Why Feed Supplemental Protein To A Cow On Pasture?

By Darrell L. Emmick Ph.D.

It never ceases to amaze me how we get caught up in "past practice" as a guide to what we do in the present, even when what we are doing in the present is not at all like what we did in the past. I have even made the statement "we should not throw away everything we have learned over the past 50-years of production agriculture just because we have gone back to grazing." Unfortunately, it now appears to me that I was wrong. The pasture-based livestock production system, be it for meat, milk, or fiber is fundamentally enough different than a confinement-based production system that we need to re-think what we are doing, how we are doing it, and why. And the first thing we need to do is to stop thinking the animal is the "stupid", and we are the, "oh so smart." Herbivores have been eating grass for about 400-million years. Think they don't know how?

Take, for example, the feeding of supplemental protein to dairy cows on pasture. Intuitively, it does not make any sense to supplement grazing cows with protein. Why would it? A well-managed pasture is at least 20% crude protein (most are much higher), and a lactating dairy cow only requires 16 to 18% protein in her diet. If a pasture is managed so as to not limit dry matter intake, i.e. grazed from a 6-8 inch starting height to not less than 2 inches of residual leaf area, and cows are moved to a fresh paddock after each milking (or whenever pasture becomes limiting), cows should be able to meet their protein requirements directly from pasture, and thus not require any supplemental protein. In fact, feeding supplemental protein may be why milk production in some herds is lower than it should be.

Protein is not limiting in well-managed pasture. However, energy is. Animals generally require 5 to 6 times more energy in their diets than protein. Thus, when supplemental protein is fed, depending on intake, total protein will exceed cow requirements, and rumen degradable protein will likely exceed what rumen microbes can efficiently utilize. Under these conditions, excessive protein is rapidly converted to ammonia, absorbed across the rumen wall, and transported to the liver where it is converted to urea and excreted. Unfortunately, this process takes energy that would otherwise be used by the cow to produce milk. Studies have shown the energy cost to excrete excess protein can result in milk production losses of 8 or more pounds/cow/

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day. In addition, ammonia is toxic, and toxic foods cause animals to stop eating. So, how much more milk do you want to lose by feeding excessive amounts of protein to your cows?

This information might be pretty hard for some folks to swallow, but not for our cows. Consider this. Behavioral studies from around the world have shown that when unsupplemented dairy cows, beef cattle, and sheep are provided with choice, they prefer 70% clover and 30% grass in their diets.

A high legume content dairy quality pasture.

Clover is generally higher in protein than grass, is more digestible, cows can eat more of it, and they can eat it faster than they can eat grass. Thus, in the absence of protein supplements, cows can more easily meet their protein requirements by eating clover than by eating grass, and that is what they do. However, in my research with lactating dairy cows, when I fed a supplement containing either 11 or 21% protein, cows generally responded by eating more grass and less clover, and specifically, the higher the protein content of the supplement fed in the barn, the less clover they ate when in the pasture. This is a complete reversal of what cows would prefer to eat in the absence of protein supplementation. In effect, when we feed protein to a cow in the barn ration, we are altering the cow's natural foraging behavior and, in the process, replacing low-cost protein derived from clover with high-cost purchased protein.

The short of it is concentrate foods do more than simply substitute volumetrically for foods obtained from pasture. Specific nutrients are replaced through nutrient-nutrient, nutrient-toxin, and toxin-toxin interactions. This is especially true when feeding protein. Too much protein fed to cows in the barn will reduce dry matter intake from pasture and cause you to have to feed more in the barn. For my money, it is not a fair trade to replace the low-cost protein derived from clover with high-cost purchased protein. A better strategy for feeding pastured dairy cows is to feed them all of the energy they can eat in the barn, let them harvest their own protein, and ask yourself the question " why was I feeding all that protein to my pastured cows anyway?"

Darrell Emmick is the State Grazing Land Management Specialist with the USDA - NRCS in New York State. ◆

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visits as individuals or smaller groups. The net effect is to put less demand on the watering system as a whole, improving its ability to keep up with the livestock's needs.

Fencing:

Energizers tend to have trouble with their "earth return system" which gathers electric pulses from the ground and brings them back to the ground terminal. Dry soil does not conduct electricity well. If other grounding systems at the farmstead become better relative to the fencing system's, the chance for stray voltage to develop in the facilities increases. Adding more ground rods to the earth return system and/or using a slurry of bentonite and salt around the full length of the ground rods can improve performance. Retest the adequacy of the system to ensure enhancements are effective enough.