

BULL SELECTION

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One of the most important decisions that a cattle producer makes is the selection of bulls for his cow herd. Bulls contribute half of the genetic material for the cow herd. If replacement heifers are selected from within the herd, the bull will influence the production of the herd for up to 10 years or more.

BASIS FOR BULL SELECTION

Bulls are selected for their genetic potential. It is difficult to determine genetic values of bulls since the outward appearance (phenotype) are a result of both genetic potential and the conditions under which the animal was developed (environment). Nutrition, climate, diseases, parasites and insects plus weather conditions influence the outward appearance of the bull. Where possible the animal should be compared with other animals within the same herd and should be raised under conditions similar to those which he is expected to perform. However, the genetic value of bulls can be determined and compared with bulls throughout the country because of the sire record systems of the purebred beef cattle associations.

INDIVIDUAL EVALUATION

The genetic value of a bull can be estimated by his own performance. In addition, the physical attributes he expresses visually will aid in selection. Genetic values are often available that take into account the performance of his sire, dam, grandsire, granddam, herdmates and brothers and sisters. The genetic evaluation is called Expected Progeny Differences (EPD).

For Bull Selection, a breeder should establish goals for his own herd, evaluate herd strengths and weaknesses and select bulls which will improve the production and genetic merit of the herd. Selection has to include a realistic appraisal of the resources available to support the cow herd and growth of calves.

There are three major categories of bulls needed for commercial beef production.

1. Maternal bulls for use on heifers.
2. Maternal bulls for use on cows.
3. Terminal bulls for use on cows.

One or all of these categories may be useful in a breeding program based upon the goals of the manager and the quality and quantity of feed resources provided by the ranch.

EDP values may be used to achieve desired production goals. However, EPD's for many desirable traits are not available. A listing of important traits for which information may be available is given in Table 1.

Table 1. Traits for Selection of Bulls Based Upon Function

Trait	Maternal Bulls		Terminal Bulls
	For Heifers	For Cows	For Cows
Scrotal Circumference	Large	Large	Medium-Large
Pelvic Area	Large	Large	Not Important
Calving Ease	High	High	High
Birth Weight	Low	Medium	Medium
Weaning Weight	Match	Match	High
Milk	Match	Match	Not Important
Total Maternal	Match	Match	Not Important
Yearling Weight	Match	Match	High
Carcass Percent Protein	Conflict	Conflict	High
Carcass Quality	High	High	High

High levels of milk production require more feed resources. An increase of 5 lb. in milk production increases energy required by 15%, protein required by 21% and minerals (calcium and phosphorus) by as much as 37%.

Larger cattle require more feed. An increase in mature cow size from 1000 to 1200 lb. results in a 15-20% increase in the maintenance requirement.

Most of the genetic traits available from performance records and EPD's are based upon increases in the weight and growth of

Where match is listed, the bulls selected should be matched with the resources available on the ranch. Matching is illustrated in Table 2.

cattle. If we all select for size increases, the result may be a mis-match of resources to support the herd, loss of maternal factors affecting fertility and a reduction in the efficiency of production. Excessive size is not desired by the meat industry, therefore, requirements for the final product must be involved in selection.

Table 2. Matching Bulls to the Resources

Mature Size	Milk Level	Availability of Food from Grazing		
		Low	Medium	High
L	H	-	0	+
L	M	-	+	+
L	L	0	+	+
M	H	-	-	+
M	M	-	0	+
M	L	-	+	+
H	H	-	-	0
H	M	-	-	0
H	L	-	0	+

+ = Matching mature size and milk production with resources.
 0 = Risky, extra feed may be necessary or fertility and production may be affected.
 - = Avoid the combination, production will be unsatisfactory.

Size affects weight required for puberty, successful reproduction and desirability of the final product. For example, a 1400 lb. cow will produce heifers that will not reach puberty until they weigh 900 and steers that will not grade choice until they reach a weight of 1300 lb.

Heifer development and fertility are important and resources normally available will not produce the desired puberty of large animals at a young age. Cattle feeders, packers and retailers do not desire excessively heavy cattle. Therefore, sire selection has to be matched with the resources available, maternal efficiency of

heifers produced and the product desirable to feeders, packers, retailers and consumers.

Breeding systems to achieve productivity, fertility and a desirable final product can be classified into three systems.

REFERENCES

Brinks, J.S., 1990. *Cattleman's Handbook for Expected Progeny Differences*. J.S. Brinks, P.O. Box 710, LaPonte, CO 80535.

1. All purpose:

Cow size and milk production are matched with feed resources and bulls of the same biological type are selected. Replacement will have similar desired attributes as the cow herd.

2. Combination:

Cow herd size and milk production matched to the feed resources. Replacements are produced by mating bulls with maternal desirability with heifers and young cows.

Mature cows, 4 years old or older, are mated to terminal sires, all calves are sold.

3. Terminal Sire System:

Matched cows are mated to large bulls. All calves are sold. Replacements are purchased or bred separately.

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