What's in your mineral formulation?

by Steve Martin

I RECENTLY received a call from a client who wondered why the cost of his milk cow mineral had increased. Remembering that we had made a few changes in recent months, he rightly suspected that they were the cause. I really appreciated the way he posed the question. He didn't make me feel as though I needed to defend the cost of the mineral, and it started a great discussion that resulted in a better-informed dairy owner.

In 23 years of building dairy rations I have often found myself defending the cost of mineral formulations. Although minerals' cost contribution is allocated to feed, the nature of that cost doesn't behave like other feeds. That disconnect causes confusion and builds mistrust. After the question from my client I thought of a way to help him better understand what he is actually buying.

We took the mineral apart and grouped its components into four different categories. This process itself illustrated the shortcomings of the word "mineral." The feed industry has given the name mineral to this ingredient over the years. In some dairy areas it might be referred to as mineral supplement, or perhaps just supplement. That name is probably more fitting. So what about those four groups?

I call the first one the true mineral group. Its ingredients provide nutrients that meet the mineral requirements of animals. The largest quantity of mineral requirement by dairy cows is calcium. Thus, it often comprises the largest single proportion of many lactating minerals. Other ingredients in this group include phosphorus, magnesium and potassium.

Salt and sodium bicarbonate are there too. This list of macro-minerals is fairly standard in U.S. dairy rations and is the feeding-rate driver for mineral formulations. By feeding-rate driver, I mean these ingredients noticeably increase the amount per head per day of the mineral formulation. These ingredients also have a bit of a commodity "feel" to them.

Trace minerals important

We also include trace minerals in the true mineral group. These nutrients are required by cows in much lower quantities and tend to increase the cost of the mineral more than its feeding rate. Chief among these are Zinc, manganese, copper and cobalt. These are available in many forms from many suppliers, have much less of a commodity feel, and require a bit more complicated shopping. The requirements for them are also less well defined. To add a further complication, different suppliers use different methods to insure biological availability to animals.

That last point is a good bridge to the next group. I call it the "technology ingredients" group and some value-added trace minerals might truly belong there. The more common, but less descriptive, term for this group is feed additives. I try to stay away from this name, since most dairy producers only see an added cost, not a delivered technology.

These technology ingredients usually don't increase the feeding rate, but they do increase the cost of the supplement formula. Included in this group are yeast ingredients, fermentation enhancers, ionophores, toxin binders, enzymes, etc. I describe these ingredients as "opportunities." Including these ingredients in your mineral blend offers cows the opportunity to participate in technology to either enhance milk production, improve efficiency, or improve health and reproduction. They are certainly not minerals, even though the vast majority are delivered in the purchased supplement.

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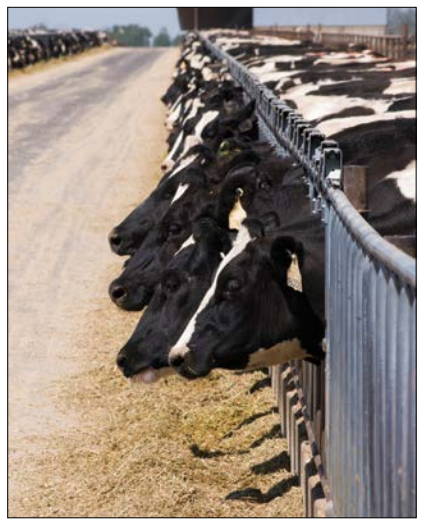
The third group I call simply "feed nutrients." The main distinction here is that their presence in a mineral formulation replaces normal feed ingredient nutrients like soybean meal, cottonseed or tallow. These are obviously not minerals and they may or may not drive up the overall feed cost per ton or per cow. Fat sources are a great example. Adding a fat supplement to the mineral formula often makes sense to reduce shrink and improve loading accuracy. However, they also add significant cost to the supplement formula. But if they are removed an ingredient like cottonseed or perhaps tallow would need to be added to the ration to make up for the lost energy.

The other common nutrient that moves in and out of mineral formulations is protein. Its addition to the mineral would allow for improved targeting of the cow's requirements and allow a lower feed rate for ingredients like canola or soybean meal. If protein is in the form of highly concentrated synthetic amino acids, it will increase cost more than feeding rate. I often see bypass soybean meal sources included in minerals and they do significantly increase the mineral feeding rate.

Urea must also be mentioned in the protein discussion of mineral formulas. Adding urea to a mineral can increase mineral cost, but it almost always results in an overall reduction in ration cost per cow. It is not a



true mineral, but more of a synthetic blend that is very rich in nitrogen. Urea is almost always included in either a dry mineral blend or in a liquid feed. Like synthetic amino acids or bypass protein, it can result in a nice reduction in needs of soybean meal or canola.

Don't forget vitamins

I should make a quick mention about vitamins, which comprise the fourth group. They are all but forgotten in most mineral discussions. Only vitamins A, D and E are routinely added to ruminant diets. The sources of A, D and E are considered commodity ingredients and their requirements are well defined. Of particular interest here is vitamin E. Various levels are recommended and it is the only vitamin with a notable cost contribution.

The goal of including the correct amounts of all four of these groups into a mineral formula is to improve milk-to-feed ratio economics. Paying too much attention to their cost per ton is perhaps a misplaced effort. It may or may not make sense to include these various parts in a particular mineral formula. The best answer depends on the situation. Most things you add to the mineral formula will increase its cost. For example, if a particular amino acid ingredient improves the nitrogen balance in your ration, your mineral price will go up, your protein meal usage will likely go down, and you hope that any extra cost will be less than the extra milk income.

The same can be said for adding technology-based ingredients to your ration. These will likely be included in the mineral and increase its cost per ton more than just a little! A technology ingredient that costs 5 cents per cow might add a whopping $66 per ton to your mineral! But it is still 5 cents per cow. If the result of that addition increases gross income more than 5 cents, you just made money. Don't sweat the $66.

An example I can't help but use here will help make the point. What if rBST could be included in the diet instead of being injected? Guess how it would probably be delivered to the cow – in the mineral blend. So let's consider its hypothetical economics in a feed cost environment.

Assume that a dose of rBST costs $6.50 and is given every 14 days. That's 46 cents per day. If that were included in an average lactating cow mineral with a feeding rate of 1.75 pounds, it would add $530 per ton to the mineral cost. I wonder how that would make dairyman feel about its cost. In reality, it would make no difference at all.

The main lesson here is to not overthink the cost per ton of your mineral. Understand it, but don't obsess on it. Spend more time focusing on the cost per cow of your whole ration and how it compares to gross income per cow from milk sales. The measuring stick for feed and milk economics is margin per cow and how much investment it took to attain it. The correctly formulated mineral supplement will improve your margin and insure that you are truly feeding for the bottom line. *WEST*