Vet Call

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Another perspective on milk production

Milk production is controlled by a number of factors, most importantly genetics and nutrition. The primary hormones that control or influence lactation are estrogen, progesterone, growth hormone and prolactin. All of these hormones are necessary for mammary development, which begins at the time heifers reach puberty and continues through pregnancy.

To initiate lactation near calving, prolactin, estrogen and cortisol levels in the bloodstream increase and progesterone decreases. Once lactation has started, these hormones have little effect on the amount of milk produced, but growth hormone has a very positive effect. Cows that have higher levels of growth hormone produce more milk by increasing the amount of nutrients captured by the mammary gland.

Peak lactation occurs at approximately 8½ weeks after calving in cows with suckling calves. Expected maximum milk production is highly dependent on cow genotype and age. Milk production is about 26% and 12% lower for 2- and 3-year-old cows, respectively, than for cows 4 years or older. Milk yield begins to decline as cows reach 5-8 years of age.

The correlation between milk yield and 205-day weight has been reported to be 0.6 (moderately correlated). This points out that although milk production has a positive effect on weaning weight, other factors also contribute. Level of milk production becomes less important in determining calf growth as lactation progresses.

Starting early in life, forage plays a role in supplying nutrients for the calf. By the time a calf is 60 days of age, it is consuming the equivalent of 1.5% of its body weight in forage dry matter. As the preweaning phase progresses, forage becomes an increasingly important nutrient source.

Researchers also have shown that calves from dams with low milk production rely on grazed forage earlier and to a greater extent than calves from dams with high milk production. The calves from low-producing dams made better use of the milk available to them. On average, 31 pounds (lb.) of milk were needed to produce 1 lb. of gain in calves from high- and medium-producing dams, while only 19 lb. of milk were needed to produce 1 lb. of gain in calves from low-producing dams.

The maintenance requirement for energy for lactating cows averages about 20% higher than that for nonlactating cows, but maintenance requirements are greatly affected by milk production potential. Because of the energy drain of milk production, high-producing cows spend more time during lactation in a negative energy balance.

In addition, the highest protein requirement during the production year occurs during early lactation. Like energy requirements, dietary protein needs to increase with increasing milk production. For each 5-lb. increase in daily milk production, protein requirements increase 13%-15%.

Milk production is important to cow-calf producers for several reasons, including its influence on calf weight at weaning and cow maintenance requirements in terms of calories and dollars. Work done in 1993 by the U.S. Department of Agriculture's (USDA's) National Animal Health Monitoring System (NAHMS) compared management practices of herds that had positive economic returns to herds with negative economic returns. They found that profitable commercial operations weaned slightly fewer pounds per cow exposed than negative-return operations (422 lb. vs. 428 lb.). More important to profitability were efficiency (that is, age at first calving for heifers), minimizing the use of feeds other than grazed forage, the attention devoted to price when buying and selling animals, and debt load. Neither calf weaning weight nor herd size was greater in the profitable herds.

In contrast, a study published in 1996 that analyzed Standardized Performance Analysis (SPA) data found that average weaning weight was higher in herds that ranked in the top 25% in terms of net income compared to the lower 75% of herds.

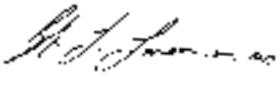
Work done in Nebraska in the early 1990s found that both biological and economic efficiency were greatest in groups of cows with low milk production compared to either medium or high production, especially if the calves were owned through slaughter.

The cows used in these studies were Hereford × Angus for the low-milk-production group, Red Poll × Angus for the medium-production group and Milking Shorthorn × Angus for the high-production group. Growth potential, mature size, feed availability and fixed costs were the same for all three groups.

The researchers concluded that expenses (in the form of energy input) contributed more to economic efficiency differences than did income (in the form of calf weaning weight) when comparing groups of cows with different milk potential. Unless feed sources for the cow herd are extremely cheap relative to those for growing calves, economic efficiencies favor cows with lower milk potential. Their recommendation, based on these trials, was that selecting for higher milking ability in breeds with an adequate milk level is questionable.

Because of these findings, it is clear that although some herds will benefit by increasing the level of milk production, many herds will not improve economic performance by increasing lactation performance. Factors such as current milk production level, harvested feed costs, grazing costs, prices received for calves, and whether or not calves are owned past weaning all affect the economic outcome for either increasing or decreasing the level of milk production in your herd.

Knowing your current cost of production and comparing that to projected changes in feed costs, pregnancy rates and weaning weights is necessary to determine the best strategy for your herd.



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