



by Steve Martin

Has alfalfa lost its seat at the table?

I SAW AN article recently detailing the decline of alfalfa in dairy diets in California. We have seen the same trend in the other Western states where we work. It is interesting to look at the causes of this and how they relate to both business/economics and biology. This trend is a sure one and in my view it is a good move for the sustainability of milk production and overall dairy feeding management.

Don't misunderstand, I am not suggesting that alfalfa is not a good feed ingredient for building dairy rations. There are many reasons why this high-protein forage has been a staple for dairy cows for several generations.

Still the best choice?

But many of those reasons are rooted in the way we used to dairy – not the way we dairy today and perhaps not how we will in the future. Going forward, alfalfa as a feed ingredient needs to stand on its own with no preconceived inherent value. It needs to be “just another good ingredient.”

Let's first consider the advancements in dairy nutrition and feeding options that have put downward pressure on alfalfa use. Back in the day, protein was likely a limiting and expensive purchased nutrient that could be more easily grown in the field next to the dairy instead of being hauled in through a grain/by-product industry with limited logistics.

Today, this protein can be sourced from a plethora of by-products and moved easily through a modern transportation infrastructure. As starch and oil are removed from various grains for use as human food, the resulting higher-protein by-products are an easy option compared to growing protein in the form of alfalfa.

This comparison brings up the question, why do we feed alfalfa? Is it for protein or for fiber? I suppose it is for both. But if so, is alfalfa forage the best way to get them?

This brings up the next advance in nutritional science that relates to this fiber. In short, the fiber in alfalfa hay isn't anything special. In fact, the digestibility of fiber in alfalfa is modest at best if the plant is harvested at a maturity that has economically sustainable yields.

When I started in this business 27 years ago we were trying to move the discussion from crude fiber and total digestible nutrients (TDN) to acid detergent fiber/neutral detergent fiber (ADF/NDF) and net energy of lactation (NEL). This served us well for a decade or so, but we soon realized that assuming all ADF and NDF in all forages had the same value was wrong.

While we knew intuitively that this was not the case, formulation systems



assumed they were. We know that wheat straw and alfalfa hay don't have the same value, but in the not too distant past their fiber digestibility was assumed to be the same. Here is where the intuition breaks down and the truth has resulted in alfalfa having less value in a higher energy dairy ration.

Grass fiber is excellent

If we use a grass forage like Bermuda or Timothy, or a small grain to compare to the fiber in alfalfa hay, guess who brings up the rear? Alfalfa is the usual loser and lignin is the problem. In recent years many forage labs have added fiber digestibility to their nutrient reports and nutritionists now use it to parse out the differences in fiber digestibility and the resulting impact on energy value for milk support.

I suppose it's time to admit the obvious and mention what is displacing most of the alfalfa in dairy rations. Its protein has been mostly replaced by by-products like distillers and gluten, along with higher value oil meals like soybean and canola. The forage/fiber portion, however, has frequently been replaced with corn silage.

This becomes an apples and oranges comparison, so it is more correct to say that the fiber in alfalfa has been replaced by the fiber in corn silage. And while you may not have guessed it, the fiber in corn stalks in corn silage is more digestible than the fiber in alfalfa. If you take a look at the NDF digestibility on your forage analysis you will see this is true.

The real winner, though, in this race for digestible fiber is not corn silage but grasses. I think it's fair to say that the dairy industry undervalues the role that grass forages can play in building rations. (It should be noted that corn is technically a grass too.)

The way a grass plant grows, no matter whether it is a warm or cool season species, its fiber can be very digestible and can easily outpace the same measure in corn silage – and especially in alfalfa. Not utilizing

grasses is a missed opportunity both nutritionally and agronomically.

But enough nutrition discussion. What about the issues related to growing these various forage options? Suffice it to say that alfalfa has a difficult time competing when considering all of the factors involved. Chief among these is water. Alfalfa is a thirsty crop. Since dairy cows are often best suited for arid climates, alfalfa acres have dropped in areas where ground water supplies are a concern.

At the same time this trend has occurred, the economics of feeding more of the needed starch in the form of corn silage has taken hold. While getting a bigger bang for the buck on input cost and water needs, dairies are buying less corn grain. Instead they are supplying the needed starch through corn silage, all the while dropping alfalfa feed rates to make room in the diet.

Better starch availability

This change has been a double-win for nutrition as it relates to digestibility. As long as kernel processing is adequate, the starch in corn silage grain is usually more available than starch in dry-shelled ground corn. The fiber in immature corn stalks also has better digestibility than alfalfa hay. In general, when considering water, economics and the cost of the nutrients supplied, alfalfa struggles to compete.

The last point I want to make relates to how we dairy today compared to the way previous generations bought or grew feed for milk production. To put it simply, really big piles of corn silage are a better fit for large-scale milk production. Cows thrive on consistent rations and if corn silage is the basis then achieving that goal is realistic. But if an alfalfa-based ration is used it is simply more difficult.

Although a high corn silage diet could certainly be crippled by a less than desirable harvest period, in most cases dairies effectively put up good quality corn silage and lean on it for a full year. If inventory math is done carefully, few ration changes can re-

sult in such a system. But if alfalfa is the basis, then each cutting can be quite different and can require frequent adjustments to keep nutrient supply constant.

We know, however, that the nutrient specifications of a diet are only half the battle. Physical presentation is equally important. Having a year's worth of corn silage that was consistently chopped, packed and stored is a very different reality than six cuttings of alfalfa hay that range from high quality soft and short to low quality long and stemmy. The bigger the dairy, the more crucial it is that rations be easy to mix to a consistent end-point. Variable alfalfa quality, length and coarseness works counter to this important goal.

I should mention the potential of harvesting alfalfa as haylage instead of dry hay being a difference-maker in this discussion. In general, feeding haylage solves many of the physical mixing concerns of using high amounts of dry hay.

But alfalfa haylage comes with its own set of potential quality issues. It has a higher risk of poor fermentation, it is very unforgiving on hitting the sweet spot for moisture content, and it often has issues with high ash content. Nutritionally, haylage is very good and can be an important part of a diet, but successful inclusion rates tend to be lower rather than higher.

We like some feeding trends better than others. Less alfalfa is one of the good ones. Even so, in some geographies and situations, high alfalfa diets will remain the best and most advantageous choice. In these instances, by using newer science to understand the shortcomings of alfalfa fiber digestibility we can support high levels of milk production in a high-alfalfa diet. Newer varieties of low-lignin alfalfa could change this entire discussion; we will have to wait and see how that opportunity develops.

Less-alfalfa trend is clear

We know that more and more of the milk produced in the U.S. will come from high corn silage diets, with alfalfa as an optional ingredient that is left to compete on its nutrient value and economics with many other options that also supply fiber and protein. If you are holding on to a pound or two of alfalfa in your ration, even though it is expensive and inconvenient, you are probably doing so more for yourself than based on science, economics or the cows.

Using sound practices for sustainable crop and milk production, along with a keen understanding of available by-products and ingredient opportunities, will insure that when it comes to picking an alfalfa feed rate for a ration, we are truly feeding for the bottom line. **WEST**

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