Evaluation of Sprouted Barley Fodder for Grazing Dairy Farms

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Sprouted grains, while not a new concept, have gained renewed interest among some grazing dairy farmers in response to high grain prices, grain scarcity (especially in the certified organic sector) and challenges in producing high-quality forages. This interest has been spurred on by high-profile advertising by companies selling the systems, as well as some farmer reports of improvements in milk yields, cow health and farm profitability. However, there is little scientific data available on feeding sprouted grains in the temperate regions of the country such as the Northeast and Upper Midwest.

Promoters of sprouting systems state that one pound of grain can be converted into roughly 6-8 lbs. of fodder in five to seven days. At first glance, this sounds VERY alluring to farmers: who wouldn't want to turn a pound of feed into six or eight lbs. in one week?

If we break it down into actual nutrients, the story changes. The grain is 5-10% water, while the fodder is 80-85% moisture. Thus, one pound of grain amounts to 0.9 lb. of dry matter, while one pound of fodder converts to 0.2 lb. DM.

Assuming that one pound of grain produces seven pounds of fodder, a pound of grain that is 0.9 lb. DM produces 1.4 lb. of fodder DM (7 x 0.2). That sounds great, right?

Except that often that kind of yield is not realistic. In a study Dr. Soder conducted at the USDA-Agricultural Research Service in University Park, Pennsylvania, the best yield obtained with barley seed was a 327% increase, or about half the claimed 700% gain. This still sounds good until it is converted to a dry matter basis. When that was done, there was a 17% **LOSS** of DM.

Dr. Soder also found a 21% loss in net energy for lactation (NE_l), meaning that one-fifth of the energy in the grain was lost, mostly during the sprouting process. Energy is needed to sprout grain, and while green plants will accumulate energy, five to seven days is not enough time for that to happen.

While there was a marginal increase in nutrient digestibility with fodder compared to barley grain, digestibility was not as good as with high-quality pasture. When combined with the losses in net energy and DM, this would likely result in a net loss of digestible energy available to the animal, which could negatively impact animal performance and increase feed costs.

But what about animal performance? A study by Dr. Brad Heins at the University of Minnesota fed lactating dairy cows either zero or 20 lbs. (as fed) of fodder/cow/day. The fodder replaced 6 lbs. of corn-based concentrate and was fed with a TMR.

The no-fodder cows were fed 8 lbs. of concentrate in the TMR while cows being fed fodder had 2 lb. of concentrate in the TMR. Milk production, milk fat, body weight and body condition score were not affected by fodder. Cows fed fodder had slightly greater milk protein and also greater MUN (16.5 for fodder cows vs. 13.5 for cows not fed

fodder). This suggests that the cows fed fodder may not have been as efficient in utilizing crude protein.

In an economic analysis of this feeding study, Dr. Heins found that at an organic price of $11.77/bushel (the price at the time), income over feed costs (IOFC) was similar for fodder and no fodder. IOFC remained similar if the organic corn price increased by 25%. When organic corn costs were increased by 50% (to about $17.65, which has happened in the past),

the fodder-fed cows had an advantage in IOFC of approximately $0.44/cow/day. However, the initial investment in the fodder system was not included in the IOFC analysis, and therefore the actual cost of producing fodder would be even higher.

Dr. Soder also obtained a Northeast Sustainable Agriculture Research and Education (SARE) grant to conduct an on-farm fodder study to try and answer some of those economic questions.

Three Pennsylvania dairy farms were selected. All were grazing farms, as they were also certified organic. Monthly visits were conducted for one year to collect feed, pasture, milk and management data.

Two of the farms quit feeding fodder during the study. One had purchased a second commercial fodder system for its 40-cow herd (the first commercial system had too much down time due to repairs), then quit feeding in the new system due to poor economics only months after the purchase.

The other farm quit feeding in a large, three-ton/day commercial system (150 cows) simply due to economics. This farm was not seeing a milk response, and feed costs were much higher when feeding fodder.

The third farm had a very low-cost, homemade system that was used to fill gaps in forage availability for a 20-cow herd managed with family labor. The forage produced on this farm was of lower quality and quantity compared to the other two, which may be why this farm saw a slight milk response when fodder was fed.

This seemed to be the trend as our study progressed: Fewer farmers were implementing systems, and quite a number were discontinuing use of fodder for economic reasons and mold issues.

If the fodder seemed to work very well on a farm, economics were not a direct factor. An example of this would be a low-cost, homemade system operated by family labor. Otherwise, issues such as labor, mold or breakdowns caused them to quit feeding fodder.

Fodder does not seem to be the "magic bullet" replacement for producing high-quality forage in temperate regions. But fodder may have a place if:

• High-quality forage is not produced due to drought, management or land restrictions. We found that low-cost fodder systems were more beneficial on farms where forage quality was low.

• Labor is not a big issue. If hired help was used, the economics generally were not favorable. However, if family labor managed the system, it was viewed more favorably, often because the family labor was not considered in the cost of fodder production.

• A system can be built for low cost. The initial investment for a commercial system can be daunting.

• Mold can be kept out of the system. If mold appears on the fodder, the farmer is out of the feed for that day and must find an alternative forage source until the mold issue is resolved.

• Feedgrain prices are very high. However, this may also impact the cost of the grain used in the fodder system.

Anecdotal economics for fodder systems can be deceiving, as each report seems to differ in what costs were included in the analysis. Some include only the direct costs of producing fodder for that day, excluding the initial investment in the system. Some do not include labor, especially if family labor was used. Few seem to include all costs.

Also, most reports and articles discuss only fresh feed production since it looks impressive. But as we showed, when converted to a DM basis (which is how we formulate rations for dairy cows), the available nutrients may not be as appealing compared to other forage sources.

Bottom line: Producing high-quality forages is certainly more economical than growing fodder under most circumstances in temperate regions of the U.S. such as the Upper Midwest and the Northeast/Mid-Atlantic regions.

Fodder is alluring because it is produced in a more controlled environment and offers (claimed) improvements in animal productivity and health. Yet there are also significant costs and risks associated with fodder production.

Several estimates show that the “real” cost of fodder may be $600-$1,000 per ton of DM produced. High-quality forage generally can be produced or purchased (even if shipped with a guaranteed nutrient analysis) at much lower expense.

Each farm must put pencil to paper to determine if implementing fodder in feeding management is a good idea. If you do so, make sure to include all costs in deciding whether the money could be better spent growing or purchasing higher-quality forage.