



# MICHIGAN BEEF PRODUCTION



COOPERATIVE EXTENSION SERVICE • MICHIGAN STATE UNIVERSITY

## Selecting a Breed of Beef Cattle

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### Criteria For Choosing A Breed

Selecting a breed or combination of breeds to use in your beef herd should be based on the following criteria: (1) marketability in your area; (2) cost and availability of good seedstock; (3) climate; (4) quantity and quality of feedstuffs on your farm; (5) how the breeds used in a crossing program complement one another; and (6) personal preference. As an example of climatic adaptability, British breeds are well adapted to cold climates, but do not fare as well in subtropical regions. Conversely, Brahman blood is needed for optimum performance in certain Gulf Coastal areas, but is not required in the northern states.

### British Breeds

Compared to breeds that originated on the continent of Europe, those developed in the British Isles generally exhibit the following characteristics: (1) mature and fatten earlier; (2) grow less rapidly and are smaller at maturity; (3) are less muscular; (4) tend to be more fertile; (5) have less difficulty calving; and (6) live and reproduce longer. As a result of these characteristics, the British breeds are thought of as maternal breeds in a crossing program; that is, they tend to contribute those traits that are deemed important in a productive beef cow.

### Angus

Angus cattle are second to Herefords in commercial numbers in the United States; however, they lead all breeds in numbers of purebred registered cattle (201,680 in 1982). They tend to be more popular in the Eastern two-thirds of the country than in the far West. Angus cattle are black and polled. Mature cows weigh about 1,100 lb. and, for a strictly beef-type breed, are

considered good milkers. Angus females are known for their fertility and ease of calving. The breed is nearly pure for the polled trait and Angus bulls can be expected to sire calf crops that are 100% hornless. The dark skin pigment provides some resistance against cancer eye and sun-burned udders.

Angus calves fatten quickly and grade Choice at a relatively light weight (1,050 lb.). They possess more marbling in the meat than any other breed of cattle, which means their quality grade (Prime, Choice, Good, etc.) is often higher than that of other cattle. For this reason, some packers pay a premium for Angus or Angus-cross steers. However, feedlot operators sometimes pay less for Angus feeder calves because they have a tendency to mature too quickly and become fat at too light a weight. Nevertheless, Angus breeders are working hard at selecting growthier cattle and are making considerable progress in changing the genetic ability of their cattle for growth rate.

The disposition of Angus cattle is considered as good or better than that of most Continental exotic breeds, but not quite as docile as that of the Short-horn or Hereford. Generally speaking, the breed is relatively free of defects such as pendulous udders, balloon teats and uterine prolapse. The breed carries a red recessive gene at a low frequency (less than 10%). When two Angus red carriers are mated, there is a 25% chance that their calf will be red. Dwarfism was a problem in the 1940's and '50's but has practically been eliminated from the breed. The frequency of other undesirable recessive genes seems to be very low.

In crossbreeding programs, the Angus contributes polledness, pigment, fertility, early maturity, small cow size, and carcass quality (marbling).

## **Devon**

The Devon, sometimes referred to as the "North" Devon or "Red" Devon, should not be confused with the South Devon, which is a larger-framed, lighter-colored, heavier-milking dual-purpose (meat and milk) breed. The Devon is dark cherry red in color and is horned. Although the cows are good milkers, the Devon is considered primarily a beef breed rather than dual-purpose. Mature cows weigh about 1,100 lb. Devon calves mature early and fatten rather easily. Devons tend to be somewhat angular and appear to be lighter-muscled than some other British beef breeds.

## **Galloway**

Like the Angus, the Galloway is black and polled, although a few are dun-colored. Size of frame is similar to the Angus, but conformation differs in that the Galloway is later-maturing, does not fatten as readily and is more angular in its shape. Also, the hair-coat of the Galloway is much longer and curlier. Some tend to have a nervous disposition. The breed is well-adapted to harsh northern climates; however, it has not attained wide-spread popularity in the United States. In its native land, Scotland, the Galloway is a popular crossing breed and the crosses have ranked high in interbreed carcass competition. Mature cows weigh about 950 lb.

## **Belted Galloway**

Although it is considered a separate breed, the characteristics of the Belted Galloway are similar to those of the Galloway. The obvious difference is the belt of white hair that encircles the body of the Belted Galloway. The latter is also reported to be slightly larger and heavier milking than the Galloway. Mature cows weigh about 1,050 lb.

## **Hereford**

There are more commercial Herefords in the United States than any other breed of cattle. There were 161,000 purebred Herefords registered in 1982, placing them second to Angus in this respect. The Hereford's white face and underline are a prepotent trademark that can be transmitted through one or more generations of crossbreeding. However, the red body color is recessive to black; hence, the popular Hereford x Angus cross calf usually has a white face and underline with a black body. Hereford cows weigh about 1,150 lb.

The Hereford is particularly noted for its ability to thrive and reproduce under range conditions. Its heavy hide and haircoat adapt it to harsh winter weather and it is able to hold its condition well during extremes in climate and scarcity of feed. Commercial

ranchers believe the fertility of the Hereford under range conditions is superior to that of any other breed. Hereford range bulls have a reputation for spreading out and covering the cow herd during breeding season more completely than bulls of other breeds. Hereford breeders are striving to select for more pigment around the eyes and teats as a means of lowering the incidence of cancer eye and sun-burned udder in areas where these afflictions can be a problem. Hereford breeders are also selecting for greater milk production, a trait in which the breed needs improvement. However, an overabundance of milk in range country can place too much stress on the lactating cow, causing her to lose condition and fail to cycle and conceive on time with the rest of the herd.

Dwarfism hit the breed hard during the 1940's and '50's but has been virtually eliminated in recent years. Hereford feeder calves are in fairly strong demand by feedlot operators who know that they can purchase large uniform groups of them at nearly any time of the year. Herefords fatten easily at a young age and can be expected to grade Choice at about 1,100 lb. liveweight. Their carcasses are not quite as heavily marbled as Angus at a comparable age.

In crossbreeding programs, the Hereford contributes range adaptability, winter hardiness, fertility under limited feed conditions, and moderate mature size with adequate growth rate.

## **Lincoln Red**

The Lincoln Red is a dark red, horned, dual-purpose breed that descended from the local Shorthorn cattle in northeastern England. In some respects, it resembles the South Devon. However, the Lincoln Red is darker colored and does not appear to be quite as large nor as trim and muscular as the South Devon. Lincoln Red cows are excellent milkers, averaging about 7,500 lb. per lactation with 3.5% fat in English milk recorded herds. Mature females weigh about 1,300 lb. Growth rate of the calves is similar to the South Devon, but they are smaller at birth, averaging 81 and 74 lb. for males and females, respectively, whereas South Devon calves average 94 and 88 lb., respectively, according to British data. In crossbreeding, the Lincoln Red could add milk production.

## **Luing**

The Luing (pronounced "Ling") is a recently synthesized beef breed that originated on the island of Luing off the west coast of Scotland where the climate is cold and wet. The breed was started in 1947 by crossing the Shorthorn and Scotch Highland breeds. No other breeds have been introduced. Selection has been for hardy, easy-fleshing cattle with the ability to survive the harsh climate of western Scotland. It is not

milked. Average size of mature cows is about 1,100 lbs. Color pattern is variable due to the variation present in the two parent breeds. It is considered a maternal breed. The breed has not been utilized in North America.

### **Milking Shorthorn**

The Milking Shorthorn and beef Shorthorn originated from the same foundation in England. Selection for beef-type Shorthorns was carried out primarily in Scotland while English Shorthorns continued to be bred as dual-purpose cattle. Mature Milking Shorthorn cows weigh about 1,250 lb. and produce approximately 10,000 lb. milk with 3.7% fat. In recent years, the American beef Shorthorn herd book has been opened to Milking Shorthorn cattle in an effort to improve size and milk production. Depending upon the country or region, they are also referred to as "Dual-Purpose Shorthorns," "Dairy Shorthorns," or "Durhams." In Australia, there is a heavier-milking strain of the Dairy Shorthorn known as the "Illawarra." It is very refined in its make-up and is considered as strictly a dairy breed. In 1982, the American Milking Shorthorn Society registered 5,099 cattle.

### **Murray Grey**

This is an Australian breed that descended from a light roan Shorthorn cow mated in the early 1900's to black Angus bulls. She lived to be very old and produced many progeny from these matings, all of which carried the gray color to some degree. From that time, these gray cattle were used in Angus herds and the gray color persisted, resulting in the Murray Grey breed. For all practical purposes, the Murray Grey is in fact a gray Angus, although Australians suspect that Charolais blood has crept into the breed in recent years. In Australia, the Murray Grey is noted for low birth weight, high calf livability and excellent carcass quality. In crossing programs, it would contribute the same traits as the Angus. In 1982, 1,700 were registered.

### **Polled Hereford**

There is very little difference between Herefords and Polled Herefords except for the absence of horns in the latter. However, commercial ranchers on the western ranges feel that Polled Hereford bulls do not spread out and trail cows as well as horned bulls, although there is no scientific evidence to confirm this belief. They also object to the fact that some Polled Hereford bulls allow their penis and sheath lining to protrude, exposing them to the risk of injury in rough country. They register the same complaints about Angus and all other naturally polled bulls, which for some reason seem to share these characteristics. However, more polled bulls are being used in

the far West all the time. The Polled Hereford breed has grown rapidly during the past 40 years and now ranks third in purebred beef registrations (131,802 in 1982).

### **Red Angus**

As noted, the Red Angus breed originated from the black Angus as a homozygous recessive trait. There were 16,850 Red Angus registered in 1982.

### **Red Poll**

The Red Poll is a deep red, naturally polled breed that was once classed as dual-purpose, but in recent years has moved in the direction of being strictly a beef breed. During its dual-purpose era, milk-recorded Red Poll cows averaged about 7,500 lb. milk with 4.2% fat. Mature cow size is about 1,100 lb. According to research at the U.S. Meat Animal Research Center (MARC), Red Poll sired calves are similar to Angus and Hereford sired calves in calving ease, growth rate and carcass characteristics. Steers sired by Red Poll bulls reached Choice grade at about 1,050 lb., which is the same weight at which Angus and Hereford steers graded Choice. In 1982, the Red Poll Cattle Club of America registered 2,360 cattle.

### **Scotch Highland**

This is an environmental breed that, like the Galloway, was developed to withstand the adverse climate of mountainous western Scotland. Most Scotch Highland cattle are dun-colored, but some are black, brindle, red, yellow, or silver. Long, widespread horns and a long, dense, shaggy haircoat are characteristic of the breed. They are small in size and lack the natural thickness and muscling of other beef breeds. Mature cows weigh about 900 lb. Their main area of activity in the United States lies in the Northern Plains. There were 682 Scotch Highlands registered in 1982.

### **Shorthorn**

The Shorthorn was the first improved breed of beef cattle that achieved prominence in the United States and was the most numerous breed in this country until the early 1900's. Since then, Herefords and Angus have taken over as the two leading beef breeds. There were 15,890 Shorthorns registered in 1982.

Shorthorns may be characterized by their variable color pattern which ranges from red-to-roan-to-white.

As the name implies, the horns are relatively small. There is a polled gene in the breed and Polled Shorthorns have increased in popularity so that they now rival horned cattle in numbers.

Shorthorns are noted for their maternal ability. The

Shorthorn cow is an excellent milker and weans a heavy calf. When Shorthorn bulls are mated to Hereford cows, the female progeny are superior to their dams in milking ability and this trait seems to carry through for one or two or more generations of back-crossing with Hereford sires.

In addition to their maternal ability, there is no breed of cattle that is more docile than the Shorthorn. Their disposition is unexcelled, and cattlemen appreciate the ease with which they can be handled.

At one time, Shorthorns were recognized as the largest British beef breed. But, when the trend to extremely small-framed, early mating cattle occurred in all breeds during the 1930's, '40's and '50's, they seemed to lose even more size and growth than Herefords or Angus. This fact, together with their lack of natural muscling, contributed to their decline in popularity. However, with the infusion of large-type Canadian, Australian, and Milking Shorthorn blood into the breed in recent years, it has made a comeback. Once again, some of the largest specimens among British cattle may be found in the Shorthorn breed. If Shorthorn breeders can now improve muscling and cutability, without losing size, their future position in the beef industry should be significantly improved.

Because of the introduction of new blood and the resultant variation in type, it is difficult to characterize the size of the breed today. Mature cows may range from 900 to 1,600 lb., but the average is probably close to 1,150 lb. Shorthorn steers fatten easily and can be expected to grade Choice by the time they weigh approximately 1,050 lb.

In crossbreeding programs, the Shorthorn contributes several maternal traits—milk production, disposition, early maturity and moderate cow size.

### **South Devon**

South Devons are light red, horned, dual-purpose cattle. They are probably the largest breed of cattle in Great Britain. Mature cows weigh about 1,400 lbs. In milk recorded herds, they average about 7,500 lb. milk with 4.0% fat. According to data from the U.S. Meat Animal Research Center, half-blood South Devon steers grade Choice when they weigh 1,100 to 1,150 lb. In most growth and carcass traits, they lie somewhere between the larger exotic (Charolais and Simmental) and traditional British beef breeds (Angus and Hereford). Fertility, birth weight, ease of calving and weaning percentage are also intermediate. In crossbreeding programs, the South Devon could improve milk production and growth rate.

### **Sussex**

The Sussex is a short-horned, dark red breed with a white switch on the tail. It is strictly a beef breed.

Mature cows weigh about 1,150 lb. Compared to the South Devon and Lincoln Red, it is a thicker, smaller-framed, earlier-maturing breed. But in British tests, ½-blood Sussex calves have been comparable in 200-day weights to those sired by South Devon and Lincoln Red bulls. In England, it has a reputation as an easy calving breed. The Sussex has not yet been promoted in the United States.

### **Welsh Black**

The Welsh Black is a horned, black, large-framed, long-haired breed that was developed under the harsh conditions of the Welsh mountains. It is known for its ability to thrive under sparse feeding conditions and for its longevity. The Welsh Black is a dual-purpose breed. Milk recorded cows produce an average of about 5,500 lb. of milk at 3.8% fat. Mature cows weigh approximately 1,200 lb. The Welsh Black cow is highly valued for crossing with terminal sire breeds such as the Charolais. The purebred Welsh Black is late maturing and must be fed for a longer period of time before it accumulates much finish.

## **Continental European Breeds**

Compared to British breeds, the Continental exotic breeds are generally larger, later-maturing, heavier-muscled, growthier, less fertile and have more difficulty calving. Because of their leanness, they exhibit a higher yield grade (cutability), less marbling, and lower quality grade. As a result of these characteristics, they are ordinarily considered terminal sire breeds for crossbreeding programs, although a few of the heavier-milking, more fertile, moderately sized Continental breeds may be classified as either dam or two-way (sire and dam) breeds.

The first of these new breeds came to North America in the late 1960's and early 1970's. There is still much to be learned about these breeds under the varying conditions that exist on our continent. Research data on ½-blood progeny from several of the new breeds have been collected since 1970 at the U.S. Meat Animal Research Center (U.S. MARC), Clay Center, Nebraska, and at several other U.S. and Canadian Experiment Stations.

### **Aubrac**

The Aubrac is a relatively small yellowish-brown breed that originated in mountainous, south central France. Mature cows weigh about 1,100 lb. It has been used as a dual-purpose breed, but is not noted for high milk production. Milk recorded cows average approximately 5,000 lb. with 4.0% fat. The Aubrac ranks at or near the top of the French breeds in fertility and

ease of calving. It is one of the few Continental breeds that would be considered maternal. To date, the breed has not been introduced to the United States.

### **European Friesian (Beef Friesian)**

This breed is the European version of the Holstein-Friesian. The first European Friesians exported to North America came from Ireland, although they are found all over Europe. Compared to the North American Holstein, they are thicker, heavier-muscled, earlier-maturing, and give less milk. The Friesian and the Simmental are the two most popular breeds in Europe. Compared to the Simmental, the Friesian produces more milk, but is not as growthy or muscular. Mature European Friesian cows weigh about 1,350 lbs. and ½-blood steers should reach Choice grade at around 1,200 lb. The Beef Friesian is considered to be two-way, but tends to be more of a maternal breed than a sire breed. In Europe, North American Holstein sires are being used in Friesian herds to increase milk production.

### **Blonde d'Aquitaine**

This is a large, blond breed from France that resembles the Limousin in shape and color except it is larger-framed and appears to be even more extreme in its musculature. They are not noted for their milk production and are classified as strictly a beef breed. Mature females in France weigh about 1,500 lbs. It is estimated that ½-blood Blonde steers will probably grade Choice at 1,250 lb. Their growth rate and cutability are comparable to the Charolais, Simmental and Maine-Anjou. They are classified as a terminal sire breed.

### **European Brown Swiss (Braunvieh)**

This breed is smaller, beefier, and produces less milk than its North American counterpart. It yields about the same amount of milk as the Simmental, but is not quite as growthy or muscular. Mature cows weigh around 1,300 lb. and ½-blood steers should grade Choice at 1,150 lb. It is considered a two-way breed. In data from U.S. MARC, ½-blood Brown Swiss cows were very high in lb. of calf weaned per cow exposed.

### **Charolais**

In France, the typical Charolais is slightly thicker, heavier-muscled, shorter-legged, and heavier-boned than the American version. As a result, they would appear to have more calving difficulty and a higher percent of caesarean births than domestic Charolais. The Charolais is strictly a beef breed and is not milked in France. There seems to be little difference in growth rate and carcass composition between the Charolais

Maine-Anjou, Simmental, and Blonde d'Aquitaine. Mature Charolais cows in France weigh about 1,550 lbs. Half-blood Charolais steers reach Choice grade at about 1,250 lb. Like other large Continental breeds, calving difficulty can be a major problem. Other French breeds may excel the Charolais slightly in female fertility; nevertheless, the Charolais is the third leading breed in France in total numbers and has contributed greatly to beef production in North America. Charolais bulls have added growth and cutability to the U.S. cattle population. A few of the new breeds can equal the Charolais in these two traits, but none can consistently excel them. In the United States, there were 28,660 Charolais registered in 1982.

### **Chianina**

This Italian white breed is the largest-framed breed of cattle in the world. Mature cows in Italy weigh about 1,700 lb. It appears that ½-blood Chianina steers need to weigh over 1,300 lb. to safely grade Choice. For this reason, there is interest in using ¾-blood Chianina bulls to produce ¾ calves, which can grade Choice at 1,100 to 1,250 lb. Chianina x Angus cross bulls are especially popular for this purpose. The Chianina is not milked and is strictly a beef breed. Growth rate of Chianina ½-bloods is similar to other large Continental breeds. Because they are later-maturing, they produce leaner, higher cutability carcasses at a given age or weight than other exotic breeds. At Choice grade and heavier weights, their cutability is comparable to other large exotics. There are data to suggest that the Chianina is an easier calving breed than some of the other large exotic breeds. Chianina ½-blood heifers seem to reach puberty later and their conception rate is lower. The Chianina tends to have a nervous disposition which is objectionable to some cattlemen. It is considered a terminal sire breed. Chianina bulls cross especially well with smaller, thicker Angus cows; steers bred this way have ranked very high in inter-breed on-hoof and carcass competition. In 1982, 15,982 were registered in the U.S.

### **Gasconne**

This is a gray French breed that is moderate in size and muscling. It is not milked. Mature cows weigh approximately 1,300 lb. The Gasconne was developed in mountainous, southern France primarily as a draft breed. It has a reputation for being one of the most fertile French breeds with minimum calving difficulty. It has not been promoted in North America.

### **Gelbvieh (German Yellow)**

The Gelbvieh is a reddish-yellow dual-purpose German breed. It is a bit smaller and slightly more refined

in its bone than the German Simmental (Fleckvieh) but appears to have slightly more muscle expression, suggesting higher cutability. The Germans do, in fact, claim that the Gelbvieh excels all other German breeds in cutability; however, the difference seems to be slight. In color and shape, the Gelbvieh somewhat resembles the Limousin and some authorities believe these two breeds share common ancestry. However, the Gelbvieh is larger and is dual-purpose, whereas the Limousin is smaller and has been developed solely for beef production. The mature Gelbvieh cow weighs about 1,450 lb. Gelbvieh cows in Germany average about 8,500 lb. of milk with 4.0% fat, which places them behind the Friesian, Fleckvieh, and Braunvieh in milk yield. Data on ½-blood steers at U.S. MARC indicate that growth rate and carcass composition are similar to the other large Continental breeds. However, birth weight and calving ease were slightly better than the Maine-Anjou and Chianina. Half-blood steers grade choice at about 1,200 lb. The ½-blood heifers reached puberty at a young age, but their conception rate was not quite as high as British heifers. According to U.S. MARC data, ½-blood Gelbvieh cows were highly productive with respect to lb. of calf weaned per cow exposed. The Gelbvieh shows promise as a two-way breed. In 1982, 11,742 Gelbvieh were registered in the United States.

### **Limousin**

The Limousin is a reddish gold colored, strictly beef type breed from central France. Among the Continental breeds, it is moderate in size, mature cows averaging about 1,300 lb. According to U.S. MARC data, Limousin ½-blood steers are intermediate in growth rate between the British and the larger exotic breeds. They mature slightly earlier than the Charolais and Simmental, grading Choice at about 1,150 lb. In cutability, they were the highest of all breeds evaluated, including the Charolais and Simmental. The very muscular appearance of the Limousin is indicative of its high cutability. Limousin-sired calves weigh less at birth and are easier to deliver than calves sired by Charolais or Simmental bulls. Although Limousin cows are not thought of as heavy milkers, they seem to do an adequate job of raising their calves. In U.S. MARC research, age at puberty and subsequent fertility of ½-blood Limousin females was similar to that of ½-blood Charolais females. Generally speaking, the Limousin is considered a terminal sire breed that works especially well in situations where rapid improvement in muscle is needed, but calving difficulty is to be avoided as much as possible. There were 49,182 Limousin registered in the U.S. in fiscal 1982-83.

### **Maine-Anjou**

The Maine-Anjou is a red and white dual-purpose breed found in northwestern France. It is the largest French breed in terms of body weight and length; the Blonde d' Aquitaine is probably taller. Mature Maine-Anjou cows in France average approximately 1,700 lb. Data from U.S. MARC suggest that it may be as rapid in growth rate as any breed evaluated to date. Although Chianina and Gelbvieh-sired calves weighed slightly more at weaning, Maine-Anjou ½-blood steers gained faster in the feedlot. Their rate of maturity resembles that of the Charolais and Simmental with ½-blood steers reaching Choice grade at about 1,250 lb. Carcass composition is similar to the Charolais, Simmental, and Gelbvieh. Half-blood Maine-Anjou heifers reached puberty later than Gelbvieh, but earlier than Chianina heifers. Calving difficulty and mortality were higher for Maine-Anjou-sired calves than for those sired by other breeds. Milk production is good, but Maine-Anjou cows do not milk as heavily as some of the other dual-purpose breeds; their average in France is about 5,500 lb. with 3.7% fat. Because of its milk production, growth and cutability, it is sometimes thought of as a two-way breed. However, many authorities argue that the mature size of the Maine-Anjou is too large to classify it in this manner and that it should be considered a terminal sire breed. In 1982, 14,000 were registered in the United States.

### **Marchigiana**

This is an Italian white breed that closely resembles the Chianina except for the fact that it is smaller-framed, thicker and more bulging in its musculature. Mature cows weigh about 1,500 lb. Like the Chianina and Romagnola, it is strictly a beef breed and is not used for milk production. All three of these breeds have white hair but are black-skinned, which presumably gives them some resistance to cancer eye, pink eye, sunburn and other skin problems. They are also heat-tolerant, which would make them well-adapted to the southern United States. The Marchigiana is a terminal sire breed.

### **Meuse-Rhine-Issel (MRI)**

The MRI is a red and white dual-purpose breed found in southeastern Holland. It probably originated from the same foundation stock as the Dutch Friesian, but underwent selection for red instead of black color and for a shorter-legged, heavier-boned, more muscular body type that tends to be more typically dual-purpose as compared to the dairyness of the Friesian. Mature cows weigh around 1,450 lb. According to research in the Netherlands, MRI bull calves averaged 6 lb. heavier at birth and gained faster, (2.53

vs. 2.28 lb. per day) up to a slaughter weight of 935 lb., than Friesian bull calves. Their carcasses were also heavier-muscled and carried less finish than the Friesian carcasses. MRI cows average about 10,500 lb. milk with 3.7% fat, compared to 11,500 lb. milk and 3.9% fat for Dutch Friesian cows. About 24% of the cattle in the Netherlands are MRI's, 74% Friesians and 2% other breeds. Because of its dual-purpose characteristics, the MRI is considered a two-way breed in crossing programs. It has not achieved popularity in North America.

### **Other Red and White Breeds in Northwestern Europe**

There are several red and white breeds in northwestern Europe which resemble the MRI and probably originated from a somewhat common ancestry. The most prominent of these are the Rotbunte (German Red and White) and three Belgian breeds: the Red and White Campine, the Red and White East Flemish, and the Red West Flemish. These breeds tend to be spotted except for the Red West Flemish which is nearly solid red. Cows in these breeds weigh from 1,350 to 1,500 lb. at maturity and average about 10,000 lb. milk with 3.7% fat. Compared to the Friesian, they produce less milk and are more muscular in their conformation. These differences are becoming greater as more North American Holstein semen is used in European Friesian herds to further improve their milk production.

### **Montbeliard**

The Montbeliard is a heavier-milking strain of the French Simmental. Compared to the beefier Pie Rouge, the Montbeliard is flatter-muscled, more refined, and generally more dairy-like in its conformation. Most authorities feel that the Montbeliard has less calving difficulty than the heavier-muscled, heavier-boned Pie Rouge, but there is no research information yet to support this belief. Montbeliard cows weigh about 1,400 lb. and produce approximately 10,000 lb. milk with 3.7% fat. They account for about 6% of the cattle in France compared to 3.5% for the Pie Rouge. The Montbeliard is considered a two-way breed.

### **Normande**

The Normande is a medium-sized dual-purpose breed that originated in the Normandy region of northwestern France. It ranks second to the Friesian in total numbers, accounting for about 19% of the French cattle population. Mature cows weigh about 1,350 lb. and produce an average of 8,500 lb. milk with 4.0% fat. The Normande bears an interesting and variable color pattern. Most specimens are mahogany and white or black and white with rings around the

eyes. However, a few are blond, others are white and some are nearly all black.

Although little research data are available, the Normande does not appear to be as growthy or as muscular as the larger exotics such as the Charolais, Simmental, etc. However, they are reported to be easier calvers and may be more fertile than the larger breeds. They are publicized as an all-around, relatively trouble-free two-way breed.

### **Norwegian Red**

This red dual-purpose breed accounts for about 60% of the cattle population in Norway. Because the breed has developed since World War II from the amalgamation of three older breeds, it is difficult to characterize the Norwegian Red. Cows range from 1,000 to 1,400 lb. with an average of about 1,250 lb. Milk-recorded cows average about 10,500 lb. of milk with 4.2% fat. In color, size and conformation, it resembles the American Milking Shorthorn. Calving ease is reported to be similar to the British breeds. In crossbreeding programs, it is considered a maternal breed that could increase milk production and perhaps cause a slight improvement in growth with no increase in calving difficulty.

### **Parthenaise**

The Parthenaise is a fawn-colored dual-purpose breed that originated in western France. Mature cows weigh about 1,400 lb. and produce approximately 6,000 lb. of milk with 4.4% fat. Emphasis has been on milk production for butter making. The Parthenaise has a good reputation for fertility and ease of calving. In this respect, it ranks near the top of the French breeds, along with the Aubrac, Gasconne, Salers and Tarentaise. As of yet, the Parthenaise has not been introduced to the United States.

### **Pinzgauer**

The Pinzgauer is a dual-purpose mountainous breed that originated in the Alpine regions of Austria, southeast Bavaria, and northeast Italy. It makes up about 14% of the cattle population of Austria. The Pinzgauer has a very distinctive color pattern—chestnut brown with white topline, buttocks and underline; the skin is pigmented even in the areas covered by white hair. It somewhat resembles the Simmental and Gelbvieh in conformation, but is not quite as large; mature cows weigh about 1,300 lb. Average production of milk-recorded Pinzgauer cows is about 8,000 lb. Milk fat test averages about 4.0%. The Pinzgauer is noted for its sturdiness and hardiness under rugged mountainous conditions.

### **Piedmont (Piemontese)**

The Piedmont differs from the other Italian white breeds in that it is smaller and nearly all of the bulls in A.I. service are of the double-muscling type. In this area of Italy (northwest), strong selection pressure has been placed on muscling. As a result, milk production and size have declined and calving difficulty has increased, although not as much as one might expect. Mature cows weigh about 1,300 lb. In addition to being extremely heavy-muscled, Piedmont cattle are characterized by thin, relatively fine bone. Carcasses from young (15 mo.) Piedmont bulls are practically devoid of fat and excel Piedmont x Friesian crossbred bulls in percent muscle by 7% (54 vs. 47%).

### **Romagnola**

The Romagnola is another of the Italian breeds with white hair and black skin. Compared to the Chianina and Marchigiana, it is a deeper-bodied, bulkier breed that is not quite as trim or upstanding. Most of the other traits are comparable to those exhibited by the Chianina and Marchigiana. Mature cows weigh about 1,500 lb. It is strictly a beef breed that is considered a terminal sire breed in crossing programs.

### **Salers**

The Salers is a dark-red, dual-purpose breed that originated in the mountainous region of south central France, where the soil and climatic conditions are relatively severe. Due to these conditions the cattle seem to be adapted to less than optimum feeding and management programs. In its native region, the milk from a percentage of Salers cows is used for making cheese. The Salers is reported to be a relatively trouble-free breed that is above the average of the French breeds in fertility and calving ease. Size and muscling are moderate; double muscling does not appear to be a problem. Mature cows weigh about 1,300 lb. They are tall cattle, characterized by upright "lyre" shaped horns. Milk-recorded cows average about 6,200 lb. of milk with 3.7% fat. The Salers is considered a maternal breed. The Salers is currently enjoying a dramatic increase in popularity in North America.

### **Simmental (Fleckvieh, Pie Rouge)**

The Simmental, along with the Friesian, is one of the two most numerous breeds throughout Europe. It originated in Switzerland, but is also very popular in Germany, Austria, and France as well as several Eastern Europe countries. In Germany and Austria, it is known as the "Fleckvieh" and in France as the "Pie Rouge." Color is red and white with the red varying from light yellow to dark red. Mature cows weigh

about 1,500 lb. Milk-recorded cows average approximately 9,000 lb. milk with 3.9% fat.

In France, there are two other Simmental strains besides the Pie Rouge; namely, the Montbeliard and the Abondance. The Montbeliard, as noted previously, is a more dairy-like strain of the French Simmental. The Abondance is somewhat smaller than either the Pie Rouge or Montbeliard, with mature cows weighing about 1,200 lb. It is also less numerous than the other two strains.

In Europe, the various Simmental strains are recorded in separate herd books, but in the United States they are recorded by one registry association. In 1982, 82,240 cattle were registered by the American Simmental Association.

### **Tarentaise**

The Tarentaise is one of the smaller-framed Continental breeds imported to date. Mature cows average about 1,200 lb. Because birth weight, growth rate and mature size tend to be highly correlated, Tarentaise calves are usually smaller at birth and grow less rapidly than those of the larger breeds. In general, their growth rate and calving ease is reported to be similar to that of the traditional British breeds. The Tarentaise originated in the Alpine region of southeastern France and has been developed as a dual-purpose breed. Muscling and cutability appear to lie between the British and larger Continental breeds. The Tarentaise is basically red in color with black pigment around the body orifices—eyes, muzzle, vulva, etc. Because the region of origin is mountainous and not particularly fertile, the Tarentaise has achieved a reputation for vigor and hardiness. It is considered a maternal breed.

## **Brahman and Brahman Crosses**

### **American Brahman**

The American Brahman is primarily a blend of three Zebu (humped) breeds from India: (1) Guzerat; (2) Nellore; and (3) Gyr. In addition to these three breeds, there are many other breeds or strains of Zebu cattle throughout the tropical and sub-tropical regions of the world. In recent years, an extremely large-framed breed from Brazil, known as the "Indu-Brazil," has been infused into the American Brahman. The Indu-Brazil is also a blend of the Guzerat, Nellore and Gyr breeds. Guzerat and Nellore cattle are gray to black in color, whereas the Gyr breed is usually red or red with white speckling. It has been roughly estimated that the American Brahman is composed of approximately: 60% Guzerat blood; 20% Gyr and Indu-Brazil blood; and 20% Nellore breeding. In addition, there is a very



small, but undetermined, percentage of British blood in the American Brahman. In 1982, the American Brahman Breeders Association registered 32,203 head of cattle.

The American Brahman was developed out of the need for cattle that could tolerate the sub-tropical environment of the southern United States. It is well-known that British breeds are not as adapted to the rigors of a hot climate as Zebu-type cattle. However, neither straight Brahman nor straight British cattle are as productive as Brahman x British crossbreeds, which exhibit a high percent of heterosis over the average of the parent breeds. The degree of heterosis is particularly evident in cow fertility, bull fertility, and growth rate. Straight Brahman cattle are low in fertility and post-weaning rate of gain. In addition, straight Brahman beef tends to be low in marbling and palatability. Purebred Brahmans also suffer from a relatively high incidence (3 to 4%) of a "weak calf syndrome" that is not generally found in Brahman x British crosses. Compared to British breeds, Brahman cattle exhibit a more nervous disposition.

A number of breeds have evolved from the crossing of Brahman and British breeds. The most notable are the Santa Gertrudis, Brangus, Beefmaster and Braford. In addition, there are several other less numerous Zebu-cross breeds.

### **Santa Gertrudis**

The Santa Gertrudis is approximately  $\frac{5}{8}$  Shorthorn and  $\frac{3}{8}$  Brahman blood. Its color is a deep red and it is large in size, mature cows averaging about 1,400 to 1,500 lb. It was developed by the King Ranch, starting in about 1920. The Santa Gertrudis exhibits an extremely rapid growth rate that is comparable to the largest of the European breeds. Fertility, however, does not seem to be as high as that of the other synthetic Brahman x British breeds. There were 41,400 Santa Gertrudis cattle registered in 1982.

### **Brangus**

The Brangus is composed of  $\frac{5}{8}$  Angus and  $\frac{3}{8}$  Brahman blood. Initial development of the breed occurred during the 1940's and '50's. Brangus cattle are black and polled. Like Angus, the recessive red gene is present in the Brangus breed, and led to the foundation of a Red Brangus Association. Compared to other Brahman x British hybrids, the Brangus tends to be slightly smaller in size and smoother in conformation. Mature cows weigh about 1,250 lb. In 1982, 25,523 Brangus cattle were registered.

### **Braford**

Braford cattle are approximately  $\frac{5}{8}$  Hereford and  $\frac{3}{8}$  Brahman. Although an "International Braford

Association" was founded in Fort Pierce, Florida in 1969, the association is relatively inactive and serves primarily to provide standards for selecting Braford cattle. Research has shown that the Brahman x Hereford cross cow may very well be the most productive beef female for the Gulf Coastal region of the United States.

### **Beefmaster**

The Beefmaster is estimated to be slightly less than 50% Brahman, and the balance about equally divided between Hereford and Shorthorn blood. It was developed through the efforts of Tom Lasater, who assumed management of his father's Texas ranch after the latter's death in 1930. Lasater stressed six criteria in his selection program: disposition, fertility, weight, conformation, hardiness and milk production. Cows that were poor milkers or failed to wean a calf for any reason were culled. Color was never a consideration in Lasater's program. Consequently color is variable, but red predominates. Beefmasters are generally horned but the polled condition does exist. In 1982, 27,110 cattle were registered by the Beefmaster Breeders Universal.

### **Charbray**

The Charbray is a Charolais x Brahman cross. Charbray cattle are recorded by the American-International Charolais Association.

### **Sahiwal**

The Sahiwal (pronounced Si-Wall) is a relatively small, heavy-milking pure Zebu breed from Pakistan. It is a fawn-colored animal. According to U.S. MARC data,  $\frac{1}{2}$ -blood Sahiwal and Brahman cows were highly productive in terms of lb. of calf weaned per cow exposed.

### **Barzona**

The Barzona is a combination of four breeds: Africander (a Zebu type), Hereford, Santa Gertrudis, and Angus. It was developed near Kirkland, Arizona by F. N. Bard, who started in 1942 with Africander x Hereford cross females. Two-thirds of these F<sub>1</sub> females were mated to Santa Gertrudis bulls. The remaining  $\frac{1}{3}$  were mated to Angus bulls. The resultant progeny formed the basis of the Barzona breed. Their color is a dark reddish brown.

### **Simbrah**

A Simbrah is a Simmental x Brahman cross. It is just in the developmental stages. Simbrahs will be recorded by the American Simmental Association. A purebred Simbrah is  $\frac{5}{8}$  Simmental and  $\frac{3}{8}$  Brahman.

## The American Dairy Breeds

### Holstein - Friesian

The Holstein — Friesian is by far the most numerous breed of dairy cattle in North America. There were 386,898 Holsteins registered in the United States in 1982. The American Holstein is unexcelled in milk production by any breed in the world. Average milk production for the breed in the U.S. lies somewhere between 14,000 and 15,000 lb. with 3.6-3.7% fat. It is a large breed, mature cows averaging about 1,500 lb. in weight, although there are a few cows that weigh 1,700 to 2,000 lb. Compared to the European Friesian, the American Holstein is larger-framed, more dairy-like in its conformation, and produces 30% more milk. However, the gap is being narrowed, because American sires are being used to improve the milk production of European Friesians.

Half-blood Holstein x British cross cows milk extremely well and produce a heavy calf at weaning time. However, they require significantly more feed than British beef cows in order to come through the winter in good condition and maintain fertility during the breeding season. In many areas a ¼ Holstein x ¾ British cow would make a more ideal female.

### Brown Swiss

Compared to the Holstein, the Brown Swiss is somewhat more rugged and beefier in its conformation. As a result, Brown Swiss cross cows may tend to come through a cold winter in better condition than Holstein cross beef cows. However, the straightbred Brown Swiss cow is not as inherently fertile as the straightbred Holstein cow. Mature Brown Swiss cows average about 1,500 lb. in body weight and produce about 12,000 lb. of milk with 4.0% fat. There were 12,770 Brown Swiss cattle registered in the United States in 1982.

### Jersey

Because of its small size, its inherent fertility and calving ease, and its high milk production relative to body size, the Jersey breed has recently received considerable attention as a producer of F<sub>1</sub> beef females when crossed with either Angus or Herefords. Research at Texas, Illinois and the U.S. Meat Animal Research Center has shown very favorable results when Jersey x British cross females are mated to a large muscular bull of a third breed, such as a Charolais. However, the Jersey x British cross male calves are discounted in price, which is an economic disadvantage to the producer of the F<sub>1</sub> cattle.

Mature Jersey cows weigh about 900 to 1,000 lb. and average about 9,000 lb. milk, with 5.1% fat. In 1982,

there were 58,569 Jersey cattle registered in the United States.

### Guernsey

The Guernsey breed is seldom used to produce dairy x beef cross females. Mature Guernsey cows weigh 1,100 to 1,400 lb. and produce about 10,000 lb. of milk with 4.75% fat. In recent years, breeders have significantly increased the body size of the breed. There were 22,729 Guernseys registered in 1982.

### Ayrshire

Because of low numbers, the Ayrshire breed does not contribute much genetic material to the beef cattle industry. In 1982, there were 11,911 Ayrshires registered in the U.S. Mature cows weigh about 1,200 lb. and produce an average of 11,000 lb. of milk with 4.0% fat.

## Other Breeds and Crosses

### Hays Converter

The Hays Converter was synthesized by combining the blood of two dairy breeds and one beef breed; namely, the Holstein, Brown Swiss and Hereford. Color is either black and white or red and white. The cows are large-framed and heavy-milking. Their musculature tends to be medium to flat. The breed takes its name from its developer, Senator Harry Hays, former Minister of Agriculture, Calgary, Alberta, Canada.

### Longhorn

Longhorns in America are descendants of cattle brought to Mexico by Spanish explorers several centuries ago. They found their way into the United States and formed the basis of Western cow herds during the 1800's. They were late-maturing, slow-growing cattle that were highly fertile and able to withstand the privations of sparse range country. They gradually dwindled in numbers to no more than 1,500 during the early 1960's. In 1964, the Texas Longhorn Breeders Association was founded in San Antonio, Texas. Since then, considerable interest in breeding Longhorn cattle has developed in the U.S. Longhorn bulls are reported to sire small calves at birth. For that reason, they are popular for crossing on virgin heifers of other breeds. In 1982, there were 12,500 Longhorn registrations.

### Senepol

The Senepol was developed in St. Croix, U.S. Virgin Islands, starting in 1918. It is a combination of the Red Poll from England and the non-Zebu, non-humped, short-horned N'Dama breed from West Africa. The latter migrated to Egypt from Asia around 1500 B.C. From there the cattle migrated along the north and

west coasts of Africa until they settled in West Africa. The N'Dama is a small, hardy, tan-colored, heat tolerant breed. The Senepol has been developed to be a relatively small, solid red, polled breed with good heat resistance and milk production, along with a gentle disposition. The name Senepol is derived from Senegal, West Africa, from where the first N'Dama were shipped to St. Croix in 1860.

On St. Croix, mature Senepol cows weigh 1,000 to 1,200 lb., but on the U.S. mainland they average about 200 lb. heavier. Frame size ranges from 3 to 6, with most of them scoring 3 or 4. Calves are reported to be small at birth and born easily. On St. Croix, the calves weigh about 450 lb. at 205 days with no creep. Male calves are fed out as bulls on an all-forage diet and slaughtered at 12 to 14 months and weigh 800 to 850 lbs. Fertility of the cows is reported to be excellent in spite of the fact that tropical pastures in the Virgin Islands are relatively low quality. Milk production averages 4,500 to 5,000 lb. in a 205-day lactation.

In crossbreeding programs, the Senepol would be considered a maternal breed that would be especially suitable for the southern states.

### Beefalo

The Beefalo is  $\frac{3}{8}$  Buffalo (Bison) and  $\frac{5}{8}$  Bovine. It was developed and promoted by Bud Basolo of Tracy, California. Its main attributes seem to be increased winter hardiness and ability to subsist on low quality forages.

## Classification of Breeds

### Classification by Mature Size, Milk Production and Muscle Type

Tables 1, 2, and 3 are an attempt to classify breeds according to mature size, milking ability and type of muscling (thick, moderate or flat.) It should be remembered that this is a very general classification and there are many exceptions in any breed of cattle.

**Table 1. Large Sized Breeds**

MUSCLE TYPE	MILKING ABILITY		
	High	Medium	Low
<b>Thick</b>	Simmental	Maine-Anjou	Charolais Blonde d'Aquitaine Marchigiana
<b>Moderate</b>	—	Santa Gertrudis	Chianina Romagnola
<b>Flat</b>	—	—	—

This can be a reasonably useful method of classification because the breeds with greatest mature size and thickest muscling tend to exhibit the most rapid growth rate and the highest incidence of calving difficulty. Conversely, those breeds with the smallest mature size and flattest musculature tend to grow least rapidly and exhibit the lowest incidence of calving difficulty. Furthermore, some knowledge of mature size and milking ability is needed to accurately predict the nutrient requirements of the cow.

### Classification as Sire, Dam, or Two-Way Breeds

Another common method of classifying breeds is to divide them into sire or dam breeds, depending upon whether their traits tend toward the paternal or maternal side. An ideal sire breed in a crossbreeding

**Table 2. Medium Sized Breeds.**

MUSCLE TYPE	MILKING ABILITY		
	High	Medium	Low
<b>Thick</b>	MRI Gelbvieh	Pinzgauer	Limousin Piedmont
<b>Moderate</b>	Montbeliard Braunvieh Beef Friesian	Normande Salers Parthenaise Brahman Brangus Braford Beefmaster Barzona	Gasconne
<b>Flat</b>	Holstein Brown Swiss Milking Shorthorn Norwegian Red	Lincoln Red Welsh Black Hays Converter South Devon	—

**Table 3. Small Sized Breeds**

MUSCLE TYPE	MILKING ABILITY		
	High	Medium	Low
<b>Thick</b>	—	—	—
<b>Moderate</b>	—	Tarentaise Abondance Aubrac Shorthorn	Angus Hereford Murray Grey Sussex Beefalo
<b>Flat</b>	Jersey Guernsey Ayrshire	Red Poll Sahiwal Devon Senepol	Galloway Scotch Highland Luig Longhorn

program would have the following characteristics:

- rapid growth rate (medium to large mature size),
- high carcass cutability (moderate to thick muscling),
- reasonable calving ease, and
- adequate carcass quality (marbling).

An ideal dam breed in a cross-breeding program would exhibit the following characteristics:

- early puberty,
- high fertility,
- longevity,
- medium to high milking ability,
- easy calving, and
- small to medium mature size.

Of course, no breed can lay claim to all of these characteristics and one must make compromises when selecting breeds for a crossbreeding program. Some breeds have a near-equal balance between sire and dam traits and may be classified as *two-way breeds*. Table 4 is an attempt to classify cattle breeds as sire, dam, or two-way breeds.

**Table 4. Classification of Cattle Breeds as Sire, Dam or Two-Way Breeds**

Sire Breeds	Dam Breeds	Two-Way (Sire & Dam) Breeds
Blonde d'Aquitaine	Abondance	Beef Friesian
Charolais	Angus	Braunvieh
Chianina	Aubrac	Brown Swiss
Limousin	Ayrshire	Gelbvieh
Marchigiana	Barzona	Maine-Anjou
Piedmont	Beefalo	MRI
Romagnola	Beefmaster	Montbeliard
	Braford	Normande
	Brahman	Parthenaise
	Brangus	Pinzgauer
	Devon	Santa Gertrudis
	Galloway	Simmental
	Gasconne	
	Guernsey	
	Hays Converter	
	Hereford	
	Holstein	
	Jersey	
	Lincoln Red	
	Longhorn	
	Luing	
	Milking Shorthorn	
	Murray Grey	
	Norwegian Red	
	Red Poll	
	Sahiwal	
	Salers	
	Scotch Highland	
	Senepol	
	Shorthorn	
	South Devon	
	Sussex	
	Tarentaise	
	Welsh Black	

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