

Increased Growth in a Range Bull...

What's It Worth?

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Range conditions and level of management effect the value of a good range bull just as cattle prices do. How much you should pay depends on the percent calf crop weaned, number of bulls needed to cover the cow herd and how many pounds the bull will add to each sale animal.

Changes in the cattle market and production costs caused by weather and other unpredictables make it difficult to put a price tag on a bull. Yet some average figures coupled with common sense and sound judgment can help you estimate a bull's worth. Table 1 shows how much more you can pay per bull in various situations for each pound of genetic improvement expected per year. (Prices are given to the nearest penny to enable readers to follow the calculations. That does not imply that we can be so discriminating when determining the value of a bull.)

When determining the value of a bull in each situation, it was assumed that the number of bulls plus cows would be constant. For example, out of 100 animal units, you could have four bulls and 96 cows or eight bulls and 92 cows. A 16% replacement rate, which included a 1% death loss, was assumed also.

Replacements

With a 96% weaning rate, 33% of the weaning heifers were needed as replacements. However, 45.8% of the heifers were saved at weaning to allow selection emphasis on yearling growth and breeding



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performance. Since the same number of heifers were needed for replacements, regardless of weaning percent, the number of sale animals changed as the weaning percent changed.

It was assumed that a selection program which gave a 1-lb. per year increase in sale weight of weaning calves and excess replacement heifers would result in an increased annual sale weight of .4 lb. for cull cows and 2.2 lb. for cull bulls. Table 3 illustrates how the increased value for 1 lb. of genetic improvement per year was determined.

For example, a bull with genetic potential for increasing sale weight of feeder cattle 1 lb. annually during a 5-year productive life is worth \$17.03 more than an average bull. That assumes you need 10 bulls per 100 animal units on your range and wean a 60% calf crop. However, the same bull is worth \$74.50 more if you run four bulls per 100 animal units in the breeding herd and wean a 96% calf crop.

Greater Improvement

If yearly improvement is greater than 1 lb., then the additional value of a superior bull can be determined by multiplying the figures in Table 1 by the expected genetic improvement per year. For example, a 5-lb. genetic increase is worth \$372.50 (5x\$74.50) more than an average bull in situations where you can wean a 96% calf crop while running 24 cows per bull.

Replacement bulls and heifers must

weigh much more than their herdmates for their progeny to achieve a small genetic improvement in weaning or yearling weight. That is because of the long generation interval in cattle (five to six years) and moderate heritability (30-45%) of growth rate. Normally, 85% of genetic improvement results from sire selection. The remaining 15% comes from selection of replacement heifers. The selection emphasis needed to get a certain level of genetic improvement under these circumstances is listed in Table 2.

The increased value of a superior sire is determined by his effect on the number and growth rate of market animals sold during his life, the genetic potential of replacements he sires and his own salvage value. These are effected by the bull's genetic

potential in each of the performance traits: Reproduction, maternal ability, growth rate, efficiency of gain, longevity and carcass merit.

Genetic Antagonisms

Because of genetic antagonisms between some traits, the highest net profit in a commercial herd is not necessarily related to the highest performance in any one of these traits. For instance, increased growth is generally desirable in market animals. However, with increased growth rate, there is a tendency for increased birth weight. This is directly related to calving difficulty and associated death loss and delayed re-breeding, especially during first and second calving.

As another example, increased milk production will boost weaning weights, but too

much milk can hurt re-breeding performance. This is particularly noticeable when feed is limited. Since genetic relationships among performance traits are not perfect, alert breeders can minimize effect of the negative relationships.

If an average range bull is worth \$1,500 on today's market, then a bull that can add 5 lb. per year is worth \$1,872.50 to a rancher who runs 24 cows per bull and weans a 96% calf crop. The weaning or yearling weight of that bull will need to be 141 lb. heavier than his herdmates. However, the same bull is worth about \$1,585.15 if it takes 10 bulls to cover 90 cows. In either case, the bull must have a modest birth weight, parents with above average reproductive performance, and he must be structurally sound. A

Table 1—Increased Value Per Bull for Each Pound of Genetic Improvement Expected Per Year*

Number of Bulls and Cows for Each 100 Animals in the Herd			Percent Calf Crop Weaned			
Bulls	Cows	Cows/Bulls	60	72	84	96
4	96	24	\$43.40	\$53.78	\$64.14	\$74.50
6	94	16	28.75	35.52	42.28	49.05
8	92	12	21.43	26.39	31.36	36.33
10	90	9	17.03	20.92	24.80	28.70

*Based on April 1981 cattle prices.

Table 2—Selection Emphasis Needed to Get Different Levels of Genetic Improvement*

Expected Improvement in Feeder Cattle Weights	Performance Level for Replacement Bulls and Heifers			
	BULLS		HEIFERS	
	Increased Pounds of Weaning or Yearling Weight	205-Day Ratio	365-Day Ratio	Increased Pounds of Weaning Weight
Pounds per Year				
1	28	106	103	5
2	57	113	106	10
3	85	119	109	15
4	113	125	113	20
5	141	131	116	25

*Assumptions: Sire selection was responsible for 85% of the genetic improvement in weight gain and heifer selection was responsible for 15%, heritability was 30% and average age of the breeding herd was five years. Average weaning and yearling weights were 450 lb. and 900 lb.

Table 3—Value of 1 Lb. of Genetic Gain

Situation: 4 Bulls, 96 Cows, 96% Calf Crop Weaned					
Sale Group	Number of Market Animals	Additional Pounds per Animal	Total Pounds	Price per Pound	Additional Return per Year
Weanling Steers	46.08	1	46.08	\$.78	\$35.94
Weanling Heifers	24.96	1	24.96	.66	16.47
Yearling Heifers	5.76	1	5.76	.63	3.63
Cull Cows	14.40	0.4	5.76	.45	2.59
Cull Bulls	.80	2.2	1.76	.55	.97
					\$59.60

Increased return for five years, assuming 5-year average life (5x\$59.60) = \$298.00
 Increased value per bull (\$298.00 ÷ 4) = \$74.50