

HEALTH & HUSBANDRY

Optimizing bull-to-cow ratio

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What is the ideal bull-to-cow ratio? This is a decision every producer faces, and there is no singular answer

due to the variation among cow-calf operations throughout the country. The goal is to find the optimum situation to balance costs of bulls while maintaining an overall good pregnancy rate and calf value.

Taking time to work through the thought process for your operation can help guide the decisions of how many bulls makes sense for your situation. To understand the implications, we need to consider bull costs, cost per pregnancy, and our plan to be sure our bull provides as many pregnancies as possible.

Bull cost

The purchase price of a new bull is a large component of bull cost, but certainly not the only cost. To evaluate the ideal number of bulls, we need to establish the cost per pregnancy that is dependent not only on bull purchase price, but also

annual maintenance expenses and depreciation.

Calculating the annual costs to keep a bull certainly varies by operation, but one consideration is the variable costs incurred to maintain an animal in the herd.

Dustin Pendell, along with Kevin Herbel, evaluated data from the Kansas Farm Management Association for a cow-calf enterprise analysis for 2016-2020. The entire report is available at [agmanager.info \(https://bit.ly/ABBenterprise\)](https://bit.ly/ABBenterprise) and describes differences between high-, medium- and low-profit cow-calf producers. This report contains a lot of good information, and the full report is worth a read.

For our purposes we are going to focus on the total variable costs per cow as reported from these ranges. The top one-third of producers in profitability had variable costs per cow of \$629, and the bottom one-third in profit had variable costs of \$862. The overall average was \$766 in variable costs per cow per year, which included feed, pasture and health costs. The average bull

might eat more feed and cost a little more than the average cow, but we'll use the average annual cow cost in our calculations.

Another cost associated with bull ownership is depreciation. This is affected by purchase price, the length of time the bull is owned and the final sale value. For easy math let's assume we purchased a bull for \$6,000, used him in the herd for five years, and then received a cull price of \$1,000. In this case the bull decreased in value by \$5,000 over the period, or an annual depreciation of \$1,000 per year.

Cost per pregnancy

Now that we have bull annual cost and depreciation costs, we can add these together to get our total annual cost (\$1,766 in this scenario). The number we care about is getting to the cost per pregnancy.

Identifying the bull cost per pregnancy is a helpful number when determining the number of bulls to purchase.

However, this has to be combined with the expected sale method of the calves to evaluate the value of each pregnancy.

We need to consider the number of cows we want the bull to breed. According to the National Animal Health Monitoring System (NAHMS), the average number of cows a mature bull is placed with is approximately 24. This number certainly has a wide range based on region of the country, stocking density of the herd, pasture size and many other factors. If we use this number and the bull gets each cow pregnant, our average annual bull cost per pregnancy is \$73.

Changing the bull-to-cow ratio to 20 or 30 results in a proportional change in bull cost per pregnancy to \$88 or \$58, respectively.

The calculations presented use

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average numbers, which may not apply to your operation. Still, the method of calculation should be straightforward to reproduce with costs and bull-to-cow estimates from your operation.

Maintaining the bull-to-cow ratio at a reasonable number for your operation is important to optimize productivity and profitability. If the number gets too low, bull price per cow increases dramatically. Conversely, if the bull is placed with too many cows, the number can increase if the pregnancy rate decreases.

Another important consideration is the value of each calf at weaning — or the added value from each pregnancy. Depending on your marketing strategy, a higher cost per pregnancy due to purchasing a bull of higher genetic value may be an added benefit to your operation. The goal is not to minimize cost per pregnancy, but rather to *optimize* this number based on your situation.

Bull insurance

One challenge, especially in single-sire pastures with reasonable bull-to-cow ratios, is if the bull doesn't do his job and the pregnancy rate is low. Some producers describe having an extra bull in the pasture as "insurance" in case one bull goes bad during the season.

While I like this concept, the bull cost per pregnancy can easily illustrate the true cost of this type of insurance policy. The other options are to combine preseason testing and breeding-season monitoring to lower the chances of a dramatic decrease in pregnancy rate due to bull failure.

A preseason breeding soundness examination (sometimes referred to as a BSE) is an important tool to determine if the bull is adequately prepared to breed cows. This includes a physical examination and an in-depth evaluation of the reproductive tract, including semen assessment. The exam evaluates if the bull is capable of successful

breeding today, but does not tell us about future performance.

The breeding soundness exam does offer the ability to identify issues that could not be observed visually, such as sperm defects that may affect breeding.

If a bull passes a breeding soundness exam, most of the subsequent issues that could detrimentally affect his ability to breed can be observed visually when they occur. Foot rot, pinkeye, other lamenesses, musculoskeletal injuries, trauma to penis or testicles all can occur during the breeding season. These injuries often occur acutely. Monitoring the bull in pasture can lead to quick identification and replacement of the bull if the injury occurs in-season.

A simple visual appraisal of the bull throughout the season can assess mobility, abnormal swellings or changes in behavior.

Also monitor body condition score (BCS). This impact can occur

more gradually, so be sure the bull's ration is adequate to meet his needs.

Conclusions

The optimum bull-to-cow ratio varies by operation factors including geographic region, management plan and marketing strategy. Identifying the bull cost per pregnancy is a helpful number when determining the number of bulls to purchase. However, this has to be combined with the expected sale method of the calves to evaluate the value of each pregnancy. After purchasing a bull, be sure a breeding soundness examination is performed before each season, and follow this with in-season visual monitoring of bull performance. **I**

Editor's note: "Health & Husbandry" is a regular *Angus Beef Bulletin* column devoted to the care and well-being of the herd. Author Brad White is on faculty at the K-State College of Veterinary medicine and serves as director of the Beef Cattle Institute. To learn more on this and other beef herd health topics, tune in to the weekly Beef Cattle Institute *Cattle Chat* podcast available at KSUBCI.org.