CENTER FOR AGRICULTURAL PROFITABILITY
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Bull Value Cow-Q-Lator (BVCQL): What It Is and How To Use It

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It's that time of year when commercial ranchers and cattle producers are looking to make bull purchases for their operation. With so many different breeds and types of bulls available, picking the right bull at the right price is not easy. To help in making the best selection possible the University of Nebraska-Lincoln Beef Economics Team created the Bull Value Cow-Q-Lator (BVCQL). This tool can be used to compare your current bull value with up to 10 bulls. The Bull Value Cow-Q-Lator is a spreadsheet available to download at https://cap.unl.edu/livestock/tools.

Each ranch or farm is going to have different goals, values, and resources available to purchase bulls. For the BVCQL, 14 key input variables (KIVs) (Figure 1) are entered into the spreadsheet by the user. In addition to costs, users make a value judgment on the effect individual bulls are expected to have on calf value and calving rate of cows. Users are expected to provide estimates for all these values.

This is where EPDs and index values can help in predicting possible calf value differences among bulls. How much more or less valuable calves are from one bull relative to another is key to making a good choice. Helpful questions might be:

Would the weaned calves from the newly purchased bull be of a higher value than those sired by your current bulls?

Do you believe that a more expensive bull will increase progeny value enough to pay for the added cost?

Any other costs and value-added factors that include uncaptured outcomes such as dystocia, price slide effects, etc. should be included in the value difference. The whole purpose behind bull selection is to produce and create what the operator believes is the ideal animal.

This tool incorporates finding a bull in two ways. First, it solicits data from the user, (cost and revenue). Second, it compares the information provided for each bull for the user to determine which bull(s) best fit their operation. This is especially significant in the ask for the estimated calf value difference among bulls. This value is line 13. From Figure 1, the line 13 value is set to a value of zero. This is done so that all possible bull candidates are compared to the current bull battery. This comparison is the second way the BVCQL uses information to help users value bull they are considering as sires. The outcome lines 24, 25, and 26 represent the buyer's expectation of bull.

Figure 1. A representation of the Bull Value Cow-Q-Lator, BVCQL, showing the Key Input Variables (KIV), line numbers 1 to 14, the unnumbered lines are the resulting calculated costs estimates, Lines 23, 24, and 25 are Key Output Variables (decision information).

Bull Value Cow-Q-Lator		
KIV's		**CCBull**
1	What is the cost of the bull?	$4,000.00
2	How much does it cost to feed this bull for one year?	$900.00
3	Expected interest rates on investments?	6%
4	How many years do you expect to keep this bull?	4
5	What is the expected cull value of bull when it comes time to cull them	$1500.00
6	How many cows will he be used to breed annually?	25
7	What is the percent increase in value of bulls in general from time of purchase to time of cull?	10%
8	This is the calculated value of the bull's replacement costs based on percent increase in line 7	$4400.00
9	What are the chances he will die (each year)?	2%
10	What are the chances of an injury during his lifetime?	5%
11	What does it cost to care and maintain this bull annually (not feed)?	$300.00
12	What are the annual miscellaneous costs?	$120.00
13	How much value will he added per calf to your herd (relative to your current bull's average)?	0
14	What is the expected calving rate? (calves weaned per pregnant cow)	87%
	Annual Replacement costs with no death or injury	$725.00
	Annual expected death costs	$88.00
	Annual expected/average injury loss	$55.00
	Annual interest on replacement costs	$52.08
	Annual maintenance costs including interest	$1,320.00
	Annual interest on feed and maintenance	$39.60
	Total Annual cost	$2,279.68
	Cost Per Cow Bred	$91.19
24	**Cost Per Weaned Calf**	**$104.81**
25	**Cost Per Weaned Calf (minus) Difference In Calf Value**	$104.81
26	**Added Calf Value Needed to have bulls an equal buy**	$ -

Performance Line 24 is the actual cost per weaned calf, line 25 is the cost of a weaned calf adjusted by any added value attributed by the bull, line 26 is the added value needed to make the prospective sire of equal value to the current bulls.

One of the most important decision-making values derived from this program is line 24, the cost per calf weaned ($/WC). The higher the $/WC the more revenue is required to maintain the same level of profit.

Another important value is line 26, added calf value needed to have bull an equal buy ($ACVN). This line captures how much additional revenue is needed to pay for a bull. This is much like a break-even value. This value is in terms of cost per weaned calf. The question is "are the calves that a bull produces worth the cost of buying him?" This tool provides a method to make that comparison.

Suppose a bull buyer using this tool finds that a higher priced bull has an $ACVN to be $100 (line 26). This means that the value of the calves would have to increase by $100/head to keep $/WC the same.

The $ACVN is calculated for all bulls and can be compared to each other since they are based on the current bull costs. With the information provided by the BVCQL it is possible to have a deeper understanding of how much a specific bull costs or is worth as valued by the user.

Bull Value Cow-Q-Lator Example 1:

Let's use an example of applying a dollar index in determining bull value. The "Angus maternal weaned calf value" ($M) index, expressed in dollars per head $M, is the most maternally focused selection index available to Angus breeders and commercial producers[1]. If Bull 2 has a $M of +$75 and the current Bull 1 has a $M of +$55 their female calves retained as replacements on average would be expected to have $20 difference in profitability, so are worth $20 more each. Looking at Table 1 the current bull cost was $4,000.

EPDs directly influencing the index include calving ease direct and maternal, weaning weight, maternal milk, heifer pregnancy, docility, mature weight as well as foot angle and claw set.

Table 1. Bull Value Cow-Q-Lator Example One.

	Current bull (A)	Bull 1	Bull 2	Bull 3	Bull 4	Bull 4	Bull G	Bull H	Bull I	Bull J	Bull K
Bull costs	4000	4500	5000	5500	6000	6500	7000	75000	8000	8500	9000
Value Add	0	5	19	6	9	43	7	30	12	12	13
$/weaned calf	97.71	97.44	104.33	111.90	119.47	127.04	142.09	142.19	149.76	157.33	164.90
Difference in value	97.71	96.19	99.58	110.40	110.47	116.29	134.69	134.69	146.76	154.33	161.65
Added Value Needed	-	(0.27)	6.62	14.19	21.76	29.33	44.48	44.48	52.05	59.62	67.19

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[1] $M, expressed in dollars per head, aims to predict profitability differences in progeny due to genetics from conception to weaning. $M is built off a self-replacing herd model where commercial cattlemen replace 25% of their breeding females in the first generation and 20% in subsequent generations. Remaining cull females and all male progeny are sold as feeder calves.

$M places greater emphasis on the cost side of commercial cow-calf production than any tool available in the past. Increased selection pressure on $M aims to decrease overall mature cow size while maintaining weaning weights consistent with today's production. Under $M selection, less emphasis is placed on maternal milk, while heifer pregnancy and docility have an increased emphasis, and foot traits start to improve. The index finds cattle that are most profitable when producers receive no economic benefit for traits affecting post-weaning performance.

We have several bulls we are looking at in a sale catalog. We are going to use the $M. We assume previous bulls that we purchased are $M of $60.

We have a bull that brought $4,500 and had $M of $65. In this example, the cost per weaned calf is $97.44 compared to the bull we used in the past which was $97.71. The added value need is a negative $0.27. This means you can pay an extra $500 for this bull and add value to the calf crop. Another example would be a bull for $6,500 with a $M of $43 would be a good buy, as the calves would need to bring $29.33 (See Table 1). Those highlighted in yellow are adding value to your calves. Those highlighted in turquoise are not adding value to your calves.

Assumption Angus Beef Value ($B), a terminal index, expressed in dollars per carcass, to predict profitability differences in progeny due to genetics for postweaning and carcass traits[2]. The current bull we are using has a $B of $100. Results of using the Bull Value Cow-Q-Lator are in Table 2 below.

Table 2. Bull Value Cow-Q-Lator Example 2.

	Current bull	Bull 1	Bull 2	Bull 3	Bull 4	Bull 5	Bull 6	Bull 7	Bull 8	Bull 9	Bull 10
Bull costs	4000	5000	5500	6000	6500	7000	7500	8000	8500	9000	95000
Value added	0	92	49	31	45	14	64	86	46	92	50
Cost per weaned calf	97.71	97.44	104.33	111.90	119.47	127.04	134.61	142.19	149.76	157.33	164.90
Difference in value	97.71	69.84	55.33	80.90	74.47	113.04	70.61	56.19	103.76	65.33	114.69
Added value to have bulls an equal buy	-	(0.27)	6.62	14.19	21.76	29.33	36.91	44.48	52.05	59.62	67.19

In this example bull 2 would be a good buy and improve your $B. Because we need a $6.62 increase per finished animal, and we have a $49 increase in beef value. Those in yellow are adding value to finished cattle those in turquoise are not adding enough value to pay for the bull. See table 2 for more information.

Using the Bull Value Cow-Q-Lator can help in making comparisons about the value of each bull being considered for purchase. To maximize profit, the cost and value of calves are important considerations. This tool provides a way to be as objective as possible when making bull purchase decisions.

Link to **Bull Value Cow-Q-Lator** https://cap.unl.edu/livestock/tools

[2] This terminal index assumes commercial producers wean all male and female progeny, retain ownership of these animals through the feedlot phase and market these animals on a carcass grid. Traits included in the index are as follows: yearling weight, dry-matter intake, marbling, carcass weight, ribeye area and fat.

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