

SALE Junior Commercial Steer Contest Suggested Study Aids

The USDA COOL website: <http://www.ams.usda.gov/cool/>

The USDA National Animal Identification System website:
<http://animalid.aphis.usda.gov/nais/index.shtml>

The Feedlot magazine archive issues at: <http://www.feedlotmagazine.com/>

Cattlemen's Beef Board & National Cattlemen's Beef Association official BSE website:
<http://www.bseinfo.org/>

Chicago Mercantile Exchange "Introduction to Livestock and Meat Fundamentals" at:
<http://www.cme.com/files/LivestockFund.pdf>

National Cattlemen's Beef Association website: <http://www.beef.org/>

National Cattlemen's Beef Association Government Affairs Center website:
<http://hill.beef.org/>

Texas Beef Council's Food Safety website: http://www.txbeef.org/food_safety.php3

Cattlemen's Beef Board website: <http://www.beefboard.org/>

Chicago Mercantile Exchange glossary at: <http://www.cme.com/trd/glossary.html>
Adopted version with selected terms attached.

Selected terms from Chicago Mercantile Exchange Glossary

American-style options	Options that permit exercise at any time on or before the expiration date.
Ask	Also called "offer." Indicates a willingness to sell a futures contract at a given price.
Basis	The difference between the spot or cash price and the futures price of the same or a related commodity. Basis is usually computed to the near future, and may represent different time periods, product forms, qualities and locations. The local cash market price minus the price of the nearby futures contract.
Basis contract	A forward contract in which the cash price is based on the basis relating to a specified futures contract.
Bear	One who believes prices will move lower.
Bear market	A market in which prices are declining.
Bid	The price that the market participants are willing to pay.
Breakeven	The point at which an option buyer or seller experiences no loss and no profit on an option. Call breakeven equals the strike price plus the premium. Put breakeven equals the strike price minus the premium.
Bull	One who expects prices to rise.
Bull market	A market in which prices are rising.
Call	An option to buy a commodity, security or futures contract at a specified price any time between now and the expiration date of the option contract.
Cash commodity	The actual physical commodity as distinguished from a futures contract.
Cash price	Current market price of the actual physical commodity. Also called "spot price."
Cash sales	The sale of commodities in local cash markets such as elevators, terminals, packing houses and auction markets
Closing price	The last price of a contract at the end of a trading session.
Commodity	Any commodity approved and designated by the Board for trading in the Exchange hall under the rules of the Exchange.
Contract	An agreement to buy or sell a specified amount of a particular commodity as specified by the Exchange (i.e., GEZ9, SPZ0C7400). The contract specifications detail the amount and grade of the product and the date on which the contract will mature and become deliverable if it is not liquidated earlier. Also, a term of reference describing a unit of trade for a commodity futures, as in "five Eurodollar contracts." Unit of trading for a financial or commodity future. Also, actual bilateral agreement between the parties (buyer and seller) of a futures or options on futures transaction as defined by an exchange.
Daily trading limits	The maximum price range permitted a contract during one trading session. Trading limits are set by the Exchange for certain contracts.
Delivery	The transfer of a commodity from a seller of a futures contract to a buyer of a futures contract. Some futures contracts are also cash settled.
Demand	The quantity of a commodity that buyers are willing to purchase from the market at a given price.
Exercise	The process of an option holder exchanging it for the underlying futures contract.
Exercise or strike price	The price at which the buyer of a call can purchase the commodity during the life of the option, and the price at which the buyer of a put can sell the commodity during the life

of the option.

Exercise price	The price at which the holder (buyer) may purchase or sell the underlying futures contract. Also called strike price.
Expiration date	The last day that an option may be exercised. Also, the last day of trading for a futures contract.
Forward contract	A private agreement between buyer and seller for the future delivery of a commodity at an agreed price.
Futures	A term used to designate all contracts covering the purchase and sale of financial instruments or physical commodities for future delivery on a commodity futures exchange.
Futures contract	A legally binding agreement to buy or sell a commodity at a specified price at a predetermined future time. Each future is standardized and specifies commodity, quality, quantity, delivery date and settlement.
Hedge	Offsetting price risk in any cash market by taking an equal but opposite position in the futures market. A means of protection against loss due to adverse price fluctuations.
Hedging	Buying and selling futures as a risk management tool. See "long hedge" and "short hedge."
Hundredweight	100 pounds. Abbreviated as cwt.
In-the-money	A call option with a strike price less than the underlying futures price. A put option with a strike price greater than the underlying futures price. A call option with a strike price lower (or a put option with a strike price higher) than the current market value of the underlying commodity for delivery at expiration time.
Limit	A contract's maximum price advance or decline from the previous day's settlement price permitted in one trading session, as determined by the Exchange.
Livestock cycle	A long, repeating pattern of increasing and decreasing livestock supply and prices.
Long	One who has bought a futures or options on futures contract to establish a market position and who has not yet closed out this position through an offsetting procedure. The opposite of short. 1) One who has bought a futures or options contract to establish a market position; 2) a market position which obligates the holder to take delivery; 3) One who owns an inventory of commodities.
Long cash	You own and plan to sell a commodity.
Long hedge	The purchase of a futures contract in anticipation of an actual purchase in the cash market. Used by processors or exporters as protection against an advance in the cash price. See "hedge."
Offer (or Ask, or sell)	A willingness to sell at a given price; the opposite of bid.
Offsetting a hedge	For a short hedger, to buy back futures and sell a commodity. For a long hedger, to sell back futures and buy a commodity. Also called "lifting a hedge."
Offsetting a long option	Offset a put by selling a put with the same strike price. Offset a call by selling a call with the same strike price.
Option	The right, but not the obligation, to sell or buy the underlying (in this case, a futures contract) at a specified price within a specified time.
Out-of-the-money	An option with no intrinsic value. A call option with a strike price greater than the underlying futures price. A put option with a strike price less than the underlying futures price.
Pure hedger	A person who places a hedge to lock in a price for a commodity. He or she offsets the hedge and transacts in the cash market simultaneously.

Put option	An option granting the right, but not the obligation, to sell a futures contract at the stated price prior to the expiration date.
Put profit / loss	For a long put, equal to the put value minus the premium. For a short put, equal to the premium minus the put value.
Put value	At expiration, equal to the strike price minus the futures price.
Risk	Possibility of suffering loss.
Short	One who has sold a futures contract to establish a market position and who has not yet closed out this position through an offsetting procedure. The opposite of long.
Speculator	Investors and traders who want to profit from price changes. Speculators accept the price risks and rewards that hedgers wish to avoid. Futures markets provide the forum in which speculators can buy or sell contract quickly and can exit their positions just as quickly to react to market changes.
Strike (price)	The price at which the option buyer may purchase or sell the underlying futures contract upon exercise. See "exercise price."
Supply	The quantity of a commodity that producers are willing to provide to the market at a given price.
Trading day	Period within which all executed trades for a given class are cleared on the same day. Hours of trading as determined by the board for each contract starting with the opening of trading and ending with the close of trading for such contract. This period may very well exceed 24 hours. One or more sessions could take place. Often referred to as clearing day.
Underlying	The stock, commodity, futures contract, or cash index against which the futures or options contract is valued.
Yield	a measurement of the annual return on an investment.

*complete glossary can be found at: <http://www.cme.com/trd/glossary.html>

Ad lib feeding – No limit placed on amount of feed intake. Self-feeding or allowing cattle to consume feed on a free-choice basis.

Alleles – Alternate forms of genes. Because genes occur in pairs in body cells, one gene of a pair may have one effect and another gene of that same pair (allele) may have a different effect on the same trait.

American Beef – These are combination beef breeds created in the United States, consisting of about ¼ to ½ tropically adapted genetics, mostly Brahman, along with British Beef or, less commonly, Continental Beef or Dual Purpose. American Breeds average medium to large size, medium to high milk, and low to medium lean-to-fat. They are particularly useful in hot climates for straightbreeding or crossing in both continuous and terminal systems. Ex: Beefmaster, Brangus, Santa Gertrudis, Simbrah.

Anaplasmosis – An infectious disease of cattle that causes destruction of red blood cells. The disease is caused by a minute parasite, *Anaplasma marginale*, found in the red blood cells of infected cattle. It can be transmitted from infected animals to healthy animals by insects or by surgical instruments.

Backcross – The mating of a two-breed crossbred offspring back to one of its parental breeds. Example: A Hereford-Angus cross cow bred back to an Angus bull.

Beef Improvement Federation (BIF) – A federation of organizations, businesses, and individuals interested or involved in performance evaluation of beef cattle. The purposes of BIF are to bring about uniformity of procedures, development of programs, cooperation among interested entities, education of its members and the ultimate consumers of performance evaluation methods, and to build confidence of the beef industry in the principles and potentials of performance testing.

Bos indicus – Humped cattle that arose in south central Asia.

Bos taurus – Non-humped cattle that originated in the British Isles and western continental Europe.

Breed – Animals of common origin with certain distinguishing characteristics passed uniformly from parent to offspring.

Breed combination – The benefits from combining breeds with different characteristics to produce a superior package.

British Beef – These are British-originated breeds used only for beef production. They are the foundation of the U.S. beef cattle population and the basis of comparison for other groups. British beef breeds average medium in body size, low to medium in milking potential, and low to medium in lean-to-fat ratio. These breeds are suitable for both straightbreeding and crossing with any other type or breed in both continuous and terminal systems. Ex: Angus, Hereford, Red Angus, Shorthorn

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

Carbohydrates – Carbohydrates make up 65-75% of the dry weight of most grains, forages, and roughages. Carbohydrates supply most of the energy needed by cattle.

Chromosome – Chromosomes are long DNA molecules on which genes are located. Domestic cattle have 30 pairs of chromosomes.

Closed herd – A herd in which no outside breeding stock are introduced.

Composite breed – A composite breed is formed from two or more established breeds, usually in exact percentages that vary depending on the goals of the breed. The primary motivation for creating composites is to create desirable breed combinations while producing heterosis without continual crossbreeding.

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 Beef – These continental European breeds were developed exclusively for beef production; they are part of what often are called “Exotics.” These breeds average medium to very large size, low milk, and very high lean-to-fat. They are used primarily as terminal sires. Continental Beef could be crossed with smaller or less muscular types to create females with more size or muscling but not higher milking. Ex: Charolais, Chianina, Limousin, Simmental

Cutability – An estimate of the percentage of salable meat from a carcass versus percentage of waste fat. Cutability depends on relative amounts of fat (which varies greatly), muscle, and bone (which varies least). Percentage of retail yield of carcass weight can be estimated by a USDA prediction evaluation that includes hot carcass weight, ribeye area, fat thickness, and estimated percent of kidney, pelvic, and heart fat.

Dam – The female parent.

Dominance – Dominant genes affect the phenotype when present in either homozygous or heterozygous condition. A dominant gene need only be obtained from one parent to achieve expression.

Dyspnea – labored or difficult breathing

Economic value – The net return within a herd for making a pound or percentage change in the trait in question.

Environment – All external (nongenetic) conditions that influence the reproduction, production, and carcass merit of cattle.

Estrus – The recurrent, restricted period of sexual receptivity in cows and heifers. Nonpregnant cows and heifers usually come into heat 18 to 21 days following their previous estrus.

F₁ – Offspring resulting from the mating of a purebred bull to purebred females of another breed.

Fat – Fat is a good source of energy and is analyzed in complete feed analysis as ether extract. In concentrates and grasses, ether extract consists largely of glycerides of fatty acids which provide about 2.25 times as much energy per unit of weight as carbohydrates.

Fleshing ability – The body’s capacity to fatten and retain fat. Fleshing ability tends to drop with increases in genetic body size, maintenance requirements relative to size, milking level, and inherent muscularity.

Foot rot – A term commonly used to include a variety of conditions affecting the bovine foot. It is a frequent problem of cattle, especially in poorly drained, muddy pens and pastures. Before the bacterial agent can gain entry, a break in the skin or hoof must occur. Once the infectious organisms become established, they cause inflammation and necrosis of tissue, resulting in slight to severe swelling and extreme pain. The signs of foot rot in cattle include lameness, holding or raising of a foot, reluctance to move, impaired locomotion and loss of appetite and weight. Severe illness or death can occur in prolonged cases.

Frame Score – A score based on subjective evaluation of height or actual measurement of hip height. This score is related to slaughters weights at which cattle will grade choice or have comparable amounts of fat cover over the loin eye at the 12th to 13th rib.

Freemartin – Female born twin to a bull calf (approximately 9 out of 10 will not conceive).

Generation interval – Average age of the parents when the offspring destined to replace them are born. A generation represents the average rate of turnover of a herd.

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 germplasm.

Genotype-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.

Gonad – The organ that produces the reproductive cells, the testicle in the male and the ovaries in the female.

Heredity – The transmission of genetic or physical traits of parents to their offspring.

Heritability – The proportion of the differences among cattle, measured or observed, that is transmitted to the offspring. Heritability varies from zero to one. 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.

Heterosis (hybrid vigor) – Amount by which measured traits of the crossbreds exceed the average of the two or more purebreds that are mated to produce the crossbreds.

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

Inbreeding – Production of offspring from parents more closely related than the average of a population. Inbreeding increases the proportion of homozygous gene pairs. Also, inbreeding increases prepotency and facilitates expression of undesirable recessive genes.

Leptospirosis – A contagious disease in animals and man caused by infection with leptospire. These are very slender, spiral bacteria with a characteristic hook in on or both ends. Transmission occurs among cattle by direct exposure to droplets of infective urine, by indirect exposure to contaminated surface waters and probably by breeding and artificial insemination. Symptoms include fever, jaundice, bloody urine, abortion and death.

Metabolic body size – The weight of the animal raised to the $\frac{3}{4}$ power ($W^{0.75}$); a figure indicative of metabolic needs and of the feed required to maintain a certain body weight.

Metabolism – The transformation by which energy is made available for body uses.

Minerals – Minerals remain as ash after the feed has been completely burned. Ash shows the total mineral content of the feed but does not identify the amounts of the individual minerals needed in the ration. Minerals are needed to form skeletal structures, for digestion, and in metabolic processes within the body.

Muscle expression – Inherent muscularity, independent of other body tissues. Muscling is the second most important factor in cutability. Heavy-muscled types often are low in fleshing ability, so reproductive efficiency may be reduced.

Nonadditive gene effects – Favorable effects or actions produced by specific gene pairs or combinations. Nonadditive gene action is the primary cause of heterosis. Nonadditive gene action occurs when the heterozygous genotype is not intermediate in phenotypic value to the two homozygous genotypes.

Outcrossing – Mating of individuals that are less closely related than the average of the breed. Commercial breeders and some 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.

Ovulation – Release of the female germ cell (egg) by the ovary. Cows usually ovulate several hours (up to 15 hours) after the end of estrus or standing heat.

Parturition – The act of giving birth; calving

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

Performance data – The record of the individual animal for reproduction, production, and possibly carcass merit. Traits included would be birth, weaning and yearling weights, calving ease, calving interval, milk production, etc.

Phenotype – The visible or measureable expression of a character, for example, weaning weight, postweaning gain, reproduction, etc. Phenotype is influenced by genotype and environment.

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

Pinkeye – (Infectious bovine keratoconjunctivitis) A common infectious disease affecting the eyes of cattle. The name results from the damage to the cornea and the redness and inflammation of the lining of the eye socket, an early sign of the disease. Two common signs are excessive weeping of the affected eye and closure due to pain. As the infection progresses, the cornea becomes cloudy or white. An ulcer usually develops near the center of the cornea. The infection may last for 4 to 8 weeks, or longer.

Polled – Naturally hornless cattle. Having no horns or scurs.

Progeny testing – evaluating the genotype of an individual by a study of its progeny records.

Protein – Proteins are complex compounds composed of amino acids. These amino acids contain nitrogen in addition to the carbon, hydrogen and oxygen contained by carbohydrates and fats. When all the different proteins are considered, their average nitrogen content is about 16%. For simplicity in evaluating feeds, the nitrogen is measured and then converted to protein by multiplying by 6.25.

Puberty – The age at which the reproductive organs become functionally operative and secondary sex characteristics begin to develop.

Qualitative traits – Those traits in which there is a sharp distinction between phenotypes. Usually, one of few pairs of genes are involved in the expression of qualitative traits.

Quantitative traits – Those 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.

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 can be observed.

Regression (regressed) – A measure of the relationship between two variables. The value of one trait can be predicted by knowing the value of the other variable. For example, easily obtained carcass traits (hot carcass weight, fat thickness, ribeye area, and cutability). Likewise, breeding value estimates based on limited data are regressed back toward the population average to account for the imperfection of this relationship.

Rotational crossbreeding – Systems 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.

Scurs – Horny tissue of rudimentary horns that are attached to the skin rather than the bony parts of the head.

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

Sire – The male parent.

Sire Summary – Published results of national sire evaluation programs.

Straightbreeding – The same breed of sire and dam is used continually, so progeny usually are rather uniform in appearance. Straightbreeding is particularly useful in producing parents for crossbreeding. The biggest shortcoming of commercial straightbreeding is the absence of heterosis.

Vitamins – Vitamins are needed by livestock for various body processes in very minute amounts.

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

Clostridial Diseases

The Clostridial diseases are a group of mostly fatal infections caused by bacteria belonging to the group called *Clostridia*. These organisms have the ability to form protective shell-like forms called spores when exposed to adverse conditions. This allows them to remain potentially infective in soils for long periods of time and present a real danger to the livestock population. Many of the organisms in this group are also normally present in the intestines of man and animals/

Blackleg – A disease caused by *Clostridium chauvoei* and primarily affects cattle under two years of age. The organisms is taken in by mouth and symptoms include lameness, depression, swelling caused by gas bubbles under the skin, fever and sudden death.

Malignant Edema – A disease of cattle of any age caused by *Clostridium septicum* is found in the feces of most domestic animals and in large numbers in the soil where livestock populations are high. The organism gains entrance to the body in deep wounds and symptoms include depression, loss of appetite, and a wet doughy swelling around the wound which often gravitates to lower portions of the body. Temperatures of 106° or more are associated with infection and death frequently occurs within 24-48 hours.

Clostridium Novyi – Infections caused by *Clostridium Novyi*, commonly known as Black disease, in cattle, occur sporadically in cow-calf operations as they are more often seen under feedlot conditions. The route of infection and transmission are not known, however, it is thought to gain entrance into the body by a wound infection, or possibly taken in orally. Only sudden deaths are thought to occur and sick cattle are not generally recognized.

Clostridium Sordelli – Clostridium Sordelli is a sudden death disease of primarily feedlot cattle, infrequently seen in cows. The route of transmission is unknown, but thought to be by mouth. No symptoms are observed as only dead animals are found. The post mortem findings are somewhat specific, as they tend to be found in the areas of brisket and throat, consisting of massive black hemorrhage and smelly muscle necrosis with no gas formation.

Tetanus – A disease of cattle caused b Clostridium tetani. Although cattle are less susceptible to tetanus than most other animals, it can occur. The organism lives in the intestines of many animals and is found widespread in soil. The organism is introduced into wounds created by punctures or lacerations caused either by accident or following “dirty surgery.” The organism remains in the small area where introduced and produces powerful toxins or poisons which primarily attack nerve tissue affecting both the spinal cord and brain. Symptoms observed are those of muscle spasms, protrusion of the third eyelid

Clostridium Hemolyticum – Clostridium Hemolyticum causes an infection commonly called red water disease. The disease has somewhat limited geographic locations, occurring mostly in Montana and along the coast of Texas, being primarily found in marshy lowlands. The organism taken in orally, is frequently associated with liver fluke infection. Symptoms seen are those of depression, anemia, bloody diarrhea, red stained urine, high temperature, collapse and death in 1-3 days.

Common Cattle Parasites

Internal parasites

Hairworms

The gastrointestinal tract of cattle is often infected with hairworms, also called stomach worms and intestinal worms. These worms are transmitted when

1. Infected cattle pass eggs in manure onto the ground;
2. Eggs hatch in the manure;
3. Rain washes the larvae from the manure; and
4. Cattle swallow larvae on wet grass in moderate temperatures.

Clinical signs of wormy cattle include pale mucous membranes, bottle jaw, diarrhea, pot belly, not grazing, not chewing cud, rough and dry haircoat, weakness and inability to stand. When cattle have a diet with enough protein, vitamins and minerals, fewer worms are normally established and the cattle are more able to withstand their effects.

Liver flukes

Cattle living in wet areas with alkaline soils may develop liver fluke infections. Liver flukes are transmitted when:

1. Infected cattle, deer and rabbits pass eggs in manure and drop the manure in water.
2. Eggs hatch in water and larvae develop in snails; and
3. Cattle swallow cysts on grass or hay.

Clinical signs of digestive inefficiency are evident in young cattle with acute liver disease and in older cattle with chronic liver disease. Fluky cattle show signs similar to those with malnutrition and hairworms.

Lungworms

Southern cattle are occasionally infected with lungworms because of the moderate temperatures and abundant moisture prevailing in most of the region. This parasite lives in the air passages of the lung, causing irritation, mucus production and leading to secondary bacterial infection. The most common sign is rapid, shallow breathing. Infected animals usually have a loose cough which is made more severe by exercise.

External parasites

Horn flies

Horn flies reproduce in fresh cattle manure from early spring to late fall. Horn flies suck blood, irritate and annoy, reduce weight gains and cause weight losses. The annoyance and irritation interfere with cattle's feeding and resting.

Treatment is economically justified when horn fly populations reach 250 per head. To control them satisfactorily throughout the season, use self-treatment insecticides or routinely apply spray, pour-on, spot-on or dust chemicals.

Lice

Biting lice and blood-sucking lice are transmitted between cattle by contact, especially in the fall, winter and spring when egg production increases in cool weather. Because cattle tend to bunch up more in cold weather, uncontrolled lice spread easily from animal to animal and quickly infest an entire herd.

Lice cause a condition called lousy, an itching skin disease with possible anemia. Clinical signs are dry, scaly skin, hair loss and itching exhibited by biting, rubbing and scratching. Although chemicals do not harm lice eggs, cattle can be treated effectively by administering insecticides twice at a 2-week interval or once with avermectins or milbemycin.

Grubs

Cattle grubs are larvae of heel flies, which lay eggs on hairs of the lower legs of cattle in late winter and spring. Grubs appear in the backs of cattle in winter. The migratory damage by the grubs in cattle causes weight losses and reduces weight gains and milk production. To control grubs, administer systemic organophosphate insecticides or milbemycin to cattle no later than 3 months before grubs appear in the back.

Vital Signs of Cattle

Temperature: 100.4° to 103.1°F

Pulse Rate: 40–70 heart beats per minute

Respiration: 10-30 per minute