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Feeding Distillers Grain to Young Dairy Heifers

Feeding distillers grain to livestock continues to be an important topic because of the widespread availability of distillers grain and cost of alternative feed grains. In the dairy industry, lactating cows are often the focus for feeding distillers grain, largely because of their demand for dietary protein. However, feeding distillers grain to dairy heifers also is a viable option.

Distillers grain is a feed that contains fairly high concentrations of both energy and protein (Table 1). Dried distillers grain with solubles (DDGS) is somewhat higher in energy because of the fat it contains. Although the nutrient value of distillers grain is variable, it typically contains approximately three times the protein, fat and mineral content of corn. This concentration of nutrients occurs because of the removal of the starch during the fermentation process. The amount of protein and energy in distillers grain or

DDGS will restrict the amount that can be fed to heifers. Feeding high levels of these feedstuffs to dairy heifers can be a challenge, as the nutritional level often will exceed animal requirements and could result in overconditioned animals. Modifications to how distillers grain — and especially DDGS — is prepared may provide opportunities for better utilization in heifer diets.

The age at which dairy heifers can begin to be fed distillers grain is a question that commonly arises. At this time, studies show that feeding distillers grain as part of a calf starter, at an inclusion rate of up to 20 percent of the starter dry matter, will result in similar body weight gain and rumen development in dairy calves (Chestnut and Carr, 2007; Suarez-Mena et al. 2011).

At Purdue University, feeding distillers grain to post-weaned dairy heifers has been a focus of recent research. Studies have looked

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at including distillers in the diets of both feedlot and pasture-raised heifers. The dairy heifers were 4-5 months of age at the start of the studies.

In the first study, DDGS was included at 20 percent of dietary dry matter. The objective of the study was to determine growth performance of dairy heifers fed DDGS, or reduced fat DDGS, compared to a corn- and soybean meal-based diet. The dietary treatments included a control diet that contained corn and soybean meal, a diet containing 20 percent DDGS, and two additional diets that contained either 20 percent or 36 percent of reduced fat DDGS. The heifers were individually housed in feedlot pens. Over a period of three months, no differences were found in the weight, hip or wither heights, or feed efficiency, of heifers fed either the DDGS or the reduced fat DDGS compared to heifers fed a corn- and soybean-based diet (Table 2).

A second study assessed using DDGS as a supplement for grazing heifers, and also was conducted for 12 weeks. The objective of this study was to compare performance of heifers fed DDGS to those fed soyhulls as a pasture supplement. In this study, small groups of four heifers were pastured in small paddocks using management intensive grazing (MIG). Throughout the study, the heifers were moved to a new paddock two times per week to provide them with additional forage. The heifers received one of two supplements: 1) DDGS and corn supplement, or 2) soybean hulls, corn and soybean meal supplement. The DDGS and soybean hulls were provided to the heifers at 0.9 percent of their body weight. In addition, the heifers either were grazed with or without goats, in an effort to determine whether goats would improve pasture quality by reducing the presence of weed species. While goats did tend to reduce weed prevalence, the grazing strategy did not affect growth performance of heifers fed either of the supplements.

In the pasture supplementation study, heifers receiving the DDGS supplement had similar average daily gain (ADG), dry matter intake and feed efficiency over the length of the study (Table 3). However, during the first six weeks of the grazing season, the heifers fed the DDGS supplement had 0.4 pound per day greater ADG than those receiving the soybean hull supplement.

Although inclusion of DDGS in diets of growing dairy heifers has been found to support growth,

the effects of feeding DDGS on nutrient excretion also must be considered. The high protein and phosphorus concentrations in DDGS easily can result in overfeeding and greater nutrient excretion. While not likely to be harmful to heifers at the mentioned rates, the excreted nutrients need to be handled properly to prevent accumulation in soils.

The economic costs and benefits of feeding distillers grain also need to be carefully considered by heifer raisers. Even though distillers grain can be included in heifer diets from the animal performance standpoint, distillers grain should be included in heifer diets only if it is an economical choice and provides at least the same economic value, based on nutrient concentrations, as other feeds available.

Because studies have demonstrated that dairy heifers are able to achieve similar weight gain, skeletal growth and feed efficiency when fed diets containing distillers grain, feeding distillers grain to dairy heifers is an option for heifer raisers. The decision to feed distillers grain ultimately should be based on its price as compared to other feed sources.

References

- Chestnut, A. B., and D. L. Carr. 2007. "The performance of calves fed starter feeds containing distillers grains." *Journal of Dairy Science* 90 (Suppl. 1):111. (Abstr.)
- Suarez-Mena, F. X., T. M. Hill, A. J. Heinrichs, H. G. Bateman, J. M. Aldrich, and R. L. Schlotterbeck. 2011. "Effects of including corn distillers dried grains with solubles in dairy calf feeds." *Journal of Dairy Science* 94:3037-3044.



Distillers grain in storage.

Table 1. Average nutrient composition of dried distillers grains with solubles (DDGS) compared to corn and soybean meal (Source: Dairy NRC, 2001).

Nutrient	DDGS	Corn	Soybean meal
----- % of dry matter -----			
Crude protein	29.7	9.4	49.9
Fat	10.0	4.2	1.6
TDN	79.5	88.7	80.0
Neutral detergent fiber	38.8	9.5	14.9
Acid detergent fiber	19.7	3.4	10.0
Ash	5.2	1.5	6.6
Phosphorus	0.83	0.30	0.71
Sulfur	0.44	0.10	0.46

Table 2. Performance of feedlot dairy heifers fed dried distillers grains with solubles. Heifers were fed control (CON), 20% dried distillers grains (DDGS20), 20% reduced fat dried distillers grains (RFDGS20) or 36% reduced fat dried distillers grains (RFDGS36) diets for 12 weeks.

Item	Treatment				P Value
	CON	DDGS20	RFDGS20	RFDGS36	
Dry matter intake, lbs/d	14.3	14.1	14.6	14.2	0.70
Intake, % of BW	2.97	2.98	3.03	2.96	0.75
Body weight, lbs/d					
Initial	391.0	384.8	384.8	390.8	0.87
Final	562.1	549.7	563.3	559.7	0.49
Average daily gain, lbs/d	2.52	2.42	2.60	2.50	0.70

Table 3. Growth performance of management-intensively grazed dairy heifers supplemented with either dried distillers grain with solubles (DDGS) or soybean hulls at 0.9% of their body weight for 12 weeks.

Item	DDGS	Soybean hulls	P Value
Starting weight, lbs/d	325.0	325.8	0.92
Final weight, lbs	423.6	416.9	0.37
Estimated dry matter intake, lbs/d ^a	15.4	15.0	0.14
Average daily gain, lbs/d	1.28	1.25	0.77
Feed efficiency, lbs gain to lbs fed	0.082	0.078	0.45

^aDry matter intake was determined by estimating pasture intake using a rising plate meter and adding it to the supplement consumed.

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