

Size Matters in the Cow/Calf Business

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Reprinted from March '09 Issue of National Cattleman

Economies of scale are an important consideration for any business and can lead to greater profitability. However, if that greater scale principle is applied to individual cow weights on the ranch, producers quickly find that bigger is not better.

Individual cow weights in the United States vary up to 1,000 pounds. It is not uncommon to see variation of this magnitude in any herd. Kris Ringwall of North Dakota State University reported in *Beef Talk* that the mature weight of 102 cows in two herds at the Dickinson Re-search Extension Center in Dickinson, North Dakota ranged from 856 to 1,935 pounds. These cattle are in two herds with average weights of 1,216 and 1,571 pounds, respectively.

Dr. John Paterson found similar variation in cow size among the Montana ranches participating in the Montana Beef Network. One ranch had an average cow weight well over 1,300 pounds. The heaviest cow was just over 1,900 pounds. To the owner's surprise, when her calf was weaned, it weighed 305 pounds. That is not heavy enough to pay that cow's winter feed bill, let alone the entirety of her annual expenses. The ranch manager punched her ticket for a trip on the first truckload of cull cows.

If the objective of cow/calf operations is to produce a calf that weighs between 550 and 650 pounds at 7 months of age, and of a quality and type to fit into our growing and finishing systems as economically as possible, then how does mature weight of the cow impact that objective? One logically would expect that larger cows are more capable of producing large calves than small cows --- but at what cost?

A cow is expected to wean a calf that is close to 50% of her mature weight every 365 days. This is a reasonable goal that is achieved in efficient operations. If a good cow can produce 50% of her body weight in the form of a calf every year, then we don't need cows that weigh in excess of 1,300 pounds. Cows in commercial cow/calf operations that weigh over 1,300 pounds are challenged to produce at this rate.

Increasing cow size has a point of diminishing returns. At some point an increase in mature weight no longer provides a sufficient return in increasing calf weight to offset the cost of the heavier cow. As cows increase in weight they have an increasingly difficult time weaning a calf that will equal 50% of their body weight. Very seldom does a 1,500 pound cow wean a 750 pound calf.

The calf's weaning weight is more a result of a cow's milking ability than her size. In the quest to increase and subsequently select for weight gain performance, producers have correspondingly selected for increased mature size as the two are highly correlated. Selection for growth in heifers over maternal qualities in retaining replacements has led to larger cows that consume costly forage with marginal improvements in weaning weight productivity.

The Cost of Larger Cows

Larger cows may possess the genotype to produce very large calves, but the nutritional environment required to support that production is the exception, not the rule, on most ranches. Large cows have higher nutritional requirements, require more supplementation, and incur higher input costs to maintain productivity. At today's prices for hay, supplement and mineral, it is estimated that every 100 pounds of mature weight costs an extra \$15 to \$20 per year for those three inputs.

Larger cows also consume more forage during grazing season. That extra 100 pounds increased dry matter intake by approximately 1.83 pounds-per-day during grazing season at the NDSU research facility. Depending on the length of the grazing season, that would amount to 200 – 300 pounds of additional dry matter per cow for each 100 pounds increase in body weight.

Using the 1.83 pounds of forage per day figure, the annualized forage dry matter requirement difference for the 100 pound difference in body weight is 668 pounds. The difference in average body weight of the NDSU herds is 355 pounds.

Assume those two herds each contain 50 cows and the difference in forage dry matter required annually then is 118,570 pounds or nearly 60 tons. Sixty additional tons for those 50 larger cows is not economically sustainable. How do you suppose those two herds will respond to drought conditions?

The next question is how many more cows can you run on 60 tons of forage? If the cows in the herd that average 1,216 pounds consume on average 2.3% of their body weight per day, then during the year each cow will consume 10,208 pounds of forage or just over five tons. This means that the extra forage the larger herd consumes could support nearly 12 more cows that weigh 1,200 pounds, which is a 24% increase.

We may not want to increase our herd by that amount, as other variables must be considered in managing the business. But certainly stocking rate could be increased moderately while maintaining a forage reserve that improves the grazing resource and allows for reserves during drought.

With increasing production costs, especially those associated with nutrition, the size of our cows must be addressed. It is well established that small and medium sized cows in crossbreeding systems are more economically efficient than large sized cows. The fact is cows that are too large cost producers millions of dollars in higher maintenance and production costs.

The challenge is to manage our way to more moderately sized cows. Even if we cull a large cow, don't replace her with a heifer of the same kind out of the herd. That gets us what we already have. Producers will need to locate replacement females with genetics for moderate size and as high in maternal traits as is sustainable in the production environment. One way to do that is to locate bulls that meet these new requirements. Breed them to moderate sized cows within the herd that have above average maternal traits and use only the heifers from those for replacements. (These will be the smaller cows that produce big calves and breed back within a controlled breeding season.)

Doing this creates a herd within a herd managed for the purpose of supplying the most efficient female. The challenge is finding enough of those cows within the herd to provide the replacement heifers needed annually. Initially producers might need to seek replacement females from outside of the cow herd that have been bred for moderate size and sound maternal traits.

Given the importance of mature cow size and its relationship to economic productivity, producing efficient replacement females is paramount to the success of a cow/calf operation. In today's economy, arguably the most valuable piece of equipment on a cow/calf operation is a good set of scales. Size does matter, so what do your cows weigh? ♦

Effertz EZ Ranch note: In one cross, a fullblood Lowline bull will help you create 1100# cows by retaining the halfblood Lowline heifer calves you raise from your current cow herd.

