

HOW DO YOU ESTABLISH THE VALUE OF A BULL?

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INTRODUCTION

Many beef producers buy bulls; however, some go a step further and purchase genetic material. No other segment of the livestock industry has a greater variation in the price paid for a herd sire than in the cow-calf business. Most commercial cattlemen in Florida pay between \$900 and \$2500 for their bulls. Criteria used to evaluate bulls include visual appraisal and performance data. Visual evaluation may include overall conformation, muscle thickness, structural soundness, breed character, hair coat color and length, etc. Performance data evaluation includes individual pre- and post-weaning performance, dam's lifetime record, sire's performance records and progeny records, breeding soundness exam, expected progeny differences (EPDs), etc.

Waller et al. (1991) evaluated records from 12 performance tested bull sales to establish the relationship between prices paid for bulls and their performance data. Buyers placed major emphasis on adjusted 365-day weight, average daily gain and frame score. All data available on sale day accounted for only 34% and 50% of the total variation in sale price for spring and fall-born bulls, respectively.

Establishing a price to pay for bulls varies from producer to producer. Establishing this price in any given year, for many cattlemen, may be as simple as the total value of two to

five steer calves at weaning.

BULL SELECTION - A NEW ERA

If you do not know where you are going, any road will get you there. As market specifications narrow, commercial cattlemen following any road with the same old breeding program will be left behind. Cattlemen can no longer afford to drive to a bull sale, spend a few minutes looking over individual lots and take home promising herd sires. Even those cattlemen who have used performance data such as birth and weaning and yearling weights are risking sliding into a hole, because targeting production toward a generic market will no longer be adequate enough. To understand where seedstock selection is headed in an era of specification beef, commercial cattlemen must understand the most useful tools presently available to them - Expected Progeny Differences (EPDs). EPDs are used to express the genetic transmitting ability of a sire. EPDs are reported as a plus or minus value in the unit in which the trait is measured, such as pounds for birth weight. EPDs are accompanied by an accuracy figure. Accuracy is a measure of the degree of certainty that one may have in an animal's EPDs. The higher the accuracy the higher the reliability of the EPD and the lower the level of risk.

EPDs are available through National

Sire Summaries from various breed associations. Both commercial and seedstock producers should find sire summaries useful. Producers using A.I. can obtain semen from bulls that are superior in the traits of interest. Commercial producers who rely on natural service can use sire summaries to select bulls that are sons or grandsons of outstanding bulls in the summaries that have high accuracy values. Because a bull receives one-half of his genetic make-up from his sire, progeny of bulls with superior EPDs are more likely to have superior breeding values for the same traits. This is especially true if individual performance data correlates to that individual's EPDs.

Simply stated, a sire summary is like a road map; you cannot use it until you know where you are and where you want to go. The first step is to know the performance history of your herd. The second step is to purchase bulls with known genetic and performance backgrounds that will improve your herd in the traits of interest.

HOW MUCH IS A BULL WORTH?

Knowing the value of a bull is important. A cheap bull is often the most expensive, but how much should you spend? The simplest answer can be found by estimating how much a bull is expected to increase the income from a herd of cows. One of the fastest ways to improve the performance of a cow herd is through the use of superior bulls (bulls with known performance and desirable EPDs). Although improvement from the bull isn't extremely large on a per calf basis, it can mount rapidly in pounds of calf weaned per herd over time.

One popular formula for comparing the value of bulls involves subtracting the herd's average weaning weight from the bull's weaning weight, dividing by two then multiplying by the heritability for weaning weight (Table 1).

Though a bull contributes only one half the genetic make-up of a calf, he has additional

impact on a cow herd through his daughters that are kept as replacement heifers. A bull that stays in service several years imparts his genetic traits directly on that many calf crops. Determining the value of a bull for all economically important traits is difficult. There are, however, at least three additional ways, besides increased weaning weight, that a bull can potentially increase herd income. A given bull may have the potential to improve calf conformation (more desirable frame and muscle scores). Secondly, the calves produced by the heifer offspring of a bull may have heavier weaning weights. Thirdly, the heifers sired by a bull with superior weaning performance may be heavier as brood cows and eventually heavier cull cows. The potential increase in herd income from these aspects are projected in Table 2. Because the potential monetary returns are spread over many years (from weaning of the first group of calves at the end of year two until the culling of the last group of brood cows sired by a bull), it is necessary to discount the benefits to take inflation and lost investment opportunities into account. In order to do this an interest rate of 6% has been used. Calculations are shown in Table 3.

When evaluating a proposed purchase, such as a herd sire, one should consider both the additional gains and expenses. We have considered the potential added income from the use of a bull, but not the expenses. The calculations to determine the improved heifer production ignored the possibility of lower reproductive and maternal ability for the larger heifers. It is possible to select bulls that will increase both growth and maternal performance by using available breed association records such as a national sire summary. In any case of increased size, the cost of nutritional maintenance will likewise increase. Big cows need more feed to support their production than small cows. Additionally, heavy milkers require more feed than poor milking cows. Though bulls with superior performance records and

EPDs bring with them the probability of increased income, one must consider the possibility of some negative aspects and/or increased costs.

CONCLUSION

The next time you decide to purchase a bull visit a breeder with a sound reputation, then insist upon reliable performance information so that a reasonable judgement can be made as to a bull's potential. The next bull(s) you select will affect the performance of your herd for many years. Before leaving home analyze the management program of your cow herd and answer the following questions:

- ! Are forages managed properly?
- ! Are your pastures properly stocked?
- ! Will your management and nutritional program allow you to take advantage of superior genetics?
- ! Is the death rate of your calves too high?
- ! Is calving difficulty a problem?
- ! How high is your pregnancy rate?
- ! Are weaning weights too low?
- ! Are cows permanently identified and do you keep records?

- ! Do these records fit your needs?
- ! Are you taking advantage of cross breeding?
- ! Do you need replacement heifers, cattle with more muscle or improved structural soundness?

Answering these questions may simplify the task of establishing the value of a bull. For example, if your management time is limited, bulls with low birth weights and low birth weight EPDs are more valuable to your operation compared to bulls with superior growth. Once a plan has been set, visit reputable breeders and insist on using their records to identify bulls you might be interested in. You will need to visually examine the bulls for structural and breeding soundness. A scrotal measurement of 32 cm at 12 months of age should be a minimum. The number of potential purchases should be narrowed to those bulls with conformation and size that support their performance records. Progressive seedstock operations should have bulls with superior genetics at affordable prices. Finally, many beef producers buy bulls; however, some go a step further and purchase genetic material.

REFERENCES

- Waller, J.C., R.G. Hayden and F.D. Kirkpatrick.
1991. Factors affecting sale price of performance tested bulls. J. Anim. Sci. 69. Supp. 1:245.

Table 1. Increased Income Based on Improved Weaning Weight^{a,b,c,d} for a Straightbred Cow Herd.

	Bull A	Bull B
Price \$	\$750	\$1500
Bull weaning wt., lbs	450	650
Improved calf weaning wt./lbs	7.5	37.5
Improved herd weaning wt./lbs	202.5	1012.5
Added 3-yr return, \$	\$486.00	\$2430.00

^a Weaning wt. $h^2 = .30$.

^b Feeder calf \$ (400-500 lb) = 80¢/lb.

^c Beginning herd weaning wt. = 400 lbs.

^d Herd size of 30 cows, 90% weaning rate and 27 calves marketed.

Table 2. Economic Value of a Bull with a 30 Pound EPD Advantage for Weaning Weight with a 6% Discount Rate^a.				
Category	Years of benefit^b	Base annual value	Annuity factor^c	Economic value
		(\$)		(\$)
Calf weight	2-4	528.00	2.5217	1331.46
Calf conformation	2-4	94.60	2.5217	238.55
Eventual brood cow salvage	3-13	10.88	7.0193	76.37
Subsequent heifer production ^d				
Group 1	4-11	48.00	5.5267	265.28
Group 2	5-12	48.00	5.2139	250.27
Group 3	6-13	48.00	4.9187	236.10
Subtotal				<u>751.65</u>
Total Additional Value				<u><u>\$2398.03</u></u>

^a Analysis based on herd size of 30 cows, weaning rate of 90%, 22 calves marketed/yr and five heifer replacements. Calf \$ (400-500 lbs) = .80¢/lb. Cull cow \$ = 40¢/lb.

^b Years are counted from the time of purchase of the bull.

^c Annuity factors are calculated by subtracting the factor shown in an annuity table of the year previous to the first year of benefit from the factor of the last year of benefit. This method accounts for all years of benefit. For example, 2.5217 = 3.4651 - .9434; 3.465 = 6% annuity factor of year four and .9434 = annuity of year one.

^d Subsequent production refers to the expected increase in weaning weight of calves out of the replacement heifers. Actual contribution of daughters for direct growth for weaning weight is 15 lbs (½ of 30 lbs.). Brood cow productive life = 8 yrs. Pregnancy rate = 80%.

Table 3. Calculations for Table 2.		
Category	Cowboy arithmetic	Base annual value
Calf weight	22 calves sold/yr x 30 lbs x \$.80 =	\$528.00
Calf conformation ^a	22 calves sold/yr x 430 lbs/calf x \$.01 =	\$ 94.60
Eventual brood cow salvage	20 lb heavier cull cows x 1.36 cull cows/yr ^b x \$.40 =	\$10.88
Subsequent heifer production	15 lbs direct growth for weaning wt. x 5 calves/yr x 80% pregnancy rate x \$.80 =	\$48.00

^a More desirable conformation from potential increase in frame and muscle = 1¢/lb.

^b 1.36 cull cows/yr = 15 replacement heifers sired by a bull ÷ 11 yrs (years 3-13).