

Can You Really Afford That Cheap Bull?

The initial cost of a bull along with annual maintenance costs can be quite high, and should be closely analyzed and monitored by the decision-maker. To aid in the analysis of the bull selection decision, a spreadsheet-based, decision-support aid titled **HerdBullCostProjection.xls** is available from Texas AgriLife Extension Service. This decision aid calculates a herd bull's annual cost and allows the user to compare two bull purchase alternatives.

The decision support aid requires information related to the capital outlay for the bull's purchase, his expected useful life, utilization rate and salvage value. Other related input is shown in Table 1.

Table 1. HerdBullCostProjection.xls bull purchase and salvage value input.

<u>Data Inputs</u>	<u>Unit</u>	BULL#1	BULL#2
Cows Per Bull (annual average over the bull's Expected Useful Life)	Head	25	25
Years of Expected Use	yr	4	4
Total Cows Per Bull During Life		100	100
Purchase Price Of Bull	\$/Head	\$3,000	\$2,000
Salvage Weight Of Bull	Lb.	1,800	1,800
Salvage Price Of Bull	\$/cwt	\$50.00	\$50.00
Death Loss	%	0.00	0.00
Calculated Salvage Value At End of Ownership Period Death Loss Adjusted	\$/Head	\$900	\$900

In addition, estimates for the components of the bull's annual maintenance cost are required to complete the analysis. These annual maintenance costs are broken down in to nutritional, health and miscellaneous categories as shown in Table 2.

To demonstrate the use of the decision-support aid, an example was constructed to show the difference in bull cost per cow serviced. In this example the original purchase price for Bull#1 was \$3,000 and Bull#2 at \$2,000. All other input related to bull utilization, as well as the financial and economic costs are assumed to be the same for both animals.

Table 2. HerdBullCostProjection.xls annual maintenance cost input.

Annual Maintenance Costs		BULL#1	BULL#2
Grazing			
Grazing Acres	Acres	6	6
Grazing Cost Per Acre (Financial)	\$/Acre	\$15.00	\$15.00
Calculated Financial Grazing Cost	\$	\$90.00	\$90.00
Grazing Opportunity Cost Owned Land (Economic Cost or Cash Rent Equivalent)	\$/Acre	\$0.00	\$0.00
Other Grazing	\$	\$0.00	\$0.00
Wintering Costs			
Number Of Days Fed	Days	120	120
Feed Cost Per Day	\$/Day	\$1.38	\$1.38
Facilities Cost Per Day	\$/Day	\$0.00	\$0.00
Calculated Wintering Cost	\$	\$165.60	\$165.60
Winter Grazing Costs	\$/Head	\$0.00	\$0.00
Input Wintering Feed Cost	\$	\$0.00	\$0.00
Annual Salt and Mineral	\$	\$14.00	\$14.00
Miscellaneous	\$	\$0.00	\$0.00
Health and Vaccination Costs	\$/Head	\$25.00	\$25.00
Reproductive Soundness Exam	\$/Head	\$40.00	\$40.00
Repairs & Maintenance Bull Equipment	\$/Head	\$5.00	\$5.00
Hired Labor	\$/Head	\$10.00	\$10.00
Management	\$/Head	\$10.00	\$10.00
Administrations and Overhead	\$/Head	\$0.00	\$0.00
Total Financial Maintenance Costs*	\$/year	\$364.60	\$364.60

Given the assumptions in Tables 1 and 2, the economic costs of purchasing and maintaining the bulls on an annual basis would be \$1,087 and \$792, respectively (Table 3). Based on 25 cows serviced per year, the economic costs would be \$43.46 and \$31.66 per cow, respectively (Table 3).

Table 3. HerdBullCostProjection.xls annual maintenance and cost per cow results.

Herd Bull Annual Economic Costs - Includes Opportunity Costs on Land and Equity Capital			
		BULL#1	BULL#2
Lease Equivalent of Owned Land	\$/Head	\$0.00	\$0.00
Opportunity Cost Of Equity Capital			
Opportunity Interest On Ave. Inv. Equity	\$/Head	\$0.00	\$0.00
Added Annual Economic Bull Costs	\$/Head	\$0.00	\$0.00
Total Annual Financial Costs	\$/Head	\$1,086.51	\$791.51
Total Annual Economic Bull Costs	\$/Head	\$1,086.51	\$791.51
Total Annual Economic Bull Costs Per Cow	\$/Cow	\$43.46	\$31.66
-Advantage of Bull #1 Compared To Bull #2---			
Difference In Bull Cost Per Cow (#1 - #2)	\$/Cow		\$11.80

Well, so what? Table 3 shows a cost advantage of \$11.80 per cow exposed for BULL#2, but is BULL#2 really the better investment? To justify buying BULL#1, we would expect that BULL#1's calves would need to have a market value that is at least large enough to offset the annual cost differential with BULL#2 for every year we own him. To make this decision at this point, we need to have some idea of the difference in expected size and quality of the calves expected to be sired by BULL#1 relative to BULL#2 in order to calculate how much, if any of the difference in cost of the two bulls can be offset. Because the bulls will be used more than one year, we need to employ a capital budgeting tool to analyze them as an investment. This decision-support aid employs the net present value capital budgeting technique to calculate the value of the cash flow differential generated by the two bulls over their useful lives.

The example shown in Table 4 is an attempt to answer the question of which of these two bulls is the better investment. In the example, the weaned calf percentage is assumed to be 85% annually for both bulls. Bull#1 is expected to wean calves that average thirty pounds heavier than Bull#2 in this example. In practice, this expected differential in weaning weights and quality would be based on expected progeny differences along with judgment by the user. Price differentials are estimated to be \$3.00 per cwt based on expected quality differences in progeny between the two bulls for the first three years, and widening to \$4.00 per cwt in the fourth year. Projected annual prices are calculated as percentage changes seen in the 1992 to 1995 time frame, based on 2004 averages. That time frame was selected for use in this example to reflect a period of increasing herd size in the U.S.

Table 4. HerdBullCostProjection.xls investment analysis results.

	BULL#1	BULL#2		
Weaned Calf Percentage	85	85		
Expected Average Weaning Weight	530	500		
Discount Rate	10			
BULL#1	Year 1	Year 2	Year 3	Year 4
Expected Steer Price	\$ 123.00	\$ 108.00	\$ 110.00	\$ 98.00
Expected Heifer Price	\$ 119.00	\$ 102.00	\$ 104.00	\$ 92.00
Average Price	\$ 121.00	\$ 105.00	\$ 107.00	\$ 95.00
BULL#2	Year 1	Year 2	Year 3	Year 4
Expected Steer Price	\$ 120.00	\$ 105.00	\$ 107.00	\$ 94.00
Expected Heifer Price	\$ 116.00	\$ 99.00	\$ 101.00	\$ 88.00
Average Price	\$ 118.00	\$ 102.00	\$ 104.00	\$ 91.00
BULL#1 - Expected Gross Sales	\$ 13,628	\$ 11,826	\$ 12,051	\$ 10,699
BULL#2 - Expected Gross Sales	\$ 12,538	\$ 10,838	\$ 11,050	\$ 9,669
Gross Sales Differential	\$ 1,090	\$ 988	\$ 1,001	\$ 1,030
Annual Sales to Cost Differential	\$ 295	\$ 295	\$ 295	\$ 295
BULL#1 to BULL#2 Annual Differential	\$ 795	\$ 693	\$ 706	\$ 735
Net Present Value of Annual Differential	\$2,328	Calculate Ownership Cost Adjustment		
Approximate Max Bid for BULL#1	\$4,328			
Ownership-Cost-Adjusted Max Bid for BULL#1	\$3,710			

As seen in Table 4, at a bid price of \$3,000, Bull#1 generates \$2,328 more in net cash flow discounted at 10% than Bull#2. The approximate maximum bid price for Bull#1 calculated in this analysis is \$4,328, which is the price of Bull#2 plus the net present value of the annual cash flow differential of the two bulls. This result indicates that Bull#1 would be a better investment up to an original bid price of \$4,328.

However, the estimated cash flow differential is dependent on the purchase price of Bull#1 because a change in bid price will impact the annual ownership cost for Bull#1. So, if we were to change our bid price to \$4,328, we will get a higher ownership cost estimate, and as a result a lower estimate for the net present value of the annual cash flow differential. This decision support aid can calculate the adjustment for changes in bid price through an iterative technique. In this case, the ownership-cost-adjusted maximum

bid price for Bull#1 is \$3,710. At any price for Bull#1 above \$3,710, Bull#2 purchased for \$2,000 would be a better investment.

It should be noted here that we are only comparing the expected value of Bull#1 to Bull#2. This analysis does not in any way make any conclusions as to the overall profitability of either bull to the cow-calf operation.

Conclusion

Bulls are the single most important source of genetic improvement for your herd. As shown in the example above, relatively small differences between two bulls in weaned calf size and calf quality can offset large differentials in the purchase price of those two bulls. After having established the criteria for the bull that you expect to buy and maintain, you should carefully examine questions related to cost of acquisition and maintenance of a suitable bull with a tool such as **HerdBullCostProjection.xls**. For a copy of the spreadsheet, please contact your local Texas AgriLife Extension Service agent or Larry Falconer by e-mail at L-falconer@tamu.edu .