Make your own corn silage selection easy button

WE'RE constantly seeking the easy button in many aspects of life and business. I'd love an easy button to encourage my children to pick up their messy rooms, to prevent the dogs from chewing up something that had been placed on the counter, or to simply clean the house when it is a complete disaster. In the office, an easy button at my desk would be fantastic when faced with a constantly evolving to-do list. Unfortunately, these easy buttons don't exist in my house or office. Yet, on the farm, there are a couple of easy buttons at our fingertips.

While cleaning the calf pens or manure lagoon still does not have a short cut, index values for bulls or seed corn are akin to an easy button in that they drastically simplify complex genetic evaluation. These indices package complex performance traits into a single value. Thus, decisions become simpler through comparing only the index value when evaluating prospective sires or hybrids.

Easy button selection

With corn silage harvest season well underway and even wrapping up, we'll focus on silage evaluation as seed corn selection will be right around the corner. Thanks to Randy Shaver, Joe Lauer, and other colleagues at the University of Wisconsin, the easy button for silage evaluation has been the Milk2006 index for the past 15 years. Back in graduate school, I remember working on a dataset with Shaver as part of this index evaluation. At that time, I had no grasp of the importance or value of this project. In the following decade, Milk2006 became the gold standard and the industry's easy button to evaluate and compare silages.

While still popular in agronomy circles, the easy button for silage evaluation is changing. To understand the changes, we need to delve into Milk2006. Then we can cover how future indices can be developed to update the silage evaluation easy button.

The building blocks

Fiber and starch drive corn silage's energy value. These carbohydrate nutrient concentrations and their associated rumen and total tract digestibility values fuel the energy equations. With Milk2006, a summative energy equation developed by The Ohio State's Bill Weiss was expanded to delve into starch as well as fiber.

Shaver and colleagues improved the digestible fiber quantification by bringing a 30-hour or 48-hour in vitro rumen fiber digestibility measure into the equation. This was a fantastic step forward, understanding that enhanced fiber digestibility means greater intake, and subsequently greater milk production, according to Mike Allen and Masahito Oba's Michigan State University research in the late 1990s.

Milk2006 also applied silage dry matter content to discount starch digestibility, realizing and accounting for the fact that drier silage equates to more mature corn and less digestible starch. Distilling the complex math down to the basics, the Milk2006 summative total digestible nutrient (TDN) equation looks like this:

Digestible Crude Protein + Digestible Starch + Digestible Fiber + Fat + Digestible Nonstarch/Nonfiber carbohydrates = Total Digestible Nutrients (TDN)

With a TDN number in hand, the Milk2006 model calculates the milk per ton and milk per acre and the easy button index value is born with a straightforward regression equation.

Over the past five years, the Milk2006 index has aged and become less popular. New York's Rick Grant and Mike Van Amburgh have led research involving undigestible fiber and industry nutritionists now consider this alongside other new fiber digestibility measures. Dave Combs at the University of Wisconsin-Madison has developed a total tract NDF digestibility (TTNDFD) index based upon an alternative standardized laboratory NDFD method that I also worked on in graduate school.

The forage TTNDFD both accounts for undigestible fiber and dramatically improves dairy performance response related to forage quality relative to older NDFD measures. These newer fiber measures have proven helpful in evaluating forage and selecting seed the past five years but are not accounted for with Milk2006.

Remember that corn silage quality is carbohydrate driven. Because of that, our industry has dramatically expanded on starch measures in the forage lab as well. Rumen starch digestibility has become a focal point with advanced diet formulation and is now more commonly accounted for both in silage and grain evaluation and, therefore, in diet formulation.

Milk2006 adjusts starch digestibility based upon silage moisture content. However, this is equivalent to using a compass to navigate to your next destination as your Global Positioning System (GPS) sits in the glove box.

Rumen starch digestibility measures are equivalent to the GPS. With improved fiber digestibility, as described above, coupled to these newer rumen starch digestibility metrics that are routinely available for silage analysis, an opportunity exists to revisit and update corn silage selection options.

All is not lost

To revisit and update Milk2006, I've worked with Shaver, dairies, nutrition groups, and seed companies to build new silage quality index measures that simplify comparisons between hybrids or management strategies. Your dairy can do the same. Work with your agronomist and nutritionist to build your own silage quality easy button. I suggest focusing on the total digestible nutrients equation, accounting for the inputs I described above.

Make sure to include starch, fiber, total tract fiber digestibility, and rumen starch digestibility measures in your equation. This may seem daunting, but adapting as little as four to five measures from silage quality analysis can yield a new version of Milk2006. This approach will put your dairy back in position to hit the easy button for silage evaluation.

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