BEEF CATTLE RESEARCH UPDATE

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Effect of Hay Feeding Methods on Cow Performance

Reducing winter feed costs for beef cows is important to cow-calf producers since Standardized Performance Analysis records have shown that feed costs account for more than 60% of beef producers' annual cow cost with over one-half of these costs attributed to winter feeding.[1] These records showed that feed cost accounted for over 50% of the variation in profit among the herds. Wintering beef cows on large round hay bales fed ad libitum is a common practice for many cow/calf operations. However, this practice often waste hay and can result in over-consumption which in turn increases feed cost. Recent research studies have addressed this issue.

University of Illinois researchers investigated the impact of restricting the time of access to large round hay bales on cow performance, hay waste and manure production.[2] Simmental cows in the third trimester of pregnancy were fed hay from mid-September to mid-December in two different trials. In both trials, the cows were fed in 1260 ft^2 pens with 12 ft fence-line round bale feeders allowing 2 ft per cow. In trial 1, 72 cows (1250 lb initial weight) were allowed access to high-quality alfalfa hay (17.6% crude protein, DM basis) for 3, 6, 9, or 24 hrs/day. Cows on all treatments gained weight (ranged from 119 to 207 lb) and body condition with gains increasing as time of access to hay increased. Both hay intake (11.9, 18.7, 20.1, and 20.7 lb/day) and wastage (6.0, 5.7, 9.3, and 13.5 lb/day) increased as time of access increased. However, hay wastage expressed as a percentage of hay disappearance did not significantly differ between treatments. Manure production also increased with increasing time of access.

In trial 2, 72 cows (1297 lb initial weight) were allowed access to lower-quality alfalfa hay (15.4% crude protein, DM basis) for 6, 9, or 24 hrs/day. Cows gained 141 to 168 in this trial. However, these differences in weight gain were not significant. Hay intake increased as time of access increased (19.6, 22.4, and 23.8 lb/day). Hay wastage was considerably lower in this trial ranging from 2 to 4.6 lb/day. Manure production increased with increasing time of access.

These researchers concluded that limiting the time that cows have access to a large round bale of hay to as little as 3 h/d will result in acceptable cow performance depending on hay quality. Limiting time of access reduced hay use by limiting intake and decreasing hay waste, thereby reducing feed costs. They also noted that limit feeding reduced manure production and manure nutrient output (nitrogen, phosphorus, and potassium).

North Dakota State University researchers conducted a 3-year study to determine the effect of three different hay (large round bales) feeding methods on cow wintering cost: 1) rolling bales out on ground, 2) bales shredded with PTO-driven bale processor and fed on ground, and 3) bales fed by placing the bale in a tapered-cone round bale feeder (Figure 1).[3] This study used 360 crossbred cows (1345 lb initial weight) in the third trimester of pregnancy fed an average of 59 days. Alfalfa-grass bales were fed in years 1 and 2 (crude protein contents of 14.5 and 10.5%, respectively) and oat hay was fed in year 3 (crude protein content of 13.0%).

Cows fed by rolling bales out on the ground gained less weight (50 lb) than when cows were fed with either the bale processor (66 lb) or the bale feeder (80lb). Compared with the bale feeder, 5 and 15.3% more hay was offered per cow using the roll out and bale processor methods, respectively. Waste contributed to the increased amount of hay required among the roll out and bale processor cow groups. These researchers observed that type of hay and firmness of bales played a significant role in success with the round bale feeder. In the first two years, when dense alfalfa-grass hay bales

were tied tightly and strings were not removed for feeding, waste around the bale feeder was 4.3 to 5 times less than either the roll out or bale processor, methods, respectively. However, in year 3 when loose, poorly tied oat bales were fed, waste did not differ between the hay feeding methods. It was noted that shredding with the bale processor would be more effective (less waste) if the hay was fed in bunks instead of on the ground.

The data from this study was also used to prepare an economic analysis model for 100- and 300-head references herds. This economic analysis showed that over the 3-year period, using the tapered-cone round bale feeder reduced wintering cost by 21.0 and 17.6%, respectively, for a 100- and 300-head reference herd compared with feeding with a bale processor. Using a bale feeder reduced wintering cost by 8% with both reference herds compared with rolling bales out on the ground.

Michigan State University researchers evaluated hay wastage of large round bales using four different types of bale feeders: tapered-cone, ring, trailer and cradle feeders (Figure 1).[4] Dry matter hay waste was 3.5, 6.1, 11.4 and 14.6% for the tapered-cone, ring, trailer and cradle feeders, respectively. These researchers also suggested that feeders with slanted bar designs encourage animals to keep their head in the feeder opening by providing some constraint. This design may contribute to fewer feeding transitions and thus, less hay waste.

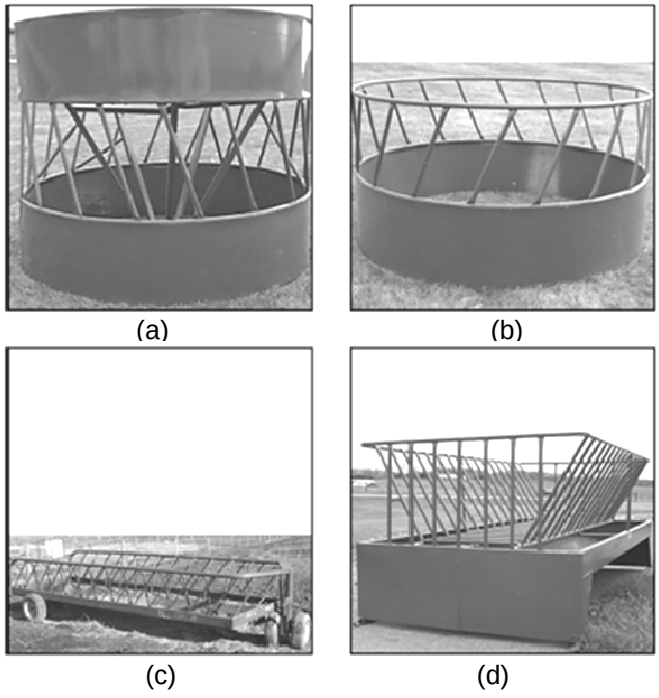

Figure 1. Round bale feeder types: (a) tapered-cone, (b) ring, (c) trailer, and (d) cradle.
Source: Buskirk et al., 2003.

In conclusion, the result of these recent studies suggest hay wastage and wintering feed cost associated with feeding large round hay bales could potentially be reduced by limiting time of access to hay and by using tapered-cone round bale feeders. However, hay analysis should be performed prior to restricting intake to be sure quality is adequate to meet production objectives without sacrificing cow performance.

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[1] Miller, A. J., D. B. Faulkner, R. K. Knipe, D. R. Strohbehn, D. F. Parrett, and L. L. Berger. 2001. Critical control points for profitability in the cow-calf enterprise. Prof. Anim. Sci. 17: 295-302.

[2] Miller, A. J., D. B. Faulkner, T. C. Cunningham, and J. M. Dahlquist. 2007. Restricting time of access to large round bales of hay affects hay waste and cow performance. Prof. Anim. Sci. 23: 366-372.

[3] Landblom, D. G., G. P. Lardy, R. Fast, C. J. Wachenheim, and T. A. Petry. 2007. Effect of hay feeding methods on cow performance, hay waste, and wintering cost. Prof. Anim. Sci. 23: 246-252.

[4] Buskirk, D. D., A. J. Zanella, T. M. Harrigan, J. L. Van Lente, L. M. Gnagey, and M. J. Kaercher. 2003. Large round bale feeder design affects hay utilization and beef cow behavior. J. Anim. Sci. 81: 109-115.