



by John Goeser

# Cows have a way of talking to us

**O**F COURSE, cows do not talk to us in the literal sense. Instead, your herd figuratively speaks to you and your advisers through production trends and other quantifiable herd tendencies.

As dairy owners, managers, or consultants, we are routinely asking, “What did the cows say?” in regards to a nutrition adjustment. We’re constantly reading what your cows communicate by monitoring dry matter intake, milk components, or other daily records. Your herd can also translate opportunities in what’s left behind in manure.

**Goeser**

## The rumen’s magic

Dairy cattle are amazing animals with the ability to derive energy and protein from feeds that other species without rumens cannot. Unlocking this otherwise unusable energy in forages and by-products for food production should be better recognized by our global mainstream society as a benefit. At the same time, most dairy producers do not recognize the average total mixed ration (TMR) digestion and use is only around 60% to 65%. This is a stark contrast with swine or poultry diets, where feed digestion can eclipse 85% to 90% of total intake.

Digestion percentages are tough to grasp, so I’ll often speak in terms of pounds or bushels to get a point across with more concrete terminology. Picture a dairy cow consuming 55 pounds of total dry matter. Then recognize that it derives energy from only around 34 to 35 pounds of that bushel basket on average.

## Tossing half away

Now, with this in mind, analogize to your refrigerator. Imagine buying 55 pounds of groceries but only eating a bit more than half and throwing the rest away! This is reality in dairy nutrition.

Fortunately, average is not the focus here. Better performing dairy herds and rations can achieve 70% to 75% TMR digestion and utilization. As we move up from 65% to 70% or even 75% TMR digestion rates, every pound of TMR we can unlock more energy from can yield roughly 3 pounds more energy-corrected milk.

Herein lies a fantastic feed conversion efficiency and economic opportunity: getting more from the same intake or less. The higher performing TMR and herds ensure cows

consume exceptional feeds, blended in a balanced TMR, and then consistently deliver and manage the feed at the feedbunk day to day.

There are many other contributing factors to high-end TMR digestion and feed conversion efficiency. The path to understanding how much of your diet is really being digested includes looking at what’s provided in the TMR and then what’s left behind in manure.

## Let’s look at starch

Roughly 10 to 20 years ago, Jimmy Ferguson, Mike Hutjens, and Randy Shaver all contributed efforts showing that dairy cattle fecal starch content could accurately measure total tract grain and starch digestibility. Focusing on grain and manure is one research-backed avenue to find performance gains, but major efficiency opportunities exist in fiber and other nutrients as well. Unfortunately, manure fiber content isn’t very informative. When we tie the TMR and manure together, we can accurately determine what cows digested for all nutrients, including fiber.

Following a similar approach to that used by researchers in feeding studies nearly 10 years ago, I was part of a group effort demonstrating that commercial TMR and fecal samples from high-production pens could accurately assess diet digestibility. We found that commercial dairy TMR apparent digestion (TMRD) related to herd performance. We published our findings in the *Journal of Dairy Science* and began using this TMRD approach to find hidden dairy nutrition opportunities.

A diet may look exceptional on paper, but there may be interactions that detract from how much value cows derive from the TMR. We can pinpoint opportunities with paired TMR and fecal samples.

There are a few drawbacks to this approach, including needing both TMR and fecal samples and recognizing that wet chemistry analysis is a must. Over the past 10 years, we’ve determined that TMR apparent digestibility calculated from NIR measures is unreliable. While NIR routine feed testing measures are exceptionally accurate for all individual feeds and manure, when multiplying NIR data together, the small errors compound. Hence, wet chemistry is required. This means that turn around time is typically 10 to 14 days.

## Cows didn’t quite respond

Understanding these factors described above, many have dug in with this approach and made strides forward. As discussed in the article “Silage quality doesn’t play out like a textbook” in the January 10, 2021, issue, we’ve found that forage quality in the Midwest has been

exceptional. Yet, recent experience alongside my colleague Stephanie Jens has uncovered opportunities in several situations where forage quality didn’t translate through the cows. With several Midwestern dairy herds recently, there was a common theme when reading what the cows told us through TMR and fecal samples. The apparent TMR fiber digestion by the high-production cows was less than what the nutritionist and dairies expected.

The forage quality for these herds was above average, but when we reviewed the TMR and manure-backed report, we recognized the cows weren’t unlocking the full caloric potential in the forage fiber. The different herds found different contributing factors to the inefficiency, but in general we discussed how TMR mixing and particle size, inconsistencies in feed delivery, or anti-nutritional factors can be contributing factors.

These herds’ rations had potential, but the cows weren’t recognizing the full energetic value in the diet. This nutrition inefficiency could be thought of similar to driving on a flat tire.

## A “flat tire” herd

If your herd seems to be driving with a flat tire, it may be worthwhile to read deeper into what the cows are capturing from the TMR. Consider exploring beyond the formulated diet projections, recognizing there are management and other interacting factors that can hamper rumen digestion and performance.

The stories above are tied into fiber, but there may also be protein or starch opportunities, which are increasingly valuable during high feed cost times like the present. Work with your nutrition and advisory team to put the air back in your herd’s tires and achieve top-notch feed conversion efficiency. 🐮



**“There’s hope for our son!  
I found a copy of *Hoard’s Dairyman* under his mattress today!”**

Goeser is the director of nutritional research and innovation with Rock River Lab Inc., Watertown, Wis., and adjunct assistant professor, dairy science department, University of Wisconsin-Madison.