Ridin' Herd

▶ *by **Rick Rasby**, University of Nebraska*

Production calculations related to nutrition

It's not news to many of you that your nutrition program in the cow-calf enterprise affects reproduction in your cow herd, or that feed costs can account for 60% or more of annual cow costs. Any time feed inputs can be reduced without having a negative effect on cow and calf performance should result in a positive impact on the profit potential of the cow-calf enterprise.

Two important calculations

Cow body condition is linked to the nutrition program. Data indicate that the greatest loss of potential calves to wean is due to cows not getting pregnant during the breeding season. For spring-calving herds, cows that don't get pregnant during the breeding season are usually a result of cows being in poor body condition at calving due to nutrition management. Two production calculations that are affected by the nutrition program are:

▶ calf crop percentage, sometimes referred to as percent calf crop weaned or percent weaned of cows exposed; and
▶ calving distribution.

Calf crop percentage

Calf crop percentage may be the most important production calculation that a cow-calf producer can record. The reason for this statement is that it has both an input and output component. Inputs include nutrition and management — management during the breeding season, management during the calving season and management from calving to weaning. The output component

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is reproduction, and reproduction impacts pounds of weight available to sell at weaning.

Following is an abbreviated method to dissect performance of your cow herd by stage of production. Percentage calves weaned of females exposed is the number of calves weaned based on the females that were exposed to bulls to produce the calves that are being weaned. Mathematically, it is the number of calves weaned (numerator) divided by the number of females exposed to produce that calf crop (denominator), and this number times 100 to get it to a percentage [(No. of calves weaned ÷ No. cows exposed) × 100].

The challenge, sometimes, is that the numbers needed to do the calculation are collected more than a year apart. For females that wean a calf in October of 2013, the number of females exposed would be the number of females exposed to a bull during the breeding season in 2012. This process can be used to dissect percent weaned of exposed into different phases of the production cycle to get at pregnancy percent, calving percent and weaning percent.

Percent pregnant would be the number of pregnant females divided by the number of females exposed to the bulls. Calving percent would be the number of females that calve divided by the number of pregnant females, and weaning percent would be the number of calves weaned divided by the number of calves born live that nursed their dam.

Percent pregnant would give an indicator of number of nonpregnant females, calving percent would give an indicator of abortions and calves lost at calving due to dystocia, and weaning percent would give an indicator of calf losses from calving to weaning. As an example, consider a 300-cow herd in which 255 cows weaned a calf. Records indicate 37 cows had no calving records, six calves were lost at calving, and two calves were lost between calving and weaning. We assumed the 37 head were not pregnant because there was no record that they aborted.

The pregnancy percentage is 87.7% {[(300 − 37) ÷ 300] × 100 = (263 ÷ 300) × 100}.

The calving percentage is 97.7% {[(263 − 6) ÷ 263] × 100 = (257 ÷ 263) × 100}.

Table 1: Effect of calving distribution on avg. weaning weight before change in nutrition

% calved by 21-day intervals	Avg. age of calf at weaning, days	Weaning wt., lb.	Weaning wt. by calving group, lb.
40% calved first 21 days	232	595	238
65% calved by Day 42	211	549	137
85% calved by Day 63	190	503	101
15% calved after Day 63	180	481	72
Avg.	209		548

Calves gain about 2.2 lb. per day from birth to weaning.

Avg. birth wt. = 85 lb.

Calving date = March; weaning date = October.

Table 2: Effect of calving distribution on avg. weaning weight after change in nutrition

% calved by 21-day intervals	Avg. age of calf at weaning, days	Weaning wt., lb.	Weaning wt. by calving group, lb.
65% calved first 21 days	232	595	387
85% calved by Day 42	211	549	110
100% calved by Day 63	190	503	76
0% calved after Day 63	0	0	0
Avg.	222		573

Calves gain about 2.2 lb. per day from birth to weaning.

Avg. birth wt. = 85 lb.

Calving date = March; weaning date = October.

The weaning percent is 99.2% {[(257 − 2) ÷ 257] × 100 = (255 ÷ 263) × 100}.

If you multiply pregnancy percent by calving percent by weaning percent, you should be close to 85% (0.877 × 0.977 × 0.992 = 0.8499).

You can further dissect cow reproductive performance by age group using the process described above. If a lot of young spring-calving females are not pregnant with their second calf, it is likely due to the lack of energy in their diet after calving. There are Standardized Performance Analysis (SPA) guidelines that outline how to calculate production measures for the cow herd. To locate the guidelines, visit the National Cattlemen's Beef Association (NCBA) website (*www.beefusa.org*), or ask your state beef specialist to help you.

Calving distribution

Calving distribution, the number of cows calving in 21-day periods during the calving season, is affected by the nutrition program, and therefore body condition at calving, especially for spring-calving cows. Cows that cycle early in the breeding season conceive early in the breeding season and calve early in the calving season.

Twenty-one-day calving intervals can be easily calculated if you know when to start the first 21-day interval. SPA guidelines indicate there are two ways to determine when to start the first 21-day calving interval:

1. Start when the third mature cow (3-year-old or older) has calved; or
2. Start the first 21-day calving period 285 days after the start of the breeding season.

Calving distribution can be affected easily by monitoring body condition/nutrition prior to calving. Cows that calve in adequate body condition (BCS = 5) breed earlier in the breeding season and calve earlier in the calving season, and their calves are older and heavier at weaning compared to calves of cows that breed later in the breeding season.

Many times, a minor change in nutrition management before calving has a substantial impact on weaning weight, as illustrated in Tables 1 and 2 on page 70. In Table 1, 40% of the cow herd calves in the first 21 days of the calving season, and 15% calved after Day 63 of the calving season. Weaning age and weaning weight for each 21-day calving interval are recorded in columns 2 and 3. In Column 4, the contribution of weaning weight by 21-day calving intervals to overall is calculated.

In this herd, average age at weaning is 209 days, and average weaning weight is 548 pounds (lb.). Without any increase in feed

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cost, but by reallocating feeds to be fed at a different time in the production cycle over a two-year period, a greater percentage of the cows calved the first 21 days of the calving season. Calf age at weaning increased to 222 days, and weaning weight increased by 25 lb. to 573 lb. Understand that those extra 25 lb. are worth something less than market price due to a price slide. Nonetheless, there was no increase in input costs for the extra 25 lb.

In addition, Rick Funston, beef reproductive physiologist at the University of Nebraska West Central Research and Extension Center at North Platte, Neb., summarized data from an experiment of steer calves that were born in either the first, second or third 21 days of the calving season. Carcass weight and percentage of carcasses grading Choice were greater for steers born during the first or second 21-day calving periods.

Final thoughts

Nutrition is important in the cow-calf enterprise. Feed costs are the major component of annual cow costs, so feed costs must be monitored closely. To squeeze a penny of potential profit will take some pretty good management. You can't manage what you haven't measured. Calf crop percentage and calving distribution are two important calculations to make.

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Editor's Note: *"Ridin' Herd" is a monthly column written by Rick Rasby, beef specialist at the University of Nebraska.*