EXTENSION
BEEF CATTLE RESEARCH UPDATE
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Effects of Bunk Management and Bulk Density of Steam-Flaked Corn on Growth Performance, Carcass Characteristics, and Liver Score of Finishing Beef Cattle Fed Diets without Tylan

Feedlot bunk management plays a critical role in achieving maximum feedlot performance while avoiding digestive upsets (both clinical and subclinical metabolic disorders).[1] Slick bunk management systems have become a common practice in the feedlot industry, as it is believed that this system reduces cyclic intake patterns thereby reducing the incidence of metabolic disorders.[1] Subclinical acidosis may induce rumenitis, leading to decreased efficiency and the formation of liver abscesses.

Surveys of consulting feedlot nutritionists in 2007 and 2016 showed that steam-flaked corn (SFC) is the predominant grain in feedlot diets.[2, 3] These surveys also reported that the average bulk density recommended for SFC was 27 lb/bushel. Increasing roll pressure in the processing of SFC to produce lighter flake density increases starch digestion and the subsequent growth performance of cattle. However, the risk of developing metabolic disorders such as acidosis, rumenitis, and formation of liver abscesses also increases.[4]

Liver abscesses in feedlot cattle are a cause of decreased performance and reduced carcass value. Loss in carcass value is due to not only to the abscessed liver being condemned, but also due to trim loss associated with the condemned liver. Tylosin phosphate (Tylan, Elanco Animal Health) is an antibiotic that is commonly fed to feedlot cattle to decrease the incidence of liver abscesses. Due to regulatory changes pertaining to the use of in-feed antibiotics in cattle production, there is growing interest in alternatives to antibiotics for liver abscess control.

Since bunk management and degree of corn processing affect the growth performance of finishing beef cattle, research conducted at Texas Tech University evaluated the effects of bunk management strategy and bulk density of SFC on growth performance, carcass characteristics, and liver abscess incidence in finishing beef cattle fed diets without tylosin phosphate.[5] In this study, 192 beef steers (732 lb initial weight) were randomly assigned to the following four treatments: 1) slick bunk management + 26 lb/bushel SFC; 2) modified ad libitum bunk management + 26 lb/bushel SFC; 3) slick bunk management + 33 lb/bushel SFC; and 4) modified ad libitum bunk management + 33 lb/bushel SFC. The study consisted of 12 body weight blocks and 12 pen replications per treatment. The basal diet was the same regardless of bulk density treatment assignment (78.95 % SFC on a dry matter [DM] basis), and only differed in the bulk density of SFC. All diets included 29 g/ton DM monensin (Rumensin 90, Elanco Animal Health). The steers were individually weighed on day o (initial), 35, 105, and 140. Final weights were taken on day 162 (light weight blocks) or on day 190 (heavy weight blocks). The steers were fed to equal back fat by visual appraisal.

The steers were fed once daily beginning at 8:00 am. Feed bunks were monitored for residual feed at 7:00 am and 4:00 pm daily. A bunk scoring system (Table 1) was used to indicate bunk conditions at both reading times. For slick-bunk management, a bunk score 0 or ½ was targeted at 7:00 am. For modified ad libitum management, a bunk score 1 or 1 ½ was targeted at 7:00 am. If the bunk was scored 2 or greater, the feed delivery was decreased equally to the visual estimate of residual feed. If the bunk was scored less than 1, the daily feed delivery was increased 1.54 lb/animal as-fed to achieve some day-to-day residual feed carryover. At 4:00 pm, a bunk score 2 was targeted for both treatments.

These authors reported that for slick-bunk management at the 7:00-am bunk read, the targeted bunk score of 0 or ½ was achieved 55% of the time. The average daily feed carryover was 1% of the previous day's feed for slick-bunk management. The modified ad libitum bunk management system

used in the study attempted to limit day-to-day feed carryover to ≤5% of feed delivered (Table 1) to prevent feed wastage and excessive overeating. The targeted bunk score of 1 or 1 ½ at 7:00 am was achieved 59% of the time. The average daily feed carryover in the experiment was approximately 8% of the previous day's feed for modified ad libitum.

Table 1. Bunk scoring system used throughout the experiment[1]

Item	Description
0	No feed remaining in bunk; slick 07:30 am target for slick-bunk management
1/2	1 to 2% of previous day's feed remaining
1	Up to 5% of previous day's feed remaining 7:30 am target for modified ad libitum bunk management
1 1/2	5% to 15% of previous day's feed remaining
2	15% to 50% of previous day's feed remaining
3	>50% of previous day's feed remaining, crown on feed is disturbed
4	Feed is virtually untouched, crown on feed is undisturbed

[1]Adapted and modified from Pritchard (1993)[6].

These researchers reported that bunk management strategy did not affect growth performance, carcass characteristics, or liver abscess score (P ≥ 0.10). The average daily gain (ADG) of steers fed 33 lb/bushel SFC was greater (P = 0.05) from days 35 to 105 than those fed 26 lb/bushel SFC; however, overall ADG did not differ (P = 0.36). As was expected, the DM intake of steers fed 33 lb/bushel SFC was greater at each interim period (P ≤ 0.05) and overall (P ≤ 0.01) than those fed 26 lb/bushel SFC (18.92 vs. 18.10 lb/day). Gain efficiency (gain to feed ratio) did not differ overall (P ≥ 0.12) between SFC treatments. Steers fed 33 lb/bushel SFC tended to have greater backfat thickness (P = 0.07) than those fed 26 lb/bushel SFC and had a greater calculated yield grade (3.47 vs. 3.20; P = 0.05). Furthermore, steers fed 33 lb/bushel SFC had 43.51% fewer (P = 0.04) liver abscesses (16.67 vs. 29.51%).

In conclusion, bunk management did not affect growth performance, carcass characteristics, or development of liver abscesses. However, since feeding SFC of increasing bulk density (decreased degree of processing) results in fewer liver abscesses, this management strategy could be useful as the "beef industry strives to decrease antimicrobial use".

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