

SELECTING A BEEF BREED

Revised by:

*Carole H. Knight, Madison County Extension coordinator and
Agriculture and Natural Resources agent*

Ted G. Dyer, former Extension animal scientist for beef cattle



UNIVERSITY OF
GEORGIA
EXTENSION

New cattle producers frequently ask, “Which breed should I choose?” This question brings cold chills to many knowledgeable cattle producers and excitement to just as many enthusiastic breeders. The diversity of resources and management capabilities of any operation makes this question difficult to answer. This publication provides accurate, unbiased information to guide the decision-making process. After reading this publication, you should understand why the only correct answer is, “It depends!”

The two fundamental categories of beef cattle operations are purebred and commercial. The purebred operation requires more time, record keeping and initial input. The commercial operation is generally a lower-input, lower-risk type of venture. When choosing a breed for either a commercial or purebred operation, base your decision on profitability. Table 1 illustrates that while production can be increased by selection for growth, the increased production from crossbreeding is more rapid and cost-effective.

Unfortunately, one of the more influential factors on breed selection is coat color. How many times have you heard someone say, “I like ‘em because they’re black”? Coat color, whether it is red, black, white, yellow, gray or mixed, has little to do with performance, but it does affect how people perceive cattle. A herd of purebred cattle will generally be more uniform in coat color than a herd of crossbred cows. There are breeds that will produce all of the colors mentioned above and more. As a producer, you must be satisfied with the color and its uniformity or lack of uniformity. Productivity will suffer, however, if coat color is a primary selection trait. If your breed selection is more dependent on production and return on investment, make coat selection low on the list of criteria.

Traits used in the final selection process should not be affected by the type of operation (commercial or purebred). The one unique aspect of the purebred industry is the high-profile advertising and educational programs, such as field days. The purebred cattle market often provides a higher return per cow unit, but at the expense of higher maintenance costs, higher breeding costs, more management inputs and greater risks.

Table 1. Comparison of Production and Profitability between Crossbred Cows, Selected and Unselected Purebred Hereford Cows

	Crossbred	Unselected	Selected*
Pregnancy Rate	83%	86%	79%
Average Cow Weight	1,234 lbs	953 lbs	1,168 lbs
Adjusted Weaning Weight	612 lbs	402 lbs	494 lbs
Calf Crop Weaned per Cow Wintered	87%	84%	73%
Weaning Weight per Cow Wintered	530 lbs	338 lbs	358 lbs
Return over Feed Cost	\$21.67	-\$9.72	-\$32.42

Adapted from Ritchie, 1986, MSU Research Report FS-473.

**Selection was for increased growth rate.*

Start with the Basics

The factors that influence returns to a commercial operation are **calf crop percentage, weaning weight, market price** and **annual cow costs**. The following formula outlines how these factors must balance in order to optimize profitability.

Annual Cost per Cow				
Land Feed (grain and mineral) Herd Health		Fertilizer Hay (purchase vs. custom) Depreciation (cow purchase)		
Must Equal				
Weaning Weight	x	Calf Crop Percentage	x	Market Price
Growth Rate Milk Production Environment		Selection Bull Fertility Dystocia Health		Season Demand Mgt. Ability

The factors that influence weaning or market weight and calf crop percentage are most affected by breed selection.

The weaning or market weight of the calves is affected by genetics, milk production of the brood cow, availability of pasture and / or creep feed, and environmental conditions such as temperature, etc. Work toward calving 30 to 60 days prior to the best forage season in your area. Cow milk production declines after three months; therefore, supplement the nutrient requirements of the growing calf by making high-quality forage available. If your forage system lacks high-quality forages, the selection of a fast-growing, heavy-milking breed would be detrimental to optimum productivity.

Researchers evaluated breed types using varying percentages of European x British and beef x dairy crossbred cows. When maintained in similar environments, the larger-framed, higher-milking cows had poor reproductive performance. Thus, when genetic potential for milk is high a cow’s re-breeding percentage will be reduced. The growth potential of the calves will only be met when adequate milk production is available. When milk supply is abundant and forage quantity and quality are marginal, the result is a reduced calf crop percentage due to low cyclicity and pregnancy rates; therefore, make sure to match your forage production system to the genetic potential of your brood cow herd.

With this “optimum philosophy” in mind, we can look at general trends in milk production, growth and reproduction of several breeds in the United States.

In the early 1970s, a research project was started at the Meat Animal Research Center (MARC) in Clay Center, Nebraska. The project was designed to evaluate the “recently” imported breeds from Europe and provides the most complete, comprehensive data available. All breeds were not compared, so some information is not available. Breeds may perform differently in Georgia. The project does provide a valid comparison of the cattle in one common environment.

Table 2 outlines how the breeds compare to the Angus x Hereford crossbred (used as a standard). The values in the table are listed in ratios. A ratio of 105 indicates a value of 5 percent above the standard of 100; a ratio of 95 indicates a value 5 percent below the standard. The actual percentage is in parenthesis for the percent of cows pregnant after the first breeding season and percent calf crop weaned. Calving difficulty was reported in actual percentage.

Since there are more than 70 recognized cattle breeds, it is impossible to compare them all at once. The breeds are generally grouped into three types: British, European and Zebu-influence. The Zebu-influence breeds were developed in the Gulf Coast region of the United States.

Table 2. Comparison of Production Traits of Several Breeds

	Calves			Heifers		Cows			
	Percent calving difficulty	Growth rate to weaning	Growth rate to yearling	Age at puberty	Percent pregnant after first breeding season ratio	Percent calf crop weaned ratio	Percent calving difficulty	12 hour milk production	Weaning weight per cow exposed
Angus x Hereford	3	100	100	100	100 (87)	100 (84)	13	100	100
Red Poll	4	98	96	106	98 (85)	95 (79)	14	123	99
South Devon	12	102	103	102	91 (79)	102 (85)	15	107	105
Tarentaise	6	103	103	102	111 (96)	102 (85)	10	130	112
Pinzager	6	104	103	106	114 (99)	102 (85)	13	132	108
Gelbvieh	8	107	105	109	107 (93)	104 (87)	11	137	116
Simmental	15	105	106	100	93 (80)	99 (83)	17	137	108
Maine Anjou	20	105	108	100	109 (94)	103 (86)	11	105	112
Limousin	9	101	102	92	88 (76)	98 (82)	12	91	100
Charolais	18	107	106	92	86 (75)	96 (80)	15	91	101
Chianina	12	106	105	92	99 (86)	103 (86)	8	100	113
Brahman	10	107	103	80	113 (98)	103 (98)	1	150	116

Adapted from USDA MARC Beef Research Progress Reports, No. 1 (1982) and No. 2 (1985).

Brahman is composed of three Zebu breeds, while others such as Brangus, Santa Gertrudis, etc., are composites of the American Brahman and either British or European breeds. The derivative breeds are usually 3/8 Zebu and 5/8 British or European. Some of the breeds within the three categories may be atypical and may not possess all the advantages or disadvantages.

The MARC project was designed to evaluate as many of the more prominent breeds as possible. There was also an attempt to compare bulls that were representative of the breed. It is possible to select a bull of one of the breeds that would be an exception to the averages. This bull could perform either better or worse than the bulls used in the MARC project. The MARC study, however, did provide useful information about relative differences among many of the European and Brahman cattle. In selecting a beef breed, use the MARC information to select breeds that have higher genetic potential for meat and milk. The specific search for a bull would be for one of the breed exceptions in a weak area. For example, the faster growing cattle are generally larger at birth and calving difficulty is higher. If your program needs more growth, select a bull from one of the growth breeds that has a light birth weight and low birth weight EPD.

When selecting a breed or individuals within a breed, be aware also of a phenomenon called “genetic-environmental interaction.” The term simply means that cattle developed under certain conditions will perform best under those same or similar conditions. Florida researchers did a classic project to illustrate this effect. Hereford cattle from a similar genetic base were relocated from Montana to Florida and vice versa. One-half of the herds were kept at the original location. Based on the reproductive and growth information, the cattle performed best in the “home” location. According to this evidence, base the selection of a breed on the level of performance in your environment. The breeds that excelled in the MARC comparison may not fit your program exactly.

Cattle generally perform at a higher level in northern climates. Heat and humidity are detrimental to most production traits. In a more recent Florida report, Florida bulls gained almost a pound more per day in Montana than their counterparts in Florida. Nevertheless, the Florida bulls out-performed the Montana bulls in Florida and the Montana bulls performed better than the Florida bulls in Montana. Cattle developed in northern climates with free choice corn silage during the winter months will do poorly when brought to the humid South and turned out on stockpiled fescue and trace-mineral salt for the winter. If your program has been designed to provide limited winter feeding, the calving season should be in the spring and the breed should be moderate in both growth and milk production. If you decide to select a fast-growing, heavy-milking breed, provide the necessary feed requirements to achieve optimum performance.

	Breed Types	Advantages	Disadvantages
British	Angus	Low birth weight High fertility Moderate milk production Moderate frame size	Lower growth rate
	Hereford		
	Shorthorn		
European	Charolais	High growth rate Larger frame size High milk production	Increased dystocia Increased maintenance
	Glebvieh		
	Maine-Anjou		
	Pinzagger		
	Simmental		
	South Devon		
	Tarentaise		
	Others		
Zebu	American Brahman	Adaptability to adapt to adverse environments	Lower growth rate Poor carcass quality
	British Derivatives	Moderate to high milk production	
	European Derivatives	Maximum heterosis in crossbreeding	

General Trends

The following generalities hold true within and across breeds:

- Faster growth rates = larger birth weights
- Larger birth weights = increased potential for calving difficulty
- More milk production and large frame size = higher feed requirements for equal reproductive performance

Whether your choice is purebred or commercial, or red, black, white or spotted, keep production and profitability high on your priority list. Select a breed or breeds that your operation can manage and you can feel confident about marketing.

Other breeds fit certain specialty markets. If you are leaning toward a specialty breed that is selected for some trait other than beef production, you must accept the risk of a limited market for the chance at the higher prices sometimes received for the product. You may decide to select a breed that is amply available, so replenishing the herd is easier. On the other hand, you may select a breed that is relatively unavailable in your area in order to offer a unique alternative for other breeders. For commercial production, it is important to recognize that the premium is paid for uniformity. In this case, being dramatically different can mean more difficult marketing.

extension.uga.edu

Circular 859

Reviewed December 2022

Published by the University of Georgia in cooperation with Fort Valley State University, the U.S. Department of Agriculture, and counties of the state. For more information, contact your local UGA Cooperative Extension office. *The University of Georgia College of Agricultural and Environmental Sciences (working cooperatively with Fort Valley State University, the U.S. Department of Agriculture, and the counties of Georgia) offers its educational programs, assistance, and materials to all people without regard to race, color, religion, sex, national origin, disability, gender identity, sexual orientation or protected veteran status and is an Equal Opportunity, Affirmative Action organization.*