



by Steve Martin

## Is there a perfect cow pie?

IT SEEMS that perhaps manure is the barometer of a dairy. When discussing weather, temperature gets most of the attention. The high and low temperatures are the key weather facts of a day. The barometric pressure is important, too, but certainly less well understood by the average person. In a way, milk production on a dairy is analogous to a thermometer reading, and manure is a bit like the barometer.

### Milk and manure metrics

The focus on milk production level for a particular dairy is logical as it would likely be the starting point for telling the story of that farm. Similarly, the high and low temperature for a place you plan to visit will get the most attention.

A trained meteorologist, however, would go a few steps further to incorporate things like wind speed and direction, humidity, and barometric trends. The analogous details describing a dairy might include several things related to feed, the body condition of the cows, and a lot of attention to the manure.

Dairy industry folks talk a lot about manure. Yes, it comes up in other livestock production sectors, but it doesn't garner near the attention it does on a dairy. The unique spot where a dairy cow sits between a brood cow and a feedlot animal might offer an explanation. Unless mature beef cows are grazing lush, seasonal forage, we expect a dry, stacky, and even "tall" manure pile.

Conversely, we expect a feedlot animal to have much wetter and looser manure, resulting in a pretty flat spot on the ground. The extremes in rations for these two groups makes the resulting manure a much less interesting topic for discussion. To be sure, when animals are sick, a

manure evaluation from a gut health and infection viewpoint is always warranted. But using it as a barometer to explain ration results and production is decidedly "dairy."

### The perfect pile

We all have a vision of our perfect pile. Freshman year nutrition tells us what makes manure stacky or loose, and it is a knob we turn often to dial-in and get that perfect pile. There is art and science in this process of tweaking rations based on what we see in manure, and we will dig in to both a little here.

In our consulting group, we have devised a 1-to-10 manure scoring system to offer a little structure between us. That perfect pile for most would be a 5 or 6, but if you are feeling a bit edgy and are pushing for milk, a 4 might be the ticket. It allows our team to communicate correctly on shared clients in routine analysis and troubleshooting. But this "thickness" discussion doesn't describe everything.

A quick reminder of freshman-level nutrition revolves around forage and roughage in the diet. The longer the material is and the higher the level of fiber, the tighter the manure. This is all related to how fast this roughage material leaves the rumen and the overall rate of flow through the entire gastrointestinal (GI) tract.

The correct term for this is rate of passage, and it is a familiar term and principle to most dairy producers. The longer those undigested feed particles stay in the large intestine, the more water is absorbed across the gut wall. If they stay longer and are not pushed onward and outward by the next meal's undigested material coming down the tract, the resulting manure will be drier and more stacky. In a feedlot

steer on a very low roughage diet, everything moves fast, and thus the manure is wet and the piles are flat. Understanding these two extremes helps us navigate the middle of the spectrum where the dairy cow lives.

### The dependable dial

When manure needs to be "tighter" or "looser" based on visual observations, adjusting the amount, length, and quality of roughage is the likely fix. As long as a loose manure problem is not from a pathogen, this roughage tweak is very dependable.

But just because we have possibly achieved the needed change and have arrived at our perfect manure score, have we really moved the needle for milk production? This has more to do with what's left in the manure and if we perhaps missed the opportunity to turn purchased feed into sellable milk.

Measuring fecal starch would be an example of going to the next level in evaluating manure. We can easily see evidence of undigested corn particles in a manure pile. The fecal starch analysis is probably necessary to fully evaluate corn digestibility. This process is helpful in evaluating kernel processing, adequate corn grinding, flaking, or rolling.

Looser manure may contain undigested starch due to a high rate of passage from inadequate physical roughage in the diet, even with adequate corn grain processing. Correcting this can certainly improve milk production.

### Moving beyond corn

Consider this same topic, but instead of looking for corn in the manure, what about whole cottonseed? As visible and obvious as undigested corn can be in manure, cottonseeds are much stealthier.

We do routine manure screens for our clients' herds. In addition to studying corn and roughage particles, we look closely at undigested cottonseeds. These undigested cottonseeds are not visible without a manure screen. An overabundance of undigested cottonseed on a manure screen indicates not only a lost opportunity to turn the fat and protein found in that seed to milk, but there is also the potential that digestibility has been lost in the rest of the diet.

Evaluating manure has a very wide range of approaches, from good cow sense to complicated math. Taking time to look at and respond to manure status from a visual appraisal is a must. The next level would be to complete a lab analysis on some manure to see levels of starch or perhaps other nutrients.

To take this topic even further, paired samples of the ration and the manure allow the use of indigestible markers, like undigested neutral detergent fiber after 10 days in the rumen (uNDF240), to calculate the actual digestibility of various nutrients in the diet. Taking the opportunity to learn from a "boot scrape" all the way to a potential nutrient digestibility study can help us maximize the efficiency of converting purchased feed into sellable milk. Getting your boots dirty is key to profitable milk production. 🐄

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.

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