

# Milk quantity vs. quality

For years, cattlemen have discussed the pros and cons of milk quantity vs. quality. Many believe milk is milk, and quantity is the only factor that is important. On the other side of the discussion, many believe the range cow mammary system should serve solely as a lunch box for the calf, not a canteen. They say the calf can go to the creek to fulfill its daily water requirement; milk quality is most important, and some cows have richer, more-concentrated milk than others, enabling them to raise a bigger calf on less volume.

Milk quality is measured in terms of protein and fat content.

“Quantity is easily measured based on volume of liquid extracted from the cow,” says Bob Ohlensehlen, Extension educator for Idaho Cooperative Extension, Twin Falls. “Applying the knowledge we have learned from the dairy industry, we know that milk production (quantity) and fat content are fairly heritable. We can increase quantity and fat content through genetic selection quite rapidly in the dairy industry.”

However, he says, milk protein content is a trait with low heritability. And fat and protein content are independent of quantity.

“Milk EPDs (expected progeny differences) do not distinguish between quantity and quality of milk, rather they predict differences in pounds of weaning weight that cannot be mathematically attributed to genetic potential for growth,” says Don Marshall, professor of animal breeding at South Dakota State University (SDSU). “This means that milk EPDs are predicting growth derived from the milk’s protein and fat content whether that content is diluted or concentrated. Growth of the calf would be due to volume and quality of milk solids, not volume of fluid milk.”

That is not to say that a heavy-milking cow couldn’t have high-quality milk, Marshall adds. “Fat, protein and quantity are separate traits, so each animal could have a different performance potential for each trait as is commonly observed in dairy genetic evaluation.”

Twig Marston, Extension beef specialist at Kansas State University (K-State) examined the quantity vs. quality issue by actually milking and measuring quantity and quality of milk produced by beef cows. His work showed little difference in the quality of milk between high-producing and low-producing cows.

An Oklahoma study showed similar results. In both studies, milk from high-producing cows was equal in quality to milk from low-producing cows. In both studies, calf weaning weights were heavier for the high-milking cows at the expense of body condition and breed-back.

“Milk is an energy- and protein-rich food,” Marston explains. “On a dry basis (milk contains about 12% dry matter), milk contains about 25% protein and 130% TDN (total digestible nutrients). By comparison, corn contains about 9% protein and 90% TDN. It should be of little surprise then that milk production requires large inputs of protein and energy.

“We were unable to detect a difference in quality of milk between high- and low-producing cows,” he continues. “Therefore, it stands to reason that heavier-milk-producing



PHOTO BY SHAIJIA ROSE HERMEL

► “Milk EPDs (expected progeny differences) do not distinguish between quantity and quality of milk, rather they predict differences in pounds of weaning weight that cannot be mathematically attributed to genetic potential for growth,” says Don Marshall, South Dakota State University (SDSU).

cows are going to wean heavier calves. However, they will require more protein and energy inputs to get that added weaning weight or it will be at the expense of body condition and breed-back.”

Marston went on to state that they did see a difference between beef breeds for milk quantity and quality.

“Brahman crosses, for example, produced milk containing about 4% fat compared to 2% for other beef breeds,” he explains. “Our research also showed that cows producing the most milk continue to have higher energy requirements even after lactation has ceased. This is mainly due to an increase in the size of the metabolic machine, or organ size, required to process the increased energy for milk.”

So what is the answer, quantity or quality?

It appears to be a question of quantity of fat and protein in the milk as well as quantity of milk produced. EPDs measure the growth of the calf attributed to the fat and protein content of the milk, not the quantity of liquid consumed. A lower volume of rich, high-quality milk can be housed in a smaller, better-attached udder, yet produce the same or more pounds of calf weaned.

— by Ron Torell