Profiting from Pasture

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You can put your cows on grass while avoiding a production slump.

During the last vestiges of winter, it's easy to conjure up visions of your dairy herd grazing on lush pasture. As you scrape the yards, you picture your beef farmer neighbour putting his cows out to pasture come spring - they'll look like a Rockwell painting.

You start to dream about your dairy cows in a similar picture. Then you snap back to reality. Putting your herd out to pasture could mean a production slump that occurs when high producing cows feed on fresh forage.

Your dream could become at least partial reality, however, if you consider supplementing economical pasture feeding with grain or a total mixed ration (TMR).

Why the difference? The fresh, lush forage would appear to meet the cows' nutritional requirements. Table 1 shows the average nutrient composition for cool-season grass pastures over a growing season.

As we can see in the table, crude protein from pasture exceeds 20 per cent. Non-fibrous carbohydrate, made up mostly of plant sugars, reaches or exceeds 15 per cent in spring. The pasture's net energy for lactation (NEL), measured in megacalories (Mcal) per kg, varies from 1.5 to 1.7 Mcals per kg. A dairy cow requires an NEL of 1.7. Corn silage, considered a high-energy forage, provides 1.6 Mcal per kg. So high-quality pasture should support high levels of milk production.

Why didn't the Penn State cows on pasture produce as much as their counterparts in the barn? A cow's intake provides the main explanation. Grazing cows consumed only 19 kg of dry matter while cows on the TMR ate 24 kg.

Social environment may be one reason for the difference. A study by Fred Provenza and Beth Burritt reported that young animals socializing with their mothers learn about every facet of their environment- from the location of water to the kinds of food available. Sheep research shows that lambs fed wheat with their mothers for one hour per day for five days eat more wheat than lambs exposed to wheat without their mothers. Even three years later, with no additional exposure to wheat, these animals will consume nearly 10 times more wheat than those that didn't learn to eat it with their mothers.

Dairy calves removed from their mothers at birth aren't exposed to the social relevance of forage as feed. Not only that, but their mothers may never have been exposed to pasture anyway. If you expect your cows to graze, then exposing them to grazing behaviour as young calves or yearling heifers will increase their comfort level when you turn them out to graze as adult cows. To ease mature cows into a comfort level with pasture, feed them some green chop before grazing. Increase pasture time gradually to reduce stress and production losses.

Once you put your cows on grass, you also have to keep in mind how much time they'll spend eating. Grassland productivity expert Andre Voisin has suggested that cows must belong to a labour union. They eat (work) no more than eight hours per day, whether or not they eat enough. If the forage is of higher quality, each mouthful gives them more nutrition.

Ensuring a pasture height in the six to eight-inch range will maximize intake. As the height of the forage decreases, intake decreases at a greater rate for low-density stands. When the height was around seven inches, intake remained the same with high, medium or low-density stands.

While the most limiting nutrient from cool-season pastures is energy, grass usually provides excess crude protein. This protein is highly soluble. It releases large quantities of ammonia nitrogen in the rumen, which can be good or bad, depending on the other dietary components.

Microbes growing in the rumen rely on fermentable carbohydrates. Providing them with highly degradable starch, along with the pastured forage, lets them utilize more of the ammonium nitrate, with less ammonia reaching the bloodstream. Another study shows reduced blood urea in grazing cows when they get ground corn as a supplement.

A cow can use up the energy equivalent needed to produce two to three litres of milk when she has to convert excess ammonia to the waste product urea in her liver. So it makes sense to give grazing animals an energy supplement.

How much grain should be supplemented? Virginia Tech research shows only small increases in milk yield when intake of grain (ground corn with mineral supplementation) goes above 4.5 kg per day. As shown in Table 2, grain feeding won't give you a significant milk yield response. But the grain causes increased dry matter intake on pasture. That means improved body condition and, it's hoped, improved reproduction.

Research findings suggest maximum grain fed on a dry matter basis should be equivalent to two per cent of a cow's bodyweight. Generally, when you supplement a cow on pasture, she consumes less forage. However, total dry matter intake will increase. Each kg of grain fed probably reduces pasture intake by 0.5 to 0.8 kg.

If you're making a TMR, you would likely supplement pastured cows with it. They can adjust their TMR intake to the quantity and quality of the pasture. The TMR provides a stable base, requiring less adjustment by your cows. The disadvantages are that you have to spend time making the TMR and silage may spoil if you make more than your cows can use.

But it can work. One study found that cows fed a TMR in a confined drylot between midnight and noon, and allowed to graze the rest of the d a y, consumed two-thirds as much TMR as cows fed totally on a TMR. The two groups produced 28 and 29 kg of milk respectively.

The required amount of TMR or grain supplement depends on many factors. The biggest is the quality and availability of pasture, and the milk production potential of your cows.

By feeding supplemental TMR or grain, you can overcome the feed intake shortage from grass feeding, taking advantage of pasture's cheaper cost. That makes the vision of your herd grazing on grass a definite option.

Table 1. Average nutrient composition for cool-season grass pasture over a grazing season. Modified from Muller and Fales (1998)

Nutrient	Spring	Summer
Crude Protein	21.0 - 25.0	18.0
RUP, % of CP	20.0 - 25.0	25.0 - 30.0
Sol. P, % of CP	30.0 - 35.0	25.0 - 30.0
ADF %	24.0 - 28.0	28.0 -34.0
NDF %	40.0 - 45.0	48.0 - 55.0
NE, Mcal kg	1.60 - 1.70	1.50 - 1.70
Non-fibre carbohydrate (NFC), % DM	15.0 - 20.0	12.0 - 15.0

Table 2. Grain (DM) feeding guidelines for a grass pasture system (Muller, 1998)

4% FCM Production (kg/day)	Spring kg	Summer kg	Fall kg
>35	10	11 - 12	10
30	7.0 - 8.0	9.5 - 10.5	7 - 8
25	4.5 - 6.0	6.5 - 8.0	4.5 - 6
20	2.5 - 3.5	4.5 - 5.5	2.5 - 3.5