

Cow Size: How Big of a Cow is Right for Your Herd??

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In your cow–calf operation, what is the most efficient size or weight of a cow that optimizes your profitability? How large or how small should your cow size be for you to maximize profitability? Obviously, heavier weight and larger framed cows consume more forage and require more pasture acreage and/or supplemental feed compared to lighter and smaller framed cows. At the same time, if larger cows wean heavier calves each year, then a greater amount of income will be realized to pay for the extra feed required to maintain the heavier and larger framed cow. Therefore, the questions that should be addressed are a) how much more calf weight is produced by heavier and larger framed cows, and b) is the additional calf weight sufficient enough to pay for the additional feed and/or pasture management required for the heavier cow?

Our research team has addressed these questions at the Tennessee Valley Research and Extension Center (TVREC) at Belle Mina, AL, an experiment station owned by Auburn University. A breeding project is currently underway utilizing the cow herd at TVREC to develop two distinct mature weights by selecting the heifers and cows, both up and down, based on their hip heights (frame). Cow-calf performance of these cattle will allow us to obtain answers to some of the aforementioned questions.

This herd consisted of 55-60 cows calving each year, primarily in January and February, resulting in a total of 373 calves produced over the 7 year study period. The first calving season for this study was in 2006 and the final calving for this report was in 2012. During the study period, the cows were grazed on pasture or fed hay. Cows did not receive any supplemental energy and/or protein feed. Prior to weaning, the calves were not given any creep feed. The calves received only the milk from their dam and whatever forage they could eat while with their dam on pasture. At weaning, approximately about 205 days of age, body weights of cow and calf, hip height of cow and calf were recorded.

The mature cow weights have been divided into percentiles, from the smallest to the heaviest mature cow weights (Table below). The table also shows the adjusted weaning weights of their calves and the percent of the cow weight at

weaning that was the calf's adjusted weaning weight. In general, the trend is that the heavier cow weights produced heavier calves and the lighter weight cows weaned a much greater percent of her own weight.

Though there is a trend in the increases in adjusted calf weight weaned from the heavier cows, the increase may not large be enough to make a sizable economic impact. Under the management conditions used in this cow herd, for each 100 lb increase in cow weight, adjusted calf weaning weight increased by **4.9 lb**. At calf prices of \$1.50 per pound, the extra value of the calf weaned is worth \$7.35.

Do Big Cows Wean Bigger Calves?

Percentile: Low to High Cow Weights	Average Cow Wt	Adjusted Calf Weaning Wt.	Percent Calf Weight Weaned Per Cow Weight
0 to 20%	1209	504	42
20 to 40%	1307	509	39
40 to 60%	1370	507	37
60 to 80%	1436	512	36
80 to 100%	1564	521	33

So what does it cost to feed an extra hundred pounds of cow for a year to produce the extra 4.9 lb of weaned calf?

Feed required for maintenance.

The following table shows the feed required for cows of two different weights, 1000 lb vs 1400 lb cows. The second column of the table shows the kcal of energy required to maintain each of the cows (1000 lb vs 1400 lb) for a day.

Maintenance Requirements of 1000 and 1400 lb Cows

Cow weight	Energy Req'd/Day Maintenance	Pounds of Bermuda Hay/Day/Cow	Pounds of Bermuda Hay/Year/Cow
1000 lb	7570 kcal	19.9 lb	7274 lb
1400 lb	9702 kcal	25.6 lb	9325 lb

The 1000 cow requires 7,570 kcal of energy per day while the heavier 1400 lb cow requires 9,702 kcal of energy per day. The 1400 lb cow requires 28% more energy and that means she will require 28% more feed or pasture compared to the 1000 lb cow. In other words, the maintenance energy of the cow for one year requires 145 small square 50 lb Bermuda hay bales for the 1000 lb cow and 186 bales for the larger 1400 lb cow, or 9.1 large round 800 lb bales for the 1000 lb cow, but 11.7 large round bales for the 1400 lb cow. At a cost of \$150/ton for hay, it would cost \$158.83 more to feed the heavier 1400 lb cow per year than the lighter 1000 lb cow.

Other considerations.

A pasture suitable to maintain 100 cows of an average body weight of 1400 lb for a year could maintain 128 cows weighing 1000 lb on the same feed resources. Labor may be greater for managing 128 smaller cows compared to the 100 heavier cows. But certainly a larger number of calves should result from the 128 cows than the 100 cows. Assuming a 90% calving rate for both cow weights, this would amount to 25 additional calves from the smaller cows compared to the heavier cows.

There also may be differences in the stayability or longevity of cows in the herd for the two weight groups. Cows might leave the herd because of foot unsoundness problems and/or not being able to conceive. If differences in cow longevity in the herd exist as a result of weight, then this would impact the economic differences that are seen between the two cow weight groups in addition to the maintenance differences. Consideration should also be made for the demand of the calves by buyers of those calves if sold at weaning or shortly thereafter. Calves out of smaller cows are expected to be lighter in weight as

indicated by the TVREC research. As lighter calves usually bring more money per pound when sold than heavier calves, there would be less advantage in return from the larger calves out of larger cows from the smaller calves out of smaller cows.

Putting it altogether, heavier cows may wean heavier calves. However, it appears that the cost of the extra feed required maintaining the heavier cows for a year will not be offset by the additional pounds of calf produced and their market value. In addition, the increased number of calves produced from the 1000 lb cows would be more profitable and cannot be equated to by the heavier weights of the calves from 1400 lb cows solely because of differences in the maintenance energy differences required between the two cow weights.

Conclusion: don't let your cows get too large. Smaller cows are more efficient with their feed usage than larger cows.