The Mechanics of Corn Silage Starch

Too much starch is no concern when the ration is balanced correctly.

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Your parents surely warned you about getting too much of a good thing. But when it comes to starch levels in corn silage, too much shouldn't be a problem. It's true that too much starch in the overall ration can lower milk-fat production and pose the threat of acidosis. A high ratio of starch to fiber isn't good for the rumen. However, today's laboratory assays allow nutritionists to adjust a ration with high starch silage to avoid the acidosis threat.

"Most nutritionists traditionally have limited the amount of non-fiber carbohydrates (NFCs), which is composed primarily of starch," notes Randy Shaver, Ph.D., professor and Extension dairy nutritionist with the University of Wisconsin's Department of Dairy Sciences. The NFC measurements include starch, sugar, pectin and volatile fatty acids. Nutritionists base ration formulations on this combined measure. Today, labs can measure starch levels independent of other NFC components. That allows more exact formulations. "Nutritionists try to limit starch to 25 percent to 30 percent of dry matter," Shaver says.

Balancing concentrates

"Nutritionists who use the starch assays can control the starch content in the ration much more precisely," Shaver says. "The silage component of the ration will not provide too much starch if the nutritionists balance the concentrate." With a balanced approach to fiber digestibility and overall starch content, high starch levels in corn silage are not the concern they were in the past.

"We have a better opportunity now to use corn silage," Shaver says. "If we have high-starch corn silage, we simply feed less corn or cut the starch content in the supplement. We may be able to take out relatively expensive corn grain and replace it with fiber sources, such as soybean hulls." This helps avoid potential incidents of acidosis while possibly costing the producer less.

"With the high corn prices we've seen recently, the more energy you can get from the starch in corn silage, the less you have to pay for in your concentrates," Shaver says.

Don't forget fiber

Shaver emphasizes the importance of the fiber fraction of the ration.

"When you have high starch levels in corn silage, it's vital to provide appropriate effective fiber," he says. "You don't want to be short on effective fiber in the rumen. Assays for effective fiber and particle length will help ensure good rumen function."

With proper management of supplements, getting more starch from silage may allow you to trim overall feed costs.

Figuring starch levels

Can you get too much starch from corn silage? Consider this example:

- Take the extreme situation of 70 pounds wet (30 percent dry matter) corn silage intake per cow per day.
- Even at 45 percent starch (from high chopping to concentrate the grain), you only feed 9.45 pounds of starch per cow per day (21 pounds of dry matter x 0.45 = 9.45).
- If eating 55 pounds dry matter intake, that's only17 percent starch in the ration from corn silage.
- Compare to comfort level of 25 percent to 30 percent starch in the ration (50 x 0.275 = 13.8 pounds total starch).
- Legumes have essentially no starch and grain co-products contain only limited amounts of starch.
- Bottom line: You simply supplement less grain in concentrates to maintain a viable overall dietary starch level.