

GLOSSARY

[Based on Kellems, R.O. and D. C. Church (1998)
and Jurgens, M. H (2002)]

A

Abomasum - The fourth compartment of a ruminant's stomach, which has functions similar to the glandular stomach of nonruminants.

Absorption - The movement of nutrients (or other compounds) from the digestive tract (or through other tissues such as the skin) into the blood and/or lymph system.

Acetic acid - One of the volatile fatty acids commonly found in silage, rumen contents, and vinegar as a result of microbial fermentation.

Acidification - The act of reducing the pH of a substance or solution; or increasing the acidity.

Acidosis - A condition in ruminants where excess acid from the rumen is absorbed into the blood stream causing a lowered bicarbonate concentration.

Additive - An ingredient or combination of ingredients added in small quantities to a basic feed mix for the purpose of fortifying the basic mix with trace nutrients, medicines, or drugs.

ADF - Acid detergent fiber; the fraction of a feedstuff not soluble by acid detergent; roughly comparable to a crude fiber plus lignin.

Adipose - Consisting of, resembling, or having relation to fat.

Ad libitum - Unrestricted consumption of feed or water.

Aerobic - Living or functioning in the presence of oxygen.

Afterbirth - The placenta and allied membranes expelled from the uterus following parturition.

Air-dry - The refers to feed that is dried by means of natural air movement, usually in open.

Albumin - A group of globular proteins; a major component of blood serum protein.

Algae - Single cell plants which synthesize, among others, proteins by the use of sunlight.

Alimentary - Having to do with feed or food.

Alimentary tract - A term synonymous with the digestive or gastrointestinal tract.

Alkali/alkaline - Any of various base, the hydroxides of alkali metals and ammonium, which neutralize acids to form salts and turn red red litmus paper blue.

Ambient temperature - The prevailing or surrounding temperature.

Amino acids - The simplest organic structure of which proteins are formed; all have the common property of containing a carboxyl group and an amino group on the

adjacent carbon atom.

Amino acids, essential (“indispensable”) - Those that must be present in the diet; they include arginine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine.

Amino acids, nonessential (“dispensable”) - Amino acids found in common proteins but which may be partly or completely synthesized by the animal's tissues; they include alanine, aspartic acid, citrulline, cystine, glutamic acid, glycine, hydroxyproline, proline, serine, and tyrosine.

Ammoniated - Combined or impregnated with ammonia or an ammonium compound.

Amylase - Any of several enzymes that can hydrolyze starch to maltose or glucose.

Anabolism - Constructive metabolism in which simple substances are converted into more complex substances by living cells.

Anaerobic - Living or functioning in the absence of oxygen.

Analogue - Something having analogy (or similarity) to something else.

Anemia - A deficiency in the blood of red cells, hemoglobin, or both.

Anorexia - Lack or loss of the appetite for food.

Anoxia - Oxygen deficiency.

Antagonist - A substance that exerts a nullifying or opposing action to another substance.

Anthelmintic - A product which destroys or expells internal parasites.

Antibiotic - A substance produced by one microorganism that has an inhibitory effect on another microorganism.

Antioxidant - A substance that inhibits the oxidation of other compounds.

Antivitamin - A substance that interferes with the synthesis or metabolism of a vitamin.

Anus - The distal opening of the gastrointestinal tract.

Appetite - A desire for food or water; generally a long-term phenomenon, in contrast to short term satiety.

Artificially dried - (Process) Moisture having been removed by other than natural means.

Ascorbic acid - See Vitamin.

Aspirated, aspirating - Having removed chaff, dust, or other light materials by use of air.

As fed - As consumed by the animal.

Ash - The residue remaining after complete incineration at 500° to 600°C of a feed or animal tissue. Only

metallic oxides or contaminants such as soil should remain.

Available nutrient - A nutrient which can be digested, absorbed, and(or) used in the body.

Avidin - A substance found in egg white which prevents the action of biotin.

B

Bactericide - A product that destroys bacteria.

Balanced ration (or diet) - A combination of feeds that provides the essential nutrients in the required proportions.

Basal diet - A diet common to all groups of experimental animals to which the experimental substance(s) is added.

Basal metabolic rate - The basal metabolism expressed in kilocalories per unit of body size; the heat production of an animal during physical, digestive, and emotional rest.

Beriberi - A deficiency (acute) of thiamin, one of the B-complex vitamins.

Bile - A secretion from the liver containing metabolites such as cholesterol and bile acids, which aid in the digestion of fats.

Bioassay - Determination of the relative effective potency of a substance by comparing its effect on a test organism with that of a standard preparation.

Biological value - The efficiency with which a protein furnishes the required amounts of essential amino acids; usually expressed as a percentage.

Biopsy - The removal and examination of tissue or other material from the living body.

Blending - (Process) To mingle or combine two or more ingredients of feed. It does not imply a uniformity of dispersion.

Bloat - A distention of the rumen or ocauch or the large colon by gases by fermentation.

Blocked, blocking - (Process) Having agglomerated individual ingredients or mixtures into a large mass.

Blocks - (Physical form) Agglomerated feed compressed into a solid mass cohesive enough to hold its form, weighing over 2 pounds, and generally weighing 30 to 50 lb.

Bolus - A solid mass of ingesta (synonymous with cud) that, in ruminants, is regurgitated for remastication during rumination.

Bomb calorimeter - An instrument used for measuring the gross energy (GE) content of any material that will burn.

Bone meal - Animal bones that were steamed under and then ground.

Bran - The pericarp or seed coat of grain which is removed during processing and used as animal feed.

Brand name - Any word, name, symbol, or device or any combination thereof identifying the commercial

feed of a distributor and distinguishing it from that of others.

Buffer - Any substance that can reduce changes in pH when an acid or alkali is added to it.

Bushel - A unit of dry measure equivalent to 2150.42 cubic inches (approximately 1.25 cubic feet).

Butyric acid - One of the volatile fatty acids commonly found in rumen contents and in poor-quality silages.

By-product - (Part) Secondary products produced in addition to the principal product.

C

Cake - (Physical form) The mass resulting from the pressing of seeds, meat, or fish in order to remove oils, fats, or other liquids.

Calcification - The process by which organic tissue becomes hardened by a deposit of calcium salts.

Calculi - An occurrence in which mineral deposits in the urinary tract.

Calorie - The amount of energy required to raise the temperature of water from 14.5° to 15.5°C.

Calorimeter - The equipment used to measure the heat generated in a system.

Cannula - A tube inserted into the body to connect internal structures with the outside of the animal.

Carbohydrate - Organic substances containing C, H, and O, with the H and O present in the same proportions as in water. Many different kinds are found in plant tissues; some are vital to animal metabolism.

Carcinogen - Any cancer-producing substance.

Carotene - A yellow organic compound that is the precursor of vitamin A.

Carrier - An edible material used to facilitate the addition of micronutrients to a ration.

Cartilage - A connective tissue characterized by nonvasculature (absence of blood vessels) and firm texture.

Casein - The protein precipitated from milk by acid and/or rennin.

Cassava - A tropical plant of the spurge family with edible starchy roots.

Catalyst - A substance that changes the rate of a chemical reaction but is not itself used up in the reaction. The use of platinum in hydrogenating unsaturated fats is an example.

Catabolism - The breaking down of complex substances into more simple compounds by living cells.

Cecum (or caecum) - A blind pouch located at the junction of the small intestine with the colon (the appendix in humans); it is part of the large intestine.

Cellulose - A polymer of glucose characterized by a linkage between the glucose molecules that is resistant to hydrolysis by most digestive enzymes (except some produced by microorganisms).

Chaff - (Part) Glumes, husks, or other seed covering

together with other plant parts separated from seed in threshing or processing.

Chelate - Refers to a ring-like structure that is formed between an organic molecule and a metal ion.

Cholesterol - The most common member of the sterol group found in blood and many other animal tissues; not present in arty plant tissues.

Cholic acid - A family of steroids comprising the bile acids; they are derived from metabolism of cholesterol by the liver.

Chyme - A semiliquid material produced by the action of gastric juice on ingested food.

Chymotrypsin - A proteolytic digestive enzyme secreted by the pancreas.

Cleaned, cleaning - (Process) Removal of material by such methods as scalping, aspirating, or magnetic separation, or by any other method.

Cleaning - (Part) Chaff, weed seeds, dust, and other foreign matter removed from cereal grains.

Clipped, clipping - (Process) Removal of the ends of whole grains.

Coagulated - Curdled, clotted, or congealed.

Coenzyme - An organic molecule required by some enzymes to produce enzymic activity; vitamin coenzymes include niacin, pyridoxine, thiamin, riboflavin, pantothenic acid, and folic acid.

Collagen - A principal supportive protein in connective tissue.

Colon - Part of the large intestine; divided into the transverse, descending, and ascending segments.

Colostrum milk - The milk secreted during the first day or two of lactation.

Commercial feed - As defined in the Uniform Feed Bill, all materials distributed for use as feed or for mixing in feed for animals other than humans, except as follows: (A) Option A, unmixed seed, whole or processed, made directly from the entire seed. Option B, unmixed or unprocessed whole seeds. (B) Hay, straw, stover, silage, cobs, husks, and hulls (a) when unground and (b) when unmixed with other materials. (C) Individual chemical compounds when not mixed with other materials.

Compensated growth - Accelerated growth following a period of limited feed intake.

Complete feed - A single feed mixture used as the only source of food for an animal.

Concentrate - Any feed containing relatively low fiber (20% or less) and with 60% or more TDN. Opposite of roughage; or a concentrated source of one or more nutrients used to supplement a feed mix.

Condensed, condensing - (Process) Reduced to denser form by removal of moisture.

Conditioned, conditioning - (Process) Having achieved predetermined moisture characteristics and/or

temperature of ingredients or a mixture of ingredients prior to further processing.

Convulsion - An involuntary spasm or contraction of muscles, often in vary rapid sequence.

Cooked, cooking - (Process) Heated in the presence of moisture to alter chemical and/or physical characteristics or to sterilize.

Cooled, cooling - (Process) Temperature reduced by air movement, usually accompanied by a simultaneous drying action.

Coprophagy - The ingestion of fecal material.

Cracked, cracking - (Process) Particle size reduced by a combined breaking and crushing action.

Creep - A feeder or an enclosure used for supplemental feeding of nursing young, which excludes their dams.

Cribber - A horse that has the vice of biting or setting the teeth against some object, such as manger, while sucking air.

Crude fat - The portion of a feed (or other material) that is soluble in ether; also referred to as ether extract.

Crude fiber - The fibrous, less digestible portion of a feed.

Crude protein - Total ammoniacal nitrogen x 6.25, based on the fact that feed protein, on the average, contains 16% nitrogen; many nonprotein nitrogen compounds may be included.

Crumbled, crumbling - (Process) Pellets reduced to granular form.

Crumbles - (Physical form) Pelleted feed reduced to granular form.

Cubes - (Physical form) See Pellets.

Cubes, range - (Physical form) See Pellets, Range cubes.

Cud - The solid mass of ingesta regurgitated and remasticated in the process of rumination (synonymous with bolus).

Curd - The semisolid mass that is formed when milk comes in contact with an acid or rennin.

D

Deamination - Removal of the amino group from an amino acid.

Debeaking - The removal of part of the beak of chickens and poults with an electronic debeaker to prevent cannibalism.

Defluorinated - Having the fluorine content reduced to a level that is nontoxic under normal feed use.

Degradation - Conversion of a chemical compound to one that is less complex.

Dehulled, dehulling - (Process) Having removed the outer covering from grains or other seeds.

Dehydrated, dehydrating - (Process) Having been freed of moisture by thermal means.

Dermatitis - An inflammation of the skin.

Desiccate - To dry completely.

Dextrin - An intermediate polysaccharide product obtained during starch hydrolysis.

Diet - A regulated selection or mixture of feedstuffs provided on a continuous or prescribed schedule.

Digestibility, apparent - The percentage of a feed or nutrient that is apparently absorbed from the GI tract as indicated by intake minus fecal output; it differs from true digestibility in that feces contain substances derived from the body, many microbial products, and various secretions, as well as undigested food.

Digestibility, true - The percentage of a feed nutrient actually absorbed from the GI tract.

Digestion - The process involved in preparing food for absorption.

Dilute - (Physical form) An edible substance used to mix with and reduce the concentration of nutrients and/or additives to make them more acceptable to animals, safer to use, and more capable of being mixed uniformly in a feed. It may also be a carrier.

Disaccharide - Any of several dimers (contains two simple sugar molecules); for example, sucrose (common table sugar) yields glucose and fructose.

Dispensable amino acid - Synonymous with nonessential amino acid.

Diuretic - A drug or agent used to increase the flow of urine.

Dressed, dressing - (Process) Made uniform in texture by breaking or screening of lumps from feed and/or the application of liquid(s).

Dried, drying - (Process) Materials from which water or other liquid has been removed.

Drug - As defined by FDA as applied to feed, a substance (a) intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in humans or other animals, or (b) a substance other than food intended to affect the structure or any function of the body of humans or other animals.

Dry matter - The portion of a feed or tissue remaining after water is removed by drying in an oven.

Drylot - A relatively small area in which animals are confined as opposed to being allowed to have free access to pasture.

Dry period - The period of time between lactation.

Duodenum - The first segment of the small intestine.

Dust - (Part) Fine, dry pulverized particles of matter usually resulting from the cleaning or grinding of grain.

E

Edema - An abnormal accumulation of fluid in a part of or in the entire body.

Element - Anyone of the chemical atoms of which all matter is composed.

Emaciated - Excessive leanness; a wasted condition of the body.

Emulsifier - A material capable of causing fat or oils to

remain in liquid suspension.

Emulsify - To disperse small drops of liquid into another liquid.

Endemic - A disease of low morbidity that persists over a long period of time in a certain region.

Endocrine - Pertains to internal secretions that affect metabolic processes or specific target organs.

Endogenous - Originating from within the organism.

Endosperm - The carbohydrate or starchy portion of seed.

Ensilage - The same as silage.

Ensiled - Having been subjected to an anaerobic fermentation to form silage.

Enteritis - Inflammation of the intestines.

Enzyme - A protein formed in plant or animal cells that acts as an organic catalyst.

Epithelial - Refers to those cells that form the outer layer of the skin or that line body cavities.

Ergosterol - A sterol found chiefly in plant tissues; on exposure to ultraviolet irradiation it becomes vitamin D.

Ergot - A disease of rye and other cereals because of fungus which replaces the grain by a long, hard, hornlike, dark-colored body.

Eructation - Belching of gas by ruminants as a normal means of expelling gases of fermentation.

Esophagus - The passageway (tube) from the mouth to the stomach.

Estrogens - Estrus-producing hormones secreted by the ovaries.

Evaporated, evaporating - (Process) Reduced to denser form; concentrated as by evaporation or distillation.

Eviscerated - Having had all organs in the great cavity of the body removed.

Excreta - The products of excretion, primarily feces and urine.

Exogenous - Originating from outside the body.

Expanded, expanding - (Process) Subjected to moisture, pressure, and temperature to gelatinize the starch portion. When extruded, its volume is increased due to abrupt reduction in pressure.

Extracted, mechanical - (Process) Having removed fat or oil from materials by heat and mechanical pressure. Similar terms are expeller extracted, hydraulic extracted, and "old process."

Extracted, solvent - (Process) Having removed fat or oil from materials by organic solvents. Similar term is "new process."

Extruded (Process) - A process by which feed has been pressed, pushed, or protruded through orifices under pressure.

F

Fasting - To abstain from all food.

Fat soluble - Soluble in fats and fat solvents but

generally not soluble in water.

Fattening - The deposition of excess energy in the form of adipose tissue (fat).

Feces - The excreta discharged from the digestive tract through the anus; composed of undigested food residues, microorganisms, and various materials originating in the liver and intestinal tract.

Feed Any material used as food by an animal; same as feedstuff.

Feed additive concentrate - (Part) As defined by FDA, an article intended to be further diluted to produce a complete feed or a feed additive supplement and not suitable for offering as a supplement or for offering free choice without dilution. It contains, among other things, one or more additives in amounts in a suitable feed base such that from 10 to 100 lb of concentrate must be diluted to produce 1 ton of a complete feed. A feed additive concentrate is unsafe if fed free choice or as a supplement because of danger to the health of the animal or because of the production of residues in the edible products from food-producing animals in excess of the safe levels established.

Feed additive premix - As defined by FDA, an article that must be diluted for safe use in a feed additive concentrate, a feed additive supplement, or a complete feed. It contains, among other things, one or more additives in high concentration in a suitable feed base such that up to 100 lb must be diluted to produce 1 ton of complete feed. A feed additive premix contains additives at levels for which safety to the animal has not been demonstrated and/or that may result when fed undiluted in residues in the edible products from food-producing animals in excess of the safe levels established.

Feed additive supplement - As defined by FDA, an article for the diet of an animal that contains one or more food additives and is intended to be (a) further diluted and mixed to produce a complete feed; or (b) fed undiluted as a supplement to other feeds; or (c) offered free choice with other parts of the rations separately available. Note: A feed additive supplement is safe for the animal and will not produce unsafe residues in the edible products from food-producing animals if fed according to directions.

Feed grade - Suitable for animal food but not permitted by regulating agencies to be used in human foods.

Feedlot - An area of land on which animals are fed or finished for market.

Feedstuff - See Feed.

Fermentation - Chemical changes brought about by enzymes produced by various microorganisms.

Fibrous - High in content of cellulose and/or lignin (or in cell walls of NDF, neutral detergent fiber).

Fines - (Physical form) Any material that will pass

through a screen whose openings are immediately smaller than the specified minimum crumble size of pellet diameter.

Finish - To fatten an animal in preparation for slaughtering for food; also, the degree of fatness of such an animal.

Fistula - An abnormal passage from some part of the body to another part or the exterior, sometimes surgically inserted.

Flaked, flaking - (Process) See Rolled.

Flakes - (Physical form) An ingredient rolled or cut into flat pieces with or without prior steam conditioning.

Flora - The plant life of a given region or locality. In nutrition, it generally refers to the bacteria present in the digestive tract.

Flour - (Part) Soft, finely ground and bolted meal obtained from the milling of cereal grains, other seeds, or products. It consists essentially of the starch and gluten of the endosperm.

Flush - The practice of feeding females more generously approximately two weeks before breeding.

Fodder - The entire above ground part of nearly mature corn or sorghum in the fresh or cured form.

Food(s) - When used in reference to animals is synonymous with feed(s). See Feed.

Forage - Crops used as pasture, hay, haylage, silage, or green chop for feeding animals.

Formula feed - Two or more ingredients proportioned, mixed, and processed according to specifications.

Fortify - To add one or more nutrients to a feed to increase its content to a needed level.

Founder - A condition of indigestion or overloaded stomach in the animals due to over eating. Or, may also be the crippled condition of an animal afflicted with laminitis.

Free choice - The method of feeding in which the animal may choose to eat its feed at will.

Fresh - Usually denotes the green or wet form of a feed or forage.

Fructose - A six-carbon monosaccharide; one of the components of sucrose.

Full-feed - A term indicating that animals are being provided as much as they will consume safely without going off the feed.

G

Galactose - A six-carbon monosaccharide; one of the components of lactose.

Gall bladder - A membranous sac attached to the liver of farm livestock (except for the horse) in which bile is stored.

Gastric juice - A clear liquid secreted by the wall of the stomach; it contains HCl and the enzymes rennin, pepsin, and gastric lipase.

Gastritis - Inflammation of the stomach.

Gastrointestinal - Pertaining to the stomach and intestine.

Gelatinized, gelatinizing - (Process) Having had the starch granules completely ruptured by a combination of moisture, heat, and pressure, and, in some instances, by mechanical shear.

Germ - When used as a feed term, the embryo of a seed.

Glucogenesis - The formation of glucose by the breakdown of glycogen.

Gluconeogenesis - The formation of glucose and glycogen from non-glucose matter.

Glucose - A six-carbon monosaccharide found in the blood and as a component of sucrose and maltose and other sugars.

Gluten - The tough, viscid, nitrogenous substance remaining when the flour of wheat or other grain is washed to remove the starch.

Glycerol - An alcohol containing three carbons and three hydroxy groups; a component of a fat.

Glycogen - A polysaccharide found in the liver and muscles as a reserve form of quickly available energy.

Glycogenesis - The formation of glycogen.

Glycolysis - The decomposition of sugars and metabolism to lactic acid in animals or pyruvic acid in enzymatic reactions.

Goiter - An enlargement of the thyroid gland sometimes caused by an iodine deficiency.

Gossypol - A substance present in cottonseed (and meal) that is toxic to swine and some other nonruminant species.

Grain - (Part) Seed from cereal plants.

GRAS - Abbreviation for the phrase “generally recognized as safe.” A substance that is generally recognized as safe by experts qualified to evaluate the safety of the substance for its intended use.

Gravid - Pregnant.

Green chop - Forage harvested and fed in the green, chopped form.

Grits - (Part) Coarsely ground grain from which the bran and germ have been removed, usually screened to uniform particle size.

Goat - Grain from which the hull has been removed.

Gross energy - The total heat of combustion of material burned in a bomb calorimeter.

Ground, grinding - (Process) Reduced in particle size by impact, shearing, or attrition.

Growth - An increase in muscle, bone, vital organs, and connective tissue as contrasted to an increase in adipose tissue (fat deposition).

Gruel - A feed prepared by mixing ground ingredients with hot or cold water.

H

Hay - The aerial part of forage crops stored in the dry form for feeding to animals.

Heat increment - The heat that is unavoidably produced by an animal incidental with nutrient digestion and utilization.

Heat labile - Unstable to heat.

Heat processed, heat processing - (Process) Subjected to a method or preparation involving the use of elevated temperatures with or without pressure.

Hematocrit - The volume of whole blood made up by the red blood cells after centrifugation.

Hemoglobin - The oxygen-carrying red protein of the red corpuscles.

Hemorrhage - Copious loss of blood through bleeding.

Hepatitis - Inflammation of the liver.

Homogenized - A process in which particles are broken down into evenly distributed globules small enough to remain emulsified for a long period of time.

Hormone - A chemical secreted in the body fluids by an endocrine gland that has a specific effect on other tissues.

Hulls - (Process) Outer covering of grain or other seed.

Hunger - The desire for food; the antithesis of satiety.

Hydrogenation - The chemical addition of hydrogen to any unsaturated compound (double bond), often to fatty acids.

Hydrolysis - The chemical process whereby a compound is split into simpler units with the uptake of water.

Hygroscopicity - The tendency for a substance to absorb or attract moisture from the air.

Hyperthyroidism - A condition due to excessive functional activity of the thyroid gland and characterized by increased basal metabolism.

Hypervitaminosis - An abnormal condition resulting from the intake of (or treatment with) an excess of one or more vitamins.

Hypocalcemia - A below normal concentration of Ca in blood.

Hypoglycemia - A below normal concentration of blood glucose.

I

Ileum - The third section of the small intestine.

Implant - A substance that is inserted into the body tissue for the purpose of growth promotion or controlling some physical function.

Inert - Relatively inactive.

Ingest - To eat or take in through the mouth.

Ingredient, feed ingredient - A component part or constituent of any combination or mixture making up a commercial feed.

Ingesta - Food and drink taken into the stomach.

Inorganic - Pertaining to compounds not containing carbon.

Insulin - A hormone secreted by the pancreas into the blood; it is involved in regulation and utilization of blood glucose.

International chick unit (ICU) - The unit used to express vitamin D for poultry .

International unit (IU) - A standar unit of potency of a biological unit as defined by the International Conference for Unification of Formulae.

Intestinal tract - The small and large intestines.

Intrinsic factor - A chemical substance in the normal stomach necessary for absorpction of vitamin B₁₂.

Inulin - A polysaccharide found in some root crops. Composed of fructose.

In vitro - "In a glass." Occurring in an artificial environment, as in a test tube.

In vivo - Occurring in the living body.

Iodine number - The amount of iodine (in grams) that can be taken up by 100 g of a fat or fatty acid; it is a measure of unsaturation.

J

Jejunum - The middle portion of the small intestine.

Joule - A unit of work or energy, as well as the concept of heat (4.184j = 1 calorie).

K

kcal - An abbreviation for kilocalorie; 1000 calories.

Keratin - An S-containing protein found in tissues such as hair, wool, feathers, horn, and hooves.

Ketone - A group of chemicals that includes acetone, acetoacetic acid, and betahydroxy butyric acid; they are produced in excess when carbohydrate metabolism is low and fat is being metabolized for energy.

Ketosis - A condition characterized by an elevated concentration of ketone bodies in body tissues and fluids.

Kibbled, kibbling - (Process) Cracked or crushed baked dough or extruded feed that has been cooked pljor to or during the extrusion process.

Kwashiorkor - A nutritional disorder of children caused by a severe protein deficiency, which is characterized by changes in pigmentation of skin and hair, edema, skin lesions, anemia, and apathy.

L

Labile - Unstable; easily destroyed.

Lactase - An enzyme present in the intestinal juice that acts on lactose to produce glucose and galactose.

Lactic acid - An organic acid commonly found in sour milk and silage and one that is important in the body during anaerobic glycolysis.

Laminitis - An Inflammation of the sensitive laminae under the horny wall of the hoof; often associated with overfeeding.

Laxative - A medicine of agent that can induce bowel movement and relieve constipation.

Lesion - An unhealthy change in the structure of a part

of the body.

Legume - A plant member of the leguminosae family (alfalfa, clovers, etc.), with the character of forming N-fixing nodules on its roots.

Lignin - A biologically unavailable polymer that is a major structural component of the cell walls of plants.

Limited feeding - A feeding system in which animals are fed less than their voluntary intake.

Limiting amino acid - The indispensible amino acid of a protein which shows the greatest percentage deficit.

Linoleic acid - An 18-carbon unsaturated fatty acid; one of the essential fatty acids; it occurs widely in plant glycerides.

Lipase - A fat-splitting enzyme; different lipases are produced by the stomach and the pancreas.

Lipids - Substances that are diverse in chemical nature but are soluble in fat solvents.

Lipolysis - The decomposition or splitting up of fat to yield glycerol and fatty acids.

Lymph - The slightly yellow, transparent fluid occupying the lymphatic channels of the body.

M

Malignant - Virulent or destructive as applied to cancer.

Malnutrition - An overall term for poor nourishment.

Malt - Sprouted and steamed whole grain from which the radicle has been removed.

Maltase - An enzyme that splits maltose to produce two molecules of glucose.

Manure - The refuse from animal quarters consisting of excreta with or without litter or bedding.

Mash - (Physical form) A mixture of ingredients in meal form. Similar term is mash feed.

Mastitis - An inflammation of the mammary gland.

Meal - (Physical form) An ingredient that has been ground or otherwise reduced in particle size.

Meconium - A dark green excrement material accumulated in the intestines during the fetal development.

Medicated feed - Any feed that contains drug ingredients intended or represented for the cure, mitigation, treatment, or prevention of diseases of animals other than humans or that contains drug ingredients intended to affect the structure or function of the body of animals other than humans.

Megacalorie (Mcal) - 1000 kcal or 1 million calories; synonymous with therm.

Metabolic size - The body weight raised to the 3/4 power ($W^{0.75}$); a means of relating body weight to heat production of an animal.

Metabolism - The sum of all the physical and chemical processes taking place in a living organism.

Metabolite - Any compound produced during metabolism.

Metabolizable energy (ME) - Digestible energy minus the energy of the urine and combustible gases from the gastrointestinal tract (primarily methane).

Methane - A major product of anaerobic fermentation of carbohydrates; found in the rumen.

Metritis - An inflammation of the uterus.

Microbes - The same as microorganisms.

Microingredient - Any ration component normally measured in milligrams of micrograms per kilogram or in parts per million (ppm).

Microorganism - A minute living organism, usually microscopic, such as bacteria and protozoa.

Mill by-product - (Part) A secondary product obtained in addition to the principal product in milling practice.

Mill dust - (Part) Fine feed particles of undetermined origin resulting from handling and processing feed and feed ingredients.

Mill run - (Part) The state in which a material comes from the mill, ungraded and usually uninspected.

Mineralize, mineralized - (Process) To supply, impregnate, or add inorganic mineral compounds to a feed ingredient or mixture.

Minerals - As applied to animal nutrition, elements that are essential to the plant or animal and that are found in its tissues.

Minerals, macro - The major minerals (in terms of the amounts required in the diet or found in body tissues): calcium (Ca), chlorine (Cl), magnesium (Mg), phosphorus (P), potassium (K), sodium (Na), and sulfur (S).

Minerals, micro - The trace elements required by animal tissues that must be in the diet: cobalt (Co), copper (Cu), chromium (Cr), fluorine (F), iodine (I), iron (Fe), manganese (Mn), molybdenum (Mo), nickel (Ni), selenium (Se), silicon (Si), vanadium (V), and zinc (Zn).

Miscible - Capable of being mixed easily with another substance.

Mixing - (Process) To combine by agitation two or more materials to a specific degree of dispersion.

Molasses - The thick, viscous by-product resulting from refined sugar production, or the concentrated partially dehydrated juices from fruits.

Monogastric - The simple stomach; often used for nonruminant animals, but technically a misnomer because ruminants have only one stomach with four compartments.

Monosaccharide - Anyone of several simple sugars.

Morbidity - A state of sickness.

Moribund - A dying state-near death.

Mucosa - The membranes that line the passages and cavities of the body.

Mucus - A slimy liquid secreted by the mucous glands and membranes.

Mycotoxin - A fungal toxin; quite often present in feeds, sometimes at lethal levels.

N

National Research Council (NRC) - A division of the National Academy of Sciences established in 1916 to promote the effective utilization of scientific and technical resources.

NDF - Neutral detergent fiber, the fraction containing mostly cell wall constituents of low biological availability.

Necrosis - Death of a part of the cells making up a living tissue.

Nephritis - Inflammation of the kidneys.

Net energy (NE) - Metabolizable energy minus the heat increment.

Neuritis - Inflammation of the peripheral nerves.

NFE (nitrogen-free extract) - Consists primarily of readily available carbohydrates such as sugars and starches; part of the proximate analysis.

Nitrogen balance - A nutritional state in the animal determined from the N intake minus the N in feces and urine.

Nonprotein nitrogen (NPN) - Anyone of a group of N-containing compounds that are not true proteins that can be precipitated from a solution; ammonia and urea are examples.

Nonruminant - A simple-stomached animal that does not ruminate.

Nutrient - Any chemical substance that provides nourishment to the body.

O

Obesity - The accumulation of body fat beyond the amount needed for good health.

Offal - Material left as a by-product from the preparation of some specific product, less valuable portions, and the by-products of milk.

Oil - Usually a mixture of pure fats that is liquid at room temperature.

Oleic acid - An 18-carbon fatty acid that contains one double bond; it is found in animal and vegetable fat.

Omasum - The third compartment of the ruminant stomach.

Orts - Fragments of feed that an animal refuse to eat.

Ossification - The process of deposition of bone salts in the cartilage of the bones.

Osteitis - Inflammation of a bone.

Osteomalacia - A weakening of the bones caused by inadequate Ca, P, and/or vitamin D or by some diseases.

Osteoporosis - A reduction in the normal amount of bone salts (often occurring with age) such that the bone becomes porous and brittle.

Oxidation - The union of a substance with oxygen; the increase of positive charges on an atom or loss of

negative charges.

P

Paddock - A small fenced field used for grazing purposes.

Palatability - The relative attractiveness of feed to the animal.

Palmitic acid - A saturated fatty acid with 16 carbon atoms.

Pancreas - An organ located near the stomach; it produces pancreatic juice, which is secreted into the small intestine via the pancreatic duct. It is also an endocrine gland that secretes insulin and glucagon, hormones that control metabolism of glucose.

Parakeratosis - Any abnormality of the outmost or horny layer of the skin, especially the condition caused by edema between the cells which prevents the formation of keratin.

Pathogen Any disease-producing microorganism or material.

Pearled, pearling - (Process) Dehulled grains reduced by machine brushing into smaller smooth particles.

Pellets - (Physical form) Agglomerated feed formed by compacting and forcing through die openings by a mechanical process. Similar terms are pelleted feed and hard pellet.

Pellet, soft - (Physical form) Pellets containing sufficient liquid to require immediate dusting and cooling. Similar term is high-molasses pellets.

Pelleted, pelleting - (Process) Having agglomerated feed by compacting it and forcing it through die openings.

Pentosan - A polysaccharide made up primarily of five-carbon sugars; araban and xylan are examples.

Pentose - A five-carbon sugar such as arabinose, xylose, or ribose.

Pepsin - A proteolytic enzyme produced by the stomach.

Permeable - Capable of being penetrated.

Physiological - Pertaining to the science that deals with the functions of living organisms or their parts.

Pica - A depraved appetite characterized by a craving for unnatural articles of food (dirt, sand, feces, etc.)

Plasma - The fluid portion of the blood; serum is plasma from which the fibrinogen has been removed by the clotting process.

Polyneuritis - An inflammation encompassing many peripheral nerves.

Polyuria - An excessive excretion of urine.

Precursor - A compound that can be used by the body to form another compound, such as carotene used to produce vitamin A.

Premix - A uniform mixture of one or more microingredients and a carrier, used in the introduction of microingredients into a larger batch.

Premixing - (Process) The preliminary mixing of ingredients with diluents and/or carriers.

Product - (Part) A substance produced from one or more other substances as a result of chemical or physical change.

Propionic acid - One of the volatile fatty acids commonly found in rumen contents.

Protein - Any of many complex organic compounds formed from various combinations of amino acids and, sometimes, other nonprotein components.

Protein equivalent - A term indicating the total N contribution of a substance in comparison with the N content of protein (e.g., urea - 45% N x 6.25 = 281%).

Provitamin - A precursor of vitamin.

Proximate analysis - A combination of analytical procedures used to describe feeds, excreta, and other agricultural products.

Pulverized, pulverizing - (Process) See Ground, grinding.

Purified diet - A mixture of the known essential dietary nutrients in a pure form that is fed to experimental animals in nutrition studies.

Putrefaction - The decomposition of proteins by microorganisms under anaerobic conditions.

Pyrexia - A feverish condition.

R

Radioactive - An element that emits particles during the disintegration of the nuclei; the emissions include alpha and beta particles and gamma rays.

Radioisotope - A radioactive form of an element; often used in experimental work with plants and animals to trace metabolic activity in the animal.

Rancid - A term used to describe fats that have undergone partial decomposition; rancid fats may have objectional tastes or odors and may be toxic.

Range cake - (Physical form) See cake.

Range cubes - (Physical form) Large pellets designed to be fed on the ground. Similar to range wafer.

Ration - A fixed portion of feed, usually expressed as the amount of a diet allowed daily.

Rennin - A milk-curdling enzyme present in the gastric juice of young mammals.

Resorption - A return of the nutritive compounds of a partially developed fetus and fetal membranes to the system of the mother.

Reticular groove - A muscular structure at the lower end of the esophagus that, when closed, forms a tube allowing milk to go directly into the abomasum; sometimes called the esophageal groove.

Reticulum - The first compartment of the ruminant stomach.

Rolled, rolling - (Process) Having changed the shape and/or size of particles by compressing between rollers. It may entail tempering or conditioning.

Rumen - The second compartment of the ruminant stomach.

Ruminant - Any of a group of hooved mammals that has a four-compartmented stomach and that chew a cud while ruminating.

Rumination - The process of regurgitating previously eaten feed, reswallowing the liquids, and rechewing the solids (cud).

S

Salmonella - A pathogenic, diarrhea-producing organism sometimes present in contaminated feeds.

Saponifiable - Having the capacity to react with alkali to form soap.

Sarcoma - A tumor of fleshy consistency, often highly malignant.

Satiety - The condition of being fully satisfied with food; the opposite of hunger.

Saturated fat A fat that contains no fatty acids with double bonds.

Scalped, scalping - (Process) Having removed larger material by screening.

Scratch - (Physical form) Whole, cracked, or coarsely cut grain. Similar terms are scratch grain, scratch feed.

Screened, screening - (Process) Having separated various-sized particles by passing them over and/or through screens.

Self-fed - Provided with part or all of the ration on a continuous basis so that the animal may eat at will.

Separating - (Process) Classification of particle size, shape, and/or density.

Separating, magnetic - (Process) Removing ferrous materials by magnetic attraction.

Septicemia - A diseased condition resulting from the presence of pathogenic bacteria and their associated poisons in the blood.

Serum - The colorless fluid portion of blood remaining after clotting and removal of corpuscles. Differs from plasma in that fibrinogen has been removed.

Shorts - The particle of bran, germ, flour or offal from the tail of the mill from commercial flour milling.

Shrinkage - A term used to indicate the body weight loss due to stressful conditions such as being transported, severe weather, or feed shortage.

Silage - Feed resulting from the storage and fermentation of wet crops under anaerobic conditions.

Sizing - (Process) See Screened, screening.

Slotted floor - Floors in an animal pen with slots through which the feces and urine pass to a storage area below or nearby.

Solubles - Liquid containing dissolved substances obtained from processing animals or plant materials. May contain some fine suspended solids.

Solvent extracted - A process for the extraction of oil from seeds involving the use of an organic solvent.

Specific heat - The heat absorbing capacity of a substance in relation to that of water.

Stabilized - Made more resistant to chemical change by the addition of a particular substance.

Starch - A polysaccharide that yields glucose on hydrolysis; found in high concentrations in most seed grains.

Steamed, steaming - (Process) Having treated ingredients with steam to alter physical and/or chemical properties. Similar terms are steam cooked, steam rendered, tanked.

Stearic acid - An 18-carbon saturated fatty acid.

Sterol - An alcohol of high molecular weight, such as cholesterol; a basic compound used to synthesize many vital chemicals for both plants and animals.

Stocker cattle - Usually, young cattle that are light and thin, and lack finish.

Stocking rate - A pasture management term pertaining to animal numbers in relation to carrying capacity of a unit of area of the pasture.

Stomach - The part of the digestive tract in which chemical digestion is initiated in most animal species. It normally lies between the esophagus and the small intestine.

Stover - The mature, curled stalks and leaves of corn after the ears, or sorghum after the heads have been harvested.

Stress - Any circumstance that tends to disrupt the normal, steady functioning of the body and its parts.

Sucrose - A disaccharide (common table sugar) composed of one molecule each of glucose and fructose.

Supplement - A feed used with another to improve the nutritive balance or performance of the total and intended to be (a) fed undiluted as a supplement to other feeds, (b) offered free choice with other parts of the ration separately available, or (c) further diluted and mixed to produce a complete feed.

Syndrome - A medical term meaning a set of symptoms that occur together.

T

Taste - The ability to distinguish flavors between or among solid or liquid components of the diet.

TDN (total digestible nutrients) - A value that indicates the relative energy value of a feed for an animal.

Tempered, tempering - (Process) See Conditioned, conditioning.

Tetany - A condition in animals in which there are localized, spasmodic, muscular contractions.

Thyroxine - An iodine-containing hormone that is produced by the thyroid gland.

Toasted - (Process) Browned, dried, or parched by exposure to a fire or to gas or electric heat.

Trace minerals - Mineral nutrients required by animals in micro amounts only (measured in milligrams per pound or smaller amounts).

Triglyceride (fat) - An ester composed of glycerol and three fatty acids.

True protein - A precipitable protein rather than any of several nonprotein compounds.

Trypsin - A proteolytic digestive enzyme produced by the pancreas.

U

Underfeeding - A term referring to not providing the animal sufficient dietary energy.

Unsaturated fat - A fat containing from one to three fatty acids that contain one or more double bonds.

Unthriftness - Lack of vigor, poor growth or development.

Urea - The chief end product of protein metabolism in mammals; one of the main nitrogenous constituents in urine; a synthetic product sometimes used as a nitrogen source in rations for ruminants.

Urease - An enzyme that acts on urea to produce carbon dioxide and ammonia; it is present in numerous microorganisms in the rumen.

Uremia - A toxic accumulation of urinary constituents in the blood because of faulty kidney excretion.

Uric acid - A nitrogenous end product of purine metabolism; it is the principal N-containing component in urine of birds.

USP (United States Pharmacopoeia) - A unit of measure or potency of biologicals that usually coincides with an international unit (IU).

V

Veal - A calf fed for early slaughter.

VFA - Volatile fatty acids.

Villi - Small threadlike projections attached to the interior of the wall of the small intestine to increase its absorptive surface area.

Viscera - The organs of the great cavities of the body, which are removed at slaughter.

Viscosity - The freedom of flow of liquids.

Vitamin - One of a group of organic substances that is essential in small amounts for the lives of animals.

Vitamins, fat soluble - Vitamins soluble in fats. This group includes vitamins A, D₂, D₃, E (tocopherol), and K.

Vitamins, water soluble - Vitamins soluble in water. This group includes ascorbic acid (vitamin C) and the B complex: biotin, choline, cobalamin or cyanocobalamin, folacin, niacin, pantothenic acid, pyridoxine, riboflavin, and thiamin.

W

Wafer - (Physical form) A form of agglomerated feed based on fibrous ingredients in which the finished form usually has a diameter or cross section measurement

greater than its length.

Wafered, wafering - (Process) Having agglomerated a feed of a fibrous nature by compressing into a form usually having a diameter or cross section measurement greater than its length.

Weaning - The stopping of young animals from nursing or suckling their mothers.

Weanling - A recently weaned animal.

Wet-milled - A process in which feed materials is steeped in water with or without sulphur dioxide to soften the kernel in order to facilitate the separation of various component parts.

Wet rendered - A process in which material is cooked with steam under pressure in closed tanks.

Whey - The watery part of milk separated from the curd.

Wort - The liquid portion of malted grain. A solution of malt sugar and other soluble extracts from malted mash.

Y

Yearling - Refer to a male or a female farm animal (especially, cattle and horses) during the first year of its life.