

Texas Dairy Matters

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BMR AND HIGH CUT CORN SILAGE: WHAT ARE THEY WORTH?

Kevin Lager, Ralph Bruno, Ellen Jordan, and Todd Bilby

Extension Dairy Team

Department of Animal Science

Texas A&M AgriLife Extension Service

The Texas A&M University System

As harvest season approaches and grain prices increase, producers question how much can they pay for higher quality forages? In recent years, high chopping corn silage at an 18-20 inch height instead of the traditional 4-6 inch chop height and switching to brown midrib (BMR) hybrids have been evaluated as two methods to increase corn silage quality.

High cut corn silage increases crude protein, net energy of lactation, and fiber digestion; however the milk produced per acre may decrease as a result of decreased corn silage yield harvested per acre. The BMR hybrids have a lower concentration of lignin, resulting in improved fiber digestibility. Because of the improved quality of BMR, some studies show no advantage to cutting it high.

A recent study in Delaware compared traditional corn silage cut either at a normal or high cut with normal cut BMR corn silage. Key production factors from a trial on 27 second and greater lactation cows are reported in the accompanying table.

The cows averaged 81 days in milk at the beginning of the trial. They were fed a total mixed ration (TMR; dry matter basis) of 45 % corn silage, 5 % alfalfa haylage, 5 % alfalfa hay, and 45 % concentrate for 21 day periods. The concentrate formulation was modified as needed to maintain the same energy and protein content in the TMR for each corn silage group.

With the current volatility in grain markets, it is hard to know what corn silage will cost producers in 2011. In the example below, a price of \$47.50/ton on an as fed basis (33 % dry matter) was used to calculate the return to the grower per acre. If no adjustment is made to the price of the high cut or BMR corn silage to compensate the grower for the higher quality, the grower grosses less income per acre with either high cut or BMR silage.

Based on the yields reported in the Delaware trial, for the grower to receive an equal gross return per acre, the price paid for high cut corn silage would need to increase to \$57.04/ton or

\$52.29/ton for BMR corn silage. Input costs per acre could also differ based on seed and fertilizer costs.

If a dairy producer grows his own corn silage, the question becomes which corn silage results in the most milk production per acre. Using MILK2006, a Wisconsin program that takes into account the nutritional value of corn silage to predict milk production supported per acre, the normal cut silage has the potential to produce significantly more milk per acre than high cut or BMR silage.

Key production factors and partial budget estimates comparing normal and high cut conventional corn silage to normal cut brown midrib (BMR) hybrid corn silage.

Factor	Price	Normal Cut	High Cut	BMR
<i>Adapted from Kung et al., 2008</i>				
DM Yield, tons/acre		10.04	8.36	9.12
(as fed, tons/acre)		(30.12)	(25.08)	(27.36)
Milk lb/acre (MILK2006)		22,009	18,390	19,689
Milk		103 ^b	105 ^b	106.7 ^a
Fat, %		3.6 ^a	3.48 ^b	3.5 ^{a,b}
Protein, %		2.88	2.87	2.87
3.5% FCM		104.3 ^c	104.3 ^c	106.7 ^d
<i>Partial budget calculations, 2011</i>				
Return to Grower/acre @ Same Price	\$47.50/t as fed	\$1445.00	\$1203.00	\$1312.00
\$/ton Required for Equal Return to Grower		\$47.50	\$57.04	\$52.29
Milk \$/acre	\$19.89/cwt	\$4377.59	\$3641.66	\$3916.14
Value of Milk, April 2011	\$19.89/cwt	\$20.75	\$20.75	\$21.22
Cost of 37 lbs. silage/day, as fed		\$0.89	\$1.05	\$0.97
Milk Value Less Silage/d		\$19.86	\$19.70	\$20.25

^{b, c, d} Values with different superscripts within a row differ significantly

In April, 2011 the statistical uniform price for milk in the Southwest Federal Order was \$19.89 for milk testing 3.5 % butterfat. Thus, the increase in production could result in \$735 or \$461 more gross milk income/acre from the normal cut silage than the high cut or BMR silage, respectively.

Another way to evaluate whether the BMR silage pays is to determine if the increase in milk production expected off-sets the cost of changing to BMR or high cut corn silage. Since milk production was improved when the BMR silage was fed, milk income increased \$0.47 per cow per day compared to traditional and high-cut corn silage.

Using the prices of corn silage calculated for the grower to receive an equal gross return per acre, cows fed the BMR silage would bring in \$0.39 per day more than those fed traditional and \$0.55 per day more than those fed the high cut silage. However this may not always be the case. The cows in this study were relatively early in lactation and high producing cows that could respond to improved silage quality with more production. Cows in later lactation might not respond with

increased milk production to offset the increased cost. Nor did they determine the response of first lactation animals.

Determining the value of cutting height variations and BMR varieties is not a simple task, and that answer can vary from year-to-year, particularly as milk and commodity prices fluctuate. The answer also changes depending upon if the producer is growing or buying his forage.

In a drought year, every ton of forage at harvest matters, so improved forage quality may not be the goal. Meeting minimum forage and fiber requirements to maintain rumen health becomes critical instead.

With our Texas winds, another issue that must be considered is lodging. Over time, BMR varieties have had fewer lodging issues due to improvements through genetic selection and management. Higher yielding varieties are also being introduced. The drought tolerance of varieties may need to be considered as well.

When making corn silage purchases or harvest decisions this season, consider more than just the price per ton. Determine the nutritional value and how that might impact your cows' milk production.

Reference

Kung, Jr., L., B.M. Moulder, C.M. Mulrooney, R.S. Teller, and R.J. Schmidt. 2008. The effect of silage cutting height on the nutritive value of a normal corn silage hybrid compared with brown midrib corn silage fed to lactating cows. *J. Dairy Sci.* 91:1451-1457.