

Principles of Beef Cattle Selection

Proper selection of animals is extremely important in the beef cattle industry. Beef producers must decide which animals to select for different purposes, such as breeding and slaughter. High-quality animals are more productive and more valuable.

Parts of a Beef Animal

The use of correct terminology for the parts of an animal is critical to avoid confusion when describing it. Figure 3.1 shows the proper names for the parts of a beef animal.

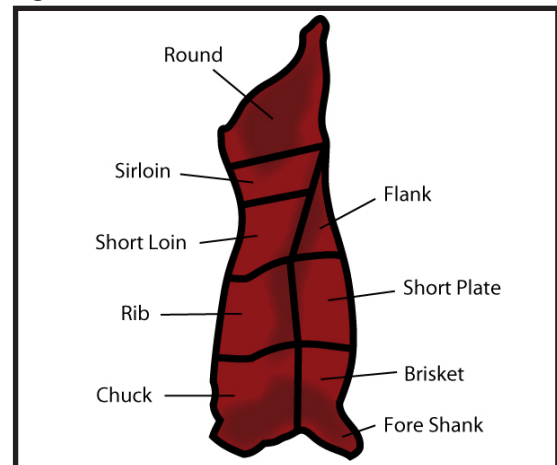
Wholesale Cuts of a Beef Animal

Wholesale cuts are large cuts of meat that retail stores, such as grocery stores, purchase and cut into smaller retail cuts. The consumer then buys the retail cuts. The wholesale cuts are the round, sirloin, short loin, rib, chuck, flank, short plate, brisket, and fore shank. Figure 3.2 illustrates the wholesale cuts.

Selection of Slaughter and Feeder Cattle

The selection of slaughter cattle is based on the future carcass quality and cutability, the percentage of salable meat from a carcass, of the animal. At slaughter, they are assigned different yield grades based on the quality of the carcass. The goal of producers is to choose slaughter cattle that will meet the standards for the choice quality grade. Choice grade beef is the most common grade

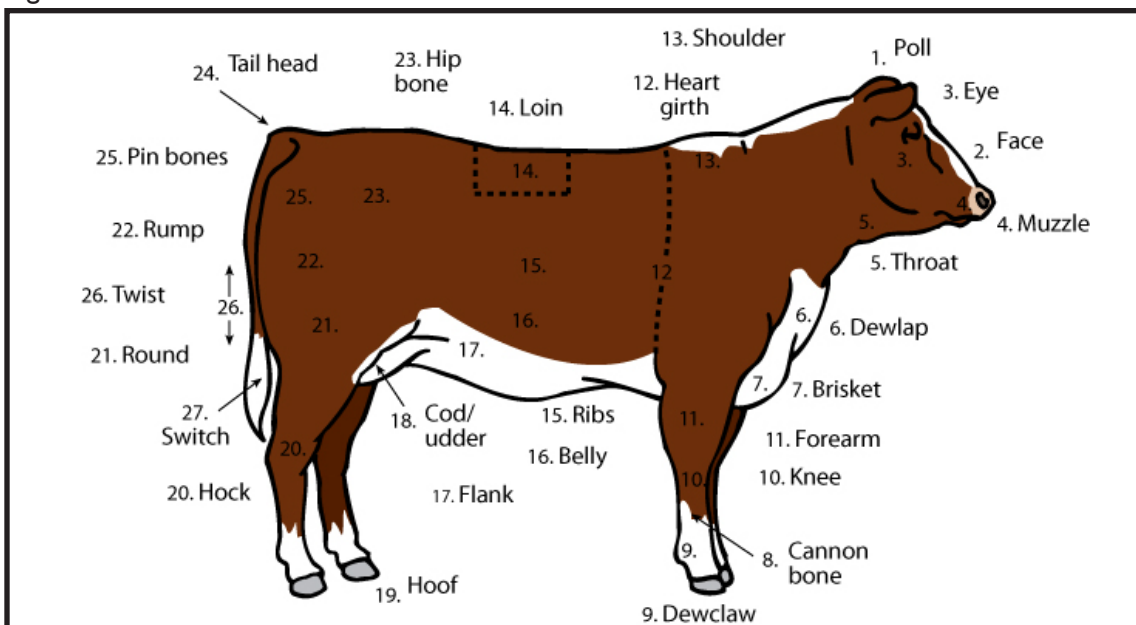
Figure 3.2 - Wholesale Cuts of Beef



purchased by the consumer. Slaughter steers and heifers should be evaluated for muscling, size, and amount of external fat.

Muscling - Muscling translates into how much thickness the animal has. Thicker cattle have more muscle thickness and width along their top line and through their rump and stifle. Heavily muscled animals are wide when viewed from the rear. Muscular cattle produce carcasses with more salable meat, which is profitable for both the producer and packer. Areas to observe when evaluating muscling are the size of the forearm, thickness along the top of the animal, and thickness and depth of the quarter, as shown in Figure 3.3.

Figure 3.1 - Parts of a Beef Animal



Introduction to Beef Production

Size - The size, or weight, of the animal is another important factor in the selection of slaughter cattle. Size suggests the potential carcass weight of the animal. Packers prefer beef carcasses to weigh between 600 and 850 pounds. Larger or smaller carcasses are harder to process into suitably sized wholesale cuts. Beef cattle generally have dressing percents (dressing percent = carcass weight ÷ live weight) between 60 and 65 percent, with 62 percent being average. Live weights should be between 1,000 and 1,250 pounds.

External fat - External fat thickness is the final major component in selecting slaughter cattle. Slaughter cattle must have approximately 1/2 inch or less of external fat on the 12th and 13th ribs to have the potential to reach choice-quality grade. Steers and heifers with 1/2 inch of external fat will have a smooth appearance along their ribs and bones of fat (fat deposits) opposite their pin bones. The calves will also have evidence of fat on the cod or udder region and through the brisket.

Feeder cattle selection is very similar to the selection of slaughter cattle. As with slaughter cattle, the producer wants to select animals that will yield a choice-quality grade carcass. Evaluation is based upon factors that will influence future carcass value. Feeder cattle are evaluated for frame size and degree of muscling, which indicate potential slaughter weights.

Priorities in Slaughter Cattle

Muscling - Heavily muscled foreman, top, and stifle

Live weight - 1,000 to 1,230 pounds

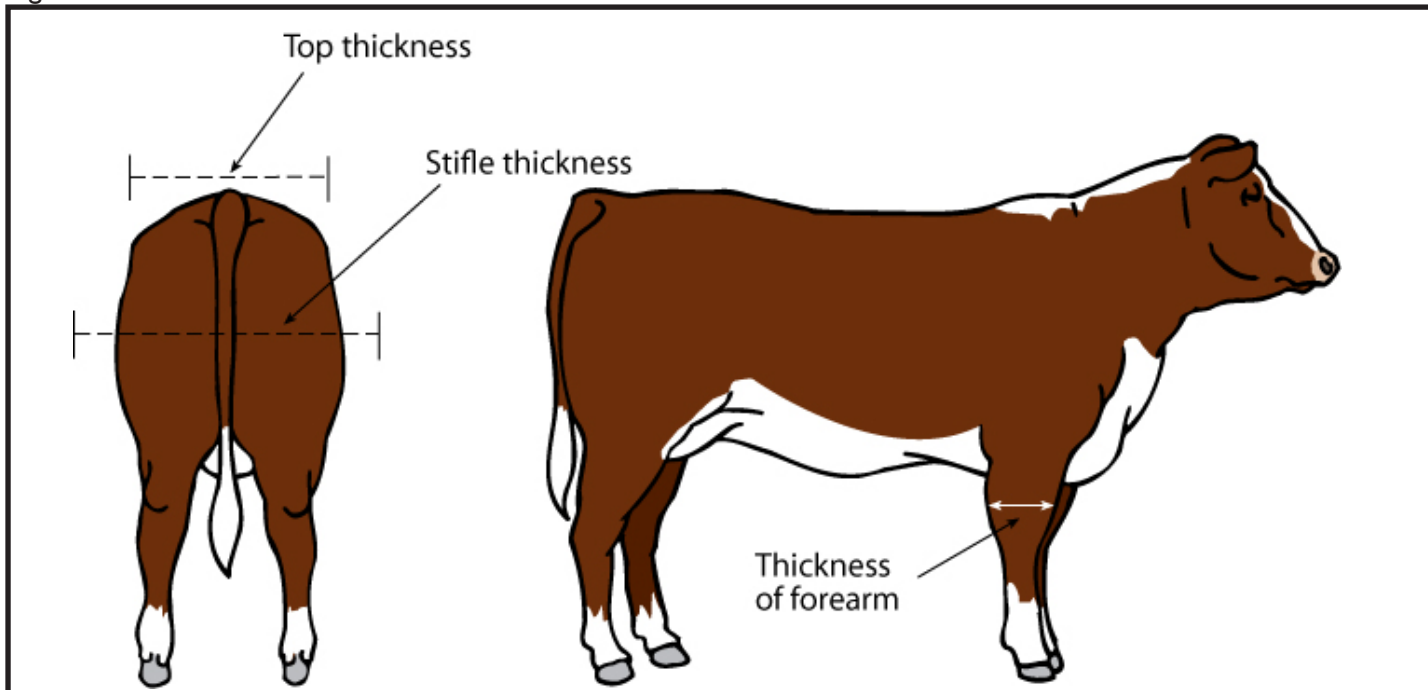
External fat - 1/2 inch or less at the 12th and 13th ribs

Frame size - Frame size is determined by looking at height in relation to age. Feeder steers and heifers can have a large, medium, or small frame (see Figure 3.4). The frame size of feeder animals is determined by predicting what the live weight of the calf will be when it has 1/2 inch of external fat in the 12th and 13th rib area.

Muscling - Muscling is the other factor in feeder calf selection. Feeder steers and heifers can have muscle scores of 1, 2, or 3, with the lower number assigned to the more muscular animal. Animals are given a muscle score depending on their thickness (see Figure 3.5).

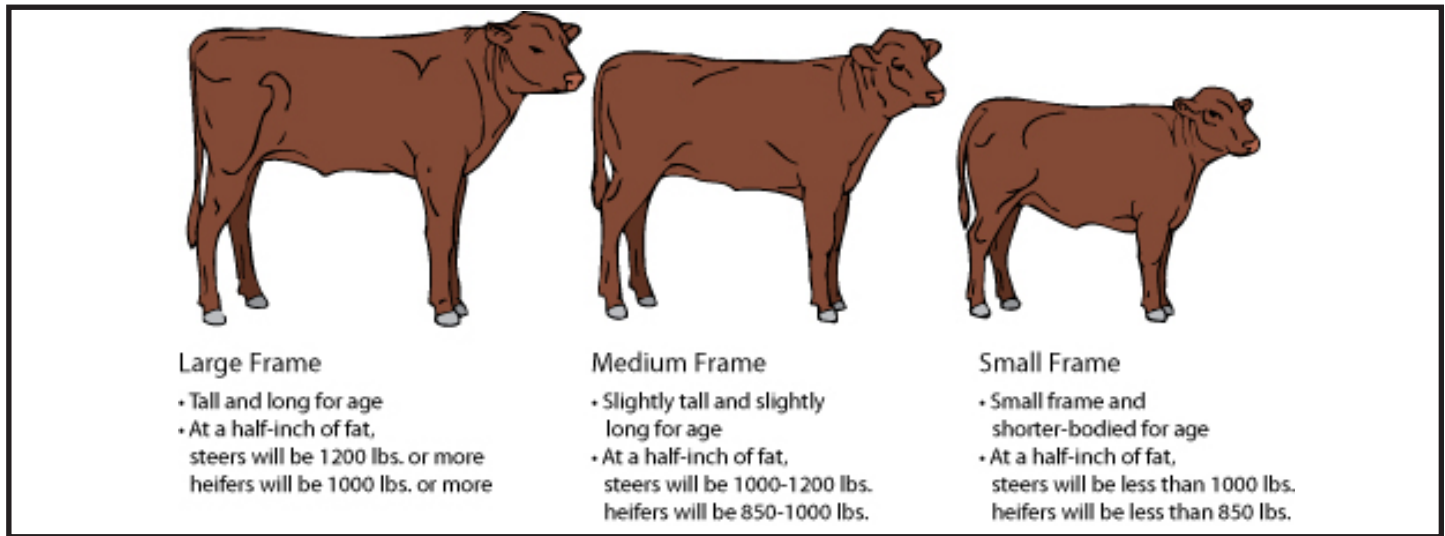
Feeder cattle grades set a standard for comparing animals. The grade of a feeder steer is the frame size combined with the muscle score. A sample grade is "Medium Frame, No. 1," which refers to a medium-framed calf that is heavily muscled. This designation refers to a steer weighing between 1,000 and 1,200 pounds with 1/2 inch of external fat and an ample amount of muscle thickness.

Figure 3.3 - Thickness



Principles of Beef Cattle Selection

Figure 3.4 - Frame Size



Breeding Cattle

The selection of breeding cattle is partly based on visual characteristics like soundness, volume/capacity, muscling, and balance. Along with visual selection, producers often use performance values, frame score, and expected progeny differences (EPDs) to evaluate and select breeding animals. The selection of breeding cattle can have a lasting effect on a producer's cow herd. If the producer keeps the female offspring from a bull or cow, they will pass on its genetic material to other animals in the herd.

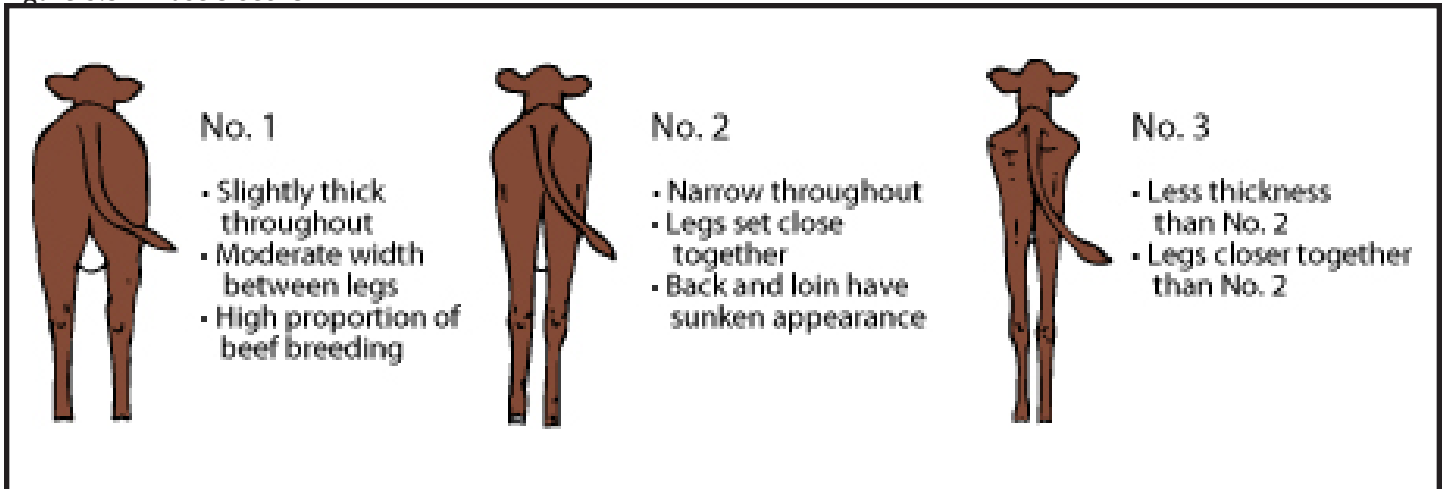
Soundness - Both skeletal and reproductive soundness are important in the selection of breeding cattle. Skeletal soundness refers to the animal's ease of movement. Beef cattle should take long strides off both ends of their skeleton and fill their track (the rear foot landing in the track left by the front foot) when moving. The animal should set its feet down square and wide. Reproductive

soundness is extremely important in both males and females. Bulls need to have at least 32 centimeters of scrotal development at one year of age. Females need to show signs of development of the vulva and udder by breeding age.

Volume/capacity - Both males and females should be evaluated for body capacity. An animal should be deep sided (possessing vertical depth) and wide ribbed and have spring or curvature to the outside of its rib cage. Capacity determines how much forage and grains an animal can consume. The more it eats, the higher its production should be.

Muscling - Breeding animals should be heavily muscled to produce feeder and slaughter animals that are heavily muscled.

Figure 3.5 - Muscle Score



Introduction to Beef Production

Balance - Balance refers to the skeletal and muscular formation of the animal. These factors contribute to the beauty of its phenotype, or physical appearance. Beef cattle should be long bodied, level topped, uniform in depth, stout boned, and clean fronted (free of excess skin). Attractiveness is more important to purebred producers who show cattle for promotional purposes.

Visual Selection Guide to Breeding Cattle

1. Skeletally and reproductively sound
2. Adequate body capacity
3. Heavily muscled
4. Attractive

In addition to looking at these characteristics, producers may look at other measures to evaluate an animal for breeding. For example, performance data consists of information about how a particular animal has performed in the past. It includes actual weights, such as birth weight, weaning weight, and yearling weight. Feed to gain ratios are another important measure used in selection.

Frame score is a measure of height in relation to the age of the animal. The frame score can be used to estimate the size of the animal at maturity. Frame scores range from one to ten, with five to seven considered ideal. Bulls are generally larger than females at the same frame score.

The current trend in breeding animal selection is to use genetic estimates, or EPDs, as an aid for selection. EPDs make a prediction about the performance of the future offspring of a parent. They look at the difference in production between the offspring of a particular animal and those of an average animal. All EPDs assume that the parent has been mated to animals of equal genetic value. Negative numbers indicate lighter calves, while positive values identify heavier calves.

The basic EPDs a producer should be aware of are birth weight EPDs, weaning weight EPDs, yearling weight EPDs, and milk EPDs. Birth weight (BW) EPDs are a prediction in pounds of the difference in birth weights. Weaning weight (WW) EPDs are a prediction of the difference in pounds in weaning weight. Yearling weight (YW) EPDs are the difference in pounds at one year of age. A milk (M) EPD shows the difference in pounds in the weaning

weights of the calves produced by the parent's female offspring due to the milk production of the cow.

Look at the sample EPDs in the box below. Evaluating the EPDs of the two bulls shows that if Bull #1 and Bull #2 are mated to genetically equal cows, calves from Bull #1 should be three pounds heavier at birth ($2 - (-1) = 3$), fifteen pounds heavier at weaning ($20 - 5 = 15$), and twenty pounds heavier at one year of age ($30 - 10 = 20$). The calves from cows from Bull #1 should be five pounds heavier at weaning than those from Bull #2 because of the cows' milk.

BW EPD WW EPD YW EPD M EPD

Bull #1	+2	+20	+30	+5
Bull #2	-1	+5	+10	0

Crossbred and Purebred Breeding Systems

Crossbreeding is mating animals of different breeds. Commercial beef producers use crossbreeding to take advantage of the characteristics of different breeds. For example, a producer may want to cross an Angus, with its high carcass value, and a Charolais, since this breed has good growth and muscling. The offspring produced by crossbreeding display heterosis, or hybrid vigor. Heterosis results in improved performance, growth, and/or carcass traits. It is evident when the animal displays superior qualities in comparison to the average of its parents' traits. Producers using crossbreeding need to select bulls to use in their herds as well as replacement females. Most commercial producers buy purebred bulls and sell feeder calves or retain ownership through the feedlot. Daughters of bulls are usually kept as replacements.

Purebred breeders must select registered bulls and females of the same breed to purchase and use as replacements. They produce bulls and females used by other purebred breeders and commercial producers.

Summary

Knowing the names of the parts of the beef animal and the wholesale cuts of beef is necessary in the production of beef cattle. It is part of making informed choices in selecting animals. Slaughter and feeder cattle selection is based upon potential carcass traits. Breeding animal selection encompasses visual traits as well as performance indicators and genetic estimates.

Credits

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