BMR or Conventional Corn Hybrids for Corn Silage: Profit/Cow or Profit/Acre?

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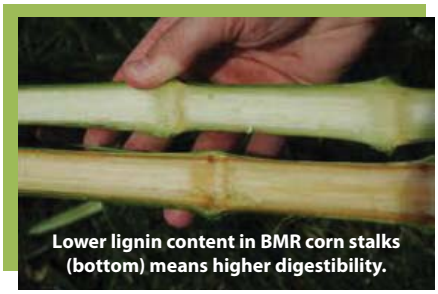
BMR corn features a distinctive brown midrib.

Over the past decade, dairy producers have increased their use of corn silage as a forage source in dairy rations. This has been influenced by the high price of feed, especially corn, and corn silage's high energy content; which can substitute and reduce corn grain inclusion rates. Due to its high yield potential of consistent forage, producers can harvest as many tons of corn silage in a week as they can put up good alfalfa all summer long.


Lower lignin content in BMR corn stalks (bottom) means higher digestibility.

While the U.S. average of corn acreage harvested as corn silage is approximately 8-12%, in dairy areas of Minnesota and Wisconsin, the proportion can run as high as 25-35% of the acreage. Many farms now harvest one thousand to several thousand tons of corn silage per year. With this much corn being harvested as corn silage, producers want to know which hybrid type (e.g., BMR, conventional, dual-purpose, leafy) is the best choice for their particular farm operation. There are several agronomic and animal-related factors that need to be considered.

One of the first criticisms of planting BMR corn is that there is a yield drag. The question is – a yield drag of what? Typically, BMR will have a 5-10% decrease in dry matter (DM) yield. However, it is known from many research trials that BMR has significantly more NDF digestibility and DM digestibility. If yield x digestibility is calculated and compared, the advantage may go to BMR corn silage. If the same logic is applied to alfalfa, three cuttings instead of four or five might be the norm. Corn silage does not have a cutting interval or PEAQ stick measurement on which to rely. Therefore, thinking needs to be shifted away from DM yields alone, to yields of digestible nutrients per acre, whether digestible NDF, crude protein, or even energy yield.

Another criticism of many silage corn varieties, BMR included, is that they are lower in starch content. This may be the case as BMR varieties are approximately 10% lower when compared to other conventional corn silage varieties. However, research reported in the Journal of Dairy Science showed similar starch content when compared to silage-specific varieties. Digestibility of the starch is similar at comparable harvest moistures and processing. One strategy to consider for increasing starch content is going to a longer season hybrid and planting on the lower-side of plant populations. In a silage field, full-season hybrids can be 5-10 days longer in maturity than what would normally be grown for grain because concern for getting the field to black layer is not as important as it is with grain. The greater expected yield potential with longer season hybrids often makes it worth the risk. If the corn grain is harvested as high moisture corn, dry down is not a concern. If anything, there is greater risk of silage and high moisture corn becoming too dry. Thus, the maturity range of hybrids planted can be greater if both corn grain and silage are produced, helping minimize the risk of weather problems during a particular growth stage (particularly pollination/silking) and spreading the harvest workload. Plant the majority of corn acreage in the full-season maturity range and less in the mid- or shorter-season range. Consideration needs to be given to how long it takes to plant and how long it takes to harvest either silage or high moisture corn and make adjustments accordingly. How many hybrids should be chosen? At 100 acres or less, focus on two varieties of the highest performing hybrids for the geographic area. If planting 1,000 acres, choose up to four or five.

What are the animal factors that need to be taken into consideration? If production goals and higher than average milk production is important, then BMR corn silage will be beneficial. However, the best corn silage will not guarantee high milk production; but neither will poor corn silage. It is known from Michigan State research that as NDF digestibility is improved, improvements in dry matter intake (DMI), most likely in production of fat-corrected milk, will be seen as well. It is best to position BMR corn silage where DMI may be limiting production; such as transition cows, early lactation, and peak lactation. Greater peak milk almost always translates into greater total lactation yields. Greater DM intake may also reduce body weight and body condition losses, which can translate into improved reproductive performance. Other factors that are being considered are improving rumen function by increasing the total amount of NDF in the diet, increasing the total amount of effective NDF, reducing corn amounts, and lowering starch content in the diets.

It has been repeatedly observed that cows fed BMR corn silage tend to eat more. This is usually good, but not if the cows don't milk more. Why do cows eat more? BMR corn silage may not only be slightly lower in NDF, but NDF may also digest faster. How full a cow is relates to how much NDF she eats and how fast it digests. One factor in feeding a cow is rate and extent of NDF digestibility. If NDF digests too fast, as can happen with BMR, it moves out of the rumen before it is digested as much as it can be. However, if NDF digests slowly, a cow stays full too long and cannot eat as much as she needs. This is what happens with poor quality forage.

New corn silage harvesters can chop longer particles and process them for greater digestibility. Recent Wisconsin research shows an advantage to cows fed "shredlage" – corn silage chopped at over 1" theoretical length of cut and processed with a new type of roller. The combination of longer fiber length and different processing may be very beneficial to BMR corn silage. Because of its faster rate of NDF digestion, physically effective NDF may be a concern when feeding high levels of BMR corn silage. If greater amounts of corn silage are fed in order to save on overall feed cost; it is necessary to increase the particle length of BMR corn silage in order to avoid some of the problems seen in the past. Among these have been cows that develop acidosis due to a lack of cud chewing and natural buffering. It is extremely critical to get an accurate rate of NDF digestion and utilize nutrition models using a rate of digestion. Forage analysis should include a 24 or 30 h NDF digestibility.

What about the economics? All corn seed is expensive and BMR is on the high side. Expensive seed, along with needing to plant an additional 10% or more, increases seed cost. However, with the high price of feed, being able to use more forages, more home-produced feed, and increased production, this may improve overall profitability. In conclusion, if done correctly, BMR corn silage allows producers to improve profit per cow *and* profit per acre.