HOARD'S DAIRYMAN

Less organic grain equals more profit

Although milk production and components are severely hindered without supplemental feeds, one study showed organic producers would be better off feeding less grain.

by Bradley J. Heins

ORGANIC dairy numbers in the Upper Midwest continue to grow. We are still discovering organic best management practices, but we know these farms need a consistent season-long supply of high-quality forage to ensure animal health and optimal milk production.

Currently, the biggest factor affecting the bottom line of organic dairy herds in the United States is the high price of organic grains. During 2010, organic corn prices hovered around $6 per bushel. However, in 2011, organic corn prices rapidly climbed to $14 per bushel. Early 2013 prices indicate that organic corn and soybeans remained at high levels. Organic soybean meal averaged $1,150 per ton during 2012, which is not economical when fed to organic dairy cattle.

Supplemented feeds should complement pasture forage at a reasonable cost. Neither grass nor legume pasture will meet the energy requirement of the high-producing dairy cow based on Dairy NRC recommendations. Levels of neutral detergent fiber (NDF), especially in grasses, will limit the cow's ability to maximize dry matter intake. High-quality legumes or grasses provide adequate levels of protein, although requirements for rumen undegradable protein (RUP) may not be met.

There remain unanswered questions on the appropriate supplementation for grazing cows. Milk production for cows on all-forage diets should respond to supplementation of high-energy feeds. Unfortunately, today's high-priced grains replace forage in the diet. Stored forage or additional grain may be provided to adjust for seasonal changes in pasture performance.

Three different strategies

During the summer of 2012, we looked for practical strategies that organic dairy producers could use to enhance the profitability of their farm. We compared organic grain supplementation levels and its effect on economics, behavior and pest management of organic dairy cows.

That summer, we put 96 lactating Holstein and crossbred organic dairy cows on paddocks at the University of Minnesota's West Central Research and Outreach Center, Morris, Minn. All cows calved during the fall of 2011 or spring 2012 calving seasons. We divided cows into three levels (no grain, low grain and high grain) of supplementation based on breed groups. These groups included pure Holsteins and various crossbreds of Jersey, Normande, Holstein, Montbéliarde and Scandinavian Red.

"No grain" cows, as the name implied, received 100 percent pasture. "Low" and "high" grain cows received 6 and 12 pounds of grain per cow per day, respectively. All three groups grazed alongside each other in the same pasture, consisting mainly of smooth bromegrass, orchardgrass, timothy, alfalfa, and red and kura clover.

A supplemental total mixed ration (TMR) was provided to the low- and high-grain cows. The TMR was 25 pounds of organic corn silage, 20 pounds of organic alfalfa silage and 1.5 pounds of organic minerals. Furthermore, in compliance with National Organic Program rules, we ensured that at least 30 percent of their diet consisted of high-quality organic pasture during the grazing season. The TMR was fed in a compost barn after the morning milking, but low- and high-grain cows were allowed to graze during the afternoon and overnight. The no-grain cows were continually on pasture except during milking.

Less grain, less milk

The no-grain cows had lower milk, fat and protein production than the low- and high-supplemented cows. Surprisingly, there were no differences in production between the two supplemented groups of organic cows, but the high-supplemented cows may have been partitioning the extra 6 pounds of grain into body condition.

Based on residual pasture results, the no-grain cows were simply not consuming enough quality dry matter intake from pasture during the latter part of the grazing season. This is likely the reason for the lower milk production.

As expected, the no-grain cows had higher milk urea nitrogen (MUN) than the supplemented groups of cows. When correcting for the fat and protein content in milk, the difference between the no-grain and supplemented cows was reduced, but the no-grain cows were still lower for energy-corrected milk.

Across the grazing season, there were no differences for body weight for the no- (1,079 pounds), low- (1,080 pounds) and high-grain (1,089 pounds) organic cows. For body condition scores across the grazing season, the no-grain cows had lower body condition scores (2.98) than the low- (3.09) and high-grain (3.15) cows. Potentially, the low- and high-grain cows in this study devoted more of the energy they consumed to maintain and restore BCS compared to no-grain cows. This, in turn, may have resulted in the enhanced reproductive cyclicity of the low and high groups.

As expected, TMR cost was lower ($0.00 versus $3.18 versus $4.21), pasture cost was higher ($1.02 versus 86 cents versus 87 cents) and production revenue from milk was lower ($5.02 versus $6.35 versus $5.53) for no-grain, versus low- and high-grain cows, respectively. But income over feed costs (IOFC $ per cow per day) was higher for the no- and low-grain cows compared to the high-grain cows ($3.61 versus $2.20 versus 38 cents, respectively).

More milk, but less profit

For profitability, grain costs were substantially higher for the high-grain cows and, therefore, resulted in a reduced IOFC. This higher cost of production is due to the extremely high value of organic corn ($13.21 per bushel, April 2013). The no-grain cows had the highest income over feed costs compared to the other supplementation groups because of these lower feed costs. Therefore, a low-grain ration may reduce feed costs without sacrificing profit.

Pasture can be a cost-effective source of feed and housing for dairy animals. The results of our study indicate that both organic and conventional producers looking to reduce input costs during high-grain prices could limit grain supplementation. Producers who have a handle on their feed costs in an organic dairy production system can make informed decisions that reduce financial loss. The most important point for reducing inputs and improving profits in organic dairy systems is to produce high-quality forages and maximize dry matter intake on pasture.

Less organic grain led to more profit

	No grain	Low grain	High grain
Measurement	**Mean**	**Mean**	**Mean**
Milk (lbs.)	32.2[a]	40.4[b]	39.4[b]
Fat (lbs.)	1.23[a]	1.53[b]	1.33[a,b]
Fat (%)	3.82[a]	3.78[a,b]	3.38[b]
Protein (lbs.)	1.03[a]	1.31[b]	1.26[b]
Protein (%)	3.20[a]	3.24[a]	3.20[a]
Somatic cell score	3.66	3.26	3.03
Milk urea nitrogen (mg/dl)	14.25[a]	10.06[b]	7.33[c]
Energy-corrected milk (lbs.)	32.2[a]	37.2[b]	36.3[b]
Body weight (lbs.)	1,079	1,080	1,089
BCS	2.98[a]	3.09[a,b]	3.15[b]
TMR cost ($)	0.0[a]	3.18[b]	4.21[c]
Pasture cost ($)	1.02[a]	0.87[b]	0.86[b]
Production revenue ($)	5.02[a]	6.35[b]	5.53[c]
Income over feed cost ($)	3.61[a]	2.20[b]	0.38[c]

a,b,c = Means within a row without common superscripts are different at P<0.05

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