

The Effect of Bunk Management Score on Dry Matter Intake by Feedlot Steers

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SUMMARY

One hundred twenty five crossbred yearling steers (1096±77 lb) were utilized in a 3 X 3 Latin Square design experiment to determine the impact of bunk management score on DMI. Three target bunk scores were evaluated: a score of 0 was a bunk devoid of all feed particles; a score of ½ represented a bunk with trace to 5.0 lbs of feed remaining; and a score of 1 was 5.0 to 20.0 lbs of feed remaining. An adaptation period of 9 days was implemented for each period prior to four days of data collection. During the data collection phase all bunks were observed at 0630, 1630, 2200, and 0200 hr the next morning. Each morning bunk scores were assigned, orts were weighed, and the daily feed call was made. Dry matter intake was greatest ($P < 0.0001$) for steers which received a bunk score of 1 (5.0 to 20.0 lbs of orts; DMI of 24.71±0.35 lb) each morning. These data indicate that slick bunk feeding systems may restrict feed intake.

Key Words: Bunk Management, Feedlot, Feed Intake, Steers.

INTRODUCTION

Bunk management is directly correlated to the health and profitability of feedlot cattle as digestive upsets, which can be caused by overeating and infrequent eating patterns, are a major cause of death in the feedlot industry (Vogel, 2003). The U.S. Department of Agriculture (USDA, 2000) reported that 1.9 ± 0.3 percent all feedlot cattle develop some type of digestive disorder, excluding those cattle that were considered to be

non-eaters (cattle that refuse to come to the bunk and eat). Cattle in large feedlots (≥ 8,000 head) are more likely to have digestive problems as 2.0 percent ± 0.3 of all cattle develop digestive disorders (USDA, 2000).

Average estimated cost of treating a single animal diagnosed with a digestive disorder based on medicine and re-treatment costs (veterinary and labor charges were not included) was \$6.19 ± 0.56 (USDA, 2000). Galyean et al. (1998) developed a list of possible factors and interrelationships among nutritional diseases in feedlot cattle which consisted of environment, management, diet type, intake, rumen metabolism, feeding behavior, social behavior, and cattle type. It can therefore be assumed that there are multiple places in the production cycle where metabolic disorders can occur.

Slick bunk systems are popular in the industry. This system aims for all feed delivered to a pen to be consumed on a daily basis with bunks being slick for a certain duration of the time prior to the next day's feed delivery. Many nutritionists believe this system reduces variation in intake by cattle and therefore reduces the incidence and severity of digestive upsets. Under a slick bunk system it is likely that cattle may approach an empty bunk and thereby be denied the opportunity to consume a meal. Research has shown that often ADG will not be reduced by modest restrictions in DMI (Pritchard, 1998). However, by restricting access time to feed, cattle will consume feed at a more rapid rate which can lead to metabolic disorders (Schwartzkopf-Genswein, 2003).

Ad libitum bunk management describes a feed delivery system which allows for feed to be in the bunk from one feeding period to the next at a given level. Cooper et al. (1999) suggested that if cattle have *ad libitum* access to feed and intake variation remains less than 3.97 lbs/d performance levels and incidence of acidosis will not be increased. Therefore, the objective of the present study was to determine what bunk score yielded the greatest DMI of

steers at the Southeastern Colorado Research Center (SECRC), in Lamar Colorado.

MATERIALS AND METHODS

One hundred twenty five crossbred steers (1096±77 lb) were used in this experiment. Steers were housed in 12 pens measuring 20 x 60 ft and a single automatic waterer was shared between every two pens. Steers were fed in fence-line 12 ft long concrete bunks (1.33 ft/hd) which had a 12 ft wide 20 ft long concrete apron adjacent to the bunk to provide a solid area to stand on while eating. Steers were pen weighed at the beginning of each period.

All steers were fed a finishing ration of steam flaked corn grain, a roughage source, and a urea and limestone based vitamin and mineral supplement (Table 1). Diets were formulated to meet or exceed all nutrient requirements for finishing steers (NRC, 1996).

Pens were fed at 0700 and 1100 hr to ensure that the steers were kept on a regular daily eating pattern to avoid data collection errors due to bunk reading as well as to prevent metabolic digestive disturbances caused by large daily shifts in feeding times.

Three target bunk scores were evaluated (Table 2). A score of 0 was a bunk devoid of all feed particles; a score of ½ represented a bunk with trace to 5.0 lbs of feed remaining; and a score of 1 was 5.0 to 20.0 lbs of feed remaining. Upon initiation of the trial, each pen was randomly assigned to one of three groups (A, B, or C) of four pens each. During period one, pens assigned to group B were fed to a target bunk score of 0, group C was fed to a target score of ½, and group A was fed to a target score of 1. Target scores were rotated each period as shown in Table 3. An adaptation period of 9 days was implemented for each period prior to the four days of data collection. The adaptation period was utilized to ensure the cattle were transferred from their previous bunk

score feed delivery to their new bunk score feed delivery, gradually, to avoid metabolic disorders and excess orts. During the data collection phase of each of the three periods, all bunks were read at 0630, 1630, 2200, and 0200 the next morning. Each morning after the bunk scores were assigned, ADFI was determined by weighing the orts in each bunk. This number was subtracted from the total amount delivered from the previous day. If the amount of left over feed was less than 2.42 lbs it was discarded, if the amount of leftover feed was greater than 2.42 lbs it was placed back in the bunk. After three days of a bunk scoring feed was discarded after it was weighed. In the event of inclement weather (i.e. rainfall), all bunks were scooped, weighed, and a sample was collected for DM analysis.

Statistical Analysis. Data were analyzed as a 3 x 3 Latin Square using the GLM model procedure of SAS (2003). The model included the effects of treatment, period, treatment x period interactions, metabolic BW, average bunk score, minimum and maximum temperature for each period, rainfall per period, and wind speed per period. Interactions were considered to be significant if $P < 0.05$.

RESULTS AND DISCUSSION

Intake. Dry matter intake was greater ($P < 0.0001$) for pens which consistently received enough feed to ensure 5.0 to 20.0 lbs of feed was left in the bunk (score = 1) on a daily basis (24.71±0.35 lb). Pens which received enough feed to ensure that between trace and 5.0 lbs were left in the bunk (score = ½) at all times had an average daily DMI of 22.86±0.35 lb. Pens kept on a slick bunk management system (score = 0) had an average daily DMI of 21.49±0.35 lb. In a preliminary study conducted at the SECRC cattle with an average bunk score of 1 had a greater average weight and a greater DMI than steers who averaged a bunk score of 0 or 1/2 (Wagner, 2006). By maximizing intake, steers will

potentially have an increase in performance and a reduction in the duration of the feeding period (Anderson, 1990). Additionally, research conducted at the University of Saskatchewan has shown that major periods of eating are around sunrise, sunset, and midnight (Gonyou, 1984). It can be hypothesized that if cattle are fed enough feed to last throughout the night, that all of the cattle in the pen will have increased access to a complete ration for a 24 hour period of time.

Bunk scores were collected four times daily and averaged to ensure that each treatment was receiving feed in amounts to yield different ort amounts. Additionally, intake per period was analyzed to ensure that intake was not varying across periods. Furthermore, all animals remained healthy throughout the experimental period.

Ambient temperature effects were also analyzed (data not shown) to ensure that intake variation was not due to climatic changes. Average minimum and maximum temperature for each period, rainfall per period, and wind speed per period did not interact with treatment.

IMPLICATIONS

Results of this study suggest that bunk management strategy has a significant effect on DMI by feedlot steers. Feeding enough feed to last through the night and into the next feeding encouraged greater DMI. This increased intake could result in increased performance. Slick bunk management systems may result in reduced DMI. Additional studies evaluating slick bunk management systems in large pens are needed.

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Table 1. Ingredient composition of basal diet.

Ingredient	Percentage of DM
Corn Silage	15.35
Steam flaked corn	71.93
Soybean meal	03.08
CCDS ^a	03.00
Yellow Grease	03.50
Supplement ^b	03.14

^a Condensed Corn Distillers Soluble

^b Supplement consisted of: Calcium, Salt, Urea, Min Ad, ATM 398, Vitamin A, Vitamin E, Rumensin 80, Tylan 100, and Mineral Oil.

Table 2. Southeastern Colorado Research Center Feed Call Score Sheet

Call ¹	lbs in Bunk	Feed Bumps
0	0	↑ feed by 0.5 lbs every third morning
½	Trace-5.0 lbs	Remains Same
1	5.0-20.0 lbs	↓ feed by 2.0 lbs; on the third morning (SCOOP) ²
2	20.0-40.0 lbs	↓ feed by 4.0 lbs; on the third morning (SCOOP) ²
3 ²	> 40.0 lbs	↓ feed by 5.0 lbs; on the third morning (SCOOP) ²

¹Due to rain or a feed call of 1 or 2 for three days or a call of 3 for one day bunks are scooped. Orts are weighed and recorded and a sample is collected for dry matter analysis.

²On the FIRST day that the bunk is slick (0) the pen receives half of total pounds cut back.

Table 3. Group background data and allotment to Latin square design.

Group / Steers (Pens)	A / 42 (4)	B / 42 (4)	C / 41 (4)
Bunk Score→	0	1/2	1
Period↓			
1	B	C	A
2	A	B	C
3	C	A	B