



What does the latest shredlage research show?

THERE continues to be a lot of interest in shredlage. In producing it, corn silage is harvested with a self-propelled forage harvester (SPFH) fitted with an aftermarket processor. The processor's new-type cross-grooved processing rolls are set for a 2 mm to 3 mm roll gap and greater roll speed differential than has typically been used in the past. Also, the developer of this processor recommends that the SPFH be set for a longer theoretical length of cut (TLOC) at 26 to 30 mm.

Thus far, this processor has only been adapted for Claas harvesters, although shredder roll kits have been made available for other machines. During the 2013 harvest, over 300 shredlage processors and shredder roll kits were in operation around the country, with an equivalent number added into operation this harvest season.

Last winter, we completed our second controlled feeding experiment with corn shredlage in our university dairy herd.

The first time around

Let's briefly review the results from our first controlled feeding experiment using a conventional corn silage hybrid harvested as either corn shredlage (30 mm TLOC) or conventional processed (19 mm TLOC) corn silage.

The percentage on the top screen of the Penn State shaker box was greater for corn shredlage (32 percent) versus 6 percent as-fed particles retained on the top screen of the shaker box for the conventionally harvested silage. The same was seen for the TMR which contained corn shredlage (16 percent versus 4 percent as-fed particles retained on the top screen of the shaker box). We observed no sorting of either TMR when fed.

Fat- and energy-corrected milk tended to be 2.3 pounds per cow per day greater, on average, across the treatment period for cows fed the corn shredlage treatment. Feed efficiency and milk composition were unaffected by treatment.

Corn silage processing score, or the percentage of starch passing through a 4.75 mm sieve, was greater for corn shredlage (75 percent versus 60 percent). Total tract starch and neutral detergent fiber (NDF) digestibility were greater for cows fed the corn shredlage treatment, too.

Can it be replicated?

In our second experiment, we wanted to evaluate: 1) the response

to corn shredlage in a brown mid-rib (BMR) corn silage hybrid, and 2) whether the greater TLOC setting for the harvest of corn shredlage elevated the physically effective fiber (peNDF) content of the silage.

For this experiment, a BMR corn silage hybrid was harvested in September 2013 with a self-propelled forage harvester fitted with either a conventional processor or a shredlage processor. Silage was harvested on the same day at 1/2 kernel milkline stage of maturity. The conventional processor was set for a 2 mm roll gap and 40 percent roll speed differential with the self-propelled set for a 19 mm TLOC for harvest of the conventional-processed corn silage. Harvest of the corn shredlage was done with the shredlage processor set at a 2 mm roll gap and 32 percent roll speed differential with the forage harvester set for a 26 mm TLOC. The conventional silage and shredlage were stored in separate silo bags until the bags were opened to begin the feeding trial in January.

Corn silage processing scores on feedout samples averaged 72 percent for shredlage and 68 percent for conventional silage, with less variation observed for shredlage over the duration of the experiment. The sample range (difference between maximum and minimum samples) was 10 percentage units for shredlage and 21 percentage units for conventional silage. For shredlage, all processing scores were above 65 percent. However, for conventional silage 43 percent of the samples obtained on a weekly basis throughout the feeding trial were at or below a processing score of 65 percent.

The proportion of coarse stover particles was greater for shredlage (18 percent) than conventional silage (7 percent) for samples collected during feedout from the silo bags throughout the feeding trial based on shaker box results. The shredlage and conventional silage were similar in dry matter content (39 percent) and pH (3.9).

Midlactation Holstein cows were used in a 16-week continuous-lactation experiment in our university dairy herd with 15 replicated pens of eight cows each. The respective treatment TMR contained 45 percent (DM basis) from either shredlage or conventional silage. Both TMR treatments contained 10 percent alfalfa silage and 45 percent of the same concentrate mix.

Additionally, a third treatment TMR (conventional silage-H) was included in the experiment to focus on the physically effective fiber question. This ration was formulated with 35 percent conventional silage, 10 percent alfalfa silage, 10 percent chopped hay, and 45 percent of

the same concentrate ingredients adjusted to balance dietary crude protein and starch concentrations across the three treatments.

For the TMR fed throughout the trial, the proportion of as-fed particles on the top screen of the shaker box was greater for shredlage than conventional silage or conventional silage-H. Our measurements of weigh-backs during the trial indicated minimal sorting and no differences in sorting among the three treatments.

Effective fiber a wash

Averaged over the treatment period, milk yield was 2.5 pounds per cow per day greater for shredlage than conventional silage. The shredlage cows averaged 113 pounds per day. Feed efficiency was similar for the two treatments. Milk yield was 5.9 pounds per cow per day lower, and feed efficiency was reduced for conventional silage-H compared to conventional silage.

Milkfat content was greater for conventional silage-H (3.7 percent) than conventional silage or shredlage (3.3 percent). Rumination activity measured with rumination collars averaged 8.4 hours per day and was not different among the treatments. Using milkfat content and rumination activity data to assess peNDF suggests that the physically effective fiber content of shredlage was not improved despite its longer TLOC and greater percentage of as-fed particles on the top screen of the shaker box compared to conventional silage.

Milkfat yield was not statistically different among the treatments but was numerically greatest for conventional silage-H and lowest for conventional silage. Similar to the milk yield differences, milk protein and lactose yields were greatest for shredlage and lowest for conventional silage-H.

Body condition score (3.1 on average) and body weight change (1.2 pounds per cow per day on average) were similar among the three treatments. Fecal samples are being analyzed for determination of total tract dietary starch and neutral detergent fiber digestibility of the three treatments.

In summary, the lactation performance response to corn shredlage using a BMR corn hybrid was of similar magnitude to the response observed in our earlier trial with a conventional corn hybrid. Despite a longer TLOC setting on the self-propelled forage harvester and longer particle size for corn shredlage relative to conventional-processed corn silage, milkfat content and rumination activity were not greater. Evaluate particle size and processing score of corn shredlage to determine your best ration formulation strategies. 🐄

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