



IN THIS ISSUE:

Manure happens. Here's how to assess it
 Consultant's Corner: Start looking down at what cows are saying
 From the Maternity Pen: Feeding strategy for short dry periods
 Beyond Bypass: Which bypass method protects best?
 West Central Happenings: Dr. Jesse Goff to Head West Central Research

MANURE HAPPENS. HERE'S HOW TO ASSESS IT

Choosing to ignore any of the dozen easy puns, let's cut to the chase: As stores of forage dwindle and additional sources are drawn into the dairy's mix, rations are in constant motion this time of year. Few simpler diagnostics for those rations exist than the manure at your feet, says U.S. Dairy Forage Research Center's Mary Beth Hall, PhD. There has to be a good biological basis for why manure looks the way it does. Screening and evaluating it can help the consulting nutritionist evaluate how cows respond to rations in flux. She suggests:

Contextualize it. Because it's not particularly quantitative, Dr. Hall says, manure screening presents information for you to use in context with your other observations. Those may include the consulting staples:

- Health: digestive upset, acidosis, laminitis
- Performance: milk and fat yields
- Rumination: at least 40 percent
- Cow behavior: feed sorting, comfort

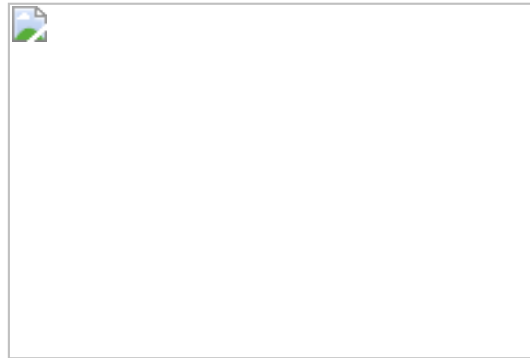
It also includes the more subtle observations that may not seem to be at first glance the province of the nutritionist, such as facilities—including feed storage—employee habits, bunk management and administrative style.

Manure evaluation should be seen as a tool to help understand how the cow is interacting with her ration, Dr. Hall says. If everything else looks fine but the manure doesn't seem right, keep watching the cows, and question what you haven't checked. Ultimately, the cow is the only one who knows what effective fiber is and how much is enough.

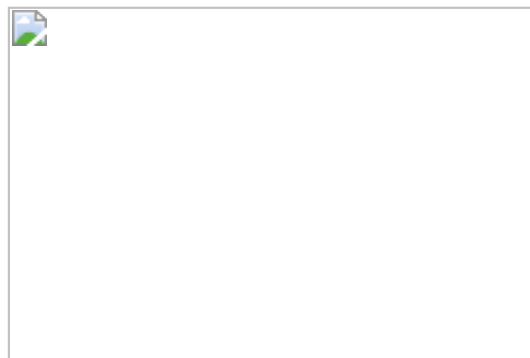
"The cows are always right," she says.

Focus on the Delta. Manure evaluation isn't

TYPICAL PROBLEM ALERTS



Diarrhea: Large-intestine damage and increased organic acids in the gut lumen may play a role in diarrhea often seen with ruminal acidosis. Feeding spoiled or moldy feed can also be a cause. Diarrhea should not be accepted as a normal result of high DMI.



Bubbling: Excessive bubbling—even to the point of foaming—signals too much fermentation is taking place in the hindgut. Whenever the rumen is bypassed on fermentable feeds, feed efficiency is likely suffering.

quantitative. We have no reliable method to standardize and predict its amounts and proportions based on the feed that cows eat. As a result, Dr. Hall says, the most meaningful results come where you find observable variation over time:

- Within groups
- Between groups
- Between rations

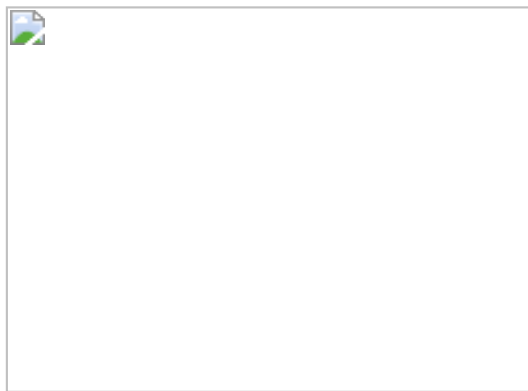
Sample about four to six pies per group for particle size and consistency. Remember manure qualities may vary with the same individuals over any 24-hour period and even as weather changes. And beware that you'll always have a number of outliers on the curve; perfect uniformity never exists.

From there, you can set observational benchmarks useful for comparison. You generally expect manure to be looser with high-protein feeding and sometimes when incorporating high levels of salts and buffers. But if the rumen is functioning well and the grain is not cracked too coarsely, you shouldn't see many particles bigger than half an inch or whole pieces of corn stalk, excessive undigested citrus pulp that's still orange, grass that's still green, whole cottonseed with the lint still on and other signals of poor digestion. If manure within a feeding group varies from OK to diarrhea, watch cows eat to ensure they're not sorting.

Interpret, but don't over-interpret. Of course, the \$64,000 question is: What's the cause and what's the fix?

Generally, evaluation of manure that's consistent within a group is about gauging the extent of digestion that takes place after the rumen. Undigested feed—long pieces of fiber from forage, cottonseed with the lint intact, whole grain and excess cracked grain—indicate overall reduction in rumen digestion. The low pH or inadequate fiber mat it signals typically owes to a poor quality forage source or poor processing. But providing adequate physically effective NDF to allow the rumen to function is always a balancing act with providing adequate nutrients, Dr. Hall recognizes. Whole or coarse grain remnants usually mean harvesting or processing problems.

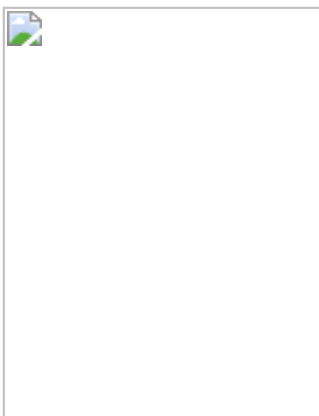
In the end, she notes, remember that manure screening is just one tool in your observational arsenal. Use it to educate dairy clients on the importance of not compromising rumen function in the name of high intake or energy density. But don't over-interpret the information.



Mucin casts: Damage to the gut structure, as can be caused by excess organic acid production in the hindgut, appears as mucin casts in the manure, indicating the gut lining is being stripped off.

All photos courtesy Dr. Mary Beth Hall.

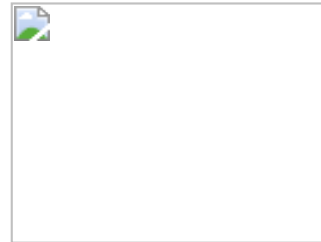
PROCEDURE



- Take four or five samples per group. Capped 8-ounce sample cups work well.
- Select for variation representing the group.
- Make sure the samples aren't contaminated with feed or bedding.
- Use a screen or kitchen strainer with about one-sixteenth-inch openings.
- Gently wash the cup contents into the strainer with a steady water stream. Rinse until water runs clear.
- Transfer the remains back to the sample cup so each can be compared side-by-side.

PARTICLE SIZE

Two samples from two cows in the same pen given the same ration—yet differing in the amount of large fiber particles or noticeable grain—typically indicate sorting that ends up providing insufficient physically effective NDF to maximize rumen digestion. Sorting can be done either by the cow or by you, if you're mixing incompletely or offering supplemental hay, for instance.



CONSULTANT'S CORNER

START LOOKING DOWN AT WHAT COWS ARE SAYING

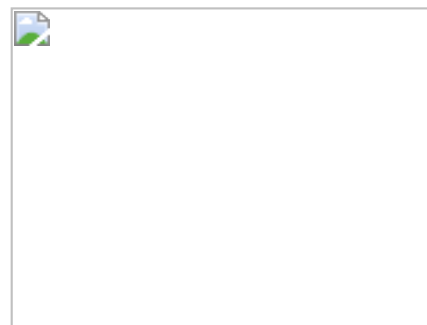
Arden J. Nelson, DVM, Dip ABVP-Dairy, Syn-Apps RD and Windsor Dairy, Windsor, Colo.

I began washing manure around 1977 to show clients when digestion was way off the mark—usually based on just having done repro exams on a third of their herd. Using a system as simple as a window screen and the parlor wash hose, in as little as two to four weeks time we could make radical changes in how efficient a dairy's ration was.

It's a very useful learning tool and a very useful teaching tool—not only for dairy producers but also for the consultants advising them. Just as we learned by shaking TMRs, a lot can be gained on most dairies by helping clients see they're not always feeding the ration they think they are.

Sometimes I think we've forgotten that cows are ruminants. In my opinion, there really hasn't been enough research into the connection between rumen function and cow health. Yet any AI technician or pregnancy detector is going to be able to tell you about the huge variation in manure they see on dairies caused by rumen dysfunction. We can learn one heck of a lot by just remembering to look down at it. In fact, one guy told me he can tell whether his cows are doing well by how easy it is to load his spreader.

Start looking! Manure is the most plentiful thing on a dairy. We walk through it daily. We spend too much money dealing with it. We just have to learn to look at it, record the observation, put it in context, and repeat, until we can translate to clients what the cows are trying to tell us.



The Cargill Digestion Analyzer combines stainless-steel top, middle and bottom screens at, respectively, three-sixteenths-inch, three-thirty seconds-inch, and one-sixteenth-inch gauges, to sift manure much as TMR shakers do. Available at Nasco Farm and Ranch, they currently go for \$195.

Photo courtesy of Cargill Nutrition Services

FROM THE MATERNITY PEN

FEEDING STRATEGY FOR SHORT DRY PERIODS

Short dry periods can help dairies eliminate stressful regrouping and diet changes twice within three weeks to manage a far-off and close-up ration. But, says University of Wisconsin's Ric Grummer, PhD, they do anything but simplify feeding strategy.

Feeding a single dry-period ration appears to offer the best alternative, regardless of length. But debate continues over the risk of overconditioning cows by choosing a moderate-energy ration in order to make transition to lactation ration easier vs. feeding a non-fattening high-fiber ration which may be harder on the rumen once the abrupt shift to high energy is made.

A potential compromise may be to shorten the dry period to permit feeding that relatively high-energy dry ration, all the while adjusting its energy depending on dry-period length to avoid fattening.

Dr. Grummer's group conducted a study, led by Robin Rastani, PhD, to assess that strategy. They dried multiparous cows off at either 56 days before calving and then fed them a far-off/close-up ration, or at 28 days precalving and continued the lactation ration minus buffer, or didn't dry them off at all.

They found that constant lactation kept dry-matter intake highest— although even those cows depressed intake near calving. It also cost about 11 pounds in fat-corrected milk production per day. However, there was no significant difference in fat-corrected milk between 56- and 28-day dry periods.

Creating a single dry group requires all cows to respond favorably, Dr. Grummer warns. Otherwise, you defeat the purpose by having to create a third dry-cow group.

IDEAL DRY PERIOD TO MAXIMIZE YIELD?

A big question remains about shortening dry periods: Will the extra milk you get from extending a lactation more than recover milk lost in the next lactation caused by a sub-60-day dry period? USDA Animal Improvements Program Laboratory geneticist Melvin Kuhn, PhD, suggests an answer by analyzing DHI field data on more than a million U.S. Holsteins on test between the start of 1997 and mid-2005. His study used actual yields and included only cows whose actual calving dates fell within 10 days of expected calving dates to ensure the dry-period length was intentional. Dr. Kuhn's findings show producers likely get little benefit by cutting the dry period after first lactation to less than 60 days. In contrast, 31- to 40-day dry periods after second and later lactations maximized lifetime production.



Source: Kuhn MT, Hutchison JL, Norman HD. Dry period length to maximize production across adjacent lactations and lifetime production. J Dairy Sci. 2006 May;89(5):1713-22.

BEYOND BYPASS

WHICH BYPASS METHOD PROTECTS BEST?

Canada's McGill University ruminant nutrition professor Leroy Phillip, PhD, and graduate student Sylvia Borucki Castro, PhD, are reporting the first study of its kind to analyze—under the same experimental conditions—the ability of different treatment methods to protect amino acids in soybean meal from rumen breakdown. They investigated *in situ*:

- Solvent-extraction
- Treatment with lignosulfonate
- Heat-treatment, combined with soy hulls
- Expeller-processing—the method used in production of SoyPLUS®

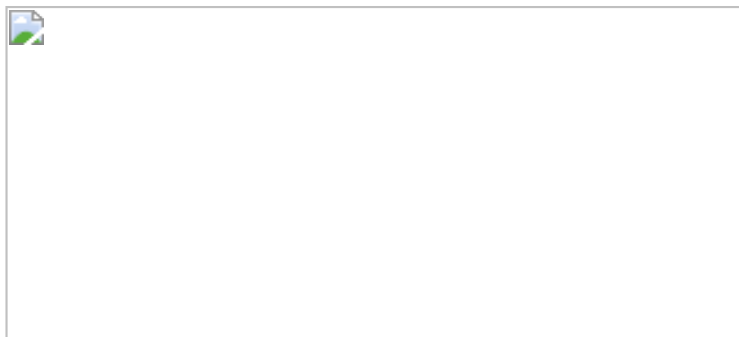
Their study concluded that heat and chemical treatment of bean meal improved the intestinal availability of amino acids. Expeller processing enhanced amino-acid supply to the small intestine of high-producing dairy cows best, they report.

Treatment was shown to protect both the crude protein and the amino acids from degradation, increasing the rumen-undegradable protein from 40 percent to 65 percent. Expeller meal contained a greater fraction of soluble protein, and exhibited a shorter lag phase and a faster rate of protein degradation than the other two treatments. In the lower intestine, expeller processing tended to increase the availability of most amino acids vs. the other methods. Solvent-extracted meal suffered the greatest amino-acid degradation before reaching the lower digestive tract.

INTESTINAL AVAILABILITY OF ESSENTIAL AMINO

Dr. Borucki Castro's study was the first of its kind in dairy cattle to comprehensively evaluate the kinetics of rumen degradation and intestinal availability of amino acids in bean meal using different methods of rumen protection. It showed that the extrusion process used to protect SoyPLUS, when compared to chemical treatment using lignosulfonate or heat and soy hull addition, tended ($P < 0.10$) to increase the estimated availability of the majority of the essential amino acids. As you'd expect, the estimates of intestinal availability of both essential and non-essential amino acids were 20 percent to 30 percent higher ($P < 0.001$) for treated products than for solvent-extracted meal.

Source: Borucki Castro SI, Phillip LE, Lapierre H, Jardon, PW, Berthiaume R. Ruminal Degradability and Intestinal Digestibility of Protein and Amino Acids in Treated Soybean Meal Products. J Dairy Sci. 2007 Feb;90(2):810-22.



WEST CENTRAL HAPPENINGS

DR. JESSE GOFF TO HEAD WEST CENTRAL RESEARCH

West Central welcomes Jesse Goff, DVM, PhD, to its team beginning March 1. As director of research and new product development, Dr. Goff will lead West Central's research and development programs, specifically working with the two dairy products, SoyPLUS® and SoyChlor.®

Dr. Goff comes to West Central after more than twenty years with USDA. Prior to that time, he taught at the Iowa State Veterinary College. A native of New York State, where he worked on a neighbor's dairy and his father's small hay operation, Dr. Goff earned his bachelor of science degree in 1977 from Cornell and then conducted poultry microbiology research there until leaving for Iowa State. There he attained his master of science degree in 1980, his veterinary doctorate in 1980, and his doctor of philosophy degree in 1986.

During the last two decades, Dr. Goff's research has focused on various dairy issues. He is best known for his research in how prepartum nutrition and management affects resistance to both metabolic and infectious disease. Along with USDA colleague Ron Horst, PhD, and Michigan State nutrition professor David Beede, PhD, Dr. Goff is credited with pioneering industry-wide application of the DCAD concept to prevent fresh-cow hypocalcemia. Refining the ability to manipulate DCAD revolutionized our understanding of nutrition's role in many common disease and performance problems, and founds the success of products like SoyChlor.

"I look forward to working with the West Central team," Dr. Goff says. "We have a lot of goals set out, continuing to increase product knowledge, and taking a look at improvements to both SoyPLUS and SoyChlor and the research targeted around these products. I'm also hoping we'll find room for some new product development."

QUALITY CORNER

Quality Corner, including an updated summary of West Central's in-house NIR and check-sample analyses from two independent labs, returns in the next Nutrition Plus.



406 First Street
Ralston, IA 51459
(800) 843-4769
www.west-central.com