
BREEDS OF BEEF CATTLE

There are approximately 250 breeds* of cattle recognized throughout the world, and several hundred breeds that are not currently recognized. More than eighty recognized breeds of beef cattle are available to producers in the United States. However, an exact count is difficult to obtain because other breeds continue to be imported and crossing existing breeds continuously creates new breeds.

A breed is a group of animals of common descent and possessing distinctive characteristics that distinguish them from other groups within the same species. These groups are referred to as purebreds. The term purebred refers to the purity of ancestry and implies that there is genetic uniformity of all characteristics.

BREED CHARACTERISTICS

Knowledge of breed characteristics is important to beef producers in purebred and crossbreeding programs. Crossbreeding is considered to be the most efficient means of commercial production, but highly productive purebreds are the backbone of successful commercial crossbreeding programs. Crossbreeding programs use breeds that possess complimentary characteristics to produce desirable offspring. The major characteristics that are important in beef production include mature body size, milk production, age at puberty, environmental adaptability, rate and efficiency of gain, muscle expression, cutability, and marbling.

The major characteristics differ in relative economic importance, especially when considering different phases of the production system. Reproduction traits such as milk production and age at puberty are the primary concern of a cow-calf producer, while efficiency of gain, rate of gain and carcass traits are most important to stocker and feeder operations. Two characteristics that have a marked effect on most production traits are mature body size and milk production. Other indicators that may be important are muscle expression and age at puberty.

Mature Body Size

Mature body size varies with every breed and gender. On average, a mature cow will weigh less than a mature bull of a given breed. Mature body size is proportionate to body size at all stages of growth. Larger mature size normally results in (1) heifers being older and/or heavier at puberty, (2) heavier birth weights (often associated with calving difficulty), (3) faster rate of gain, and (4) heavier weaning weights. Larger mature size is also associated with later maturity. Research indicates that increased body size results in higher nutritional requirements to maintain life and physiological functions. As body size increases, milking potential, ease of fleshing, nutrition, and general management considerations become more critical.

* Underlined words are defined in the Glossary of Terms.

If various sizes of cattle are fed for the same length of time, those cattle with a larger mature body size will have faster, more efficient gains, lower marbling, less fat, and improved cutability. However, if various size cattle are fed to similar carcass grades, these differences among cattle of different mature sizes are greatly reduced or eliminated. Smaller cattle and excessively large cattle are currently penalized in commercial markets. Their slaughter weight at acceptable levels of fatness is outside the range desired in the beef industry.

Milk Production

Milking ability is related to mature size in that larger animals have the inherent ability to consume more feedstuffs that may be used for milk production. **This does not mean that all large breeds are heavy milkers or that all small breeds are light milkers.** Selection for or against milk production within a certain mature size is an effective tool. Cattle selected only for increased milking ability, without consideration for other factors, tend to increase in body size with some reduction in muscle expression.

The main reason for increasing milk production in a beef cattle operation is to increase the weaning weights of calves. However, there are several reasons why very high milking ability could be undesirable. Heavy milking cows often produce milk at the expense of other body functions. If nutrition is inadequate, heavy milkers may become thin. Research has shown that thin females are less likely to come into heat and are harder to settle than those in good flesh. There is also evidence that heavy milkers may be slow to cycle even when heavily fed. This lengthens the breeding interval and reduces general reproductive efficiency.

Muscle Expression

As the emphasis on the percentage of lean in slaughter cattle continues to increase, the importance of a breed's muscularity also increases. Most breeds that are ranked above average in muscle expression are also above average in size. This indicates that there is less of a difference between breeds in muscle-to-bone ratio than in body size. There is also little difference between types of cattle in the distribution of muscle (relative percentage of desirable versus undesirable carcass parts).

One concern of beef producers is that muscularity appears to affect reproductive efficiency. Very heavily muscled cattle are associated with calving difficulties, but producers can combat calving problems through selection at breeding. A bull that is large and muscular should be used with caution as a sire, particularly on small to medium size cows.

Age at Puberty

In cattle, age at puberty is related to body size, milking potential, genetic classification, and environment factors. Smaller cattle and cattle with higher milk yield have been known to mature earlier. Cattle exposed to harsh environmental conditions, whose nutritional requirements are not being met, reach puberty later. Age at puberty is important because cattle that reach puberty at an earlier age conceive at an earlier age. These cattle have the potential to have a longer productive life, which is economically important to cattle producers.

Cutability and Marbling

Cutability is the percentage of lean in a slaughter animal and is directly affected by an animal's muscle expression. Cutability is evaluated in slaughter cattle as an USDA Yield Grade and is dependent upon the amount of fat, muscle, and bone. The relative amount of fat varies greatly in cattle, while the amount of

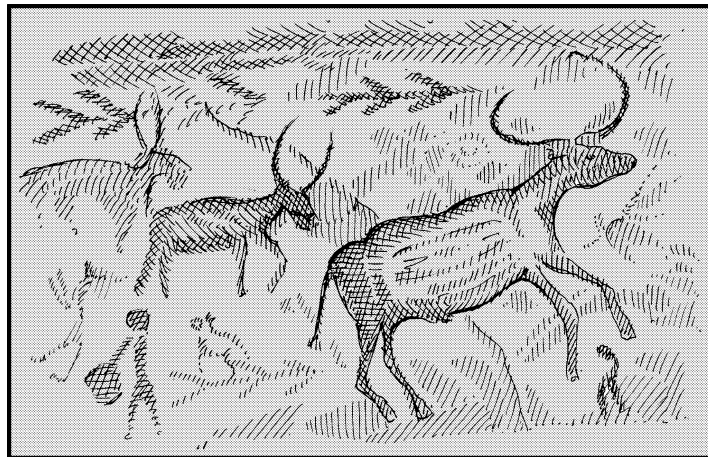
bone is least variable. When comparing slaughter animals, it is assumed that similar breeds and genetic types have similar nutrition levels, but in all probability they do not. A producer can directly affect or alter cutability through nutrition.

Marbling, or intramuscular fat, is often referred to as “taste fat.” Marbling is used to determine USDA Quality Grades, which are indicators of palatability. Marbling increases with age until cattle reach physiological maturity, which normally occurs prior to thirty months of age. Cattle that are early maturing and have high milk yields are usually high in marbling. *Bos indicus* and heavily muscled, low milking types are normally low in marbling.

BIOLOGICAL SPECIES

In beef cattle production, there is no one breed that can be considered the best. There are many variations in climatic conditions, production conditions, and market requirements throughout the United States and the world that breeds have to be chosen to fit the conditions and requirements for specific areas.

It is believed that all modern domestic cattle evolved from a single ancestor, the Aurochs, which is now extinct. Modern beef cattle can be classified as one of two biological types, *Bos indicus* or *Bos taurus*. Each biological type has characteristics that are found in the breeds of cattle that fall under that classification, but the breeds are not limited to these characteristics.



Bos indicus

Bos indicus (also referred to as Zebu-type) are humped cattle originating in South Central Asia. *Bos indicus* are adapted to tropical and sub-tropical environments, which include the stresses of heat, humidity, parasites, and poorly digestible forages. Environmental adaptability and hybrid vigor of cattle with a percentage of Zebu-type breeding are particularly significant in the southern part of the United States.

The general vigor, especially early in life and reproductive efficiency of purebred *Bos indicus* may be poor, but this can be remedied through crossbreeding. Hybrid *Bos indicus*-*Bos taurus* cattle are generally vigorous and fertile. Formal research and commercial producer experience reveals that the most practical and productive commercial application is with crossbred cows that have some *Bos indicus* genetics. The birth weight of purebred *Bos indicus* calves are unusually low. This seems to be primarily a maternal characteristic. When *Bos indicus* bulls are used on other types of females, the birth weights are higher. *Bos indicus* cattle are later maturing than *Bos taurus*, but their longevity is greater than *Bos taurus*.

Some examples of *Bos indicus* cattle are the Nelore, Gyr, Guzerat, Brahman, Brangus, and Beefmaster breeds. The Brahman, Brangus, Beefmaster, and other *Bos indicus* breeds developed in the United States are often referred to as American breeds. Several of these breeds are composite breeds, which means that they were developed by crossing two or more breeds, but these breeds are still classified as *Bos indicus*. The following are *Bos indicus* breeds that are commonly found in the United States.

Brahman - The Brahman breed (see Figure 1) originated in the United States from humped cattle that were imported from India and Brazil. Brahman cattle are a horned breed that vary in color, but are predominantly gray and red. Brahman cattle are humped, have large drooping ears, and loose skin in the throat and dewlap. These cattle have a very high tolerance to heat and have a natural resistance to many parasites. They are considered a maternal breed.



Figure 1. Brahman Bull

Brangus - The Brangus breed (see Figure 2) was developed in the United States. Registered Brangus, a composite breed, consists of $\frac{3}{8}$ Brahman and $\frac{5}{8}$ Angus. Brangus cattle are black in color and are polled. The Brangus breed has combined many of the most desirable traits of the Brahman and Angus breeds. Some of these traits include hardiness, heat tolerance, muscularity, early maturity, and production of quality beef.



Figure 2. Brangus Bull

Beefmaster - The Beefmaster breed (see Figure 3) was developed on the Lasater Ranch in Texas in the 1930s. The cattle do not have a color standard although they are predominantly red or dun. A majority of Beefmaster cattle are horned. The Beefmaster is a composite breed consisting of $\frac{1}{2}$ Brahman, $\frac{1}{4}$ Hereford, and $\frac{1}{4}$ Shorthorn. This breed thrives under both practical and severe range conditions. Beefmaster cattle possess many desirable reproductive traits and have high milking potential.

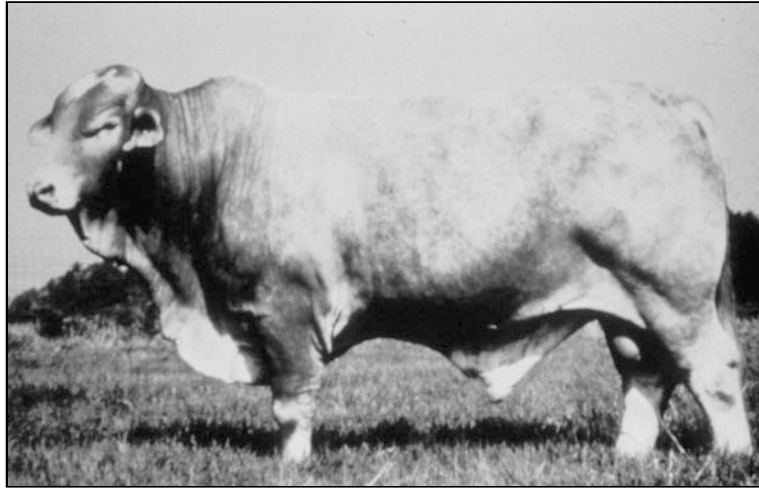


Figure 3. Beefmaster Bull

Santa Gertrudis - The Santa Gertrudis breed (see Figure 4) was developed on the King Ranch in Kingsville, Texas. This composite breed consists of $\frac{5}{8}$ Shorthorn and $\frac{3}{8}$ Brahman. Santa Gertrudis cattle are dark red in color and can be horned or polled. Santa Gertrudis cattle are a desirable breed because of their overall hardiness. This breed adapts to adverse conditions and is productive in hot climates. Santa Gertrudis cattle also possess many desirable maternal characteristics.



Figure 4. Santa Gertrudis Bull

Simbrah - The Simbrah breed (see Figure 5) was developed in the United States in the late 1960s. This breed is a composite breed that consists of $\frac{5}{8}$ Simmental and $\frac{3}{8}$ Brahman. There are no color standards for Simbrah cattle. Simbrahs can be horned or polled. The Simbrah breed has both maternal and survival characteristics in a hot environment and produces a modern, lean, high-quality beef product.



Figure 5. Simbrah Bull

Bos taurus

Bos taurus breeds are descendants of the ancient Celtic Shorthorn. *Bos taurus* breeds show a closer resemblance to the Aurochs, particularly Scotch Highland cattle, than *Bos indicus* breeds.

Bos taurus can be classified into two sub-categories, British breeds and Continental breeds. Continental breeds, also called Exotics, are breeds that originated in Europe. These cattle are known for weight gain and cutability. Continental breeds are generally large in size, lean, muscular, and vary in adaptability to hot climates. The following Continental breeds are commonly found in the United States.

Charolais - The Charolais breed (see Figure 6) was developed in France and was introduced into the United States in 1936. This breed ranges from white to light straw in color. Charolais cattle can be horned or polled. This large, heavily muscled breed's traits include a fast growth rate and feed efficiency.



Figure 6. Charolais Bull

Chianina - The Chianina (pronounced kee-a-nee-na) breed (see Figure 7) originated in central Italy. Chianina genetics were first introduced in the United States in 1971, but the first Italian Chianina was not imported into the country until 1975. Fullblood Chianinas range in color from white to steel gray and have black pigmented skin. The Chianina have been acknowledged as the largest breed, with some bulls weighing more than three thousand pounds. This breed is characterized by good feed efficiency, increased rate of gain, and calving ease, which is uncommon in larger breeds. This large well-muscled breed is most often identified as terminal breed.



Figure 7. Chianina Bull

Gelbvieh - The Gelbvieh breed (see Figure 8) originated in Germany and was introduced into the United States in 1971. The Gelbvieh stresses both maternal and carcass traits, including increased fertility, high milk ability, excellent growth rate, and good muscling. The Gelbvieh breed has no color restrictions and can be horned or polled.



Figure 8. Gelbvieh Bull

Limousin - The Limousin breed (see Figure 9) originated from France and was introduced into the United States in 1969. Limousin cattle can be polled or horned and range in color from golden red to black. These large, muscular cattle are known for increase in rate of gain and feed efficiency. Limousin cattle have the natural genetic ability to produce lean, flavorful beef in a variety of settings.



Figure 9. Limousin Bull

Maine-Anjou - The Maine-Anjou breed (see Figure 10) is one of the larger breeds of cattle developed in France. These cattle were introduced into the United States in 1969. The Maine-Anjou coloring is very dark red with white markings on the head, belly, rear legs, and tail. Maine-Anjous can be horned or polled. White on other parts of the body is also common. Maine-Anjou cattle yield extremely lean, muscular carcasses.



Figure 10. Maine-Anjou

Salers - The Salers (pronounced Sa'lair) breed (see Figure 11) originated in France. The first Salers bull was imported into the United States in 1972. This breed is typically horned and dark mahogany red in color, but there are a growing number of polled and black Salers. The breed's attributes include calving ease, maternal efficiency, and carcass merit. Salers are capable of adapting to rough terrain and harsh climates.



Figure 11. Salers Bull

Simmental - The Simmental breed (see Figure 12) originated in the Simme Valley of Switzerland. The breed became established as a North American beef breed in 1967. Simmental color patterns vary from red and white spotted, to fawn or straw colored, to dark red, to black. Simmental cattle are acknowledged for both growth traits and maternal traits. The Simmental breed has been recognized as the heaviest milking of the Continental breeds.

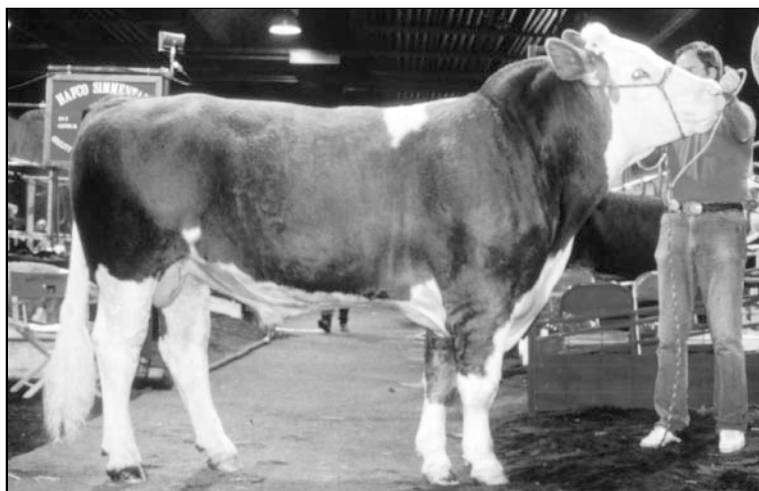


Figure 12. Simmental Bull

Tarentaise - The Tarentaise (pronounced TAIR en taze) breed (see Figure 13) originated in France and was imported into the United States in 1973. Tarentaise cattle are red with dark pigmentation around the eyes and orifices. These cattle are moderate in size and are predominantly known for their maternal traits, including fertility and high milk ability. This breed is considered to be a dairy breed in their native region. Tarentaise cattle are less widely known for their ability to produce a quality carcass.

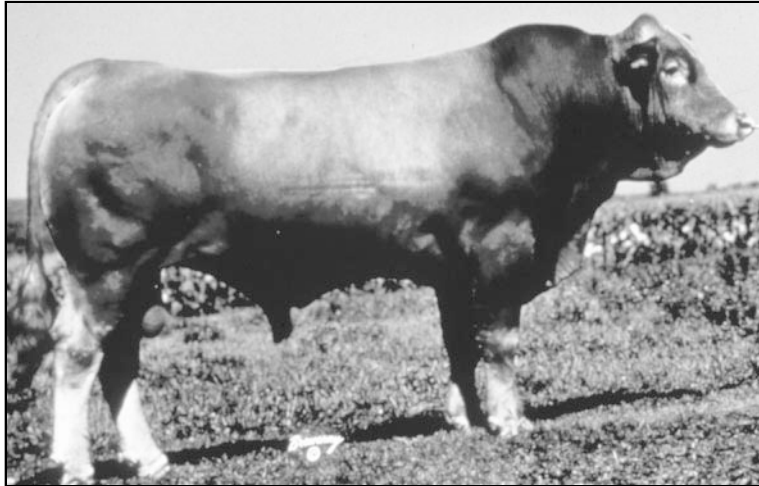


Figure 13. Tarentaise Bull

Texas Longhorn - The Texas Longhorn (see Figure 14) is a descendant of the Spanish cattle brought to the Americas by explorer, Christopher Columbus. These cattle lived as feral cattle for over three hundred years. Texas Longhorns are known for their distinctive long horns. Longhorn cattle have various colors and color patterns, including spotted color patterns. Longhorn traits include longevity, hardiness, and adaptability. Longhorn cattle are light muscled and produce calves with low birth weights.



Figure 14. Texas Longhorn Bull

British breeds, also known as English breeds, originated in the British Isles. British breeds are smaller in size than Continental breeds but have an increased fleshing and marbling ability. These breeds are the foundation of the United States beef herd.

Angus - The Angus breed (see Figure 15) originated in the highlands of northern Scotland in the shires of Aberdeen and Angus. Angus cattle were first imported into the United States in 1873. These naturally polled cattle have black hair and skin. Angus are moderate in size and considered a maternal breed. These cattle are characterized by early sexual and compositional maturity, ease of fleshing, good milk ability, and excellent marbling.



Figure 15. Angus Bull

Hereford and Polled Hereford - The Hereford breed (see Figure 16) consists of both horned and polled cattle, both of which are registered with the American Hereford Association. The Hereford originated in England and was imported into the United States in 1817. Herefords are brownish red in color with a white face, chest, underline, and switch. The Hereford breed is a docile breed known for longevity, early maturity, and good milking ability.



Figure 16. Hereford Bull

Red Angus - The Red Angus breed (see Figure 17) originated in the British Isles and was introduced into the United States in the 1870s. This breed possesses many of the traditional Angus traits including carcass quality, maternal characteristics, calving ease, and moderate size.

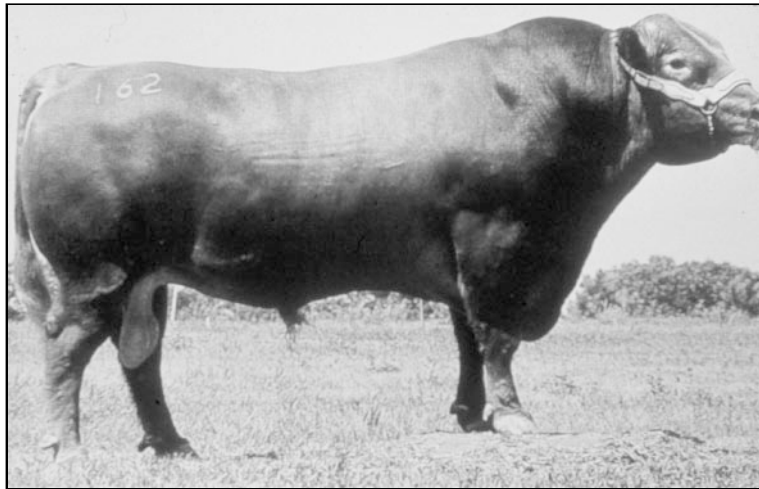


Figure 17. Red Angus Bull

Red Poll - The Red Poll breed (see Figure 18) originated in England and was imported into the United States in 1873. Red Poll cattle range from light to dark red in color. This small breed is known for its maternal traits, carcass merit, and genetic consistency. Red Poll calves have been recognized for their rapid rate of gain.

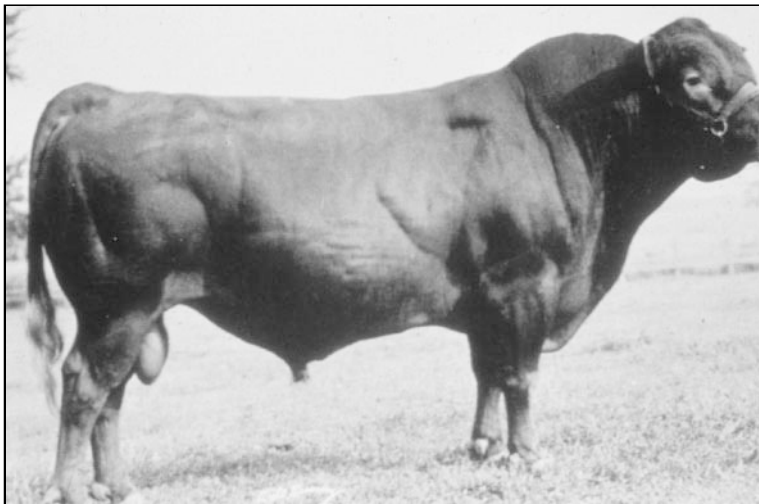


Figure 18. Red Poll Bull

Shorthorn - The Shorthorn breed (see Figure 19) originated in England and was imported into the United States in 1783. Shorthorns can be horned or polled. The Polled Shorthorn was developed in the United States in 1870. Shorthorn cattle can be red, white, or roan in color. These cattle are early maturing, excellent milkers, and known for their good disposition.

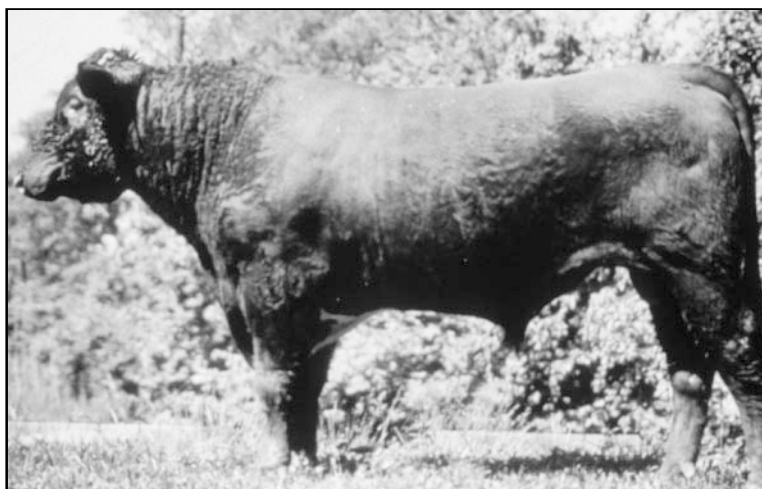


Figure 19. Shorthorn Bull

Table 1. Breed Registry Association Addresses

| | | |
|---|---|--|
| American Angus Association 3201 Frederick Blvd. St. Joseph, Missouri 64501 http://angus.org | American Beefalo International P.O. Box 656 Somerset, Kentucky 42502 www.ababeefalo.org | Belted Galloway Society, Inc. 5584 Shaver Mill Road Linville, Virginia 22834 www.beltie.org |
| United Braford Breeders 422 East Main #218 Nacogdoches, Texas 75961 www.brafords.org | Beef Friesian Society 25377 Weld County Rd. Johnstown, Colorado 80534 | American Brahmousin Council P.O. Box 12363 N. Kansas City, Missouri 64116 |
| American Brahman Breeders Association 3003 S. Loop West, Ste. 140 Houston, Texas 77054 http://brahman.org | Barzona Breeders Association of America Box 631 Prescott, Arizona 83602 | American Bralers Association Box 75 Burton, Texas 77835 |
| American Chianina Association P.O. Box 890 Platte City, Missouri 64079 www.chicattle.org | Amerifax Cattle Association P.O. Box 149 Hasting, Nebraska 68901 | American Galloway Breeders Association 310 West Spruce Missoula, Montana 59802 |
| American Gelbvieh Association 10900 Dover Street Westminster, Colorado 80216 | American Tarentaise Association P.O. Box 34705 Kansas City, Missouri 64116 | American Hereford Association P. O. Box 014059 Kansas City, Missouri 64101 www.hereford.org |
| American-International Charolais Association 11700 Northwest Plaza Circle P.O. Box 20247 Kansas City, Missouri 64195 www.charolaisusa.com | American Simmental Association 1 Simmental Way Bozeman, Montana 59715 http://simmental.com | American-International Marchigiana Society Box 198 Wallton, Kansas 67151 |
| American Dexter Cattle Association 26804 Ebenezer Concordia, Missouri 64020 www.dextercattle.org | American Shorthorn Association 8288 Hascall Street Omaha, Nebraska 68124 www.shorthorn.org | American Maine-Anjou Association 760 Livestock Exchange Building Kansas City, Missouri 64102 www.maine-anjou.org |
| American Milking Shorthorn Society 800 Pleasant Street Beliot, Wisconsin 53511 www.agdomain.com/web/usmilkingshorthorn | American Highland Cattle Association Ste. 200 Livestock Exchange Bldg. Denver, Colorado 80216 www.highlandcattle.org | American Murray Grey Association P.O. Box 34590 N. Kansas City, Missouri 64116 |

Table 1-Continued

| | | |
|--|---|---|
| American Normande Association 11538 Spudville Rd. Hibbing, Minnesota 55746 | Senepol Cattle Breeders Association 354 Monticello St. Somerset, Kentucky 42501 | American Pinzgauer Association 21555 St., Rt. 698 Jenera, Ohio 45841 |
| Red Angus Association of America 4201 I.H. 35 North Denton, Texas 76201 www.redangus1.org | Texas Longhorn Breeders Association of America 2315 N. Main Street, Suite 402 Ft. Worth, Texas 76106 www.tlbaa.org | American Red Brangus Association 3995 E. Highway 290 Dripping Springs, Texas 78620 www.brangusassc.com |
| American Red Poll Association Box 147 Bethany, Missouri 64424 | American Salers Association 7383 Alton Way, Ste. 103 Englewood, Colorado 80112 http://salersusa.org | American Romagnola Association 2000 Flagstone Rd. Reno, Nevada 89510 www.americanromagnola.com |
| International Brangus Breeders Association 5750 Epsilon San Antonio, Texas 78269 http://int-brangus.org | International Zebu Breeders Association 1901 Miller Rd. Rowlett, Texas 75088 http://cowmans.com/izba.htm | Simbrah See: American Simmental Association |
| International Brah-Maine Society RR 1, Box 233 Franklin, Texas 77856 | American Blonde D'Aquitaine P.O. Box 12341 Kansas City, Missouri 64116 | Brahmanstein Breeders Association P.O. Box 798 Canton, Texas 75103 |
| Braunvieh Association of America P.O. 6396 Lincoln, Nebraska 68506 | Char-Swiss Breeders Association 407 Chambers Marlin, Texas 76661 | Devon Cattle Association, Inc. 1082 Richie Rd. Bunkie, Louisiana 71322 |
| Welsh Black Cattle Association 208 N. Hymera East Shelburn, Indiana 47879 | Gelbray International Rt. 1 Box 273C Madill, Oklahoma 73446 | Sussex Cattle Association of America P.O. Drawer 107 Refugio, Texas 78377 |
| Piedmontese Association 108 Livestock Exchange Bldg. Denver, Colorado 80216 | White Park Cattle Association of America 419 North Water Street Madrid, Iowa 50156 | Sahiwal See: American Brahman Breeders Association |
| North American Limousin Foundation 7383 Alton Way Box 4467 Englewood, Colorado 80111 www.nalf.org | North American South Devon Association 2514 Avenue S Santa Fe, Texas 77510 www.southdevon.com | Nelore See: American Brahman Breeders Association |
| Beefmasters Breeders United 6800 Park Ten Blvd. Suite 290 West B San Antonio, Texas 78213 www.beefmaster.org | Santa Cruz King Ranch Box 1090, 201 E. Kleberg Kingsville, Texas 77835 | Guzerat See: American Brahman Breeders Association |
| Santa Gertrudis Breeders International P.O. Box 1257 Kingsville, Texas 78363 www.sgbi.org | Charbray See: American-International Charolais Association | Pinzbrah See: American Pinzgauer Association |

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GLOSSARY OF TERMS

- Breed - A group of animals of common descent and possessing distinctive characteristics that distinguish them from other groups within the same species.
- Composite breed - A breed that has been formed by crossing two or more breeds.
- Crossbreeding - Mating animals from different breeds. Utilized to take advantage of hybrid vigor (heterosis) and breed complimentary.
- Feral - Wild.
- Fertility - The degree to which a beef animal is capable of breeding or reproducing.
- Fullblood - A purebred that possesses only the genes of a recognized breed.

Horned - Cattle that have horns and carry the horned trait as a homozygous (pure) recessive condition.

Hybrid vigor - Increased growth rate often noted in cattle resulting from first-cross mating. It is believed that desirable traits in parents are dominant over undesirable traits.

Longevity - Life span of an animal; usually refers to the number of years a cow remains productive.

Marbling - Flecks of intramuscular fat distributed in muscle tissue. Marbling is usually evaluated in the rib eye between the twelfth and thirteenth ribs.

Maternal - Pertaining to the female (cow or heifer).

Maternal traits - All traits expressed by the cow. A limited definition implies milk and weaning weight production of the cow.

Orifice - Mouth or openings.

Polled - Naturally without horns; the polled trait is dominant over the horned trait.

Purebred - Animal eligible for registry with a recognized breed association.

Terminal breed - Breed used in a crossbreeding system in which their progeny, both male and female, are marketed.

SELECTED STUDENT ACTIVITIES

SHORT ANSWER/LISTING: Answer the following questions or statements in the space provided or on additional paper if necessary.

1. List four results of selection for larger mature size in cattle.

- a. _____
- b. _____
- c. _____
- d. _____

2. What is the main reason for increasing milk production in a beef cow herd?

3. How is muscle expression related to reproductive efficiency in cattle? How can producers combat this problem?

4. Why is age at puberty important to beef cattle producers?

5. How can producers directly affect cutability?

6. What is used to determine USDA Quality Grades? What do USDA Quality Grades indicate?

7. What breed of beef cattle can be considered the best breed in the United States? Explain your answer.

8. Identify the four composite breeds discussed in this topic. What breeds were used to develop each composite breed?

9. What are the two sub-categories of *Bos taurus*?

10. How is milking ability related to mature size?

MATCHING: Match the term in the left column with its definition in the right column.

- | | |
|---------------------------|--|
| _____ 11. Limousin | A. Considered a dairy breed in its native region |
| _____ 12. Santa Gertrudis | B. Originated in Switzerland |
| _____ 13. Chianina | C. Developed on the King Ranch |
| _____ 14. Simmental | D. Consists of $\frac{5}{8}$ Simmental and $\frac{3}{8}$ Brahman |
| _____ 15. Brahman | E. Known for excellent marbling |
| _____ 16. Texas Longhorn | F. Acknowledged as the largest beef breed |
| _____ 17. Hereford | G. Descendant of Spanish cattle brought over by Christopher Columbus |
| _____ 18. Tarentaise | H. Known for heat tolerance and natural insect repellent |
| _____ 19. Simbrah | I. Red with white on the face, chest, underline, and switch |
| _____ 20. Angus | J. Have a genetic ability to produce lean, flavorful beef |

ADVANCED ACTIVITIES

1. Develop a composite breed using three breeds of beef cattle. This composite breed should be developed to meet the needs of producers in your area. Take into consideration your local environment, parasites, and the cattle market. Develop a breed profile to be used by the breed association. This profile should include a brief history, physical description, and breed characteristics.
2. Obtain breed information and pictures from various breed associations. Develop a pictorial review of breeds of beef cattle and include a brief profile of each breed. Cattle should be classified by biological species.

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