flower; an enlarged hollow part containing ovules that develop into seeds.

**overlapping operations** - Food processing that includes a combination of unit operations to achieve the total process.

**oxalic acid** - An organic acid that forms an insoluble salt with calcium.

**oxidase** - Enzymes that catalyze oxidation reactions.

**oxidation** - A chemical change that involves the addition of oxygen; for example, polyphenols are oxidized to produce different flavor and color compounds; a chemical reaction in which oxygen is added; addition of oxygen to carotenoid pigments lightens the color; chemical reactions in which oxygen is added or hydrogen is removed, or electrons are lost; gain in oxygen or loss of electrons.

**oxidation-reduction reactions** - Loss of electrons from an atom produces a positive oxidation state, while the gain of electrons results in negative oxidation or reduction.

## **P**

**pan broil** - To cook uncovered on hot metal such as a grill or frying pan; the utensil may be oiled just enough to prevent sticking.

**pan fry** - To cook in a small amount of fat.

**papain** - A vegetable enzyme used to tenderize meat.

**parboil** - To boil until partially cooked. Foods with strong or salt flavor are often parboiled, as are tough foods that are to be roasted or cooked in hot fat.

**pare** - Peel to remove outer cover.

**parenchyma** - Thin-walled, highly vacuolated cells, forming the ground tissue of plants; often photosynthetic; relatively unspecialized, sometimes capable of cell division.

**pasteurization** - Process of heating a food to a specified temperature for a specified time to destroy pathogenic organisms.

**pasteurize** - To treat with mild heat to destroy pathogens—but not all microorganisms—present in a food product.

**pathogenic** - Capable of causing disease.

**pectic enzymes** - Enzymes such as pectinase that hydrolyze the large pectin molecules.

**pectin** - A gel-forming polysaccharide (polygalacturonic acid) found in plant tissue; a complex carbohydrate (polysaccharide) composed of galacturonic acid subunits, partially esterified with methyl alcohol and capable of forming a gel.

**pectin esterase** - An enzyme that catalyzes the hydrolysis of a methyl ester group from the large pectin molecule, producing pectic acid. Pectic acid tends to form insoluble salts with such ions as calcium ( $\text{Ca}^{2+}$ ). These insoluble salts cause the cloud in orange juice to become destabilized and settle.

**pectinase** - An enzyme that hydrolyzes the linkages that hold the small building blocks of galacturonic acid together in the pectic substances, producing smaller molecules.

**penetration** - (1) Refers to distance heat and/or electromagnetic waves will “penetrate” a product; (2) a marketing term indicating the number or percentage of a product sold in each market.

**pentose** - A simple sugar or monosaccharide with five carbon atoms.

**peptide** - A variable number of amino acids joined together.

**peptide bond** - Formed by the condensation of the amino group ( $-\text{NH}_2$ ) of one amino acid with the acid group ( $-\text{COOH}$ ) of another amino acid resulting in the loss of water.

**peptide linkage** - Linkage between two amino acids that connects the amino group of one and the acid (carboxyl) group of the other.

**PER** - Protein efficiency ratio.

**per capita** - Per person.

**permanently hard water** - Contains calcium.

**permeate** - To penetrate through the pores. magnesium, and iron sulfates that do not precipitate when boiled.

**peroxide value** - Indicates the degree of oxidation that has taken place in a fat or oil. The test is based on the amount of peroxides that form at the site of double bonds. These peroxides release iodine from potassium iodide when it is added to the system.

**PET** - Polyethylene Terephthalate; a type of plastic that is easy to recycle.

**pH** - A scale of 1 to 14, indicating the degree of acidity or alkalinity; 1 being most acid, 7 neutral, and 14 most alkaline.

**phenolic compound** - An organic compound that includes in its chemical structure an un-saturated ring with –OH groups on it; polyphenols have more than one –OH group; organic compounds that include in their chemical structure an unsaturated ring with –OH groups on it; these compounds are easily oxidized, producing a brownish discoloration.

**phenols** - Organic compounds that include, as part of their chemical structures, an unsaturated ring with an –OH group on it.

**phospholipid** - A type of lipid characterized chemically by glycerol combined with two fatty acids; phosphoric acid, and a nitrogen-containing base, for example, lecithin.

**phytochemical** - Chemical from plants.

**pigment** - Any biological substances that produce color in tissues.

**pizza** - A round savory tart made with a crisp yeast dough, covered with tomato sauce, mozzarella cheese, and a variety of other ingredients such as meat, seafood, vegetables, fruit, and other condiments.

**plant exudates** - Materials that ooze out of certain plants; some that ooze from certain tree trunks and branches are gums.

**plasma** - (1) A component of blood; (2) a gas whose atoms or molecules have been ionized and is characterized by a colored glow. "Plasma" is often seen in a neon bulb or under low pressure in microwave freeze-drying experiments.

**plasticity** - Ability to be molded or shaped; in plastic fats, both solid crystals and liquid oil are present.

**pneumatic trailer** - A type of bulk carrier that allows unloading of the product by air pressure.

**poach** - To cook in a hot liquid, carefully handling the food to retain its form.

**polar** - Chemical molecules that have electric charges (positive or negative) and tend to be soluble in water; having two opposite natures, such as both positive and negative charges.

**polarimetry** - Amount of rotation experienced by a beam of polarized light as it passes through a solution. The rotation reflects the type and amount of solution. The amount of sucrose can be measured by a polarimeter and is called saccharimetry.

**polarized light** - Light that vibrates in one plane.

**polarized molecules** - Molecules that have both positive (+) and negative (–) charges on them, creating two poles.

**polymer** - A giant molecule formed from smaller molecules that are chemically linked together; a large molecule formed by linking together many smaller molecules of a similar kind; molecules of relatively high molecular weight that are composed of many small molecules acting as building blocks.

**polymerize** - To form large molecules by combining smaller chemical units.

**polyphenol** - An organic compound with more than one –OH group attached to the unsaturated ring of carbon atoms; some produce bitterness in coffee and tea.

**Polyphenol oxidase** - A mixed function oxidase that catalyzes enzymatic browning.

**polysaccharide** - A complex carbohydrate made up of many simple sugar (monosaccharide) units linked together; in the case of starch, the simple sugars are all glucose; carbohydrate polymer consisting of at least 20 monosaccharides or monosaccharide derivatives; complex carbohydrates with many basic units (up to thousands).

**polyunsaturated fatty acid** - Fatty acid with two or more double bonds between carbon atoms; for example, linoleic acid with two double bonds.

**post-consumer recycle** - Collection, separation, and purification of the consumer's disposed food packages.

**postmortem** - After death.

**potable** - Drinkable.

**potassium bromate** - An oxidizing substance often added to bread dough to strengthen the gluten of high-protein flour.

**poults** - Young turkeys.

**powdered sugar** - A sugar product produced by grinding a mixture of granulated sugar and corn starch.

**PPO** - Polyphenoloxidase.

**precipitate** - To become insoluble and separate out of a solution or dispersion.

**precursor** - Substance that "comes before"; precursor of vitamin A is a substance out of which the body cells can make vitamin A; in flavor study, it is a compound that is non-flavorful but can be changed, usually by heat or enzymes, into a flavorful substance.

**pressed sugar** - A sugar product formed by molding and pressing damp granulated sugar into shapes such as cubes and drying the product.

**pretzel** - A yeast dough that is typically rolled into a long rope and often knotted. They can be crisp or soft and chewy.

**primary containers** - Containers that come in direct contact with the food.

**primary treatment** - A process in which wastewater is allowed to settle, and the floating materials are removed.

**printability** - Ability to take on ink for printing.

**processed meats** - Combined with other spices and additives to form a new product such as hot dogs, sausage, bologna, and jerky.

**production** - In the food industry, production includes such industries as farming, ranching, orchard management, fishing, and aqua-culture.

**proofing** - Last rising of bread dough after it is molded into a loaf and placed in the baking pan.

**proofing yeast** - Dissolving yeast in warm liquid about ¼ cup water and about 1 teaspoon sugar and setting it aside for 5 to 10 minutes until it develops foam on top.

**propellant** - Compressed inert gas that dispenses the contents of a container.

**protease** - An enzyme that breaks down or digests proteins.

**protein** - Large molecules of long chains of amino acids.

**protein efficiency ratio (PER)** - A measure of protein quality assessed by determining the extent of weight gain in experimental animals when fed the test item.

**protein hydrolysate** - Resulting mixture when a protein is broken down or hydro-lyzed by an enzyme or other means to smaller units called peptides and amino acids.

**protein quality** - Refers to amino acid content of a protein.

**proteinase** - An enzyme that hydrolyzes protein to smaller fragments, eventually producing amino acids.

**proteins** - Long chains of amino acids.

**proton** - Positively charged particle found in all atomic nuclei.

**protoplast** - That part of the plant cell lying within the cell wall; the plasma membrane and all that lies within it. This term is often used to describe plant cells from which the cell wall has been removed.

**protozoa** - One-celled animals.

**proximate analysis** - Approximate composition of food products consisting of its proportions of water, carbohydrate, protein, fat, and ash.

**PSI (pounds per square inch)** - A measure of pressure referenced to atmospheric pressure.

**psychrophilic** - Thriving at a relatively low temperature.

**psychrotrophic** - Bacteria that grow best at cold temperatures (cold-loving bacteria).

**pungency** - A sharp, biting quality.

**purity** - Degree of singularity of a constituent in a product, generally expressed as a percentage. For example, in sugar it indicates the degree of sucrose and other extraneous products.

## Q

**quality assurance (QA)** - Continual monitoring of incoming raw and finished products to ensure compliance with compositional standards, microbiological standards, and various government regulations; requires many diverse technical and analytical skills.

**quality grade** - In meats, are based on meat characteristics and qualities.

**queso** - Spanish word for cheese.

**quick bread** - Any bread product leavened with a chemical leavener (baking soda and an acid, such as buttermilk, or baking powder) rather than yeast; includes muffins, biscuits, popovers, pancakes, and the like.

**quinones** - Cyclic, conjugated di-ketones that are highly reactive.

## R

**radiation** - Emission or transmission of energy in the form of waves or particles through space or through a material medium.

**radioisotope** - A chemical element that spontaneously emits radiation (such as electrons or alpha particles) and that exhibits the same atomic number and nearly identical chemical behavior but with differing atomic mass and different physical properties.

**rancidity** - A special type of spoilage in fats that involves oxidation of unsaturated fatty acids; the deterioration of fats, usually by an oxidation process, resulting in objectionable flavors and odors.

**raw sugar** - Intermediate crystalline product of cane sugar factories resulting from the evaporation of water from sugarcane stalk juice. True raw sugar cannot be sold in the United States. It contains too many impurities. These are washed off, and it is sometimes called "turbindado sugar" and possibly labeled raw sugar.

**RDA** - Recommended Daily Allowances.

**reciprocating** - Moving forward and backward alternately.

**recycle** - To obtain, treat, or process used materials for reuse.

**reducing end** - End of a polysaccharide or oligosaccharide chain that contains a free glycosidic hydroxyl, and thus acts as a reducing agent; only one reducing end per molecule.

**reducing sugar** - A sugar with a free-aldehyde or ketone group that can chemically "reduce" other chemical compounds and thus become oxidized itself; glucose, fructose, maltose, and lactose, but not sucrose, are reducing sugars.

**reduction reactions** - Chemical reactions in which there is a gain in hydrogen or in electrons.

**Reference Daily Intake (RDI)** - Daily intake level of a nutrient that is sufficient to meet the requirements of 97-98% of health individuals in the U.S.

**refining** - Separating of corn seed and soybeans, respectively, into component parts and converting these to high-value products.

**reflectance color** - Observed color.

**refractive index** - Bending, refraction, and diffraction of a beam of light of defined wavelength when shown through a solution. The index is the bending of the solution compared to the bending through pure water.

**refractometer** - An instrument for measuring the refractive index of a solution.

**refrigeration** - Holding a food product at temperatures that range from 40° to 45°F (4.5° to 7°C).

**rehydrated** - Having water added to replace that lost during drying.

**rendering** - Freeing fat from connective tissue by means of heat.

**rennet** - Used for enzyme coagulation of milk.

**respiration** - A metabolic process by which cells consume oxygen and give off carbon dioxide; continues after harvest.

**résumé** - Written information for a prospective employer that may include any of the following: career objectives, work experience, education background, accomplishments, awards, or skills; also called a data sheet.

**retentate** - A concentrated fluid.

**retinol equivalent** - Vitamin A activity.

**retort** - Container in which a product is heated.

**retorted** - Canned or sterilized by processing in a pressurized vessel in order to raise the temperature to 250°F (121°C) to kill microorganisms.

**retrogradation** - Process in which starch molecules, particularly the amylose fraction, re-associate or bond together in an ordered structure after disruption by gelatinization.

**reverse osmosis** - A process of “dewatering” whereby ions and small molecules do not pass through a membrane, but water does pass through, under pressure.

**rheology** - Study of the science of deformation of matter.

**riboflavin** - One of the B vitamins.

**rigor mortis** - One of the changes after slaughter, the contraction and stiffening of muscle.

**ripening** - To age or cure to develop characteristic flavor, odor, body, texture, and color.

**rise** - A stage in the process of making yeast breads where the dough is set in a warm, draft-free place for a period (usually an hour or so) while the yeast ferments some of the sugars in the dough, forming carbon dioxide. This causes the bread to increase in size. A rising period usually lasts until the dough doubles in size.

**risk** - A measure of the probability and severity of harm to human health.

**rizcous** - Cracked rice that may be used interchangeably with bulgur.

**roast** - To bake, applied to certain foods such as meats.

**roe** - Fish eggs.

**ropey** - Capable of being drawn into a thread or tending to adhere in stringy masses.

**round fish** - Whole fish sold just as they came out of the water, nothing being removed.

**roux** - Thickening agent made by heating a blend of fat and flour.

## **S**

**saccharimeter** - A polarimeter to measure the optical rotation of sucrose solutions. This is calibrated to read the rotation in degrees S or degrees Z.

**Salmonella** - A bacterium that may cause food poisoning.

**Salmonella enteritidis** - A bacterial organism that causes gastroenteritis in humans; A form of salmonella.

**salmonellosis** - Illness produced by ingestion of salmonella organisms.

**salt** - A chemical compound derived from an acid by replacement of the hydrogen (H<sup>+</sup>), wholly or in part, with a metal or an electrically positive ion, for example, sodium citrate; sodium chloride crystals used as a flavoring.

**sanitization** - Removal of or neutralization of elements that may be injurious to health.

**saponification value** - Indicates the average molecular weight of the fatty acids in a fat. This value represents the number of milligrams of potassium hydroxide needed to saponify (convert to soap) one gram of fat. The saponification value increases and decreases inversely (opposite of) the average molecular weight.

**saturated fatty acid** - A fatty acid with no double bonds between carbon atoms; it holds all the hydrogen that can be attached to the carbon atoms.

**saturated solution** - A solution containing all the solute that it can dissolve at that temperature.

**saturation** - Indicates the level at which a solute is dissolved into a solution at a specific temperature.

**sauté** - To cook in a small amount of fat.

**scald** - To heat a liquid, usually milk, until bubbles appear around the edge, approximately 198° to 203°F (92° to 95°C); to blanch, as when preparing vegetables for freezing.

**sear** - To brown the surface quickly by intense heat to develop color and flavor and to improve appearance; usually applied to meat.

**secondary amines** - Derivatives of ammonia (NH<sub>3</sub>) in which two of the hydrogen atoms are replaced by other carbon-containing chemical groups (R-NH-R).

**secondary container** - A container that holds several primary containers together.

**secondary treatment** - A process in which solids are removed from wastewater, and a biological process is used to remove dissolved and suspended organic compounds.

**sediment** - Solid material that settles out from a liquid-like dispersion.

**semipermeable** - Membrane allowing passage of water and solute selectively to equalize solute concentration on either side of the membrane.

**senescence** - State of growing old or aging.

**separator** - A machine that separates the cream and skim portions of the milk.

**septicemia** - Presence of pathogenic micro-organisms in the blood.

**sequestrant** - A substance that binds or isolates other substances; for example, some molecules can tie up trace amounts of minerals that may have unwanted effects in a food product.

**shelf life** - Time required for a food product to reach an unacceptable quality.

**shorts** - A by-product of flour milling consisting of small particles of bran, germ, aleurone layer, and coarse flour.

**shucked** - Removed from the shell.

**simmer** - To cook in liquid below the boiling point, a liquid is simmering when bubbles form slowly and break just below the surface, about 185°F (85°C).

**single-celled protein (SCP)** - Refers to protein obtained from single-celled organisms such as yeast, bacteria, and algae grown on specifically prepared media.

**slurry** - A thin mixture of water and a fine insoluble material such as flour.

**smoke point** - Temperature at which smoke comes continuously from the surface of a fat heated under standardized conditions.

**smoking** - A preservation method for meat that inhibits microbial growth, protects fat from rancidity, contributes to the characteristic color, and creates unique flavors in processed meats.

**soft wheat** - A general term for varieties of wheat that contain relatively small amounts of gluten.

**solids-not-fat** - Includes the carbohydrates, lactose, protein, and minerals of milk.

**soluble** - Able to be dissolved or liquefied.

**solute** - Dissolved or dispersed substance.

**solution** - (1) A mixture resulting from the dispersion of small molecules or ions (called the solute) in a liquid such as water (called the solvent); (2) the resulting mixture of a solute dissolved in a solvent.

**solvent** - A liquid in which other substances may be dissolved.

**solvent extraction** - A method to separate compounds based on their relative solubilities in two different immiscible liquids.

**sorbitan monostearate** - An emulsifier used in yeast manufacturing to aid in the drying process. Sorbitan monostearate protects the yeast from excess drying and aids in the rehydration of the yeast cells.

**sorbitol** - A sugar alcohol similar to glucose in chemical structure but with an alcohol group ( $-C-OH$ ) replacing the aldehyde group ( $H-C=O$ ) of glucose. It occurs naturally in fruit and berries. It is slowly absorbed by the body, and it is a caloric sweetener.

**sous vide** - Literally means “under vacuum.”

**SPC** - Standard plate count.

**specialty sugars** - Varied and unique from granulated sugar; may be “engineered” for a special need.

**species** - A group of taxonomic classification consisting of organisms that can breed together.

**specific gravity** - Weight of a volume of material divided by the weight of an equal volume of water.

**specific heat** - Number of calories needed to raise the temperature of 1 gram of a given substance 1-degree C; the specific heat of water has been set at 1.0; fats and sugars have lower specific heats, thus requiring less heat than does water to raise their temperature an equal number of degrees.

**spectrophotometers** - Are used to measure color in foods.

**spectrophotometry** - A method of chemical analysis based on the transmission or absorption of light.

**spores** - A microorganism in a dormant state or a one-celled reproductive organ of a fungus. Spores may be activated by appropriate environmental conditions.

**stability** - Resistance to chemical change, disintegration, or degradation.

**stabilizer** - A water-holding substance, such as a vegetable gum, that interferes with ice crystal formation and contributes to a smooth texture in frozen desserts.

**standard plate count (SPC)** - A test that determines the presence of microbiological organisms in a food.

**standardized** - To have a rule or principle used for the basis of judgment applied.

**standards** - Set up and established by authority as a rule for the measure of quantity, weight, extent, value, or quality. Set by the USDA to specifically describe a food; to be labeled as such, a food must meet these specifications.

**starch** - A carbohydrate polymer made up of many units of glucose.

**starch granule** - Composed of millions of starch molecules laid down in a very organized manner; the shape of the granule is typical for each plant species. Starch molecules are organized into tight little bundles, called granules. As they are stored in the seeds or roots of plants, the granules with characteristic shapes and sizes can be seen under the microscope.

**starter culture** - A concentrated number of the organisms desired to start the fermentation process.

**steam** - To cook in steam, with or without pressure.

**steeping** - Extracting flavor, color, or other qualities from a substance by allowing it to stand in liquid below the boiling point; soaking.

**sterilization** - Process of heating a material sufficiently to destroy essentially all micro-organisms.

**sterilize** - To destroy essentially all microorganisms.

**sterol** - A type of fat or lipid molecule with a complex chemical structure; for example, cholesterol.

**stew** - To simmer in a small to moderate quantity of liquid.

**still retort** - See retort.

**stir** - To mix with circular motion, to blend food materials, or to obtain a uniform consistency as in sauces.

**storage tissue** - Located in the cytoplasm in leucoplasts; dominant in roots, tubers, bulbs, and seeds.

**straight grade** - Flours that should contain all the flour streams resulting from the milling process; most patent flours on the market include about 85 percent of the straight flour.

**strain** - A subgroup of a species in taxonomic classification that has a common ancestor with distinctive characteristics but is not different enough from other organisms to be a separate species.

**stunting** - Reduced growth of children who do not have adequate nutrition.

**subcutaneous** - Under the skin.

**sublimation** - Water goes from a solid to a gas without passing through the liquid phase.

**substrate** - Substance acted upon by an enzyme.

**succulent** - Having juicy tissues; not dry.

**sugar** - Sucrose, the disaccharide with the chemical formula  $C_{12}H_{22}O_{11}$ .

**sugar alcohols** - Sugars that have been chemically reduced to an alcohol.

**sugar-based sweeteners** - Sweeteners developed from corn starch.

**sugar refinery** - Factory where sugar is extracted from either sugar beet or sugar-cane.

**sulfhydryl compound** - A chemical substance that contains an –SH group.

**surface active agents** - An emulsifier; these improve the uniformity of a food—the fineness of grain—the smoothness and body of foods such as bakery goods, ice creams, and confectionery products.

**surface area** - Measure of exposed surface; measured in square inches, meters, centimeters, millimeters and so on.

**surface tension** - Tension or force at the surface of a liquid that produces a resistance to spreading or dispersing; due to the attraction of the liquid molecules for each other.

**surfactant** - Compounds that lower the surface tension between two liquids, between a gas and a liquid, or between a liquid and a solid.

**surimi** - A minced fish flesh washed to remove solubles including pigments (color) and flavors leaving an odorless, flavorless, high-protein product.

**sustainable** - Enduring without giving away or yielding.

**sweeteners** - Any food that adds a sweet flavor to foods.

**sybiotic** - An interdependent or mutually beneficially relationship.

**synchrometer** - A metering device that measures syrup and water in fixed proportion to the carbonator.

**syneresis** - Oozing of liquid from a rigid gel; sometimes called weeping.

**synergism** - An interaction in which the effect of the mixture is greater than the effect of the sum of component part; two or more factors acting cooperatively, so that their combined effects when acting together exceed the sum of their effects when each act alone.

**synthetic** - Compound produced by chemically combining two or more simple compounds or elements in the laboratory.

**syrup** - A viscous, concentrated sugar solution that occurs due to evaporation of liquid.

## T

**tactile** - Having to do with the sense of touch.

**tannins** - Term applied to phenolic compounds that contribute to both astringency and enzymatic browning.

**tariffs** - A schedule of duties imposed by a government on imports or exports.

**taste bud** - A group of cells, including taste cells, supporting cells, and nerve fibers.

**taste receptor** - Tiny ends of the taste cells that contact the substance being tasted.

**taste sensations** - Perceived through stimulation of taste buds on the tongue; primary tastes are sweet, salty, sour, and bitter.

**tea** - Beverage made when processed leaves of the tea plant are infused with boiling water.

**teff flour** - Smallest of grains and therefore has a high ratio of bran and germ.

**tempering** - Holding a substance at a specified temperature to give it the desired consistency; frozen foods may be tempered by holding them just below 32°F (0°C).

**temporarily hard water** - Contains calcium, magnesium, and iron bicarbonates that precipitate when boiled.

**tensile strength** - Ability to resist stretching; the strength when under tension.

**tertiary container** - A container that groups several secondary holders together into shipping units.

**texture** - (1) Arrangement of the parts of a material showing the structure; for example, the texture of baked flour products such as a slice of bread may be fine and even or coarse and open; or the texture of a cream sauce may be smooth or lumpy; (2) the arrangement of the particles or constituent parts of a material that gives it its characteristic structure.

**textured protein** - Products that are usually at least 50 percent protein and contain the eight essential amino acids and the vitamins and minerals found in meats; soybean protein is most commonly used; other plant proteins—wheat gluten, yeast protein, and most other edible proteins—can be used singly or in combination.

**thermization** - To heat.

**thermophilic** - Preferring hot temperatures.

**thermotrophic** - Can tolerate high temperature.

**thiamin** - One of the B vitamins.

**toms** - Male turkeys.

**total sugars** - A measurement of the total amount of saccharides.

**toxins** - Poisonous to humans.

**TQM** - Total quality management.

**traditional active dry yeast** - Active dry yeast should be dissolved before using for best results.

**tramp material** - Soil and extraneous material.

**trans** - Configuration in which the hydrogen atoms are on opposite sides of the double bond, particularly with unsaturated fatty acids.

**translucency** - Partially transparent.

**trends** - General direction of a market.

**Trichinella spiralis** - A tiny parasite that may be present in some fresh pork and, if not destroyed by cooking, causes a disease called trichinosis.

**triglycerides** - Neutral fat molecule made up of three fatty acids joined to one glycerol molecule through a special chemical linkage called an ester. A type of lipid consisting chemically of one molecule of glycerol combined with three fatty acids.

**tuber** - A short, thickened, fleshy part of an underground stem, such as a potato; new plants develop from the buds or eyes; an enlarged underground stem (for example, the potato).

**turbidity** - Cloudiness in a fluid; the opposite of translucence.

**turbinado** - A semi refined light brown crystalline sugar. It is a steam-cleaned, partially refined sugar. In the United States it is sold as raw sugar.

## U

**UHT** - Ultra high temperature pasteurizing.

**ultrafiltration** - A membrane process that filters out or separates particles of extremely small size (0.02 to 0.2 microns), including proteins, gums, glucose, and pigments; filtration through an extremely fine filter.

**ultrapasteurization** - Heating milk to 138°F or higher for 2 seconds, followed by rapid cooling to 45°F or lower.

**unbleached flour** - White flour without bleaching or aging agents added to hasten the aging process.

**undernutrition** - A person does not get enough food to have a healthy life.

**underproof** - Under risen or fermented.

**underweight** - Means of defining malnutrition; below weight for age in children.

**unit operation** - A basic step in a process

**unleavened** - Bread or dough product containing no yeast or chemical (baking soda, baking powder) leavener.

**unsaturated fatty acid** - A general term used to refer to any fatty acid with one or more double bonds between carbon atoms; capable of binding more hydrogen at these points of unsaturation.

**U.S. Fancy** - Grade designations for vegetables; more uniform in shape and have fewer defects.

**U.S. Grade A, B, C** - Quality grades for fruits and vegetables.

**U.S. No. 1, 2, 3** - Quality grades for fruits, vegetables, and pigs.

**USP** - Abbreviation for United States Pharmacopoeia. Standards for various products including sugar are available from this organization.

## V

**vacuum** -A space partially or nearly completely exhausted of air.

**vacuum cooling** - Cooling under conditions of no air (atmosphere).

**vacuum drying** - Drying a product in a vacuum chamber in which water vaporizes at a lower temperature than at atmospheric pressure.

**vacuum evaporation** - Removal of water under conditions of no air (atmosphere).

**vacuum packed** - Air-free and airtight in a heavy foil package to minimize exposure to oxygen.

**value** - Magnitude, relative worth; estimated or assigned worth.

**van der Waals bond** - Very weak bonds formed between nonpolar molecules or nonpolar parts of a molecule.

**vapor pressure** - Pressure produced over the surface of a liquid as a result of the change of some of the liquid molecules into a gaseous state and their escape from the body of the liquid.

**vascular** - Includes the xylem and phloem of plants.

**veal** - Describes a young calf, or meat from a calf, 1 to 4 months old.

**vegan** - A person who eats only food of plant origin.

**vegetable fruit** - Botanically, a fruit is the ovary and surrounding tissues, including the seeds, of a plant; fruit is the fruit part of a plant that is not sweet and is usually served with the main course of a meal.

**vegetable gums** - Polysaccharide substances that are derived from plants, including seaweed and various shrubs or trees; can hold water, and often act as thickeners, stabilizers, or gelling agents in various food products; for example, algin, carrageenan, and gum arabic.

**vinegar** - A sour liquid consisting of dilute acetic acid obtained from the fermentation of wine, beer, cider, or similar products.

**viniculture** - Science and art of growing grapes for wine.

**vinification** - Conversion of fruit juices, like grape juice, into wine by fermentation.

**viscosity** - Resistance to flow; increase in thickness or consistency.

**visible fat** - (1) Refined fats and oils used in food preparation, including edible oils, margarine, butter, lard, and shortenings; (2) fats seen and easily trimmed from meat.

**vitamin fortified** - Vitamins added to processed foods.

**vitamins** - Vitamins are chemical compounds in our food that are needed in very small amounts (in milligrams and micrograms) to regulate the chemical reactions in our bodies. They are fat-soluble and water-soluble.

**vitelline membrane** - Covering of the yolk of an egg.

**viticulture** - Science and art of growing grapes.

**volatile** - Evaporates readily.

## W

**warmed-over flavor** - Describes the rapid onset of lipid oxidation that occurs in cooked meats during refrigerated storage; oxidized flavors are detectable after only 48 hours.

**wastewater** - Water left over after being used in food processing.

**wasting** - Gradually reducing the fullness and strength of the body.

**water activity** - See Aw.

**waxy** - Starch granules devoid of amylose.

**weeping** - Starch gives up water while cooling and during storage.

**wet scrubber** - Process to remove pollutants.

**whey** - Liquid by-product of cheese making.

**whip** - To beat rapidly to produce expansion due to incorporation of air; applied to cream, eggs, and gelatin dishes.

**white sauce** - A starch-thickened sauce made from fat, flour, liquid, and seasonings.

**whole wheat** - Wheat flour milled using the entire wheat berry (germ, endosperm, bran).

**winterization** - Oils go through a process so that they will not become cloudy when chilled.

**wort** - Clear filtrate from enzymatic action on the malt during the mashing process of beer making.

## X

**xanthan gum** - A microbial produced from the fermentation of corn sugar; used as a thickener, emulsifier and stabilizer in foods such as dairy products and salad dressings.

## Y

**yeast** - A single-celled fungus in the species *Saccharomyces cerevisiae* that ferments sugars; by-products of fermentation are principally carbon dioxide and alcohol. Carbon dioxide raises breads.

**yeast bread** - Any bread whose primary leavening action results from the fermentation of sugar by yeast.

**yeast fermentation** - A process in which enzymes produced by the yeast break down sugars to carbon dioxide and alcohol, and produce some flavor substances.

**yield grade** - Classifies carcasses based on the proportion of usable meat to bone and fat, and are used in conjunction with quality

**yolk** - Yellow spherical mass of an egg which stores most of the egg's nutrients.

## **Z**

**Z value** - Temperature required to decrease the time necessary to obtain a one log reduction in cell numbers to one tenth of the original value.

**zein** - Chief protein found in corn and corn products.

**zest** - (1) Perfumed outermost skin layer of citrus fruit (usually oranges or lemons); removed with the aid of a paring knife or vegetable peeler. Only the colored portion of the skin (and not the white pith) is considered the zest. (2) A term used to mean "spice."

**zinfandel** - A red wine grape.

**zuppa** - Italian word for "soup."

**zwieback** - Bread baked, cut into slices, and then returned to the oven until very crisp and dry.

**zymurgy** - Science or study of fermentation.



**Just  
the Facts™**

