Ridin' Herd

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How cow weight, milk affect revenue

In the October issue we discussed the impact of mature weight and milk production on nutrient needs of the beef cow. Depending on the operation, feed costs are usually between 40% and 60% of annual cow costs. From a cost standpoint, continual focus on feed cost results in the greatest opportunity to increase profit potential of the cow-calf enterprise.

Again, breed sire summaries indicate the genetic trends for growth traits, carcass weight and milk production have increased over the years. It's hard to see how milk production and mature weight of commercial cow herds could not have continued to increase over time as well. In addition, it is hard to see how nutrient needs of the commercial cow herd wouldn't have increased over time, too.

McMurray (*Feedstuffs* article, 2008) suggested that average cow weight had increased 322 pounds (lb.) between 1975 and 2005. McMurray indicates that average cow weight [weight for cows at body condition score (BCS) 5] in 2005 was 1,369 lb. compared to 1,047 lb. in 1975.

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Nutrient needs increase

As a refresher from October, maintenance feed is proportional to the animal's metabolic body weight. Metabolic body weight is defined as body weight to the ¾ power (body weight^{¾}), which also describes the surface area and is representative of the active tissue mass or metabolic mass of an animal. So, as cow weight increases, maintenance feed increases because metabolic body weight increases.

In addition, as daily milk output increases, so do nutrient needs. In regard to milk production, not only are nutrient needs increased during the time of lactation, but the nutrient needs are also increased during the dry period because high-milk-potential females have a greater visceral organ weight compared to cows that have lower milk potential.

Effect of mature weight, milk

If milk output per day is fixed at 20 lb. per day and cow mature weight changes from 1,000 lb. to 1,200 lb. or 1,400 lb. and cows are managed on a fixed resource base, with some assumptions, gross sale dollars can be determined.

If par is a set of cows with a mature weight of 1,200 lb. and daily milk production is 20 lb., using annual maintenance energy needs, 100 head of 1,200-lb. cows producing 20 lb. of milk daily could be managed on a fixed resource base. Using similar calculations, about 90 head of 1,400-lb. cows

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producing 20 lb. of milk daily or about 112 head of 1,000-lb. cows could be managed on the same fixed resource base.

Again, if cows in each weight group had a weaning rate of 85%, 85 calves, 77 calves and 95 calves would be weaned from cows that weighed 1,200, 1,400 and 1,000 lb., respectively.

It is a little more difficult to determine weaning weight of the calves as a percent of cow weight for cows of similar daily milk production. On a limited resource base, larger cows have potential to wean off heavy calves, but because of the limited resources, that genetic potential is not met. Bigger calves have greater nutrient needs.

Just the opposite would be expected for calves from light-mature-weight dams. If the 1,200-lb. cows wean 47% of their mature weight, 1,400-lb. cows will wean about 44% of their mature weight and 1,000-lb. cows with similar milk production would wean about 49% of their mature weight.

Remember, these calculations are based on cows being managed on the same resource base in the same environment. Using the percentages above, it calculates that 1,400-lb. cows wean about 616-lb. calves, 1,200-lb. cows wean 564-lb. calves and 1,000-lb. cows wean 490-lb. calves.

For all groups of cows on the same fixed resource base, we'll assume 85% of the cows exposed to a bull during the breeding season wean a calf. Gross pay weight at weaning for each of the groups would calculate to 47,432 lb., 47,940 lb., and 46,550 lb. for the group of 1,400-lb., 1,200-lb., and 1,000-lb. mature cows.

If 500-lb. calves sell for $100 per hundredweight (cwt.) and there is a $5-per-cwt. price slide, 616-lb. calves sell for $94.20 per cwt., 564-lb. calves sell for $96.80 per cwt., and of course 490-lb. calves sell for $100.50 per cwt.

There likely needs to be a discount for frame — for too much frame and for not enough. The calves from large-mature-weight females will be discounted another 50¢ per cwt., and calves from the small-mature-weight females will be discounted another $1.50 per cwt. This discount seems to make sense as frame affects carcass weight at which they will grade USDA Choice. The question might be: Should both large and small frame size be discounted equally?

Gross sale dollars generated from the sale of calves from 1,400-lb. cows would be $44,444. Calves from 1,200-lb. cows would generate $46,406, and calves from 1,000-lb. cows would generate $46,085.

The above calculations do illustrate the importance of weaning weight and reproductive rate. Can a producer continue to drive weaning weight up at the expense of weaning rate? The final piece to the puzzle is to calculate annual costs. These numbers could vary and are harder to arrive at, but we do know that the majority of annual cow costs is a function of feed costs. So it makes sense to calculate differences in annual feed costs based on annual maintenance energy needs.

Summary

Breed differences allow producers to design genetic packages that best fit the feed resources of the operation. An extra calf to sell appears more important than extra weaning weight per calf. If the genetic trends continue in the direction they have been, how does a producer maintain the genetic package they have worked so hard to fit to their resources and environment?

The idea is to help you keep your eye on the target of what genetic package fits your environment and to make an attempt to relate the amount of revenue generated in cow herds that differ in mature size managed in the same environment and with the same resources.

Editor's Note: *"Ridin' Herd" is a monthly column written by Rick Rasby, professor of animal science at the University of Nebraska. The column focuses on beef nutrition and its effects on performance and profitability.*