

# Monitoring Hay Quality for Mineral Content

2015 is behind us, but 2016 will be a year to watch for mineral toxicities and deficiencies when feeding last year's hay crop.

Weather-wise, 2015 was a tough act to follow. It was a year of severe weather and flooding in many of the country's high-volume cattle-producing states. Purdue University Extension Beef Cattle Specialist Ron Lemenager says the overabundance of rainfall early in the year should prompt cattle producers to take a closer look at their forage quality.

"We had a lot of rain, so a lot of our producers delayed harvest, waiting for a window of opportunity to cut dry hay," he explains. "During that waiting period, forage maturity advanced, so we've got a lot of low-quality forage."

Low-quality forage contains an increased concentration of fiber, which is more difficult for cows to digest. This leads to a decrease in dry-matter intake (DMI), thus leading to decreased nutrient intake.

## Energy and protein

Since the first hay cutting could represent up to 50% of producers' total tonnage of hay for the year, Lemenager stresses that nutritionally, hay is of significantly lower quality this year than it is in normal years. Energy is the first limiting nutrient in beef cattle diets, followed closely by protein, he explains.

"Mineral concentration doesn't change too much, but the availability of those minerals decreases," he says. "What really suffered with delayed hay harvest is the energy value. As fiber increased, energy content decreased. I think a lot of our producers are going to be short on energy for their cows, particularly with the first cut of hay."

## Phosphorus

The next limiting nutrient producers should watch is phosphorus. While it is important to have adequate phosphorus in the diet, Lemenager cautions producers to double-check their herds' phosphorus intakes. If producers are using a byproduct like distillers' grains or corn gluten feed as a supplement, they bring a significant amount of phosphorus to the diet and it is critical that the calcium-to-phosphorus ratio be evaluated.

"If you read the textbook, it says [to feed] about a 2:1 ratio — two parts calcium to one part phosphorus," Lemenager says. "I think we can go down to about a 1.5:1 ratio. If we can meet that, I think we're in pretty good shape."

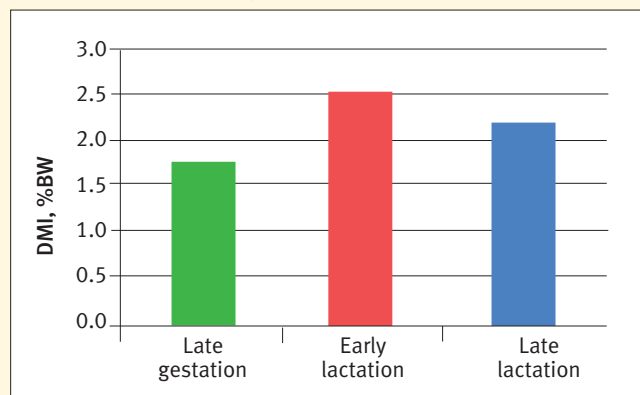
## Vitamin A

Low-quality forages are often deficient in vitamin A, Lemenager points out. If producers are feeding a commercial mineral mix, he urges them to make sure the vitamin A content is adequate.

On a free-choice basis, cows will consume about ¼ pound (lb.), or 4 ounces (oz.), of mineral per day, he explains. Cows need 40,000-60,000 international units (IU) of vitamin A per day, so if they're eating ¼ lb. per day and producers are shooting for 40,000 IU, the mineral mix should contain at least 160,000 IU per lb.

"Four times the 40 or four times the 60 is what you need to be looking for when it comes to mineral tags because of these low-quality forages, particularly if producers are feeding some year-old hay," Lemenager says. "Vitamin A content decreases about 10% per month in storage, so if we're feeding hay cut last year, after eight months, we're losing a fair amount of vitamin A content, and it was probably short in the first place compared to normal because it wasn't as green and leafy."

**Fig. 1: Dry-matter intake (DMI), expressed as percent of body weight (BW), of beef cows consuming low-quality forage during three different stages of production**



Source: Johnson et al., 2003.

## Geographic concerns

**Copper.** "Copper is highly important from a reproductive standpoint," Lemenager stresses. Depending on geographic area in the country, copper and selenium concentrations in the forages can be either deficient or toxic, which is an issue to be aware of when selecting a mineral supplement.

"As we think about copper levels, there are other minerals that can create antagonisms," Lemenager says. "Depending on how the forages were harvested, we could have some fairly high levels of iron or ash content because we brought in a lot of dirt."

High iron levels can create a mineral complex that makes copper less available to the animal. Producers must overcome this by adding more copper. Another factor that impacts copper requirements is milk production. Cows with the genetic potential for higher milk production have higher copper requirements, Lemenager says.

**Selenium.** Another mineral of geographic concern is selenium. States that touch the Great Lakes tend to be marginally deficient in selenium to start with, Lemenager says, and producers in the area might need to think about adding additional selenium or purchasing a mineral mix with a higher concentration of the mineral.

## Limit feeding

When hay is in short supply, Lemenager says it can be beneficial to limit cow access time to the bale feeder. It's like going to the buffet, he says.

"If a cow has 24 hours of access time to a round bale, she'll try to find the piece of chocolate in the middle of that bale," he says. "She's going to bypass the broccoli and the Brussels sprouts. If cows are limited to six or eight hours of access time per day, she's going to focus more on eating so she'll waste less hay and still eat the same amount of dry matter per 24-hour period."

If hay intake is limited, it is important for producers to supplement the herd's diet with mineral. As hay intake is limited, mineral intake will tend to increase, and as this occurs, salt will likely need to be added to the mineral mix to prevent overconsumption.

— by *Shelby Mettlen*