

NEW WAYS TO MEASURE MOISTURE

Advances in technology are making it faster to monitor dry matter content.

BY MEGAN PIERCE



ANYONE FEEDING A TOTAL MIXED RATION (TMR), which is most operations today, knows that forage moisture or dry matter is one of the most significant variables faced on-farm. That's according to Ken Grube a dairy nutritionist with Homestead Nutrition in New Holland, Pa. "As a nutritionist we balance for protein, energy and various other nutrients, but dry matter directly impacts if the right amount of those nutrients is delivered to the cow."

From variations in varieties planted, field terrain, soil conditions to weather at harvest or during storage, all can impact moisture levels. "A tremendous amount of outside factors can influence the amount of moisture in a feedstuff at feedout," says Grube.

To better understand how these factors influence the amount of nutrients fed, consider this example. If a herd is feeding 10,000 pounds of corn silage that was 50 percent dry matter it would be providing 5,000 pounds of dry matter with the corn silage. During a big rain event the corn silage could have picked up 1,000 pounds of rain water. At the next feeding 10,000 pounds of corn silage now equal 4,000 pounds of dry matter. If no adjustments are made to the ration it will not be in balance and milk production will be impacted.

On the opposite end of the spectrum, cows can also be overfed nutrients if too much dry matter is fed. "If a forage dry matter increase goes undetected you will be feeding a greater volume of that forage than you intended, diluting all other components of the TMR," notes Grube.

How much variability are we talking about? Speaking in extreme terms, corn silage dry matter can range from 25 percent to 60 percent. "Even a 1 percent or 2 percent change in dry matter makes a big difference," says Grube, explaining that cows will notice the smallest changes.



Other applications

New technologies to measure dry matter content are offering dairy producers' new opportunities to better manage diets. Outside of every-day ration adjustments these new technologies are finding additional possibilities for implementation.

SELLING FEED: As a farmer who sells his feed to other dairy producers the possibility to accurately and instantaneously knowing the dry matter content holds a lot of potential. "We charge by the dry matter," says **Mike Witt, Witt Farms in Monticello, Wis.** "Currently we rely on samples that are sent to a lab weekly to determine the average dry matter."

HARVEST: Taking samples during harvest and getting a better dry matter average is really appealing, says **Allan Kutz, Kutz Dairy in Jefferson, Wis.** "We try to establish an average moisture content of each field, but we're not able to sample every semi load. Being able to measure dry matter instantly would allow us to take more samples and hopefully be more accurate."

FEEDING BALEAGE: It can be very challenging to accurately gauge the moisture content of wrapped baleage. "With a hand-held moisture tracker, it may be possible to pull a core sample on the bale and read the moisture levels on the sample," says **Chris Horton, product planning manager with Digi-Star in Fort Atkinson, Wis.** "This would allow dry matter coming into the ration from baleage to be more accurately accounted for."

New technologies

Until recently, options for monitoring dry matter on-farm consisted of an oven, microwave, koster tester or food dehydrator. Each option can successfully be used to monitor dry matter, but they take varying levels of skill and time. Recent advancements in technology are providing dairy producers with new ways to monitor dry matter levels, simply and in seconds.

As a beta-tester for a new hand-held moisture tracking device, Allan Kutz of Kutz Dairy in Jefferson, Wis., says he is excited about what they've seen so far and the possibilities this new technology and others might have.

"We now have the possibility to know the dry matter content of our forages within minutes versus hours," says Kutz. Prior to testing this hand-held device, Kutz measured dry matter with a koster tester and adjusted the ration every day.

Speed of information is one of the features that Kutz says that he likes thus far. "With the hand-held device we can read the moisture on all of our feedstuffs in a couple of minutes, instead of 40 minutes each." Currently, Kutz plans to continue using the koster tester and send feed samples to the lab until they feel more comfortable with the information from the hand-held device, but if things continue to go well those additional steps will be discontinued in the future.

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Putting it into practice

The hand-held device that Kutz is testing is a gun-like device introduced to the market in 2013. The device utilizes near-infrared technology to measure the moisture level and is accurate within 1 percent.

To obtain a reading, it takes 20 quick trigger pulls from various locations on the feed sample. Based on the 20 readings the device automatically calculates the moisture level and dry matter content.



"We think this new technology offers some unique advantages over traditional moisture testing methods," says Chris Horton, product planning manager with Digi-Star in Fort Atkinson, Wis. "If you told someone that they had to get 20 samples and mix them together every time to get a representative sample, they



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likely aren’t going to take the time to do it. With the hand-held moisture tracking device, in one minute you can have 20 scans and a reading.”

Horton says that they’ve found that taking 20 scans is very important, because of the amount of variability in the feed itself. “How you collect your sample that you’re going to test is more important than the device used to measure the moisture,” he adds.

The other upside that Horton says he sees with this type of technology is the ability to recheck moisture levels. “If you’re unsure of the reading, very quickly three additional readings can be taken to see if they corroborate each other.” For example, if dry matter was at 40 yesterday, but today it is at 36, moisture levels can be rechecked to see if the readings match up.

In comparison, Horton says, with a koster tester, if the reading on a sample doesn’t make sense it can be another 40 minutes for a recheck. “The ability to check your own readings with traditional methods is just not efficient,” says Horton. “But with an instantaneous device you can check readings with almost no effort.”

It all circles back to consistency. “If these new technologies allow us to provide a more consistent ration to the cows, day-in day-out they will be a win-win for our cows and for our bottom-line,” says Kutz. 🐄



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