

# Shadow prices can help shape rations

**L**IKE many reading this column, I spend a lot of time in the truck — probably more time than most. One of the ways to redeem that time is to listen to radio stations covering agricultural markets. This is a great help in keeping up with feed value trends for ration formulation. I never want to act surprised when a client tells me about a feed price reality impacting the dairy. Especially over the past few years, the volatility has been a constant challenge.

Most market information commentary on the radio seems to come from the viewpoint of the crop farmer as opposed to the farmer who feeds cattle. It is a bit like listening to your team's football game with the opposing team's announcers.

High feed input costs are a significant concern for my clients. Corn or soybeans reaching or surpassing a certain "high value" mark is celebrated in a market report from a crop farmer's perspective. However, the farmer who feeds dairy cows or beef feeders sees a struggle instead of a celebration.

## Look at the deliverables

One of the key concepts in a volatile feed market is to remember that we are feeding nutrients, not ingredients, to make milk and beef. The requirements are for grams of metabolizable protein, not pounds of soybean meal or canola. We need energy, not necessarily a certain amount of corn or fat.

The use of a strong nutrition model with a good linear program function will aid in this effort. Yes, we all have ration tendencies and ingredient combinations that have been proven time after time. In feeding today's dairy cattle, we need to be able to pivot as needed based on ingredient values.

In many instances, I often get asked to calculate shadow prices for different ingredient options. This is one of my favorite tasks as it flexes the muscles of both economic and biological modeling.

Can we build it cheaper while maintaining the correct nutrient supply and animal performance? This is the key question. We must look hard for feed cost savings. Shadow price calculation is a way we look for these opportunities to reduce feed cost.

Should we feed canola or soybean meal? Should we feed bypass soybean meal or include some rumen stable amino acids? The ration model can answer these questions with careful use of the linear programming function often called optimizing, solving, or least-costing. Shadow price projects, however, are tricky and can easily give a formula-tor the wrong answer.

A great example of this might be in finding the value of alfalfa hay in a ration. The question might be related to replacing alfalfa hay with a combination of wheat silage and soybean meal. When solving this ration and looking for the shadow

price of additional soybean meal in the diet, you must be careful to watch ration calcium.

Calcium?

I thought we were talking about the protein value in alfalfa compared to soybean meal. Yes, but alfalfa hay supplies a significant amount of calcium to a diet.

If you have a calcium minimum on the diet and fail to offer more limestone to the ration solution using soybean meal and wheat silage, the shadow price of the ingredients in question will not be correct. It will overvalue the alfalfa hay even though calcium is the least expensive nutrient in the entire diet. Many times, calcium is included in a mineral package delivered to the dairy and not offered as a single ingredient.

A new formulation exercise, as we move from the 2021 crops, involves planning the 2022 silage crops by allowing this year's silage to compete with next year's crop. With projected input costs skyrocketing, the cost of the recently harvested silage in storage is a significant value compared to the projected cost for what will soon be planted for the 2022 harvest.

## Consider your inventory

If you look at the total cost of feeding over the two crop years combined, stretching the current crop and actually planting less of the next crop could be an advantage. Now, with the way things have been lately, the 2023 crop may be even more expensive. However, if

a producer has a large quantity of nicely priced silage in current storage, looking at how the smart use of grain by-products and other roughage options to stretch that advantage might be the right choice.

The use of the "solve function" in most ration software will result in lower feed costs. It is true that the computer is smarter than you! However, this process must be guarded with much attention given to numerous "minimums" and "maximums" on both nutrients and ingredients. Also, one must apply a healthy dose of good cow sense.

Additionally, we don't need to be in a state of constant change, chasing every penny of feed cost savings opportunity. This is more of a high-level, long-term ingredient selection to supply the needed nutrients with an open mind and a measure of care.

Overall, cows are more flexible than you think. A deep dive into true nutrient values from a variety of on-farm and purchased ingredients is the path to maximum profitability. 🐄

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