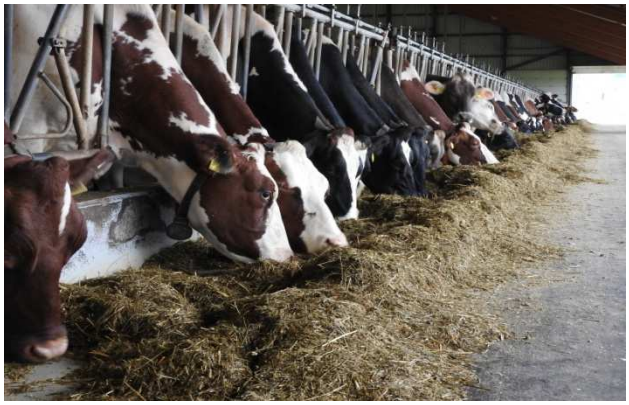
Corn silage uNDF: Potential impact factor relative to feed conversion efficiency

***From Dr. John Goeser, ROCK RIVER LABORATORY INC. in Wisconsin**. This article was recently published and provides valuable information to understand fiber and its digestion at a comprehensive level.*



Lignified fiber in corn silage and forage has been compared to the rebar in concrete, providing the structural integrity and strength to hold the road or your driveway, but added strength in forage fiber corresponds to limited digestion and energy potential per pound.

Less lignified fiber is desirable in the diet, but measuring lignin hasn't been overly useful for nutritionists. Lignin measures at the forage analysis laboratory are typically fairly small values, with limited range to the data, thus limiting how your nutritionist can use the data on your feeds. This would be like watching a movie on a tube television. The lignified fiber measure has changed, though, thanks to a new forage measure – undigestible neutral detergent fiber at 240 hours (uNDF240; percent of DM). This advance has been equivalent to watching movies on large UHD televisions.

The uNDF240 measure has caught on with dairy nutritionists following Kurt Cotanch and his colleagues' observations at the Miner Institute several years ago. More recently, Rick Grant has summarized several studies from the Miner Institute and shown that total mixed ration (TMR) uNDF240 relates to dairy cow intake and milk production potential.

Building on their findings, through unintended observations, results from a 2018 Wisconsin commercial dairy survey suggested there may be a tie between corn silage uNDF240 and dairy performance.

In the survey and case study, Jared Geiser (interning with CP Feeds, Valders, Wisconsin) visited and sampled roughly 60 dairies as part of an internship project. Our aim was to investigate corn silage kernel processing score (KPS) relative to starch digestibility and dairy herd performance. Beyond KPS and starch digestibility measures, we also analyzed the corn silage samples via routine forage analysis (NIR) or nutritive and fiber digestion parameters. The silage nutrition analyses uncovered a striking potential relationship between corn silage uNDF240 and energy-corrected milk production per cow.

Before getting into uNDF240, recognize that several routine fiber digestibility parameters appeared correlated to dry matter intake (DMI), energy-corrected milk per cow (ECM) and feed conversion efficiency (pounds ECM per pound DMI). Both in vitro NDF digestibility at 30 hours (NDFD30) and the University of Wisconsin total tract NDF digestibility (TTNDFD) metrics were correlated with ECM across the roughly 60 dairies represented in the survey data. The trend lines suggested the ECM gains per unit NDFD improvement were roughly 1 and 0.8 pound, for corn silage NDFD30 and TTNDFD, respectively.

These observations fall in line with Masahito Oba and Mike Allen's observations roughly 20 years ago, where the authors detailed in a well-done study that a single unit change in forage NDFD corresponds to roughly 0.4- and 0.6-pound gains in DMI and 4% fat corrected milk, respectively. Perhaps today's cows respond to an even greater extent to improved fiber digestibility.

Getting back to corn silage uNDF240, the relationship with both DMI and ECM caught our attention as much as the NDFD relationships. Keep in mind that uNDF240 measures lignified fiber, and the rumen can't digest this fiber at all. This measure in itself may be meaningful as corn silage uNDF240 was negatively correlated (P less

than 0.05; independent pair wise correlations) with DMI and ECM production. Based on the case study and survey results, a single unit of corn silage uNDF appeared to correlate with roughly 0.6 and 1.3 pounds less DMI and ECM per cow per day, respectively.

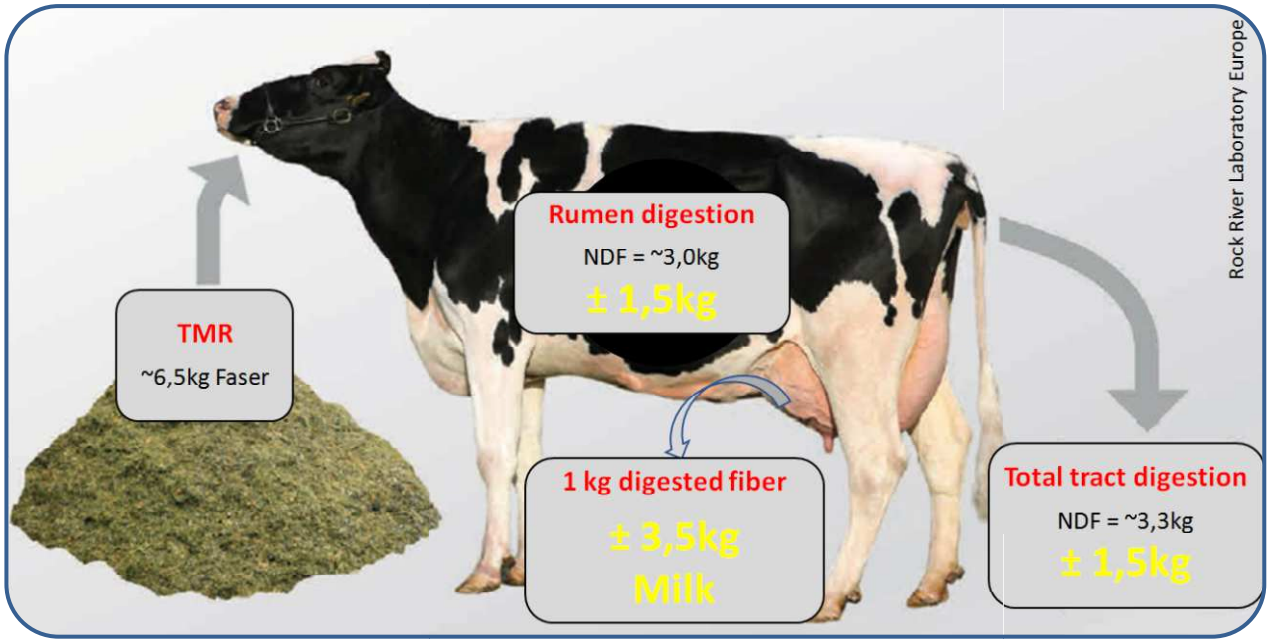
Bear in mind: These are survey data and not a controlled research study. The observations simply suggest a relationship between uNDF240 and performance may exist. However, if these observations are real, then the implications are important for your herd to grasp. Greater uNDF240 in corn silage could decrease the milk and economic performance potential for your herd.

Corn silage uNDF240 is influenced by many factors, including environment, seed genetics, cut height, grain-to-stover ratio and agronomic management. There are numerous ways to decrease the negative potential impact. Work with your nutritionist, seed consultant and/or agronomic adviser to benchmark your current silage, and then use uNDF240 as a future silage quality indicator.

Last, recognize that uNDF240 measures lignified fiber, and remember that lignified fiber is important for plant health. If selecting reduced-lignifying hybrids, monitor plant health closely with your agronomist during the growing season. Corn silage hygienic quality is an increasingly important area to understand. We shouldn't look to gain in fiber potential only to give up plant health in the field.

John Goeser earned a Ph.D. in animal nutrition from the University of Wisconsin – Madison, where he currently serves as an adjunct professor in the dairy science department. He also directs animal nutrition, research and innovation efforts at Rock River Lab Inc. based in Watertown, Wisconsin.

References omitted but are available upon request.



Use the full potential of your silage through a complete digestibility analysis like DYNAMIC CNCPS from our laboratory and you will get the information on TTDNFD and the dynamics of the feed.

ROCK RIVER LABORATORY EUROPE is

- 100 % independent - the data is fully yours,
- FAST - We have a very short turnaround time, and you receive your data in less than 24 hours,
- Get the most information about your feeds and forages.

ROCK RIVER LABORATORY EUROPE
"Knowing what's in it!"