



YOUR LINK TO

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Do the math

I am sitting beside my wife in our 1983 half-ton GMC pickup in the middle of a lush, green buffalo-grass pasture checking Angus cows for heat. The meadowlarks are singing from the fence posts. A full moon is coming up in the east, and the most brilliant western Kansas sunset is displayed across the horizon.

The kids are on the tailgate, and our black Lab dog is chasing jackrabbits through the creek. It doesn't get any better than this. Sure puts one in the mood to count his blessings.

It also provides time to ponder. Time to ponder about how many ranch and farm families, many of which are perhaps third- and fourth-generation, can continue their accustomed way of life given the generally depressed agricultural economy.

These are not easy financial times. Though many issues and factors either directly or indirectly play a role, long-term staying power of commercial cow-calf production really boils down to this formula:

$$\text{COMMERCIAL COW-CALF PROFITABILITY} = \text{VALUE OF OUTPUT} - \text{COST OF INPUTS}$$

Value of output

This issue has been cussed and discussed many times. Output in the minds of many cow-calf producers is the same as average weaning weight. Even though numerous Standardized Performance Analyses (SPAs) indicate virtually no relationship between average calf weaning weight and return on investment, this remains one of the few tangibles that many producers can grasp.

Indeed, through the years, one of the easiest ways to increase weaning weight has been to emphasize selection for growth rate or milk production through crossbreeding and/or through direct selection within breed. Perhaps the easiest way to increase weaning weight has been to simply make the calves older at weaning by calving earlier.

Both of these ploys have had little regard for increased cow size, milk production, maintenance requirements and associated increased cost of production.

For commercial cow-calf producers who retain ownership through harvest, increased output value can be captured through high-quality carcass

Table 1: Relationships among cow size, stocking rate, pounds of calf weaned and return

Cow weight, lb.	1,400	1,250	1,100
No. of cows	100	110	120
Pregnancy rate, %	95	95	95
Calving rate, %	99	99	99
Weaning rate, %	98	98	98
% calf crop	92	92	92
No. calves weaned	92	101	110
Avg. weaning weight, lb.	630	600	550
Total lb. weaned	57,960	60,600	60,500
Value/lb., \$	0.78	0.82	0.85
Total \$	\$45,209	\$49,692	\$51,425
Difference from 1,400-lb. cow:		\$4,483	\$6,216

premiums, particularly for those that achieve Certified Angus Beef™ carcass specifications or USDA Prime. However, in the bottom-line analysis, these are truly premiums only if no efficiency has been lost in the production of the superior carcass characteristics.

If the cow has become less functionally adapted to the given environment through long-term single-trait selection for carcass merit or if the feedlot cattle have been overfed (reduced average daily gain [ADG] and feed efficiency [FE]) to achieve higher Certified Angus Beef acceptance rates, what has been gained?

Weaning weight does have significance in the output side of the equation if it is placed in the context of "whole-herd weaning weight" or "total pounds of calf weaned from the whole herd." This can be put into perspective only through understanding of the missing ingredients — stocking rate and cow size.

The age-old discussions about matching cow size and genetic potential for milk production to the environment implies that larger, more highly productive cows are a better match for environments characterized by higher rainfall and more lush, abundant feedstuffs. In contrast, smaller, more moderately productive cows are better matched to drier, sparser-vegetation environments.

Again, the missing ingredient is stocking rate. Perhaps the example in Table 1, which includes various cow sizes and stocking rates, can help put these relationships into perspective.

Let's talk about the numbers. I have made numerous assumptions, which may or may not be applicable to individual ranching enterprises. I

would encourage you to input your own numbers, hopefully based on historical data from your own situation.

Let's assume we have grazeable and harvested forage resources (summer range and winter hay) that can maintain 100, 110 and 120 cows that range in mature weight from 1,400 to 1,100 pounds (lb.), respectively. All cows have the same calving season. Calving later, closer to green grass, is a topic for another discussion.

Let's assume that fertility (95% pregnant), calving rate (99% pregnancy retention) and calf death loss at and after calving (98% weaning rate) are identical for all cow weights. Evidence exists for increased fertility, pregnancy retention and less calving difficulty and calf death loss in smaller cows; however, for the sake of a simplistic stocking rate discussion, let's hold these numbers constant.

Multiplying pregnancy rate, calving rate and weaning rate together yields a constant 92% calf crop across cow weights. Smaller cows tend to wean a higher percentage of their body weights than heavier cows (45%, 48% and 50% of body weight, respectively). Even though the 1,400-lb. cows weaned calves that were 80 lb. heavier on average, they weaned 2,540 fewer total pounds of calf from the whole herd due largely to differences in stocking rate.

Admittedly, total-herd fixed costs on a per-cow basis would be cheaper for the heavier cows; however, in this simplistic example, the 1,100-lb. cows returned an additional \$6,216 over the 1,400-lb. cows, again largely due to differences in stocking rate.

If ownership on the calves were retained

through the finishing phase, approximately the same total feedlot expenses (feed, yardage, etc.) would be incurred finishing 110 likely smaller-framed calves from the smaller cows vs. 92 likely larger-framed calves from the heavier cows.

In addition, the feedlot cattle from the smaller cows would likely finish with less time on feed, perhaps providing more timely marketing before the summer slump in fed-cattle prices (assuming spring-calved calf-feds marketed in April and May at 13-14 months of age). These cattle also

may produce a more moderate carcass size (650-750 lb.), which is more consistent with consumer desires.

A word about inputs

To paraphrase Cheyenne Wells, Colo., seedstock producer Kit Pharo, inputs can be minimized by: **(1)** producing the right kind of cattle – frame 5, deep-ribbed, easy-fleshing, and functionally fault-free; **(2)** calving in synch with nature, closer to green grass (minimizes expensive

supplementation); and **(3)** intensively grazing forages (minimizing harvested forages).

These are topics for further discussion.

Summary

Full appreciation of the value of output requires understanding the relationships between cow size and stocking rate.

Do the math.

