

Weaning Weight Versus Reproductive Efficiency

Helping commercial producers improve profit potential.

by **Mark Z. Johnson**

Economic analysis of cow-calf operations shows a strong relationship between profitability and both the percentage of calf crop weaned per exposed female and pounds weaned per exposed female. This “economic analysis” discussion often leads to a debate about which metric contributes more value to the profit potential of a commercial cow-calf operation selling calves at weaning. Is it reproductive efficiency in the form of a higher percentage of the calf crop weaned? Or, is it the weaning weight of the calves?

Using USDA market report prices, look at the following example of gross revenue generated from an extra 50 pounds of weaning weight versus an additional 5% calf crop weaned per exposed female, relative to current market values.

Table 1: Trait Impacts

Traits	Heritability	Heterosis
Reproduction	Low	High
Growth	Medium	Medium
Carcass	High	Low

Sources:

Oklahoma Cooperative Extension Service. Chapter 4, OSU Beef Cattle Manual, Eighth Edition, E-913
Speer, N.C. 2011. Crossbreeding: Considerations and Alternatives in an Evolving Market. White paper published through Certified Angus Beef, Wooster, OH

USDA AMS Livestock, Poultry & Grain Market News. OK Dept. of Ag Market News
Oklahoma State University Extension Beef Cattle Breeding Specialist

Herd A

200 cow operation

Average mature weight = 1,300 pounds

- 90% calf crop weaned results in 180 calves (90 steers and 90 heifers) at an average of 525 pounds)
- Herd A averages 472.5 pounds of weaning weight per exposed female.

Herd B

200 cow operation

Average mature weight = 1,300 pounds

- 85% calf crop weaned results in 170 calves (85 steers and 85 heifers) at an average of 575 pounds)
- Herd B averages 488.8 pounds of weaning weight per exposed female.

Prices used below are from the Nov. 17, 2023, USDA *Oklahoma Weekly Cattle Auction Summary*.

Herd A calves

525-pound steer calves were worth \$294 per hundredweight (cwt.) or approximately \$1,544 per head.

525-pound heifer calves were worth \$243 per cwt. or approximately \$1,276 per head.

90 steers x \$1,544 = \$138,960

90 heifers x \$1,276 = \$114,840

Gross value = \$253,800

Herd B calves

575-pound steer calves were worth \$273 per cwt. or approximately \$1,570 per head.

575-pound heifer calves were worth \$235 per cwt. or approximately \$1,351 per head.

85 steers x \$1,570 = \$133,450

85 heifers x \$1,351 = \$114,835

Gross value = \$248,285

Bottom line, with market conditions at the time, Herd A's 5% advantage in calf crop weaned resulted in \$5,515 more revenue, compared to Herd B's 50-pound advantage in actual weaning weight. Yes, prices vary from week to week and year to year, and some operations retain ownership past weaning to different marketing endpoints. That being said, reproductive efficiency — in the form of a higher percentage of calf crop weaned — has significant economic importance in a cow-calf operation.

Improving the percentage of calf crop weaned

To improve the percentage of calf crop weaned, we need to address selection, mating and management to boost reproductive efficiency. Look at Table 1, which shows the inverse relationship between heritability and heterosis.

From the standpoint of genetics and animal breeding, reproductive traits are low in heritability (typically 10% to 20%) but show high levels of heterosis in response to crossbreeding. From a practical standpoint, this means if commercial producers are going to take advantage of heterosis in one part of their cow-calf operation, they should take advantage of maternal heterosis in their cow herd. The benefits of crossbreeding have been well documented. Beyond additive genetic merit and breed complementarity, heterosis gives the crossbred cow an advantage in "reproductive fitness" and the ability to increase efficiency in commercial cow-calf operations. The crossbred beef female reaches puberty earlier, is less likely to be open after breeding season and stays in production longer.

The opening segment of this article does not intend to diminish the importance of weaning weight. It is intended to illustrate the difference between a production level and profit potential. Weaning

weight equals pay weight and represents the primary source of revenue for most cow-calf producers. It is worth noting that crossbred cows tend to have greater calf survival rates, and crossbred calves nursing crossbred cows typically have 10% to 20% heavier weaning weights. It is also noteworthy that these advantages of crossbreeding don't require much additional input. We create crossbred cows as a result of mating decisions.

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— Mark Johnson,
Oklahoma State University

When selecting seedstock for a well-designed crossbreeding system, consider genetic values. Additive genetic change is cumulative and permanent. When selection pressure is applied to identify bulls with strong EPDs (expected progeny differences) for maternal and reproductive traits, their resulting daughters will have greater additive genetic potential for reproductive efficiency. Yes, these traits are low in heritability; however, additive genetic merit works like building blocks and pays long-term dividends. Each beef breed registry publishes a sire summary including several EPDs that fall under the "maternal" heading. Applying selection pressure to EPDs such as heifer pregnancy, maternal calving ease and mature weight, or bio-economic indices like stayability, maternal weaned calf value, baldy maternal profit index or Brahman influence profit index enable you

to genetically tailor your cow herd to fit your production environment and maximize reproductive efficiency. This is by no means a complete listing of all the maternal EPDs that could be considered.

From a management standpoint, herd health and proper nutrition are essential to maximize reproductive performance. A good working relationship with your veterinarian enables you to tailor a herd health plan best suited to your production environment and cow herd. When it comes to a proper vaccination program and parasite control, an ounce of prevention is worth a pound of cure.

Past Handle on Health articles stress the importance of nutritional management and the critically important role it plays in reproductive efficiency. Cows and heifers that go into the calving season at a body condition score (BCS) of 5.5–6.0 are optimum. This ensures the cattle have the energy reserves to deal with the spike in nutritional requirements once lactation starts and enables them to have timely breed-back.

Optimum reproductive efficiency is getting all cows to raise a calf to weaning in a 365-day window of time. That means the rebreeding interval needs to stay within 80–85 days of calving. With this in mind, cows that breed back earlier in the breeding season calve earlier and wean an older, heavier calf. If cows breed back one heat cycle earlier, and calves have an average 2.5 pounds pre-weaning weight per day of age, it results in about 50 pounds of additional weaning weight.

Parasite control, a good vaccination program and proper nutrition all play a vital role in maintaining an optimum rebreeding interval, keeping cows bred and maximizing the percent calf crop weaned. **HW**

Editor's note: Mark Z. Johnson, Ph.D., is an Oklahoma State University Extension beef cattle breeding specialist. Copyright © 2024 Merck & Co., Inc., Rahway, NJ, USA and its affiliates. All rights reserved.