Dairy One Forage Laboratory

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Spring is coming, right?

The Variability of Corn Silage Processing Score

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Corn silage processing score (CSPS) or kernel processing score is a tool that is talked about a lot in the dairy industry and is useful for evaluating corn harvest management and starch availability to cows. I recently received questions about the variability of CSPS when tested on the same corn silage and the difference in CSPS score in fresh versus fermented corn silage.

Corn silage processing score represents the percentage of starch that passes through the coarse sieves (particles < 4.75 mm) derived from the adequately processed kernels. The percentage of starch passing through the 4.75 mm sieve is determined by subtracting the amount of starch that did not pass through the 4.75 mm sieve from the total starch in the sample. The percentage of starch that passed through the 4.75 mm sieve is the CSPS. The guidelines for interpreting the results are:

- Greater than 70% - Optimum
- 50 - 70% - Adequate
- Less than 50% - Inadequately Processed

Variability of CSPS through a harvest day

As part of a project in Fall2015, the Forage Lab analyzed CSPS on fresh corn silage sampled four times throughout a harvest day on four different farms (Table 1). Each farm used a different chopper. On average, CSPS was adequately processed on all the farms (Table 1). The largest within-farm difference of CSPS was seen at Farm 3 (15.4 %) and the smallest difference was at Farm 4 (5.3 %). There was no trend on any of the farms for CSPS to decrease or increase throughout the sampling day (Table 1). Sampling one time during corn silage harvest does not look like a good way to evaluate CSPS. However, multiple samples in a day are not practical, but sampling every day or every few days during harvest will provide a better evaluation of processing performance and be a good tool for management.

Table 1. Corn silage processing score (CSPS) through a harvest day.

	Farm 1	Farm 2	Farm 3	Farm 4
Time	CSPS, %			
1	65.7	55.3	53.5	55.5
2	69.5	64.7	41.3	56.5
3	61.5	63.5	53.6	60.8
4	-	63.5	56.7	58.6
Average	65.6 ± 4.0	61.8 ± 2.6	51.3 ± 2.4	57.9 ± 2.4

Fresh versus Fermented Corn Silage Processing Score

The second part of the discussion about CSPS with producers and consultants is always if the CSPS was performed on a fresh or fermented sample. This leads to the question of "Is CSPS different at the two different times and is CSPS changing during fermentation?" The CSPS measured on fresh corn silage samples was lower than when measured on fermented corn silage samples that were analyzed in the Dairy One Forage Lab (Table 2). The missing piece in this data is the relationship of the fresh samples to the fermented samples, i.e., we do not know if the fresh samples are the same corn silage as the fermented samples. Interestingly, the difference between the lowest and highest CSPS and the standard deviation are the same for fresh and fermented corn silage samples (Table 2). A project that tests CSPS at harvest and again in the same corn silage after fermentation is the only way to determine if CSPS is changing during the fermentation process.

Table 2. Fresh versus fermented Corn Silage Processing Score (CSPS) from the Dairy One Forage Lab in 2015 and 2016.

Type of Corn Silage Sample	N	CSPS	Low CSPS	High CSPS	Standard Deviation (±)
Fresh CS	20	60.3	52.9	67.7	7.4
Fermented CS	60	64.9	57.5	72.3	7.4

Using CSPS

The CSPS measured during harvest on fresh corn silage is a harvest management tool, while the CSPS measured during feed out and after fermentation is an animal feeding tool. During harvest, it can be used to evaluate chopper performance, plant harvest condition differences (dry matter), and to make adjustments while harvesting. After fermentation, it is a tool to help define animal performance. During feed out, CSPS can help identify corn that may be limiting milk production due to poor processing, or finely processed corn that needs to be buffered in the diet with fiber to avoid rumen acidosis conditions.

This spring, the Forage Lab is going to continue to look at differences in CSPS and how we can improve the value of a CSPS analysis with additional measures.

Upcoming Events: March

Mid Atlantic Animal Nutrition Conference
March 23-24
https://ansc.umd.edu/extension/mid-atlantic-nutrition-conference

Introducing the Dairy One and Agro-One Pasture Management Package

The Dairy One Forage Lab and the Agro-One Lab are offering a package to help you better understand your pasture. The package is designed for use in one pasture during a growing season. Testing your pasture from top to bottom (clippings and soil) will tell you what you are providing for your animals and what you might need to supply for your pasture.

Pasture Management Package Includes:

Forage Testing: You will get 3 Forage testing kits and sample submitting sheets to be used through the grazing season

Soil Testing: One soil sample to determine the nutrient needs of the pasture (Phosphorus, Potassium, and pH)

Interpretation: Each forage sample result will come with an interpretive sheet. The sheet will have the Dairy One Forage Lab sample ranges for comparison to your results and some management suggestions for changing your pasture.

Price $75.00
(includes all shipping costs and is a 15% savings over list price)

Dairy One Forage Laboratory Agro-One Agronomy Services

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