EXTENSION
BEEF CATTLE RESEARCH UPDATE
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The Effects of Feeding Frequency on the Finishing Performance and Carcass Characteristics of Feedlot Steers

In most large feedlots, cattle are fed more than once per day. A 2016 survey of consulting feedlot nutritionists indicated that the feedlots they serviced provided feed to cattle twice daily (54.0%); however, they also serviced feedlots that fed 3 times per day (48.5%) and once per day (8.06%), as well as a small number that fed greater than 3 times daily (0.125%).[1] Similar results were reported in a 2007 survey of consulting feedlot nutritionists. In this survey, feedlots typically fed 2 (46.4%) or 3 (46.0%) times daily. In 3.4% and 0.8% of the feedlots, cattle were fed once daily or more than 3 times daily, respectively.[2] Feeding cattle more often assures freshness of feed, may reduce the magnitude of feeding errors, may reduce overeating, and may improve performance since feed delivery stimulates cattle to eat. Feeding more than once per day has been reported to increase feed intake by 2 to 5% and reduce digestive upsets in feedlot cattle.[3] In contrast, cattle fed once daily at consistent morning times had higher gains and better feed efficiencies than cattle fed once in the afternoon or twice daily.[4] Theses discrepancies between studies may be due to one or more of several factors including feedlot location, management strategies, diet composition, and cattle type.

Recent Oklahoma Stage University research used 64 yearling Angus steers (initial weight = 710 lb) from a single ranch to determine the effects of delivering feed once (1X) or twice (2X) per day on finishing performance and carcass characteristics.[5] The steers were fed in small pens (15 X 50 ft; 4 steers per pen). All steers were fed a common dry-rolled corn finishing ration for 141 days with the only difference between experimental treatments being the frequency of feed delivery. The 1X steers received 100% of the daily feed call at 9:30 am, while the 2X steers received 50% of the daily feed call at both 9:30 am and 2:00 pm.

These researchers reported that there were no differences in final weights ($P = 0.95$) or overall average daily gain ($P = 0.94$) between experimental treatments. However, overall feed intakes were greater in 1X steers than 2X steers ($P < 0.01$). The difference in intakes combined with no difference in gains resulted in a 4% improvement in overall Gain:Feed ratio for the 2X steers ($P = 0.03$). No differences between the treatments for any carcass characteristics ($P \geq 0.28$) were reported.

These authors concluded that while this experiment was conducted in a small pen research setting, “the results suggest that the frequency of feed delivery impacts the intake and feed efficiency of feedlot steers. Consideration should be given to the impacts of feed delivery on feedlot logistics and batching in commercial settings.”

A Colorado State University study published in 2011 also evaluated the effects of feeding frequency on the performance and carcass characterizes of feedlot steers.[6] In this study, crossbred yearling steers (700 lb initial weight) were fed once a day (1X) starting at 8:00 am, twice daily (2X, fed 60% of diet starting at 7:30 am and 40% starting at 1:00 pm), or three times daily (3X, fed 34% of diet stating at 7:00 am, 33% starting at 10:00 am, and 33% staring at 2:00 pm). The steers were housed in small pens (20 X 60 ft, 9 steers per pen) and fed a high-concentrate steam-flaked-corn based finishing ration for 170 days.

These researchers reported that feeding three times per day increased average daily gains ($P < 0.03$) and dry matter intake ($P < 0.04$) compared to once or twice per day feeding (Table 1) and were greater in steers fed 3X when compared with steers fed 1X or 2X. Feed efficiency was similar for all 3 treatment groups. In addition, steers fed 3X had a greater hot carcass weight ($P < 0.01$) than did

steers fed 1X or 2X. No differences between treatments were noticed for USDA quality or yield grades. These authors concluded that increased feeding frequencies may improve performance. However, if properly managed, once per day feeding may result in greater profitability due to reduced labor and equipment operation cost.

Table 1. Effects of feeding frequency on feedlot steer performance.

	Feeding Frequency			Treatment
	Once Daily	Twice Daily	Three Times Daily	P<
Initial weight, lb	699.0	703.4	701.2	0.99
Final weight, lb	1307.6	1307.6	1331.8	0.05
Daily Gain, lb	3.59	3.62	3.77	0.03
Dry Matter Intake, lb	20.37	20.44	21.32	0.04
Feed/Gain	5.56	5.56	5.56	1.00
Carcass Weight, lb	798.4	795.3	817.8	0.01

Adapted from Schutz et al., 2011.

In conclusion, the result of both of these studies suggests that feeding frequency can affect the performance of feedlot cattle. The Colorado researchers suggested that "because of the discrepancies that exist in the literature, it is important that each individual feedlot evaluate the effect of feeding frequency on total profit and loss to better identify the appropriate feeding frequency system for that operation".

[1] Samuelson, K. L., M. E. Hubbert, M. L. Galyean, and C. A. Löest. 2016. Nutritional recommendations of feedlot consulting nutritionists: The 2015 New Mexico State and Texas Tech University survey. J. Anim. Sci. 94:2648-2663.

[2] Vasconcelos, J. T. and M. L. Galyean. 2007. Nutritional recommendations of feedlot consulting nutritionists: The 2007 Texas Tech University survey. J. Anim. Sci. 85:2772-2781.

[3] Anderson, P. 1990. Feedbunk management for maximum consistent intake. University of Minnesota Cattle Feeders Days. Issue 12:1–13.

[4] Delehant, T., and M. Hoffman. 1996. Effect of feeding procedure and intake level on steer feedlot performance and carcass composition: A progress report. Iowa State University, Ames, IA. A. S. Leaflet R1344.

[5] Wilson, B. K., W. Ryan and C. Richards. 2020. The effects of once or twice daily feed delivery on the finishing performance and carcass characteristics of feedlot steers. J. Anim. Sci. 98 (Suppl. 2):48 (Abstr.).

[6] Schutz, J. S., J. J. Wagner, E. D. Sharman, N. E. Davis and T. E. Engle. 2011. Effect of feeding frequency on feedlot steer performance. Prof. Anim. Sci. 27: 14-18.