



by Steve Martin

## Good kernel processing pays off

IF WE were to make a list of the top five dairy nutrition topics in the past few years, kernel processing of corn silage would certainly be on it. As newer harvest-time technology has become more common, the opportunity to better process the starch-containing kernel in corn silage has offered a new way for dairy producers to improve milk production. We must be sure the cow's digestive system has access to the valuable starch inside corn kernels in silage.

The debate about pluses and minuses of kernel processing during harvest picked up steam a few years ago when corn was north of \$7 per bushel. At times, it takes extreme circumstances to get the attention of an industry that relies heavily on how things have been done in the past, and is slow to change at times.

When dairy producers were paying \$300 or more per ton of flaked corn, they took better notice of corn pieces in cows' manure. They had been seeing these undigested kernels forever, but had not been motivated to change feeding practices to fix the problem.

Every dairy has a place on the farm where parlor or holding pen flush water is congregated and flows through. It is in this spot where you might have the best opportunity to tell if this is a problem at your dairy with your silage. At times it is shocking – and might make a guy consider buying a few pigs or chickens to have one last shot at converting that lost opportunity into a sellable product.

The problem has its source on both ends of the corn silage spectrum – in the cornfield and in the cow. In recent years there has been a trend toward harvesting corn silage a little later to let starch content reach higher levels. This has likely done just that, but it has also resulted in more mature corn kernels that are dryer and harder – which also makes them more difficult for the cow to digest.

### Fast passage is a problem

At the same time, dairy rations have changed and may have resulted in higher rates of passage through the digestive tract. Less time in the rumen, where we want corn starch to ferment, has resulted in an overall loss of digestibility for the corn.

This is not a problem without a solution. Kernel processing (KP) units in corn silage choppers can break up

the kernel and solve this problem, and nearly every corn chopper I see in the field has a KP unit. There are several manufacturers available and all of them can help dairy producers either reduce feed cost, improve milk yield, or both.

Are we using this tool to its full potential? My experience across several states indicates that we are nowhere close to where we should be as an industry in this area.

There may be no more hectic time in all of agriculture than corn silage harvesting in the dairy world. The number of people and machines involved and the sheer amount of total horsepower used is stunning. As choppers get wider, packing tractors get heavier, and piles get taller, the trucks struggle even more to keep up. It is a synchronized system that is truly amazing. When you add to this a narrow range of desired harvest maturity, plant moisture content, and unpredictable weather, you have a very stressed environment.

It is in the midst of all of this craziness that you have to pay attention to being sure that KP technology is working at its best.

For sure, management of the KP unit is not the very most important effort in the midst of a frantic silage harvest time. With tight weather windows, custom choppers who always have other dairy producers screaming to hurry up and get there, and the inevitable mechanical breakdowns that occur, it is easy to at some point forget the finer points and just get the crop in. This is a decision that, if the results are negatively impacted, you will have to live with compromised silage for a whole year.

I am not an expert on the mechanical inter working of a silage chopper. Just like I don't want to expend too many brain cells understanding all of the intricacies of what happens inside a milking parlor, I don't want to climb inside a chopper and understand all of what makes nicely processed corn silage.

In both cases I lean on other experts to dig deep into these parts of the dairy and insure that they are operating at a high level of excellence. The results will tell the tale. Be sure that such experts are employed at your operation and that the results are, in fact, excellent.

The subject of kernel processing



is a frequent point of contention between dairy producers and custom silage harvesters. In addition to the frequent arm wrestling match related to the start and stop of chopping to obtain correct moisture levels, disagreements about KP settings and results are common. It seems the roller settings in KP units need frequent attention to be sure they are adequately processing kernels. Checking and re-checking loads throughout the chopping day is critical.

The dairy producer and harvester need to be sure they are on the same page on what will be considered successful KP results. I often hear from the harvesters that since "every kernel is nicked" it is adequate. The truth is, that is simply not enough kernel disruption to insure good starch availability. As long as adequate chop length is maintained on the forage portion, the kernel can't really be over-processed. We need to disrupt the integrity of the kernel as much as possible.

### KP results are easy to see

The impacts of good versus poor KP corn silage are evident in milk production and are easily modelled in a strong nutrition formulation platform. With what we now know about starch rates in the rumen, post-ruminal digestion, and the impact of starch on microbial protein synthesis, we can model one of two things.

First, we can predict the negative impacts of poor KP on reduced starch rate and total availability for milk solids production. In other words, we can predict how much less milk protein and butterfat you will have to generate income for the dairy. Sec-

ond, we can model adjustments to the ration that will be necessary to make up for poor KP. In this approach, the model will tell us how much incremental cost is necessary to "fix" the negative impacts of poor KP.

Ration adjustments to compensate for poor KP corn silage are mostly related to adding more purchased corn to the diet. This almost always increases ration cost. If corn prices are high, then obviously cost is more of a problem.

In any case, adding corn to a ration due to poor availability of corn that is already in the ration is a big negative. This increase in total starch to account for poorly digested starch would also increase cow health concerns. Adding corn to an already balanced ration means something else has to come out. Oftentimes this is forage, and that is bad for cows!

I could go into more details on the extra predicted milk income for well KP corn silage, or calculate the milk loss if nothing is done to make the ration better. I could also calculate the bad news about how much extra cost you will incur by accounting for poor KP. Suffice it to say that the difference in margin per cow for either scenario will be noticeable in your year-end financials.

These are not small issues at the dairy. Corn starch is the major energy supply that drives milk production in most dairy rations in the U.S. We cannot afford to be lax in managing corn silage harvest as it relates to kernel processing. Paying close attention to this issue this fall will insure that you are truly feeding for the bottom line.