Will more milk mean cows won't rebreed?

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This is the last in a series of three articles intended to provide you with facts on the relationship between milk production, reproduction and profit. The discussion is based on six questions:

- What is a milk EPD (expected progeny difference)?
- Do milk EPDs really work?
- How much milk does it take to produce 1 pound (lb.) of weaning weight?
- Will more milk mean more feed? If so, how much more?
- What is the cost of weaning weight from increased milk production?
- Will increasing milk production mean cows won't rebreed?

In the first two articles of this series we defined milk EPD as a breeding value for milk production by a bull's daughters. An experiment in which groups of high- and low-milk-EPD Angus cows were machine-milked was used to prove that milk EPDs do reflect differences in actual milk production. The amount of milk needed to produce 1 lb. of weaning weight was estimated to be 15 lb., and the cost of calf gain from increased milk production was calculated to be $72/hundredweight (cwt.).

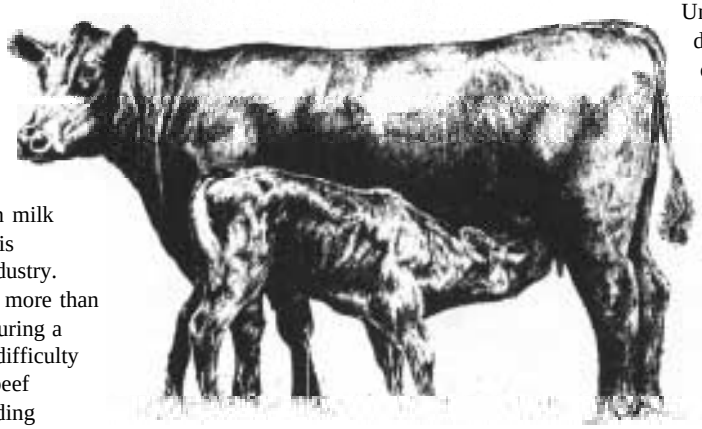
The final question to consider is whether the selection of replacements based on a higher milk EPD would lead to cows that won't rebreed. Simply put, the answer is "No." There is no negative relationship between milk production and reproduction in beef cattle per se, meaning we can increase milk production in beef cows and not necessarily cause a decrease in reproductive efficiency.

Why is there a widespread belief among producers that there is a negative relationship between milk production and reproduction? This probably arises from the dairy industry. Frankly, dairy cows that produce more than 20,000 lb. of fat-corrected milk during a 305-day lactation do in fact have difficulty rebreeding. Therefore, I suspect beef producers assume that the rebreeding problems of high-producing dairy cows would occur in beef cows. But beef cows don't necessarily suffer the same problems experienced by high-producing dairy cows.

The first thing that needs to be understood is what has happened to milk production of the average dairy cow during the past 50 years. National Dairy Herd Improvement Association (DHIA) records indicate that in 1950 the average cow in a DHIA herd produced less than 10,000 lb. of fat-corrected milk during a 305-day lactation. Thirty-eight years later that value has been increased 69% to an average of 16,915 lb. of fat-corrected milk in 1997. That 69% increase in milk production is the direct result of selection and the use of artificial insemination (AI) to maximize the selection pressure for increased milk production, as well as improvements in management.

In 1952 -when dairy cows were only producing 10,000 lb. of milk and AI use was in its formative years— first-service conception rates were around 65%. Today the conception rate in an average dairy herd is less than 50% and the highest-producing dairy cows — those producing more than 20,000 lb. of milk— have the poorest conception rates.

After sharing this information with you, how could anyone believe that, in the beef industry, we could increase milk production without decreasing conception rates? To understand why, you need to understand the reasons behind lower conception rates in high-producing dairy cattle.



First, you must realize that the milk production of a dairy cow producing more than 20,000 lb. of milk per lactation peaks at 75-100 lb./day. Conversely, the heaviest-milking beef cows produce only 20-25 lb./day, Therefore, dairy cows produce three to four times as much milk at peak lactation as any beef cow.

There is a period of time during the first three months of lactation when a high-producing dairy cow's energy requirement is so great that the cow physically cannot eat enough feed to meet that energy requirement. Therefore, even though dairymen feed high-energy, high-concentrate rations, there is no way their best cows can eat enough feed. That means the cow is obliged to go through a period of negative energy balance.

Reproductive efficiency of cows gaining weight or losing weight during the month of breeding

	Cow wt. change	
Item	Gaining	Losing
Inseminations, No.	1,368	544
Pregnancies, No.	911	234
Conception rate, %	67	44

Negative energy balance occurs any time an animal doesn't consume enough feed to support lactation. To produce 75- 100 lb./day of milk, a cow must "steal" energy and protein from her own body stores. As a result, body weight decreases.

Unfortunately, high-producing dairy cows go through this period of weight loss during the first three months of lactation, when that cow must be bred back to maintain a 365-day calving interval. Therein lies the problem.

Conception rates of animals that are losing weight during the 30 days prior to breeding are 23% lower than in cows in a positive energy balance during the month prior to breeding (see table).

Low reproductive efficiency of dairy cows is not directly related to milk production per se. High-producing dairy cows simply can't eat enough feed to meet their energy and protein requirements. They are in a negative energy balance, and they are losing weight. As a result, their conception rates are low.

Why is this not a problem in beef cows? Beef cows are not dairy cows. There is no beef cow that produces 100 lb./day of milk. That means that beef cows don't have to suffer the same problems with negative energy balance. Beef cows *can* eat enough to support their own lactations. Therefore, beef cows don't have to suffer the same reproductive problems as long as beef producers feed adequate diets to meet the needs of cows in the herd.

Summary

- **We have established that milk EPDs do work. The best evidence that they work is the different levels of milk production in groups of cows with different milk EPDs. If that doesn't convince you that milk EPDs work, there probably is no data on this earth that will.**
- **Does more milk take more feed? The rule of thumb presented was that every 1 lb./day increase in milk production would increase energy and protein requirements by 3%.**
- **How much milk does it take to produce 1 lb. of weaning weight? Research estimates were that an increase in milk production per cow by 1 lb./day should increase weaning weight (at 205 days) by 13.6 lb. Another way to put it: For every 1 -lb. increase in weaning weight, the cow is producing an extra 15 lb. of milk.**
- **The cost of the gain in weaning weight that is accomplished through increasing milk production was estimated at $72/cwt. You could argue that if high-quality forage is already available, it could cost less or that creep-feeding accomplishes the same thing more cheaply. The point is, to increase weaning weight through milk does have a cost. What each breeder has to decide is whether the situation justifies selection to increase milk production.**
- **Will heavier milkers rebreed? The claim that beef producers won't suffer the problems that the dairy industry suffers with high-producing cows is based principally on the fact that beef cows are producing about one-fourth as much milk as dairy cows. Under most conditions, beef cows don't have to experience a negative energy balance as long as rations are balanced appropriately for the needs of the lactating beef cow.**

Relating milk production with reproduction and profit is something that everybody talks about, but very few people have many facts to back up their opinions. This series of articles has covered a broad spectrum of critical issues. The purpose has been to "arm" readers with a few more facts. Hopefully, these facts will form the basis for further thought about milk production in beef cows and the role of selection based on milk EPDs. AJ