by Steve Martin

What is my ration balanced for?

OCCASIONALLY, I get a question from a client regarding how much milk their lactating cow diet will support. This question usually comes up when the cows may not be meeting expectations.

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"Well, then, how much milk is my ration balanced for?" would be the likely follow-up question. This question is relevant and opens the door to a good conversation about the basics of formulating lactating dairy diets.

Digging into the answer for this question touches on several topics ranging from biology to economics and even how I choose to print my ration formulation for my client. It is also a great example of a question that can truly be answered with, "Well, it depends."

A step-by-step process

After doing the sacred work of sorting through forage analysis reports, feed cost information, and silage inventories, a lactating ration is solved, balanced, and ready to feed. Then, I have to pick a way to communicate this to my client. Though this seems like it should be the simplest part of the whole process, it actually requires some thought. Most ration formulation software programs have an abundance of choices when printing a diet. Checking the right boxes for the report is definitely an important step in the process.

I take time to thoughtfully communicate the important pieces of information relevant to implementing the ration. One of the many choices in this process is including the answer to the aforementioned question. At the top of the page for the ration, I can include the pounds of milk this ration is balanced to support. It would seem this would be a good idea to include and would remove the need for the question in the first place.

So, why do I almost never include that milk support in my reports? Well, it is because it truly does depend on a few things.

The reason it's missing

The first and most obvious reason might be related to legal issues. The questions would come from the client, "Why do the cows sometimes milk less than the milk pounds the ration is balanced for? Are you guaranteeing this much milk?"

The real reason is another question. Are we balancing a diet to meet the needs of the average cow on a farm or in a group? Are we balancing for the top-end producer to be sure it has enough?

We do, in a way, balance for averages of animals. Since lactating cows are nearly always fed to appetite, variations in actual intake for each individual cow is the key to making the approach work.

The two major factors that justify the answer "it depends" are body weight and intake. But that is not all. When answering the question posed early in this story, you need to also consider areas like butterfat and protein variation in milk, weather, walking distance, pregnancy status, and body weight loss or gain. The list goes on. So, it truly does depend!

I do reject the notion that ration models always overpredict milk production. This is a bad answer to the question.

I am confident that for an individual cow, if we input the actual details mentioned above, we can say how much the ration is balanced for and it should be very close to what that cow is producing.

Just think of all the variables for these details. We have animals that are losing weight and gaining weight, are pregnant or not, in a pen closest or furthest from the parlor, and all of this variability is within genetic differences. It is really amazing that balancing for the average cow actually works as well as it does.

As mentioned before, the ability for cows to eat more or less of the same diet is the key. If we actually hand-fed every cow, we would have to be much more detailed. I should add that in tie stall barns, research farms, the computer feeders of 20 years ago, and now with robotic milkers offering cows more feed, we have the opportunity to address some nutritional needs on an individual cow basis.

The real goal

The reality of individual cows modulating their voluntary intake based on their actual production, body weight, reproductive status, and stage of lactation allows us to build rations to nutrient specs from a concentration basis. Instead of knowing that a ration is somehow magically formulated to support 100 pounds of milk, I would prefer my client to know that their high production diet is balanced to a high net energy for lactation (NEL) and that it has the metabolizable protein (MP) and amino acids support for that energy level. Since energy is almost always the limiting factor in a lactation ration, maximizing NEL in a diet with adequate roughage and being sure the ratio of MP is adequate is truly the key to success.

So, we talk a lot about NEL. The MP and other protein-side nutrients are more difficult to sum up and quantify, but we can focus on NEL. If I send a client a ration that indicates an NEL of 77 (mcal per 100 pounds), and this high production diet is usually a 79, I would expect my client to ask why the NEL dropped.

Likewise, if we have a late lactation pen of cows that are balanced for 76 NEL, and I sent a diet at 78, I would perhaps expect to be questioned. I know NEL isn't a perfect science, but it is the one number that best indicates if a ration is built with the pedal down by including starch, high added fat, and digestible forages.

Each time I get asked the question about how much milk a ration is built to support, I go immediately to the formulated NEL level for a more meaningful discussion. Keeping these levels aggressive and being sure cows can consume to appetite will offer the best results as we all strive for that 100-pounds-of-milk supported ration.

The author is the founder of DNMCmilk, which works with dairy producers and heifer growers in several regions of the U.S. and around the world.