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Night feeding to reduce bird predation in feedlots

Abstract

During times of heavy infestations by birds, feedlots can have 25 to 30% increases in feed usage, thereby resulting in large economic losses. Because starlings, blackbirds, grackles, and other avian pests normally feed during daylight hours, we hypothesized that feeding cattle at night would minimize feed contamination and feed loss due to bird infestation. Crossbred beef heifers (n=96; 770 lb) were used to evaluate the effects of feeding at night on performance and carcass characteristics. Heifers were fed for 107 days during the months of November to March, when large bird populations were observed. Feed was delivered once daily at approximately 10:00 a.m. for heifers with continuous access to feed and 30 minutes before dusk for heifers that had access to feed only at night. Feed calls for heifers fed at night were managed so that no feed remained in the bunk at dawn, whereas the control heifers were allowed ad libitum access to feed. Daily feed deliveries per animal (21.51 vs. 18.15 lb for heifers fed continuously or only at night, respectively) were decreased by 16% ($P<0.01$) when cattle were provided access to feed only at night, but daily gain was not different. Feed efficiency was improved by 14% ($P=0.05$) with night time feeding, but carcass weights and dressing percentage remained similar. Overall, feeding cattle only during hours of darkness yielded similar growth performance compared to cattle fed continuously. However, feed efficiency was improved substantially, which we attribute to reduced theft by birds.

Keywords

Cattlemen's Day, 2004; Kansas Agricultural Experiment Station contribution; no. 04-242-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 923; Beef; Night feeding; Reduce bird predation; Feedlots

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NIGHT FEEDING TO REDUCE BIRD PREDATION IN FEEDLOTS

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Summary

During times of heavy infestations by birds, feedlots can have 25 to 30% increases in feed usage, thereby resulting in large economic losses. Because starlings, blackbirds, grackles, and other avian pests normally feed during daylight hours, we hypothesized that feeding cattle at night would minimize feed contamination and feed loss due to bird infestation. Crossbred beef heifers (n=96; 770 lb) were used to evaluate the effects of feeding at night on performance and carcass characteristics. Heifers were fed for 107 days during the months of November to March, when large bird populations were observed. Feed was delivered once daily at approximately 10:00 a.m. for heifers with continuous access to feed and 30 minutes before dusk for heifers that had access to feed only at night. Feed calls for heifers fed at night were managed so that no feed remained in the bunk at dawn, whereas the control heifers were allowed ad libitum access to feed. Daily feed deliveries per animal (21.51 vs. 18.15 lb for heifers fed continuously or only at night, respectively) were decreased by 16% ($P<0.01$) when cattle were provided access to feed only at night, but daily gain was not different. Feed efficiency was improved by 14% ($P=0.05$) with night time feeding, but carcass weights and dressing percentage remained similar. Overall, feeding cattle only during hours of darkness yielded similar growth performance compared to cattle fed continuously. However, feed efficiency was improved substantially, which we attribute to reduced theft by birds.

Introduction

Thievery by birds can be an enormous economic burden to agriculture systems in some areas of the country. Feedlots located in traditional migratory flyways can be overwhelmed by starlings, blackbirds, grackles, and other birds that take advantage of an accessible food source during the winter months. Starling intakes have been estimated to be near 1.0 lb/bird monthly directly from the feed bunk, and total feed usage in some feedlots may be increased by as much as 25% during heavy infestations. In addition to the economic impact, bird infestation creates sanitation issues, can cause physical destruction of properties, and may serve as a vector for transmission of disease to cattle and humans. However, steps to reduce bird infestation are heavily scrutinized by the general public and, ideally, would be conducted in a manner that is acceptable by public standards. Because the birds are drawn to the feedlot by the accessible feed supply, it is conceivable that simply by taking the feed supply away, the birds can be discouraged from congregating in these areas.

Studies have shown that access to feed by cattle can be restricted to 9 to 15 hours daily with no detrimental effects on feed intake, average daily gain, or feed efficiency. In theory, due to the roosting habits of most species of birds, limiting access of feed for cattle to night hours may help to control bird infestation and resulting theft and sanitation problems.

The objective of this experiment was to limit access of finishing cattle to feed to only

night hours and to determine the impact of this strategy on feed intake, gain, feed efficiency, and carcass attributes of cattle fed during times of extensive bird infestation.

Experimental Procedures

The experiment was conducted in concrete-surfaced pens at the Kansas State University Beef Cattle Research Center from November 2002 to March 2003. Yearling cross-bred heifers (n=96; 770 lb body weight) were allocated to one of two experimental treatments. A common finishing diet was fed to cattle at 10:00 a.m. each day to provide continuous 24-hour access to feed, or was fed approximately 30 minutes before dusk in amounts sufficient to ensure nearly complete consumption by 7:00 a.m. the next day.

Heifers were individually weighed, blocked by initial weight, stratified by receiving date, and then allotted, within strata, to one of 12 randomly assigned pens (8 animals/pen; 6 pens/treatment).

Heifers were acclimated to a steam-flaked corn finishing diet (Table 1) during a period of approximately two weeks, during which time the night-access heifers were acclimated to the change in feeding time by advancing feeding time 1 hour per day until the desired feeding time was achieved. The continuous-access heifers were fed once daily at approximately 10:00 a.m. The continuous-access heifers were given ad libitum access to feed, and the night-access cattle were managed so that no feed remained in the bunk at daybreak. Heifers were fed for 107 days. Final shrunk weights were determined by dividing carcass weight by a common dressing percentage of 64%.

Results and Discussion

Feed deliveries (21.51 vs. 18.15 lb for continuous-access and night-access heifers, respectively) were decreased by 16% (P<0.01)

for night-access heifers, but daily gain was not different. Apparent feed efficiency was improved by 14% (8.33 vs. 7.14 for continuous access and night access, respectively; P=0.05) with night feeding. Carcass weights and dressing percentages were similar. Night-access heifers tended (P=0.08) to be leaner (0.34 vs. 0.39 inch backfat) than heifers fed continuously, whereas marbling and USDA quality grades were not different.

Taking into account a 3.36 lb difference in feed usage (\$0.06/lb for 107 days), feed cost was \$21.57 greater for heifers given continuous access to feed. This cost can be attributed to the combination of bird thievery, reduced feed efficiencies, and changes in digestive function. Because previous studies have shown that cattle can be limited to 9 to 15 hours per night of eating time by adjusting feed calls without detrimental effects on feed intake, daily gain, and feed efficiency, we speculate that a significant part of the difference in intake can be attributed to bird thievery. Further research is necessary to separate effects of bird thievery from those of changes in digestive patterns.

Table 1. Composition of Finishing Diets

Ingredient	% of Diet Dry Matter
Steam-flaked corn	75.6
Alfalfa hay	8.0
Steep liquor	7.0
Tallow	3.0
Limestone	1.4
Soybean meal	1.3
Urea	1.0
Vitamin/mineral premix ¹	2.7

¹Formulated to provide 0.13 ppm cobalt, 10 ppm copper, 0.63 ppm iodine, 1.1 ppm iron, 60 ppm manganese, 0.25 ppm selenium, 60 ppm zinc, 30 grams/ton monensin, and 10 grams/ton tylosin.

Table 2. Finishing Performance and Carcass Characteristics of Heifers with Continuous Access or Night Access to Feed

Item	Treatment ^a		SEM	P-value
	Continuous Access	Night Access		
No. of head	48	48	-	-
No. of pens	6	6	-	-
Days on feed	107	107	-	-
Initial weight, lb	770	770	4.1	0.98
Final weight, lb ^b	1047	1042	11.0	0.76
Dry matter intake, lb/day	21.51	18.15	0.42	<0.01
Weight gain, lb/day ^b	2.59	2.55	0.10	0.78
Feed:gain	8.33	7.14	0.51	0.05
Hot carcass weight, lb	670	667	7.0	0.76
Dressing percentage, %	63.39	62.90	<0.01	0.29
Ribeye area, inch ²	12.95	12.78	0.18	0.54
Marbling ^c	SI ²	SI ¹⁶	18	0.61
Backfat, inch	0.39	0.34	0.02	0.08
Kidney, pelvic & heart fat, %	2.13	2.18	0.03	0.31
USDA Yield grade 1, %	4.1	12.5	4.2	0.19
USDA Yield grade 2, %	45.8	52.1	4.2	0.32
USDA Yield grade 3, %	47.9	31.3	4.7	0.35
USDA Yield grade 4, %	2.1	4.1	2.6	0.58
USDA Prime, %	0.0	4.2	1.5	0.08
USDA Choice, %	56.3	45.8	8.8	0.43
USDA Select, %	41.7	50.0	7.4	0.45
USDA Standard, %	2.1	0	1.5	0.35
Dark cutter, %	0	0	-	-
Liver abscess, %	6.3	4.2	0.04	0.69

^aHeifers were fed for 107 days from November to March, when large bird populations were observed. Feed was delivered once daily at approximately 10:00 a.m. for heifers with continuous access to feed and 30 minutes before dusk for heifers with night access to feed. Feed calls for night-access heifers were managed so that no feed remained in the bunk at dawn, whereas continuous-access heifers were allowed ad libitum access to feed.

^bCarcass adjusted final weight was calculated by dividing hot carcass weight by a common dressing percentage of 64%.

^cSI = slight amount of marbling.