

The Economics of Bull Investments

A ranch management economist has developed a spreadsheet to help ranchers consider paying more for a better bull.

by Sara Gugelmeyer

Figure 1: \$4,000 bull investment per cow cost calculator

Operating Cost Item	Annual Bull Cost	Cows per Year	Annual Cow Service Cost	Annual Service Cost per Cwt Weaned	Percent of Total Cost
Grazing and Supplemental Feed	\$600		\$24.00	\$5.13	
Veterinary Medicine	\$45		\$1.80	\$0.39	
Other Cost	\$0		\$0.00	\$0.00	
Annual Interest on 1/2 of Operating Cost	\$16		\$0.65	\$0.14	
Annual Operating Cost	\$661		\$26.45	\$5.66	45%
Ownership Cost					
Depreciation			\$595	\$23.80	\$5.09
Average Annual Interest Cost*			\$141	\$5.62	\$1.20
Death Loss (% of Purchase Cost)	2.0		\$80	\$3.20	\$0.68
Annual Ownership Cost	\$816		\$32.62	\$6.98	55%
Breeding Seasons Per Year	1	Cows Exposed/Bull	25	25 % of Calf Val.	
Total & Cost per Cow Exposed - Cwt. Weaned	\$1,477		\$59.07	\$12.63	5.97%
Total Cost per Calf Weaned	\$69.49		85 Calves During Life of Bull		
Purchase Cost of Bull			\$4,000		
Useful Life - Years			4		
Bull Salvage Value	1,800	Wt. Lb./Hd.	\$90.00	\$1,620	
Interest rate Used	5.0	%			
Average investment is cost plus salvage value divided by 2 or			\$2,810		
Weaned Calf Crop - Based of Exposed Females	85.0	%		Weaned Calf Price	
Average Weaning Weight	550	Lb.		\$180.00	\$/Cwt.
Weaned Calf/Exposed Female	468	Lb.		\$990.00	\$/Head
					Head of Calves/Bull
					4.0

Annual Bull Cost for Different Bull Purchase Cost

	Annual Bull Service Cost per Cow	Annual Service Cost per Cwt Weaned*	Change in Cow Service Cost	Pounds of Weaned Calf per Cow*	Breeding Cow Total Production Cost
	\$/Cow	\$/Cwt.	\$/Cow	Lb.	\$/Cow
Table Price Increment	\$200				\$600
Price of Weaned Calf	\$180.00				Bull as % of Total Cost
Bull Purchase Cost	\$3,400	\$51.99	\$11.12	-3.9	8.7%
	\$3,600	\$54.35	\$11.62	-2.6	9.1%
	\$3,800	\$56.71	\$12.13	-1.3	9.5%
Base Purchase cost	\$4,000	\$59.07	\$12.63		9.8%
	\$4,200	\$61.43	\$13.14	1.3	10.2%
	\$4,400	\$63.79	\$13.64	2.6	10.6%
	\$4,600	\$66.15	\$14.15	3.9	11.0%

*Change in pounds weaned per exposed female or percent weaned times average weaning weight.

Comments: Bulls used for spring calving herd

Sensitivity Analysis to Number of Cows Serviced

Table - Number of Cows Serviced Increment	Number of Cows Serviced Annually and Cost per Exposed Cow				
Head Serviced Annually	15	20	25	30	35
	\$/Head				
	\$3,400	\$86.64	\$64.98	\$51.99	\$43.32
	\$3,600	\$90.58	\$67.93	\$54.35	\$45.29
	\$3,800	\$94.51	\$70.88	\$56.71	\$47.25
Base Purchase cost	\$4,000	\$98.44	\$73.83	\$59.07	\$49.22
	\$4,200	\$102.38	\$76.78	\$61.43	\$51.19
	\$4,400	\$106.31	\$79.73	\$63.79	\$53.15
	\$4,600	\$110.24	\$82.68	\$66.15	\$55.12

Author: Jim McGrann - Professor Emeritus, Texas A&M University, 11-1-2012.

Buying a bull is as important a decision to a cow-calf producer as buying a tractor for a farmer. It's impossible to plant a crop without a tractor, much as it's impossible to raise a calf without a sire. Similarly, bull buyers should keep in perspective that a bull is a long-term investment, which greatly affects the productivity of an operation. However, relatively speaking, a bull represents a small percentage of a rancher's input costs.

Texas A&M University Emeritus Ranch Management Economist Jim McGrann has developed an easy-to-use Excel spreadsheet to help cattlemen keep bull purchases in perspective. He has set up the spreadsheet to consider the following factors: "Purchasing herd bulls is an investment that is expected to pay out over three to five years," McGrann says. "The ownership costs (depreciation, death loss and interest cost) are an annual cost spread over females serviced and calves produced during the bull's productive life. Depreciation is the purchased cost minus salvage value. Salvage value or cull bull net sales value is a substantial portion of bull initial purchase cost reducing bull depreciation."

For example, paying \$4,000 for a bull that will service 25 cows a year for four years means that bull cost is just \$12.63 per hundredweight (cwt.) or 6% of each calf's value if the 550 lb. calf is worth \$180/cwt.



at weaning. And that figure is based on weaning an 85% calf crop from cows exposed (see Figure 1).

Let's say you find a superior bull and spend \$4,500 and get a 575 lb. calf. If all the other factors stay the same, you spent \$500 extra dollars to get \$45 more per weaned calf and your bull cost per cwt. of weaned calf is just \$13.29 — less than a dollar more. This makes the bull cost 6.3% of the calf's value (see Figure 2).

McGrann says, "The investment in a higher priced bull that can contribute to improved production of more market acceptable calves and better weaning weight for the cow-calf producer is not that costly when numbers are put into perspective for calves sired and as a percent of the breeding cows total annual cost.

"This decision aid helps put the bull investment into proper cost perspectives. Annual cost is calculated in terms of the number of cows serviced and what change would be required in weaning weight to pay for the higher priced bull. Calculated cost per calf and per cwt. of calf weaned per cow exposed are good indicators to compare bull investments. This provides information on what the market would have to pay to justify paying more for a herd bull that could produce a more market acceptable higher valued calf."

Another example would be if an extra \$1,000 spent on an older or

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Figure 2: \$4,500 bull investment per cow cost calculator

Operating Cost Item	Annual Bull Cost	Cows per Year	Annual Cow Service Cost	Annual Service Cost per Cwt Weaned	Percent of Total Cost
Grazing and Supplemental Feed	\$600		\$24.00	\$4.91	
Veterinary Medicine	\$45		\$1.80	\$0.37	
Other Cost	\$0		\$0.00	\$0.00	
Annual Interest on 1/2 of Operating Cost	\$16		\$0.65	\$0.13	
Annual Operating Cost	\$661		\$26.45	\$5.41	41%
Ownership Cost					
Depreciation	\$720		\$28.80	\$5.89	
Average Annual Interest Cost*	\$153		\$6.12	\$1.25	
Death Loss (% of Purchase Cost)	\$90	2.0	\$3.60	\$0.74	
Annual Ownership Cost	\$963		\$38.52	\$7.88	59%
Breeding Seasons Per Year		1			
Total & Cost per Cow Exposed - Cwt. Weaned	\$1,624		\$64.97	\$13.29	6.28%
Total Cost per Calf Weaned	\$76.43		85 Calves During Life of Bull		
Purchase Cost of Bull			\$4,500		
Useful Life - Years			4		
Wt. Lb./Hd.	1,800		\$/Head	\$1,620	
Bull Salvage Value	\$90.00				
Interest rate Used	5.0%				
Average investment is cost plus salvage value divided by 2 or			\$3,060		
Weaned Calf Crop - Based of Exposed Females	85.0%				
Average Weaning Weight	575 Lb.				
Weaned Calf/Exposed Female	489 Lb.		Weaned Calf Price	\$180.00	Head of Calves/Bull
			\$1,035.00	\$/Head	4.3
			Calves per Bull Investment		

Annual Bull Cost for Different Bull Purchase Cost

	Annual Bull Service Cost per Cow	Annual Service Cost per Cwt Weaned*	Change in Cow Service Cost	Pounds of Weaned Calf per Cow*	Breeding Cow Total Production Cost
	\$/Cow	\$/Cwt.	\$/Cow	Lb.	\$/Cow
Table Price Increment	\$200				\$600
Price of Weaned Calf	\$180.00				Bull as % of Total Cost
Bull Purchase Cost	\$3,900	\$57.89	\$11.84	-3.9	9.6%
	\$4,100	\$60.25	\$12.33	-2.6	10.0%
	\$4,300	\$62.61	\$12.81	-1.3	10.4%
Base Purchase cost	\$4,500	\$64.97	\$13.29		10.8%
	\$4,700	\$67.33	\$13.77	1.3	11.2%
	\$4,900	\$69.69	\$14.26	2.6	11.6%
	\$5,100	\$72.05	\$14.74	3.9	12.0%

*Change in pounds weaned per exposed female or percent weaned times average weaning weight.

Comments:

Sensitivity Analysis to Number of Cows Serviced

Table - Number of Cows Serviced Increment	Number of Cows Serviced Annually and Cost per Exposed Cow				
Head Serviced Annually	15	20	25	30	35
	\$/Head		\$/Cow		
	\$3,900	\$96.48	\$72.36	\$57.89	\$48.24
	\$4,100	\$100.41	\$75.31	\$60.25	\$50.20
	\$4,300	\$104.34	\$78.26	\$62.61	\$52.17
Base Purchase cost	\$4,500	\$108.28	\$81.21	\$64.97	\$54.14
	\$4,700	\$112.21	\$84.16	\$67.33	\$56.10
	\$4,900	\$116.14	\$87.11	\$69.69	\$58.07
	\$5,100	\$120.08	\$90.06	\$72.05	\$60.04

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more fertile or simply more structurally sound bull could increase the number of cows serviced to 30 head instead of 25. Still using the same variables, this better bull would increase the number of calves produced over four breeding seasons by 22 head. At \$990 a calf, the increased cost is an investment that would more than pay for itself. You could even take into consideration that the bull's salvage value may be less because it is part of the calculations.

"I think sometimes when people buy bulls they go through the sale catalog and pick out the bulls they want but don't do this investment analysis," McGrann says. "So they end up buying bulls that are inferior to what they wanted because of a few hundred dollars in price. By running this analysis before they go into the sale they can see what would happen if you end up paying more for the bull you really want. In the end an extra \$200 dollars or so doesn't mean that much in the long-term. Don't go in there and buy cheap bulls thinking that you're going to be better off and that it's a good economic decision."

McGrann stresses that he is an economist and his spreadsheet is meant to use as a decision-making tool. "If somebody said to you, I've got

a \$4,000 bull and a \$5,000 bull, your first reaction is going to be: 'What do I get for that extra \$1,000'. By using the spreadsheet, you can put it in proper

perspective and see that if \$1,000 more achieves what you want to achieve it's not that much more. You are going to spread that \$1,000 difference over four years and get some back in salvage value."

He adds, "It might be a tough decision but you can certainly put numbers into this spreadsheet and evaluate it properly."

Yes, bull prices have gone up but so have calf prices and land prices and feed prices and fuel prices. McGrann stresses that you should keep it all in perspective and use this spreadsheet to help determine what you can spend to get the bull that will really make a difference in your herd.

McGrann says, "I developed this to help producers not get bogged down in thinking about the cost of the bull and instead think of it as an investment. And with the higher calf price now and salvage value of bulls way up, it is a relatively small investment with the potential for great gain." **HW**

Editors Note: Use the spreadsheet at agrisk.tamu.edu/herd-bull-investment and find out for yourself how bull cost affects your profitability.

"This decision aid helps put the bull investment into proper cost perspectives."

— Jim McGrann