Glossary of Terms

Abscess: A swollen, inflamed area in body tissue in which pus gathers.

Accuracy: A measure of reliability associated with an Expected Progeny Difference (EPD). The measure ranches from 0 to 1, with values closer to 1 indicating greater reliability because of the inclusion of more information.

Active ingredient: The specific drug component part of a chemical compound.

Additive: An ingredient or substance added to a basic feed mix, usually in small quantities for the purpose of fortifying it with certain nutrients, stimulants and/or medications.

Animal unit: Common animal denominator based on feed/forage consumption.

Anthelmentic: A drug or chemical that kills or expels worms.

Antibiotic: A class of drugs, such as penicillin, used to control or cure disease. Antibiotics are used to treat both human and animal disease caused by bacteria.

Antiseptic: A substance that reduces or stops growth of organisms in or on living tissue.

Artificial insemination (AI): The technique of placing semen from the male into the reproductive tract of the female by means other than natural service.

Average daily gain: Measurement of an animal's daily body weight change.

Backcross: The mating of a crossbred (F1) animal back to one of its parental breeds (for example, a Hereford-Angus crossbred mated to an Angus bull).

Beef Quality Assurance (BQA): Begun in 1987, the beef industry's BQA program includes training for cattle producers aimed at ensuring beef safety from conception to the consumer's dinner plate. It includes instruction on everything from proper vaccination procedures and withdrawal times to monitoring feed ingredients for potential chemical contaminants.

Bloat: A digestive disorder of ruminants usually characterized by an abnormal accumulation of gas in the rumen. Usually seen on the animal's upper left side.

Body Condition Score: A score on a scale of 1 to 9, reflecting the amount of fat reserves in a cow's body, where 1 = very thin and 9 = extremely fat.

Bos indicus: These are Zebu (humped) cattle that originated in India. Includes breeds like the Brahman breed in the United States.

Bos taurus: British and European/Continental breeds are derived from this species.

Bovine Spongiform Encephalopathy (BSE): It is an extremely rare, chronic degenerative disease affecting the central nervous system of cattle. It was first identified in Great Britain in 1986. Based upon USDA surveillance efforts, there are no documented cases of BSE in the United States.

Breed: Animals with a common origin and common characteristics that distinguish them from other groups of animals within that same species.

Breeding program goals: The objective or "direction" of breeders' selection programs. Goals are basic decisions breeders must make to give "direction" to their breeding programs. Goals should vary among breeders due to relative genetic merit of their cattle, their resources and their markets.

Breeding soundness examination: Inspection of a bull involving evaluation of physical conformation and soundness through genital palpation, scrotal circumference and testing semen for mobility and morphology.

Breed type: The combination of characteristics that makes an animal better suited for a specific purpose.

British breeds: Breeds of cattle originating in Great Britain, such as Angus, Hereford and Shorthorn.

Calving difficulty (Dystocia): Abnormal or difficult labor, causing difficulty in delivering a fetus and/or placenta.

Carcass evaluation: Techniques of measuring components of quality and quantity in carcasses.

Carcass merit: Desirability of a carcass relative to quantity of components (muscle, fat and bone), USDA Quality Grade and potential eating qualities.

Carcass yield: The carcass weight as a percentage of the liveweight.

Carrier: A heterozygous individual having one recessive gene and one dominant gene for a given pair of genes (alleles). For example, an animal with a dominant gene for polledness and a recessive gene for horns will be polled, but can produce horned offspring when mated to another animal carrying the gene for horns.

Clinical disease: Visible signs of poor health due to the presence of invading organisms.

Colostrum: The milk secreted by mammalian females for the first few days before and following parturition, which is high in antibodies and laxative.

Compensatory gain: Gain from cattle that have been nutritionally deprived for part or all of their lives. When fed feedlot rations, they compensate for the earlier restriction of feed by gaining very rapidly and efficiently.

Composite or Combination breed: A breed formed from a combination of two or more breeds.

Concentrate: A broad classification of feedstuffs that are high in energy and low in crude fiber (less than 18%).

Conformation: The shape and arrangement of the different body parts of an animal.

Congenital: Acquired during prenatal life. Condition exists at or dates from birth. Often used in the context of congenital (birth) defects.

Contemporary group: A group of cattle that are of the same breed and sex and have been raised in the same management group (same location on the same feed and pasture). Contemporary groups should include as many cattle as can be accurately compared.

Continental breeds: Breeds that originate from Europe (other than British Isles).

Correlation: A measure of how two traits vary together. A correlation of +1.00 means that as one trait increases, the other also increases — a perfect positive relationship. A correlation of -1.00 means that as one trait increases, the other decreases — a perfect negative, or inverse, relationship. A correlation of 0.00 means that as one trait increases, the other may increase or decrease — no consistent relationship. Correlation coefficients may vary between +1.00 to -1.00.

Creutzfeldt-Jakob Disease (CJD): It is a human disease of a class of rare degenerative brain diseases called Transmissible Spongiform Encephalopathies (TSE), some of which affect humans and some of which affect animals. While the agents which cause CJD are poorly understood, CJD occurs spontaneously at a consistent rate worldwide of one case per million persons per year. (Also see new variant CJD.)

Crossbreeding: The mating of animals of one breed or breed combination to dams of another breed or breed combination. Crossbreeding usually results in positive heterosis (hybrid vigor).

Culling: The process of eliminating cattle from a herd, especially because of low productivity or less desirability.

Cutability: An estimate of the percentage of salable meat (muscle closely trimmed of external fat) from the high-valued cuts (round, loin, rib and chuck) vs. percentage of waste fat. Percentage of retail yield of carcass weight can be estimated by a USDA prediction equation that includes hot carcass weight, ribeye area, fat thickness and estimated percent of kidney, pelvic and heart fat. Also estimated by USDA Yield Grade.

Dark cutter: Refers to the dark appearance of the lean muscle tissue in a carcass and is usually caused by stress (excitement) of the animal prior to harvest.

Dioxin: An organic compound found throughout

the world in air, soil, water and food. It is the by-product of natural events like forest fires and man-made processes, such as manufacturing and vehicle exhaust. Humans are exposed to dioxins through the air they breathe and the water they drink. Humans can also be exposed to dioxins in the food they eat. Due to the efforts of many industries, including beef, human dioxin levels have declined more than 72% during the past 20 years.

Disinfectant: A chemical capable of destroying disease-causing microorganisms or which inactivates viruses.

Dressing percent: (Hot carcass weight divided by liveweight) x 100.

Dry matter basis: A method of expressing the level of a nutrient contained in a feed on the basis that the material contains no moisture.

Dystocia (calving difficulty): Abnormal or difficult labor causing difficulty in delivering the fetus and/or placenta.

Ear notching: Makings slits or perforations in an animal's ears for identification purposes.

***E.coli* 0157:H7**: A class of bacteria commonly found in the environment. *E.coli* 0157:H7 is a virulent strain of this bacteria found in the intestinal tract and feces in animals and humans. While *E.coli* 0157:H7 can cause food poisoning, thorough cooking destroys the bacteria. The beef industry continues to develop newtechnologies and procedures aimed at reducing the risk of *E.coli* 0157:H7.

Energy feeds: Feeds that are high in energy and low in fiber (less than 18%), and that generally contain less than 20% protein.

Environment: All external (non-genetic) conditions, not just climate, that influence the reproduction, production and carcass merit of cattle.

Established safe level: Concentration of drug metabolite in tissue considered to be without hazard to consumers and below which the FDA normally will not take regulatory action.

Estrous: The female reproductive cycle, averaging 21 days in cattle.

Estrus: Regularly recurrent state of sexual excitability during which the female (cow or heifer) will accept the male (bull). Also called heat.

Estrus synchronization: Causing a group of cows or heifers to exhibit estrus together at one time by artificial manipulation of the estrous cycle.

European Hormone Ban: A ban instituted in 1989 by the European Community (now called the EU) on imported meat and meat products treated with hormones. While the EU continues to argue the ban is based on health risk, there is no scientific evidence to support their claims. The United States views the ban as an artificial trade barrier erected by the EU to keep imported meat from competing with EU member countries who had created huge surpluses of domestic meat when the ban was initiated.

Expected Progeny Difference (EPD): The difference in performance to be expected from future progeny of an individual, compared with that expected from future progeny of another individual. EPD is an estimate of one-half of the transmittable breeding value of an animal.

Extra-label usage: Administering a drug or other substance in a manner not specified on the label. Can be performed or authorized only by a licensed veterinarian.

F1: Offspring resulting from the mating of a purebred (straightbred) bull to purebred (straightbred) females of another breed.

Fat thickness: Depth of fat in tenths of inches over the ribeye muscle between the 12th and 13th rib interface. It consists of a single measurement at a point 3/4 of the lateral length of the ribeye muscle from the split chine bone.

FDA: The Food and Drug Administration is part of the U.S. Department of Health, Education and Human Services. It is charged with the responsibility of safeguarding American consumers against injury, unsanitary food and fraud.

Feed conversion (feed efficiency): Units of feed consumed per unit of weight gained. Also the production (meat, milk) per unit of feed consumed.

Fed cattle: Steers and heifers that have been fed

concentrates prior to harvest.

Feeder cattle: Young, underfinished animals that will be placed on feed for slaughter.

Frame Score: An estimate of relative skeletal size based on height measured over the hips.

Frame Size: A subjective evaluation of differences in skeletal size, related to estimated slaughter weight at 0.5 inches external fat over the ribeye (predicted to result in low-Choice quality grade).

Freemartin: Female twin born with a male twin calf. Approximately 9.8 out of 10 of these female twins will not be fertile.

Genes: The basic units of heredity that occur in pairs and have their effect in pairs in the individual, but which are transmitted singly (one or the other gene at random of each pair) from each parent to offspring.

Genetic correlations: Correlations between two traits that arise because some of the same genes affect both traits. When two traits (i.e., weaning and yearling weight) are positively and highly correlated to one another, successful selection for one trait will result in an increase in the other trait. When two traits are negatively and highly correlated (i.e., birth weight and calving ease) to one another, successful selection for one trait will result in a decrease in the other trait.

Genotype: Actual genetic makeup (constitution) of an individual determined by its genes or germ plasm. For example, there are two genotypes for the polled phenotype PP (homozygous dominant) and Pp (heterozygote).

Genotype x environment interaction: Variation in the relative performance of different genotypes from one environment to another. For example, the "best" cattle (genotypes) for one environment may not be the "best" for another environment.

Gestation: The period of pregnancy or the period of time from conception until birth.

Hazard Analysis and Critical Control Points (HACCP): A systematic, science-based approach to assuring the production of safe food. The USDA Food Safety and Inspection Service requiries all U.S. meat and poultry processing facilities to implement the system.

Heredity: The transmission of genetic factors from parent to offspring.

Heritability: The proportion of the difference among cattle, measured or observed, that is transmitted to the offspring. Heritability varies from 0 to 1. The higher the heritability of a trait, the more accurately does the individual performance predict breeding value and the more rapid should be the response due to selection for that trait.

Heritability estimate: An estimate of the proportion of the total phenotypic variation between individuals for a certain trait that is due to heredity. More specifically, hereditary variation due to additive gene action.

Heterosis (hybrid vigor): Amount by which measured traits of the crossbreds exceed the average of the purebreds mated to produce the crossbreds.

Heterozygous: Genes of a specific pair (alleles) are different in an individual.

Homozygous: Genes of a specific pair (alleles) are alike in an individual.

Hormones: Naturally occurring chemical substances in all animals that affect such things as growth and development. Hormones are present naturally in virtually all foods of plant or animal origin. Growth-promoting hormones utilized by the U.S. beef industry to produce leaner beef more efficiently have the same effect as naturally occurring hormones. Neither naturally occurring hormones nor growth-promoting hormones used in beef production pose any sort of health risk to consumers.

Hot carcass weight: Weight of a carcass before chilling.

Immunity: The ability of an animal to resist or overcome an infection to which most members of its species are susceptible.

Immunization: The process and procedures involved in creating immunity (resistance to disease) in an animal. Vaccination is a form of immunization.

Implants: All growth-promoting hormone products used in the U.S. beef industry are manufactured as implants, which are placed beneath the skin on the back side of an animal's ear.

Intramuscular fat: Fat within the muscle, or marbling.

Intramammary: Placement of drugs and other substances directly into the udder, usually through the teat opening.

Intramuscular injection (IM): An injection into the muscle.

Intrauterine: Placement of drugs and other substances directly into the uterus.

Intravenous injection (IV): Injection of a drug or other substance directly into a vein.

Irradiation: The non-injurious exposure of food to low levels of radiation to eliminate harmful microbes. It destroys fungi, parasites and insects in and on food.

Kidney, pelvic and heart fat (KPH): Internal carcass fat associated with the kidney, pelvic cavity and heart expressed as percentage of chilled carcass weight. The kidney is included in the estimate of kidney fat.

Labeling: Written information detailing the content, intended use, instructions for use, withholding times and other specifics attached to the drug container and/or on a separate sheet accompanying the container.

Lactation: The period following calving during which milk is formed in the udder.

Lesion: The change in the structure or form of an animal's body caused by disease or an injury.

Marbling: The specks of fat (intramuscular fat) distributed in muscular tissue. Marbling is usually evaluated in the ribeye between the 12th and 13th rib.

Maturity: An estimation of the chronological age of an animal or carcass by assessing the physiological stages of maturity of bone and muscle characteristics.

Medicated feed: Any feed which contains drug ingredients intended or represented for the cure, mitigation, treatment or prevention of diseases of animals.

Metritis: Inflammation of the uterus.

Microorganism: A living creature, such as a virus or bacterium, capable of being seen only under a microscope.

Microflora: Microbial life characteristic of a region, such as the bacteria and protozoa populating the rumen.

Morbidity: A state of sickness or the rate of sickness.

Mortality: Death or death rate.

Mycotoxins: Toxic metabolites produced by molds during growth, sometimes present in feed materials.

National Cattle Evaluation: Program of cattle evaluation conducted by breed associations to genetically compare animals. Carefully conducted national cattle evaluation programs give unbiased estimates of expected progeny differences (EPDs). Cattle evaluations are based on field data and rely on information from the individual animal, relatives and progeny to calculate EPDs.

Natural beef: A USDA label used by some beef purveyors. By definition (minimally processed and without food additives), all beef produced in the United States qualifies for the natural label.

New variant CJD (nvCJD): A new form of Creutzfeldt-Jakob Disease (CJD) identified in Great Britain. Some scientists believe it is related to Bovine Spongiform Encephalopathies (BSE), but it is clearly different from normal CJD. There are no documented cases of nvCJD in the United States.

Non-fed cattle: Animals slaughtered without a finishing period, usually cull cows and bulls sold for slaughter.

Number of contemporaries: The number of animals of similar breed, sex and age against which an animal is compared in performance tests. The greater the number of contemporaries, the greater the accuracy of comparisons.

Offal: All organs or tissues removed from the carcass.

Optimum level of performance: The most profitable or favorable ranges in levels of performance for the economically important traits in a given environment and management system. For example, although some cows may produce too little milk, in every management system there is a point beyond which higher levels of milk production may reduce fertility and decrease profit.

Oral: Placement of a drug or other substance into an animal through its mouth.

OTC: Drugs and other substances that can be bought by anyone over the counter because adequate instructions for safe and effective use by laymen can be printed on the label.

Outcrossing: Mating of individuals that are less closely related than the average of the breed. Commercial breeders and most purebred breeders should be outcrossing by periodically adding new sires that are unrelated to their cow herd. This outcrossing should reduce the possibility of loss of vigor due to inbreeding.

Pathogen: A type of bacteria, such as *Salmonella* or *E.coli* 0157:H7, that causes foodborne illnesses.

Palatability: Overall eating satisfaction to be sufficiently agreeable in tenderness, texture and taste.

Parturition: The act of giving birth or calving.

Pedigree: A tabulation of names of ancestors, usually only those of the three to five closest generations.

Percent calf crop: The percentage of calves weaned within a herd in a given year relative to the number of cows and heifers exposed to breeding.

Performance data: Records of individual animals for reproduction, production and carcass merit. Traits include things like birth, weaning and yearling weights, calving ease, milk production, marbling, etc.

Pesticide: A broad class of crop protection compounds used to combat insects, fungus and rodents.

Phenotype: The visible or measurable expression of a character; for example, weaning weight, postweaning gain, reproduction, etc. Genotype and environment influence phenotype.

Phenotypic correlations: Correlations between two traits caused by both genetic and environmental factors influencing both traits.

Polled: Naturally hornless cattle.

ppb: Parts per billion.

ppm: Parts per million.

Postpartum: After the birth of an individual.

Preconditioning: A way of preparing the calf to withstand the stress and rigors of leaving its mother, learning to eat new feeds and being shipped to a stocker or feedyard operation.

Preweaning gain: Weight gained between birth and weaning.

Prion: A protein molecule found in the membrane of brain cells. Prions are hypothesized by some researchers as the responsible agents for rare degenerative neurological diseases called Transmissible Spongiform Encephalopathies.

Progeny: The offspring of the parents.

Progeny records: Lifetime performance records of progeny of sires and dams.

Progeny testing: Comparison, under the same conditions, of progeny of more than one parent for purposes of estimating relative breeding value.

Protein supplements: Products that contain more than 20% protein or protein equivalent.

Puberty: The age at which reproductive organs become functionally operating and secondary sex characteristics begin to develop.

Purebred: An animal of known ancestry within a recognized breed that is eligible for registry in the official herd book of that breed.

Qualitative traits: Traits in which there is a sharp

distinction between phenotypes, such as black and white or polled and horned. Usually, only one or a few pairs of genes are involved in the expression of qualitative traits.

Quality Grade: An estimate of palatability based primarily on marbling and maturity, and to a lessor extent on color, texture and firmness of lean.

Quantitative traits: Traits in which there is no sharp distinction between phenotypes, with a gradual variation from one phenotype to another, such as weaning weight. Usually, many gene pairs are involved, as well as environmental influences.

Rate of genetic improvement: Rate of improvement per unit of time (year). The rate of improvement is dependent on: (1) heritability of traits considered, (2) selection differentials, (3) genetic correlations among traits considered, (4) generation interval in the herd and (5) the number of traits for which selections are made.

Recessive gene: Recessive genes affect the phenotype only when present in a homozygous condition. Recessive genes must be received from both parents before the phenotype caused by the recessive genes occurs.

Replacement females: Females entered into a herd to replace loss of numbers from culling or death. May be heifers produced in the herd or animals brought in from outside.

Residues: Remnants of the compounds in drugs and other substances found in fluid, tissues and feeds.

Retained ownership: Refers to cow-calf producers maintaining ownership of their cattle beyond weaning for growing and/or finishing.

Ribeye area (REA): Area of the longissimus muscle measured in square inches at the 12th rib interface on the beef forequarter.

Rotational crossbreeding: A system of crossing two or more breeds where the crossbred females are bred to bulls of the breed contributing the least genes to that female's genotype. Rotation systems maintain relatively high levels of heterosis and produce replacement heifers from within the system. Opportunity to select replacement heifers is greater for rotation systems than for other crossbreeding systems.

Route of administration (ROA): The method by which a drug or other substance is given to an animal (oral, subcutaneous, intramuscular, topical, etc).

Rx (prescription drugs): Drugs that must be prescribed by a licensed veterinarian.

Salmonella: A family of bacteria that includes more than 2,000 strains,10 of which are responsible for most cases of reported illness associated with the bacteria. *Salmonella* can be found on any raw food of animal origin. Thorough cooking destroys the bacteria.

Sanitary: Clean. Absence of organisms that can cause disease or ill health.

Scurs: Horny tissue or rudimentary horns attached to the skin rather than the bony parts of the head.

Seedstock: Breeding animals.

Seedstock breeders: Producers whose primary role is to produce breeding animals for other producers.

Selection: Causing or allowing certain individuals in a population to produce offspring in the next generation.

Sibs: Brothers and sisters of an individual.

Sire summary: Published comparative results of sires from a breed's national cattle evaluation programs.

Stockers: Calves and yearlings, both steers and heifers, intended for eventual finishing and harvesting, which are being fed and cared for in such a manner to produce growth, rather than finishing. Stockers are generally younger than feeder cattle.

Stress: Any physical or emotional factor to which an animal fails to make a satisfactory adaptation. May be caused by excitement, temperament, fatigue, shipping, disease, hot or cold weather, nervous strain, number of animals together, previous nutrition, breed, age or management. The greater the stress, the more exacting the nutritional requirements.

Subcutaneous (SQ): An injection under the skin.

Systems approach: An approach to evaluating alternative individuals, breeding programs and selection schemes that involves assessment of these alternatives in terms of their net impact on all inputs and output in the production system. This approach specifically recognizes that intermediate optimum levels of performance in several traits may be more economically advantageous than maximum performance for any single trait.

Terminal sires: Sires used in a breeding system where all their progeny, both male and female, are marketed. For example, F1 crossbred dams could be bred to sires of a third breed and all calves marketed. This system allows maximum heterosis and breed complementary but replacement females must come from outside the herd.

Therapy: Treatment of disease or health disorders.

Tolerance: Maximum legally allowable level or concentration of a drug or chemical in a food product at the time the milk is marketed or the animal is slaughtered.

Topical: Application of a drug or other substance to the skin surface or an external membrane, usually concentrated in a small area.

Transmissible Spongiform Encephalopathies (TSE):A class of rare, degenerative brain diseases that affect both animals and humans. Human TSEs include Creutzfeldt-Jakob Disease and Fatal Familal Insomnia. Animal TSEs include Bovine Spongiform Encephalopathy in cattle and scrapie in sheep.

Ultrasonic measurements: Used to estimate carcass and reproductive characteristics. Operates off the principle that sound waves echo differently with different densities of tissue.

Yield Grade: Estimate of carcass cutability categorized into numerical categories with 1 being the highest in lean-to-fat ratio and 5 being the lowest.

Vaccination: An injection of vaccine, bacterin, antiserum or antitoxin to produce immunity or tolerance to disease.

Vaccine: A preparation containing microorganisms controlled in such a way as to create a response by the recipient animal's body that results in increased protective immunity.

VCPR: Valid veterinarian/client/patient relationship, generally meaning that the veterinarian knows and regularly sees the animals and the individual responsible for authorizing medical treatment for those animals agrees to follow the veterinarian's instructions.

Variance: Variance is a statistic that describes the variation we see in a trait. Without variation, no genetic change is possible.

Weaning rate: Number of calves weaned divided by number of cows exposed to a bull.

Weight per day of age (WDA): Weight of an individual divided by days of age.

Withdrawal time: The time required between the application or feeding of a drug or additive and the harvest of the animal to prevent any residue of the drug from remaining in the carcass. Withdrawal times are legally specified by the FDA.

Zero-Tolerance: The standard to which U.S. beef processors must adhere when it comes to fecal and ingesta carcass contamination. In layman's terms, no visible contamination is allowed on beef carcasses. (*Executive Summary of the National Non-Fed Beef Quality Audit, 1994. National Cattlemen's Beef Association. Englewood, CO.*)