

“Cow Math:” Estimating Cow Herd Productivity

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Over the summer, many questions were raised about individual cow and cow herd efficiency. Several meetings were held where this topic was addressed and great discussion was stimulated about how to improve efficiency through genetics and management. However, record-keeping (the most important aspect about being able to make profitable changes) was glanced over in many of those discussions. Maintaining production records has been the cornerstone of Extension education programs in Tennessee for the 100 years of its existence.

There are many ways to keep records on a cow herd. They range from complicated spreadsheets and commercially available software to calving books or notes on the back of a feed tag. More powerful decisions can be made with more detailed records. Remember that “without data, everything else is just an opinion.” Choosing a record-keeping system that is easy to use should result in more dedication to keeping it updated. Even simple records are useful for many different purposes, but a minimum amount of individual cow and calf data is required.

Once the records are in place, making decisions with them can sometimes be as intimidating as setting up the system in the first place. Again, keeping it simple and gradually moving up to more complicated calculations is likely the best way to approach it. Several methods exist to determine cow and calf productivity. This article will address using calf weaning weight records to track productivity of a small cow herd.

Consider this example: Calves are weaned and a total weight is calculated (either by weighing them on the farm or using the pay weight from a marketing facility check). Then, the total pounds of calf weaned are divided by the number of calves weaned:

Basic Weaning Weight = Total Pounds of Calf Weaned / Number of Calves Weaned

This is a decent start, but there are several major flaws in using this simple calculation as an indication of productivity. It does not account for differences in individual calf ages, the number of steers and heifers, weight of the cows, cows that did not calve and calves that died between calving and weaning. It also does not account for shrink if using pay-weights from the marketing facility. While weaning weight is likely the simplest and most widely used, it is also the most abused measure of productivity. So, to begin to get a true understanding of productivity, weaning weights should be adjusted.

One commonly used method to account for age variation is to adjust all weights to 205 days (approximately 7 months). To do this, birth weight and birth dates are needed. These can be estimated for commercial purposes, but actual measurements are ideal and are required for registered cattle. Simply subtract the calf's birth weight from the actual weaning weight. Then, divide that gain by calf age in days. The result-

ing number is the Average Daily Gain (ADG) from birth to weaning. Now, multiply the ADG by 205 days for a uniform adjustment. There are other factors that can skew this adjustment, but it is adequate for making basic productivity estimates.

Adjusted Weaning Weight = ((Weaning Weight – Birth Weight) / Days of Age) × 205 Days

Total weaning weight should also be adjusted for the number of steers and heifers in that calf crop. Over a number of years, the sex ratio will usually balance out to be 50:50. But individual years often yield more of one sex than the other. Knowing this is important because, all else being equal, steers weight more at a given age and grow faster than heifers. The first step in adjusting for sex is to calculate the actual difference in weaning weight between the steers and heifers and divide by two. Then, subtract that adjustment from the individual steer weights and add it to the individual heifer weights.

Adjusted Steer Weights = Individual Steer Weight – ((Avg. Steer Weight – Avg. Heifer Weight) / 2)

Adjusted Heifer Weights = Individual Heifer Weight + ((Avg. Steer Weight – Avg. Heifer Weight) / 2)

So, what should be done with the total or average weaning weight once it is adjusted for individual age and sex of the calf crop? The ideal measurement for most commercial cattlemen will be the “pounds of calf weaned per cow exposed.” Again, a number of factors influence cow and overall herd productivity, including reproductive efficiency, genetics, nutrition and health. These factors are accounted for when the total adjusted weaning weight is divided by the number of cows that were originally exposed during the breeding season, regardless of whether they calved or weaned a calf.

Pounds of Calf Weaned per Cow Exposed = Adjusted

Total Weaning Weight / All Cows

If the capability is there to weigh all the cows at weaning, the “pounds of calf weaned per pound of cow exposed” can similarly be determined — an even more powerful tool for determining the production efficiency. At least calculating the pounds of calf weaned per cow exposed gives a commercial cattlemen the power to compare calf crops from year to year to determine how management decisions and changes in the environment (drought, heat, severe winter, hay shortage, etc.) really affected productivity. Having that information makes it easier to know how to improve it. More importantly, when income and expenditures are applied, profitability can be also be analyzed. Without these data, decisions at best are based on an educated guess. Basing decisions that affect profitability and quality of life on an educated guess is not sustainable practice. Δ

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