

Quiz Bowl Study Guide I

Livestock has four main functions as well as many many by-products that are in products that we use every day. These by-products range from tires for your car or truck to cosmetics and medicine. The four main functions are: food, clothing, power, and recreation. The only major meat animal native to the United States is Bison. All other meat animals were imported mostly from Europe.

Only about 2% of the American population is involved in food production. Whereas, in Third World Countries, this number moves as high as 80% of their population are involved in the production of their food. The U.S. consumer spends about 16-17% of their income to buy the food for their tables, and in Third World Countries they spend between 60% and 90% of their income to feed themselves and their families.

In our country, there are several ways that livestock handlers and producers identify their animals. There are 3 ways of branding. There is the common way of using a hot iron to leave a permanent mark on the hide or freeze branding that takes a little more preparation but also leaves a permanent mark or brand in the hair. A chemical application can also be used to leave a brand or marking to identify ownership. In swine production, an elaborate system of notches removed from the edges of the ear will identify an individual pig. Ear tags are often used to identify animals, sometimes with a DNA notch taken from the ear and kept on record that will positively identify an animal even if the tag is lost or removed. Tattoos are also used as permanent identification, they are usually placed inside the ear. This type of identification is not easy to read without restraint on the animal.

All livestock in the U.S. are inspected and regulated by the USDA, the United States Department of Agriculture. Some states like Arizona have active inspectors as well. The ADA, Arizona Department of Agriculture, monitors movement and sales of livestock in the state and also inspects and will quarantine animals for disease control if necessary.

The FDA, Food and Drug Administration, is responsible for any testing and regulating of medicines that may be administered to animals just like it is for people.

Any medicine that will be administered to an animal must be approved for that

species and have an established withdrawal period that will allow the medicine to be metabolized and eliminated from the body. This is very important for any animal that is destined to be part of the food chain as the carcass will have drug residue if there hasn't been enough time for it to be eliminated prior to slaughter. All of the necessary information is on the label of the medicine, however, not all drugs that are approved for cattle are also approved for sheep or goats and so on. Drugs or medicine must be administered according to the label for that medicine and the withdrawal period must be expired for any animals intended for the food chain.

There are situations that require an injection of medicine be given to livestock. This can be done 3 different ways. The most common is SQ or subcutaneous which means under the skin. This is given in the area between the skin and the muscle. The medicine is slower to dissipate throughout the body. There is also IM or intramuscular. The medicine is injected directly into a large muscle of the animal. An IM injection distributes medicine faster than SQ but sometimes leaves an injury in the muscle. The fastest way to distribute medicine throughout the body is to give the injection IV or intravenous, directly into the vein. Most medicines are measured in milliliters, ml, and most syringes are calibrated in cubic centimeters, cc. It is very convenient that an ml is the same measurement as a cc.

The male parent of a 4-legged animal is called the Sire. The female parent is called the Dam. However, there are different names for the offspring that they produce, calves, kids, lambs, and piglets. As the offspring grow, their names change based on their gender and their age. A young female cow that hasn't had a calf is called a heifer. A young female pig that hasn't had a litter of piglets is called a gilt. A young goat is called a kid doe if it's a female and a kid buck if it's a male. A young female sheep is called a ewe lamb and a young male is a ram lamb. Breeding male cattle are called Bulls, breeding females are Cows. Breeding male pigs are called Boars and a breeding female is a Sow. Breeding male goats are Bucks and females are Does. Breeding male sheep are Rams and females are Ewes.

The majority of market animals are males that have been castrated. Females can also be used for market, and many are spayed for this purpose. The lack of reproductive hormones improves quality of the product. A castrated male cow is called a steer, a castrated male pig is a barrow. Castrated male sheep and goat are both called a wether.

There are five main nutrients required by livestock to grow and be healthy. They are water, minerals, vitamins, protein, and carbohydrates. Water is necessary for life, for their cooling system to work properly, for their food to digest properly, for the females to produce enough milk for their young. Vitamins and minerals are necessary for proper development of the body and the immune system. Protein is necessary for the development of muscles and carbohydrates are necessary for energy.

A pig has a digestive tract like that of a human. A cow, sheep and goat all are ruminants. A ruminant has 4 stomachs. The first and largest stomach is called the Rumen. The second is called a reticulum, the third is the omasum, finally the abomasum which is most like a true stomach as we know it. A ruminant can digest large amounts of roughage and convert it to pounds of gain. Most ruminants are given a diet of roughage and concentrates. Examples of roughage are hay, pasture, beet pulp, cottonseed hulls, oat hulls and corn silage. Concentrates are feed high in energy, highly digestible and low in fiber. They also contain protein, vitamins and minerals. Good sources of protein are soybean meal, cottonseed meal, distillers' grains, corn gluten meal and urea. On the other hand, a pig with only one stomach excels in feed conversion over other farm animals. Their diet is mostly concentrates and little roughage.

Most livestock animals are fed bags of feed or bales of hay that they purchase from a local feed store. Most bags of feed are developed for a specific species. Each bag of feed must have a label that gives the net weight of the feed, the product name and brand name, a guaranteed analysis of the feed's nutrients, a list of all ingredients from the largest amount to the smallest amount, a list of any drug additives, directions of use, and cautionary statements if applicable.

The scientific name for a goat is a caprine. Meat or Boer goats originated in South Africa. Boer goats commonly have white bodies with a dark head, variations of this are not uncommon. They are known to be docile, fast growing and have high fertility rates. Does are known to have superior mothering skills as compared to other goat breeds. In an open pasture situation, it is common for goats to have a guard animal among the herd. Donkeys, llamas or guardian dogs are used for this purpose.

As a goat is a ruminant, they eat primarily forages or grasses and hay. These forages are high in roughage and fiber. Essentials for raising healthy goats

should be to have a vaccination program, do regular deworming, provide fresh clean water and provide quality hay and browse.

The gestation for a goat is about 150 days from breeding. In nature, goats most often breed in the fall to have spring kids when the spring feed will be available. The ideal body score for breeding a goat would be 3.0 to 3.5. There is a practice called flushing that increases the feed given to the doe before breeding that will increase her production of kids. Most commercial herds breed their does to have 3 sets of offspring in 2 years. A good young goat can reach market weight of 49-70 pounds by weaning at 3 months of age.

A normal birth presentation is the front feet pointing downward followed closely by the muzzle. If this is not the case, some intervention may be necessary. A leg back, a muzzle turned to the side are all correctable by pushing the kid back in and making the correction. If the feet are turned upward and there is no muzzle, then probably the kid is breech or rear legs presented first. This is possible for the kid to be born this way, it just needs to be done quickly as the umbilical cord breaks early and the kid needs to get out to start breathing.

Young goats should be have their buds (horns) removed as soon as they can be felt, usually 4-7 days of age. The male kids should be castrated at about 2 weeks of age.

A normal body temperature for a goat is 102.5° to 104°. To take the pulse on a goat, feel the inner thigh. Internal parasites that can invade you goat are worms and coccidia. External parasites can be ticks, fleas or lice. Goats should be wormed 2 times per year.

There are three selection grades for meat goats. These are strictly based on the amount of muscle the goat carcass has regardless of the fat. An normal market weight would be between 50-80 pounds. Goat meat is called chevron.

Market and breeding goats are shown only with a collar. The exhibitor may move to either side of the goat for the judge to have the best advantage for viewing the animal. They are judged on the move as well as the judge is allowed to "feel" the goat to determine the quantity of the meat and the quality of the finish.

The scientific name for cattle is bovine, however there are 2 types of bovine. *Bos Indicus* are humped cattle common in tropical countries and belonging to the Zebu and Brahman group. These cattle can move their skin to dislodge

insects and sweat through their skin. Bos Taurus are the beef and dairy breeds. They can not giggle their skin and must cool themselves by panting and sweating on their noses and the bottom of their hooves.

Bos Taurus are broken down into four types, beef, dairy, dual purpose (both beef and dairy), and draft. The leading state in the U.S. for cattle production is Texas. Texas is also responsible for developing a few breeds of cattle. Everyone knows the Texas Longhorn, and have probably heard of the Santa Gertrudis that was developed on the King Ranch. Gerts as they are commonly called, is a cross between the Bos Indicus Brahman with the Bos Taurus solid red Shorthorn. The Bos Indicus Brahman has been a popular crossbreeding addition to the Bos Taurus Breeds. The Beef Master Breed is a combination of Hereford Cows and Shorthorn Cows crossed with a Brahman Bull. The Brangus Breed required genetics of 5/8 Angus and 3/8 Brahman. There are Simbrahs which is a Simmental crossed with a Brahman. There are Charbras which is a Charolais crossed with a Brahman. There are Braford, which is a Brahman crossed with a Hereford. In Texas these are called American Crosses.

There are several other breeds developed in Europe and Britain that influence cattle in the U.S. and influence show cattle. From Britain came the three with excellent carcass traits, Angus (both Red and Black), Hereford and Shorthorn, France developed Limousin, Charolais, Saler and Maine-Anjou, Germany developed the Gelbvich that is used in lots of crossbreeding programs of commercial herds. Simmentals came from Switzerland and in Italy they developed cattle with the largest possible cuts of beef in the Chianina.

Advantages of beef production are that you can use home grown feed, or use land that isn't suitable for farming, the cattle maintain fertility, there is little death loss, and it may also be suitable for part time work. Disadvantages would be when compared to other species it uses considerably more land, it requires fencing and water availability, they propagate slowly, and are relatively inefficient in converting feed, it is also costly to assemble a herd. There are a few different cattle systems that you can get involved in. They are a feedlot program, seedstock producer, cow/calf operation or stockers (yearlings on pasture or feed).

The average body temperature of cattle is 102.5°, normal pulse rate is 60-70 bpm and respiration rate is 10-30 per minute. The pulse can be found on the outside of the jaw just above its lower border.

Market cattle are graded in two ways, Quality Grade and Yield Grade. Quality Grade is based on marbling which is intramuscular fat flecks. The highest quality grade would be Prime, followed by Choice, Select, Standard and Utility. Yield Grade is a number between 1 and 5 that is based on muscle to fat ratio. Measurements are taken of the fat thickness $\frac{3}{4}$ of the way down the rib eye muscle between the 12th & 13th ribs, the rib eye area, the weight of the hot carcass and an estimate of the kidney pelvic and heart fat. These numbers are put into a calculation to come up with the Yield Grade. A "1" would be a carcass with lots of muscle and no fat, a "5" would be a carcass with little muscle and lots of fat. A common dressing percentage, which is the carcass weight percentage of the live weight, is about 63%. Market beef average between 1150 and 1350 pounds.

The estrus cycle for a cow is every 21 days. Heifers can be bred as early as 15-18 months of age to calve around 2 years old. Estrus cycles on numbers of cows can be synchronized to occur at a predictable time, therefore breeding and then calving can be fairly predictable. The most important factor in Bull selection is structural correctness and fertility. Artificial Insemination and Embryo Transfers allow for faster improvements to genetics and herds. Pregnancy testing on cows can be done 3 ways, rectal examination, ultrasound, or a blood test. Gestation for a cow is about 283 days or 9 months and 10 days. A cow in the right condition will rebreed in 1 $\frac{1}{2}$ to 2 months after calving.

A cow will produce twin calves about 1 time in 250. Most times the twins are the same sex but occasionally they will be opposite sexes. In the case of twins with 1 heifer and 1 bull calf the heifer will be more than likely not have a functioning reproductive tract and will have masculine traits. She is called a Free Martin.

Like most livestock, parasites can cause livestock to have less than ideal growth. Regular worming and treatment for both internal and external parasites is a must.

When showing cattle, you lead them from their left side. A halter, show stick and a scotch comb are the required equipment for the show ring. Most show halters are leather with a chain that goes under the chin then connected to a leather lead. A show stick is used to help place the feet and legs in their proper position. The scotch comb is for incidental grooming in the ring. Cattle are judged on the move as well as the quantity of the muscle and the quality of their finish.

Pigs, hogs, swine are all names for the porcine animal that produces tasty, nutritious pork, bacon, ham. Pigs are produced in purebred operations, in feeder pig operations, just finishing operations, and complete farrowing to finishing operations. Advantages of producing pork over other farm animals are that pigs excel in feed conversion, they are prolific, can produce 2 litters a year, they don't need a great investment in buildings and equipment and they take minimal labor. Some disadvantages are that they require a maximum of concentrates and a minimum of roughage, they are susceptible to disease, they are difficult to pasture and fencing for them would be expensive and sows need constant attention and care at farrowing (birthing of piglets).

Popular breeds follow with a description:

Berkshire has the oldest swine registry in the U.S. they are usually black with white on their legs and face. They have erect ears and are known for fast efficient growth, reproduce efficiently, cleanliness, meat flavor and value.

Duroc is the second most registered swine in the country. They are red pigs with a drooping ear. They are valued for their product quality, carcass yield, fast growth and lean gain efficiency. They have prolificacy and longevity in the females.

Landrace are white hogs with drooping ears. They are known as "America's Sowherd" because the females are heavy milkers and farrow large pigs. Landrace cross well with other breeds and usually possess length of body, a high percentage of body weight in their ham and loin and the ideal amount of finish.

Spotted swine breed is characterized by large black and white spots. They are known for feed efficiency, rate of gain and carcass quality. Commercial producers appreciate the females for litter production, docility and durability.

Poland China swine originated in the early 1800's in Ohio. Today these hogs are known for their large frame, length of body, leanness and muscle. They are also excellent feeders gaining well under good feeding and management. They have a quiet disposition.

Chester White pigs originated in Chester County, PA. These pigs have droopy medium sized ears and are known for their mothering ability, soundness and durability. Packers also tout the quality of their muscle.

Hampshire hogs have the "belt". They are black with a white belt across their shoulders and under their chest. They are known for producing lean muscle and

high carcass quality, minimal back fat and large loin eye areas. Females are known for their mothering ability and longevity. Hampshire hogs crossed with Yorkshire hogs produce the "blue butt" colored hogs.

Yorkshire hogs are the most recognized breed in North America. These hogs are white with erect ears and are found in almost every state in the U.S. Primarily they live in the states in the middle of the country where corn grows. Yorkshires are known for their muscle, producing a high proportion of lean meat and low back fat.

Soundness and durability are additional strengths.

Crossbreeding combines the traits of different breeds and capitalizes on heterosis (hybrid vigor). Hybrid vigor is when a crossbred offspring will perform above the average of the purebred parents' breeds. This is true inside all species of livestock.

A gilt will reach puberty at about $5 \frac{1}{2}$ to $6 \frac{1}{2}$ months of age. Typically, they are bred at 8-9 months and weigh between 275 and 300 pounds. Artificial Insemination (AI) is used extensively for breeding quality pigs. A boar will produce 150 to 200 ml of semen. Most genetic improvement for growth efficiency and carcass merit comes from the boar. A gilt or sow can be fed 20% more before breeding to produce a higher number of piglets (flushing). A female is bred when she is in standing heat. Standing heat is when the female will stand to be mounted. Gestation for pigs is 114 days. Also known as 3 months, 3 weeks, and 3 days. A minimum number of teats on each side for a breeding gilt is 6. The average litter size is 10 piglets. Baby piglets should be kept at a temperature between 85° and 90° for the first 10 days of life. Their eight needle teeth and their tails should be clipped within 24 hours.

The most valuable cuts of pork come from the loin. The two factors that determine cutability is muscle and fat. Muscle scores 1-3, 1 is lean and 3 is fat. Average weight for slaughter is 220 to 260 pounds. A measure of carcass leanness is the loin eye area at the 10th rib.

Brushing your pig adds bloom and makes the hair lie down properly. Bathing and clipping the hair gives the pig a clean shiny look. The equipment you'll need to show a pig are a bat or whip and a small brush. You'll need to train your pig to turn and stop and turn around using the bat or whip by tapping on the side of their face. When showing your pig you should keep your pig between 10 and 30 feet and in

plain view of the judge. The judge will need to see the front, back and sides of the pig to make the best judgement.

The scientific name for sheep is ovine. Sheep produce both wool and meat. Breeds such as Cheviot, Dorset, Hampshire, Montadale, Oxford, Shropshire, Southdown and Suffolk are all meat producers. Some wool producing breeds are Merino, Corridale, Cotswold, Lincoln and Rambouillet. Dual purpose breeds that will produce both meat and quality wool are Columbia, Corridale, Finnsheep and Targhee.

Factors that affect production costs (other than initial investment) are feed costs, level of winter feeding, when the ewes lamb, pasture costs, the number of lambs produced, and the average weight per lamb sold.

Sheep are ruminants, so they can digest large amounts of roughage. A well-balanced ration including roughage and concentrates works best for sheep in confinement. Sheep that get too fat are fed too much for a long time. The protein content of a balanced ration for growing lambs should be at 16%. Good sources of protein are cottonseed meal, soybean meal, linseed meal, corn gluten meal, meat meal and urea. The energy portion of the ration can be made up of barley, oats, wheat, corn, corn silage and hay. In early gestation a ewe should be given 4-5 pounds of feed per day. A hay:grain proportion for lactating ewes should be 65:35 to 50:50.

Ewes will breed naturally when the days get shorter in the fall. Rams should be purchased for the flock about a month before the breeding season. Shearing rams increases vigor and activity and avoids sterility. Mature ewes, flushed ewes and Finn cross ewes are more likely to have 2 or more lambs per breeding. An average ewe can produce 5 to 6 years and may produce 3 sets of offspring in 2 years. Gestation is 145 days. Ease of lambing is determined by the weight of the lamb, size and shape, pelvic room in the ewe and if the presentation is normal. Milk production in the ewe is influenced by the number of lambs, age of the ewe, feed, and udder soundness. Her diet should consist of energy, protein, calcium, phosphorus, vitamins and plenty of water. A lamb's tail should be docked at 1 to 7 days old. Lambs will begin to eat dry feed at 2 to 3 weeks of age.

A sheep's normal temperature is 102° to 103°. A sheep that isn't feeling well will be laggard, off by itself, won't eat, and the manure isn't normal. The major diseases that affect sheep are pneumonia, pregnancy disease, vibrio,

enterotoxemia, sore mouth, scours, mastitis, foot rot, and parasites. Many of these diseases can be prevented by worming, spraying or vaccinating. Tagging of sheep is when dirty wool is removed around the doc area. Sheep keds are ticks. Ticks can be prevented by spraying sheep after shearing. Sheep on pasture are more likely to have parasites. A healthy sheep in pasture when approached will run away.

The main factor in determining yield grade in sheep is back fat. Yield grades are 1 - 5. The average rib eye area is $2 \frac{1}{2}$ sq. inches. Carcass quality grades are prime, choice, utility and cull. The lamb is ribbed, viewed and measured between the 12th and 13th ribs. The carcass of a young sheep is called lamb. The carcass of a sheep over 14 months of age is called mutton.

To prepare a sheep for show, you can use a blocking table to restrain it. Only meat breeds are bathed and usually the wool is slick sheared. Wool breeds should not be washed. A brush with small bent wires is called a wool card. It is used to fluff the wool. Hand shears are used to trim the wool for breeding sheep. A show ewe should be alert, good size, length, height, and body width. She should have muscled legs, substance of bone and should follow breed type. A Hampshire lamb with wool on its legs can be carded and trimmed to make the lamb appear to have more bone. A blanket kept on a sheep will help keep them clean, firm and neat.

Market lambs and breeding ewes are shown with no halters, whips, bats or collars. They must be trained to allow the exhibitor to handle them, move them and turn them just using their head and perhaps a small push at the doc. The exhibitor can move to either side to best show the sheep to the judge. When the judge wants to "feel" the sheep they should be braced to allow the judge to feel the muscle and finish on the animal. Weight range for market lambs is between 30 pounds for a "hot house" lamb to over 200 pounds for an extra heavy commodity lamb, but the average lamb slaughtered is around 135 pounds.