Kernel processing (KP) at harvest is routinely used on many NY dairy farms. This breaks up corn kernels to improve digestibility and use in the cow. A meta-analysis of research data done at the University of Wisconsin indicated that total tract starch digestion increased by 5.9% when KP rolls are set at one to three mm, compared with no processing. They also reported a decrease in the number of whole kernels found in the corn silage when KP is used.

How good should corn silage be processed? Dr. Dave Mertens, formerly of US Dairy Forage Lab, developed a laboratory method to assess the adequacy of kernel processing. The corn silage sample is dried and shaken for 10 minutes on a series of sieves. The portion of the sample that passes through a 4.75 mm sieve is collected and analyzed for starch. The percentage of the starch that passes through this sieve is termed the corn silage processing score. The guidelines for interpreting the results are:

- greater than 70% = Optimum,
- 50 – 70 = Adequate,
- less than 50% = Inadequately Processed.

What do lab results show for the adequacy of kernel processing? Cumberland Valley Analytical Services measured the CSPS on 1,131 samples in 2010 to 2012. Only 7% of the samples were optimally processed, while 51% were adequately processed. More importantly, 42% of the samples were inadequately processed. More whole kernels from the inadequately processed corn silage and a lower total tract starch digestibility when fed to the cow are expected. This corn silage has less feed value.

How much impact would this have in a dairy cow? Dr. Randy Shaver at the University of Wisconsin estimates about two lbs more milk are produced from optimally processed versus adequately processed corn silage. A number of studies report relationships between the CSPS and fecal starch content. As CSPS decreases, fecal starch increases. A field study of herds conducted by Vita Plus reported that fecal starch averaged 4% for herds fed corn silage with a CSPS >60. However, fecal starch was 6.7% when the CSPS value was <50. Dr. Jim Ferguson at the University of Pennsylvania indicated that a one unit change in fecal starch equates to 0.72 pounds of milk. This would be a difference of about two pounds of milk in the data from Vita Plus.

The challenge with CSPS is that it is a value determined after the corn silage is harvested. What can you do to estimate the degree of kernel processing as the crop is being harvested? A number of options can be used at the field level. These include:

- Pioneer suggests filling a 32 ounce cup with corn silage and looking at the corn kernels. If two or less whole or half kernels are observed, this is considered ideal.
- Put some corn silage in a tub of water and agitate it slightly. The kernels will sink to the bottom. Pour off the water and visually inspect the kernels. Workers at the University of Wisconsin suggest that properly processed corn silage should have almost no cracked or whole kernels.
- Use the Penn State box and look at the kernels in the pan. The guidelines for the water separation procedure can be used to determine the results.

These approaches can be used during harvest to determine if roller settings need to be changed. You may need to make roller setting adjustments a number of times during the harvest process due to changes in dry matter, maturity and other factors. By doing the monitoring and adjustments during harvest, you can improve the CSPS of the silage, increase starch utilization and increase milk production by the cow.

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