



# Dairy Keeper's Barn Report

## March 5, 2009

## Report #1

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**Reference Source:** The Beef Site, Writer Barry Potter - Livestock Socialist/OMAFRA

**Barn Report Topic:** Short Cut Corn Silage Works

Those tell-tale nose prints in the total mixed ration (TMR) you put in front of your milking herd provide indisputable evidence the cows have been sorting their feed again. Chopping your corn silage into finer particles can help reduce sorting and won't hurt performance-as long as you take other steps to ensure your animals get enough effective fibre.

The recipe for properly ensiling corn includes maturity, moisture content and hybrid selection. Chopping it fine allows better packing density, fermentation and maintenance of nutritive value.

However, fine chopping raises some serious questions:

- will reducing corn silage particle size impact the cow's eating activity?
- what's the impact of fine chopping on cow's rumen?
- how do you balance quality in the bunker with quality in the feed bunk?

A research study by P.J. Kononoff and associates recently answered the first two questions, and a simple device for measuring particle size can take care of the third.

The researchers looked at the effect of corn silage particle size on eating behaviour, chewing activities and rumen fermentation in lactating dairy cows. Four groups of cows were offered four different diets over a period of time. These diets had similar chemistry, but varied corn silage particle size. Lengths were short (7.4 mm), mostly short (7.8 mm), mostly long (8.3 mm) and long (8.8 mm).

### **Shorter cut preferred**

In the study, cows increased dry matter intake as the silage cut length was decreased. Also, the amount of neutral detergent fibre (NDF) intake increased as the chop got finer, and leftover feed, or orts, had less NDF remaining.

While fine chopping or processing corn silage may take more power, it definitely reduces sorting by cows. Reducing particle size resulted in less sorting and greater consumption of coarse, high-fibre particles, the researchers found. The longest particle size resulted in the most sorting.

### **Effects on rumen**

It is generally accepted that cows secrete less buffer saliva when fed short particle size forages. This should then lower rumen pH and butterfat percentage. Having enough effective fibre should stimulate chewing activity, an indicator of the diet's effect on the rumen.

While cows increased their intake of fine-chopped silage, they also spent less time chewing each unit of dry matter and NDF consumed. But the reduced chewing time did not impact rumen pH. This was possibly due to cows continuing to secrete saliva while resting.

### **Maintaining adequate fibre**

Reducing corn silage particle size can work successfully, but a ration still has to contain, on average, 31.5 per cent NDF and 42.5 per cent NFC (non-fibre carbohydrate). Feedstuffs containing rapidly fermentable carbohydrates probably have a greater impact on variations in the rumen pH than ration particle size.

As you prepare to harvest and then feed corn silage, haylage and TMR rations, check the particle sizes of each feed ingredient. The Penn State Particle Separator was developed to let you determine particle size effectiveness. Figures in the table indicate current particle size recommendations.

If you do not look after effective fibre through balancing particle size, you risk causing a bunch of problems with ruminal acidosis. Ask your nutritionist to measure the particle size of your forages and TMR, or buy a Penn State Particle Separator to ensure your ration meets the requirements.

Constant checking during harvest can also indicate whether knives on harvesting equipment are sharp enough. As well, reviewing the fibre length during harvest can provide insight into:

- too many round cobs retained in the top sieve of the particle separator. This may require a finer adjustment of the theoretical length of cut (TLC);
- too many hard kernels attached to the cobs. This may require a finer TLC setting;
- too few kernels processed if there is a processor;
- the sharpness and precision of the leaf and stover particle cut.

When you reduce particle size, corn silage packs and ferments better. This also reduces sorting by cows, making better use of feed. Using the Penn State Particle Separator lets you make sure your cows still get enough effective fibre to have a good total chew for producing adequate rumen buffering capacity.

Type	Corn Silage	Haylage	TMR
<b>Sieve Size</b>	<b>% DM Retained</b>		
<b>&gt; 19.0 mm</b>	5+/-3	15+/-5	5+/-3
<b>19.0 - 8.0 mm</b>	55+/-10	60+/-15	40+/-10
<b>8.0 - 1.18 mm</b>	40+/-10	30+/-10	40+/-10
<b>&lt;1.18 mm</b>	<5	<5	
<b>MPL (mm) a,b</b>	8+/-2	10+/-2	5+/-2

a As estimated by the Penn State Particle Separator (Kononoff et al., 2003a)  
b MPL = geometric means length as calculated by the ASAE (2001)

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