

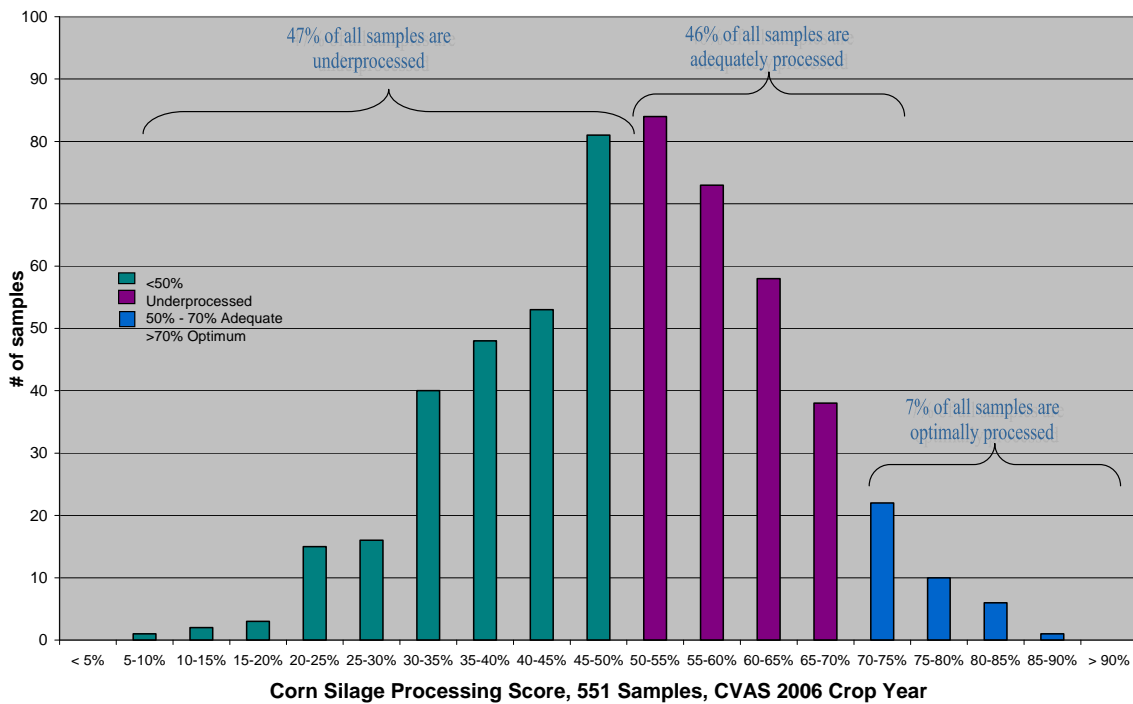
Corn Silage Processing Score (CSPS)

The Corn Silage Processing Score was developed by Dr. Dave Mertens at the USDA Forage Research Center as a tool to define adequacy of kernel processing by forage harvesters. In addition, the CSPS is a tool that defines starch particle size and can be used to make inference on ruminal and total tract digestibility of starch in ruminants.

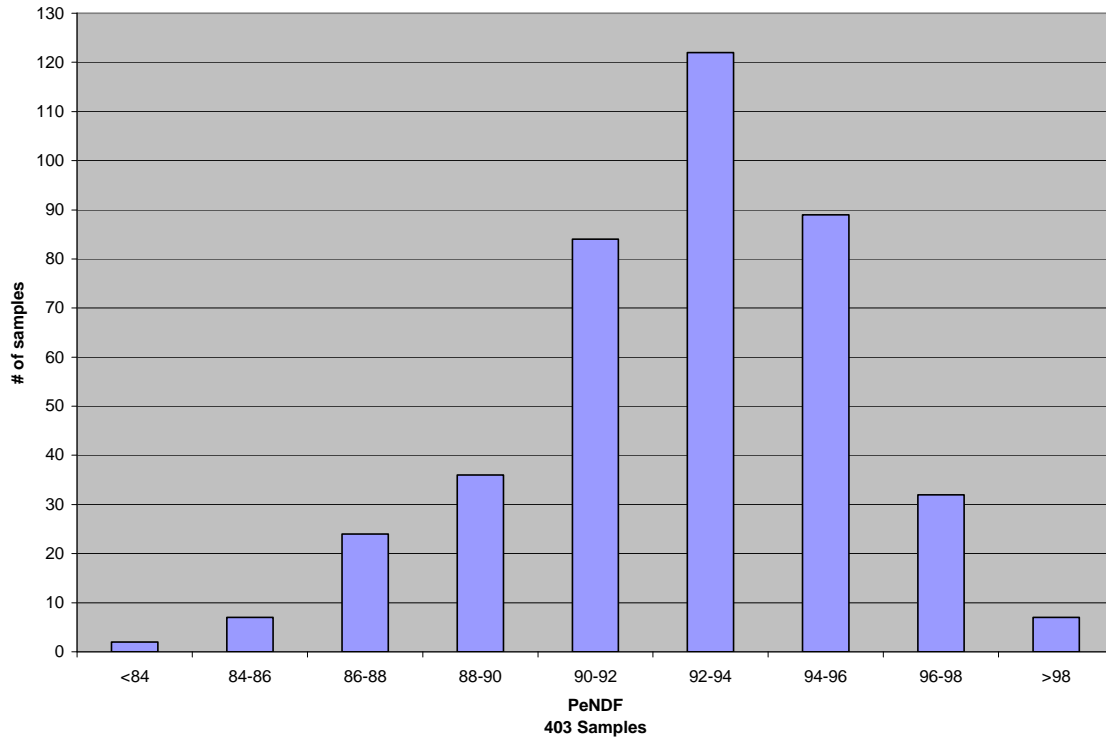
In the Corn Silage Processing Score approximately 600 ml of dried corn silage is sieved in a Ro – Tap Shaker for 10 minutes. This unit oscillates 278 times per minute and “taps” the top of the sieves 150 times per minute to create an aggressive shaking action.

Material that passes through the 4.75 mm sieve screen is collected and analyzed for starch content. The percentage of starch that passes through this screen becomes the “Processing Score”. As part of the same sieving process, the amount of material that passes through the 1.18 mm sieve screen can be evaluated for NDF. This NDF is considered ineffective fiber and is subtracted from the total to determine the percentage of NDF that is effective, or the PeNDF value.



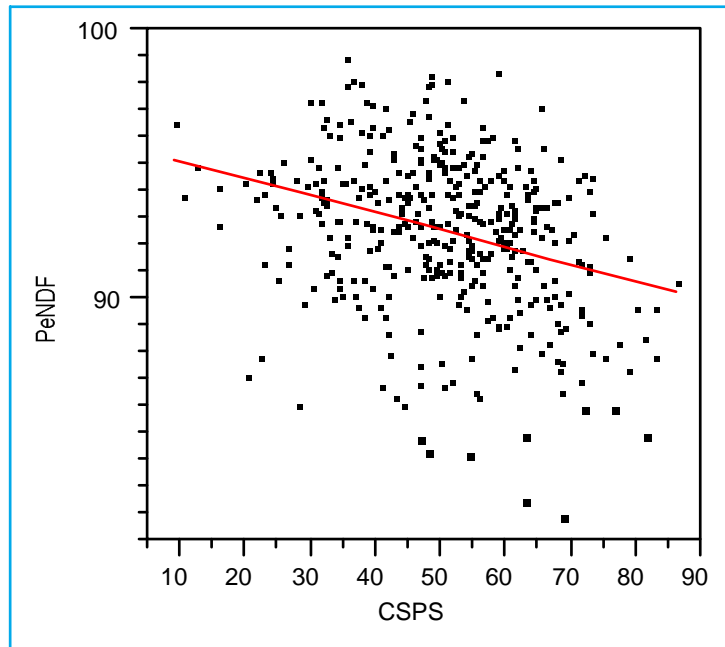


The above data was generated from Cumberland Valley Analytical Services, Inc. analysis of corn silage data from the 2006 crop year. The mean score is 51% on 551



As we consider possible relationship between CSPS and PeNDF we might expect that the better processed corn silage with higher CSPS values will have lower amounts of PeNDF. As we look at the relationship statistically of the two indexes, we find a trend toward lower PeNDF values as CSPS increases. However, this relationship has an R^2 of only .09, even though statistically significant. Below is a graph of this relationship:

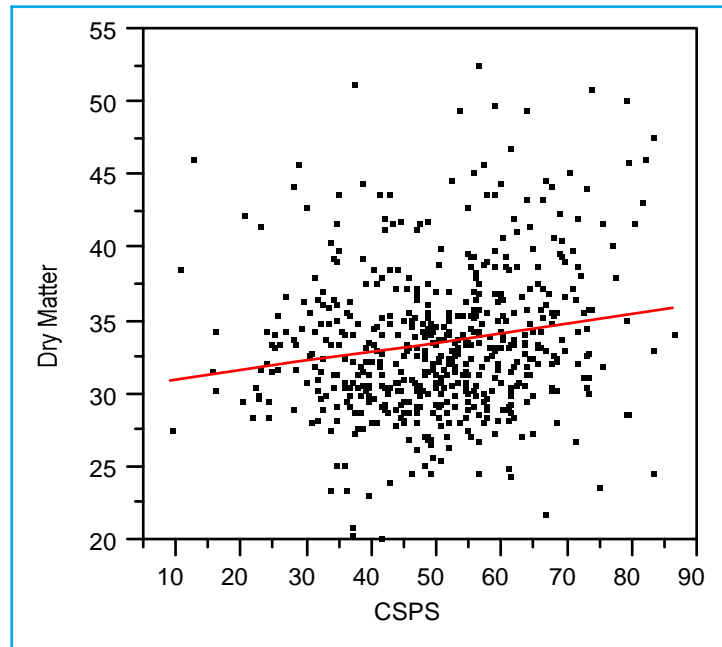
Relationship of PeNDF to CSPS in Corn Silage
(CVAS, 2006 – 2007)



Ferreira and Mertens in the development of the CSPS found that the percentage of starch greater than 4.75 mm (minimally fragmented) was positively correlated to mean particle size with an ($r=.46$) but with a low correlation due to different degrees of fragmentation within the same chop length.

One might expect some influence of dry matter on the friability of the grain in corn silage. As measured by the CSPS, we find no relationship. The amount of variation explained by dry matter differences is only 3%. Below is a graph of this relationship:

Relationship of Dry Matter to CSPA in Corn Silage
(CVAS, 2006-2007)



Use of CSPA in Milk2006

Milk2006 uses estimates of starch degradability to impact the estimate of TDN and NEI of a corn silage. The CSPA in this model is used to define the use of one of three estimates of starch degradability:

- CSPA > 69 (Optimum processing):
Digestible starch % = $((121.59 + (-0.8755 * DM))/100) * 1.08$ (from 86% to 98%)
- CSPA > 69 (Adequate processing):
Digestible starch % = $((133.20 + (-1.2731 * DM))/100) * 1.08$ (from 81% to 98%)
- CSPA > 69 (Inadequate processing):
Digestible starch % = $((144.81 + (-1.6707 * DM))/100) * 1.08$ (from 76% to 98%)