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## Potential Economic Value of Increased Feed Efficiency in Dairy Cows via Corn Silage Quality

**Rich Lutz, BASF Plant Science**

Due to the constantly increasing cost of feed and milk production, improving feed efficiency (FE) is more important than ever in high-producing dairy herds. A number of papers on the subject have been published in recent years, including Casper (2008), Hutjens (2007, 2010), Erdman (2011) and Fry (2011).

Casper et al. (2003) observed that higher FE occurred when dairy herds were having high milk production on lower than expected dry matter intake (DMI). Evaluating these dairy herds indicated that the apparent reason for achieving higher milk production on lower than expected DMI appeared to be related to forage quality.

Hutjens (2010) offered practical applications on how improved forage quality impacts FE and profitability in dairy herds. With herd FE ranging from 1.4 to 1.7 (pounds of 3.5 percent milk per pound of dry matter, or DM) each 0.1 point change is worth approximately 34 cents per cow per day. Key factors impacting FE include forage quality, fiber digestibility, ration formulation, DMI and rumen health. Forage quality remains a key solution in obtaining optimum FE. Producers should consider increasing corn silage levels in rations as feed cost per cow per day may drop by 15 to 30 cents.

A recent Cornell University study (Chase, 2010) demonstrated significantly improved FE for high-producing dairy cows fed NutriDense® Silage hybrids compared to those fed either dual purpose corn or brown midrib (BMR) corn silage hybrids.

Agronomic results from the Cornell University study demonstrated that the NutriDense Silage hybrid yielded 5 percent more tons of DM/acre than the BMR hybrid. Yields of the NutriDense Silage hybrid versus the Pioneer® dual purpose hybrid were not significantly different.

### Agronomic Results

Item	NutriDense	BMR	Pioneer
Wet tons/acre	23	22.5	21.9
Tons DM/acre	8.1	7.7	8.2
Dry matter, %	35.18	34.29	37.19

In the feeding trial, high-inclusion levels of corn silage were evaluated. Total mixed rations (TMR) consisted of 59 percent of the respective corn silage hybrid, 5.5 percent straw and 35.5 percent grain. Twenty cows were assigned to each treatment – NutriDense Silage, BMR or Pioneer dual purpose – at seven to 12 days post-calving and individually fed their respective rations for 10 weeks.



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Summer 2011

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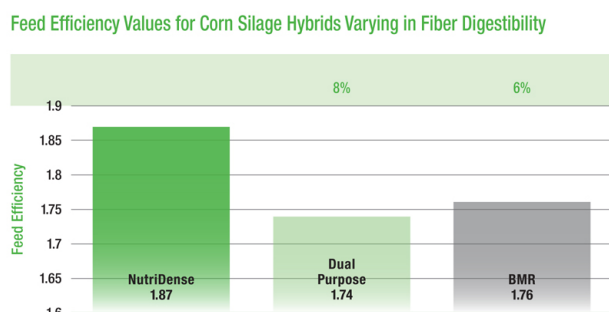
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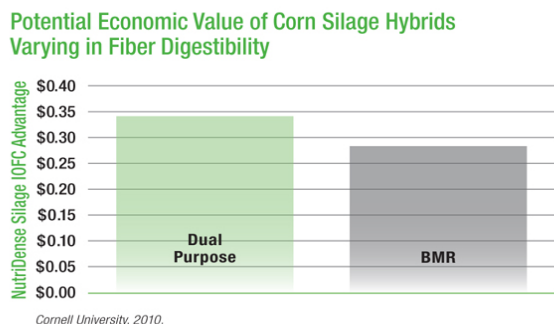
FE, 3.5 percent fat corrected milk (FCM) per pound of DMI, was significantly improved ( $P < 0.002$ ) for cows fed NutriDense Silage (1.87) compared to those fed either the dual purpose (1.74) or BMR (1.76) corn hybrids.



Although feeding the BMR-based TMR did result in improved milk production compared to those fed either dual purpose or NutriDense Silage, this increase in milk yield was a feed intake-driven response (higher DMI) and not indicative of greater energy contribution from the BMR corn silage.

Cows fed NutriDense Silage were 6.3 percent and 7.5 percent more efficient in converting DM into milk than those fed BMR or dual purpose hybrids, respectively. In addition, NutriDense Silage contained 6.3 percent more net energy for lactation ( $NE_L$ ) than BMR and 7.5 percent more  $NE_L$  than the dual purpose hybrid. These data confirm earlier published work by Akay & Jackson (2001) and Spain & Sampson (2007), who reported improvements in FE when comparing NutriDense hybrids to dual purpose hybrids available in the marketplace.

Assuming 50 pounds DMI/cow/day and feed costs averaging \$0.10 per pound of DM, the observed FE improvements could result in a significant income over feed cost (IOFC) advantage.



Utilizing the data generated from the 2010 Cornell University feeding trial, BASF Plant Science L.P. has developed a silage value calculator. This tool will allow the user to quickly evaluate the potential value that an improvement in FE may bring to a dairy operation, taking into consideration specific input values from the dairy.



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Nutrition professionals and their producer clients may wish to consider evaluating corn silage hybrids that have demonstrated improved FE in controlled feeding trials.

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