# Blending Confinement Feeding with Grazing: What to Consider*

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Have you utilized grazed forage as a significant portion of the diet of lactating cows? Have you considered doing that? Would you consider grazing if you could put more money in your pocket? I'll bet you would!!

Some might say "No, Grandpa grazed his cows and come July, they didn't give much milk." True. But since Grandpa's day, we all know cows have improved and nutritional knowledge has improved. Also, knowledge of grass-clover and how it can be managed has improved. Most of all, the technology that makes it work has improved vastly – high-impedance electric fence controllers, polywire, tread-in fence posts, plastic pipe, and mobile water tanks.

QUALITY FEED: CHEAP PRICE. The highest quality feed that you can make available to your cows is the cheapest price! Lush growing clover-grass, that has been managed by intensive grazing, is high in both crude protein and energy, and low in NDF.

NEL content of 0.74 Mcal/lb is expected of young, actively growing plants. Compare that to recommended dietary NEL of 0.78 for a heavily lactating cow or for corn silage of 0.72.

In 1995, when forages to be grazed were analyzed separately as grass and clover, they averaged 24 and 26.8% in crude protein, respectively, May through August. NDF averaged 48.9% for grass and 23.6% for clover.

Truly, this is a quality feed resource. And the feed value is always more when grazed directly. It has been proven more than once that forage quality decreases when ensiled and even greater losses occur when made into hay. Therefore, when possible, it may be better to take the cow to the forage rather than take the forage to the cow.

CROPLAND TO PASTURE. To make grazing a significant portion of the diet, most dairymen would have to allocate some nearby cropland to grazing. Are you willing to do that? It does have advantages. Less stored feed is required, saving storage space, labor, machinery wear, chemicals, and costs of planting. Grazing offers advantages in herd health, environmental concerns and possibly economics. Ration balancing becomes more challenging because grazed plants continue to change in value, however, good grazing management counters extreme change.

Does it pay to convert cropland to pasture? As always, every circumstance is different. A survey of New York and Pennsylvania dairy farms by USDA (1989 study) showed that farms that used moderate intensive grazing had 23% fewer cows and produced 14% less milk per cow. Purchased feed costs were less ($167/cow) in intensive grazing.

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Health and labor costs were also less, saving $136/cow. When overhead costs, interest, and capital replacement costs were summed, another $124 was saved. So, farms with moderate intensive grazing earned higher returns/cow ($643 vs $461) and higher net farm income (32,115 vs 29,949) with 23% lower cows.

In a follow-up (1992) study of 48 northeast Pennsylvania farms, "the farms that employed" intensive grazing "achieved 16% higher profit per cow and per worker than did the farms that employed extensive grazing" (more or less exercise fields). In this study, corn silage produced nearly twice the DM yield per acre of moderate intensively grazed pasture, but because of input costs of corn silage production, the bottom line return per acre of pasture exceeded corn silage ($319 vs $298).

Penn State, in a simulation study, compared a typical Pennsylvania dairy farm (200 acres, 53 cows, 49 replacements, 15,000 lb milk) using dry lot feeding with one using intensive grazing (30-35% energy intake from concentrates) from May to October. The grass margin was $121/cow higher on the grazing farm. However, remember, production was held constant!

Now, for a recent example in our own herd. A six-week study beginning early in September used 54 Holsteins in mid-lactation (averaging 62 lb/milk) divided equally by milk production and days in milk into three groups. One group was fed herd TMR only, the others were also fed TMR, but were allowed to graze grass-clover while in the paddock about 8 h either before noon or after 2 p.m. Those cows that grazed in the p.m. presumably obtained 34% of their DM from pasture because they voluntarily ate that much less TMR during the other part of the day. Cows fed only TMR produced 65 lb daily vs 62 lb for the group that grazed in the p.m. When feed cost and pasture budget numbers were applied, those cows that grazed returned approximately $5.00/week more than the totally TMR fed animals. Consider 100 cows! That's $500/wk.

PASTURE MANAGEMENT. The same as cows have to be managed, pastures must be managed to provide both quality and quantity for the animal. In our climate, cool season plants will provide the best quality and the greatest yield per acre when properly managed by intensive rotational grazing.

From both the animal and plant standpoint, the best time to graze dense growth of grass is when it reaches about 8 inches in height. Ideally, it should be grazed down to 2-3 inches during one day, the animals removed, and returned only after regrowth to 8 inches.

What are the advantages for the cow? First, quality is near peak. Secondly, this represents the best bite size for the cow. Rate of grass intake is the product of biting rate/minute times intake per bite. Under these ideal conditions, maximum forage intake per cow would occur.

What are the advantages for the plant? Grass that has grown 6 to 8 inches has stored energy below the leafy portion of the plant. This stored energy aids the plant in regenerating leaf material so that a good rate of photosynthesis and regrowth can occur. If animals remain

in a paddock more than 3 days, there's a good chance they will bite the regrowth of the plant again, robbing the plant of energy reserves resulting in a considerable delay in regrowth as well as reduced potential yield. If grass is grazed before it reaches 5 to 6 inches, a great deal of productivity is lost because the most rapid growth is between 5 to 8 inches in growth. In conclusion, to obtain the best balance in quality and yield, size the paddocks to be grazed so that growth is removed in a short interval. Then, keep animals off until it has reached targeted grazing height again.

GRAZING FOR MILK PRODUCTION. Maintaining the very high amounts of milk yields that can occur in cows fed a well-balanced TMR is likely not possible in cows getting a major portion of the nutrients by grazing. Research from other countries indicates that grazing, with no supplementation, would support 50-55 lbs milk/day during the spring. Limitations on intake when grazing explains why very high amounts of milk cannot be maintained. Voisin, author of the classic Grass Productivity, notes that cows will only work 8 h/day – whatever dry matter they consume in that time satisfies them. Obviously, to get greater milk yield, additional dry matter intake must be supplied from other sources.

SUPPLEMENTATION OF GRAZING COWS. Several forms of supplementation have been studied and/or have been used by dairymen. A favored way among dairymen has been to make available their usual TMR twice daily with access to pasture after a period of consumption. This should work well if grazing is somewhat restricted allowing the TMR to make up the gap in DM intake. One can get in and out of grazing rather easily with this approach.

One of the opportunities or problems (depends) with high quality grazed grass-clover is the very high content of ruminal soluble and degradable crude protein. This is very useful nutritionally to the extent that it is used in the growth of rumen bacteria. However, much of it, in the form of ammonia, passes into the bloodstream and is excreted as urea in the urine and milk. This elimination process costs energy to the animal; theoretically, enough to reduce milk production by 3 to 6 lb/day. The only way to counter this is by including fermentable carbohydrates in the diet so that excess ammonia can be captured by rumen bacteria in an accelerated growth process. Our research shows that milk urea nitrogen (MUN) continues to decline as more supplemental corn is included in the diet.

Grazed forage may be better utilized if considered a protein supplement in the diet. This gives the opportunity to reduce the protein content of a TMR by 3 to 4 percentage points while grazing, depending on the amount of TMR actually consumed. We have generally supplemented grazed cows successfully with principally ground corn. The addition of soybean meal has given only small responses in milk yield, however, in some cases, sources of undegraded protein has boosted milk production.

So, what is the recommended method to supplement lactating cows on pasture? There is probably not any absolute best way. It depends on the dairymen's goals (maintain top production or cut expenses), availability of high quality pasture, and/or desire to manage pasture.

In our experiments, cows have been supplemented from 0 to 20 lb of ground corn-mineral daily in two equal feedings. Response to energy supplementation is generally greater later in the season when quality or availability of pasture is lowered. Additional corn supplement beyond 10 to 12 lb daily gives small responses in milk yield. A decrease in forage intake occurs with grain feeding, but according to Penn State summaries, it is usually less than any increase in grain intake. In general, pasture DM intake decreases 0.5 to 0.9 lb per pound of grain fed. Milk yield response from added grains is about 0.7 to 1.2 lb per pound of grain. Long term effects of more grains may be observed in improved body condition or reproductive gains.

We have concern about feeding more than 7-8 lb of corn or equivalent at any one feeding. "Slug" feeding has the strong potential to increase acidity in the rumen. Rumen pH approaching 6.0 and lower has been shown to reduce fiber digestibility. In our studies, the rumen of cows fed 6.6 lb of corn followed by grazing, averaged about pH 6.0 for the 8 hours. The lowest pH, 5.8, was observed at 8 h post-corn feeding, which may indicate that grazed forage was as responsible for lowering the pH as was corn. However, in another experiment, NDF digestion in the rumen was lowered when corn was added to a diet of pasture. Penn State have fed supplement 4 hours after grazing began and have also offered synchronous computerized feeding in the pasture, but neither have enhanced the milk yield beyond that observed with twice daily (slug) supplementation in lactating cows.

In our studies, we have compared TMR, corn silage, and corn-mineral as supplements to grazing cows. During the spring season, corn has yielded similar or often slightly more milk than TMR or silage. The big advantage to feeding ground corn is that no TMR has to be mixed or no silo has to be kept open in the hot weather. This may release some time to do some other needed spring-time chores.

IN SUMMARY, MY THOUGHTS. Grazing of high quality forage can potentially contribute to net income of dairymen if they are willing to allocate land and management to this enterprise. To maintain high amounts of milk yield, it may be necessary to supply 65-75% of DM intake from a modified TMR, one in which the soluble protein is reduced by 3 to 4% in order to better utilize the high protein of grazed material. Holstein cows producing less than 70 lbs/day can utilize pasture as a principal DM source and with 10 to 16 lbs of corn supplementation (depending on quality and quantity of pasture), maintain production according to a normal lactation curve. Besides providing high quality feedstuffs through grazing, this provides an opportunity to reduce cropping costs, wear and tear on machinery, and waste handling, and perhaps create a welcome change in routine lifestyle during the grazing season.

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