

“Fresh” Forage Research

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The annual meeting of the American Dairy Science association was held in Kansas City, Missouri in July. One of the many presented topics included forage quality and feeding. The following summarizes a couple of the related studies.

Effect of hybrid and growing location on corn silage

Researchers from DuPont Pioneer recently explored the effect of 5 different corn plant hybrids and 15 growing locations throughout Michigan on yield, plant and grain composition at silage harvest, and potential milk yield. Whole plant dry matter, grain dry matter, starch, NDF, dry matter yield, and milk per ton all differed by growing location. Specifically, as growing degree days before harvest increased from 1916 to 2367, sugar content was negatively affected and starch was positively affected. Increasing precipitation from 14.2 to 25.6 inches throughout the growing season produced a positive effect on yield and milk per ton, but negatively affected protein and NDF digestibility. The only difference between hybrids was that drought resistant hybrids had greater plant and grain starch content and availability, but lower NDF digestibility.

Take home message: Growing location has a greater impact on the yield and nutritional value of corn silage than hybrid type.

Effect of maturity and planting density on corn silage

In a similar study, Illinois researchers looked to quantify the effect of maturation and corn plant density on nutrient composition and potential milk yield. They found that when corn plant density increased 21%, starch content decreased 1.5%, milk yield per ton decreased 2.5%, dry matter yield increased 7.2%, and NDF increased 9.0%. As dry matter at harvest increased from 28 to 42%, starch concentration increased 21% while sugar, NDF, ADF, and ash concentration all decreased.

Take home message: Increasing planting density can increase corn silage yield, but with some loss in starch concentration. Varying dry matter at corn silage harvest can alter nutrient content and yield of the crop.

Effect of ensiling on corn silage

In a third corn silage study, Wisconsin researchers evaluated the effect of length of ensiling on nutrient profiles while considering multiple hybrids. Corn silage was stored for 0, 30, 120, or 240 days. As length of ensiling increased, soluble crude protein increased from 34% to 55% and starch digestibility increased from 50% to 71%. At the same time, ammonia and pH decreased. NDF digestibility differed between leafy and BMR hybrid types, but no other hybrid differences in dry matter, crude protein, soluble crude protein, ammonia, or starch digestibility were observed. Additionally, no interaction between ensiling length and hybrid type was found.

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Take home message: Management, particularly storage length, affects the nutrient profile of corn silage more than hybrid type. Availability of starch changes the most with storage and needs to be considered when balancing rations throughout the feeding season.

Effect of sample size on forage analysis

The importance of sampling consistency in order to produce accurate forage analysis results is well known. But does sample size also affect forage analysis results? That is the question that Cornell University researchers were interested in answering. They collected corn silage samples weighing 50, 100, 150, 200, 400, and 600 g and conducted a separate forage analysis on each. Crude protein, NDF, ADF, total digestibility, and starch all varied between sample sizes. The least amount of variation occurred in the 400 and 600 g samples.

Take home message: Consistent corn silage samples weighing 400 g (0.88 pounds) should be adequate to receive accurate forage analysis results.

A new method for alfalfa harvesting

The US Dairy Forage Research Center presented research on a new alfalfa harvesting method. They noted that the current system of frequently cutting alfalfa (to reduce fiber content) requires a large amount of physical and mechanical inputs and is highly dependent on weather. Their goal was to determine a way to reduce the number of times alfalfa would need to be harvested by harvesting leaves and stems separately. In an attempt to accomplish this, two cuttings of alfalfa were made during the 2013 season. The first cutting (August, 2013) was harvested at the typical early-bud stage and ensiled for alfalfa silage. The second cutting (September, 2013) occurred at the late full-bloom stage using a leaf stripping machine that allowed separate harvest of leaves and stems which were then ensiled separately. For 24 days, 44 lactating cows were fed either the traditional alfalfa silage or a blend of stem silage and leaf silage in order to produce a similar crude protein and NDF. Cows fed both diets had similar intake (52.5 vs. 52.7 lbs per day), milk production (93.7 vs. 90.6 lbs per day), milk composition (milk fat: 3.95% vs. 4.00% and milk protein: 2.96% vs. 2.99%), and MUNs (10.7 vs. 11.5 mg/dl). The researchers hope to follow up this study with a longer trial to determine repeatability and long term effects of this method.

Take home message: Researchers are exploring alternative methods for harvesting alfalfa.