Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 1 *Cattleman's Day (1993-2014)*

Article 358

2001

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Abstract
Eight paired comparisons conducted at three field sites with 1059 newly-received lightweight stocker calves were used to determine the effect of free-choice cooked molasses tubs designed for receiving cattle on 28-day receiving period performance, percentage of cattle treated for respiratory disease, and death loss. At all sites, cattle received similar management with the exception that cooked molasses tubs were added to half of the pens immediately following initial processing. Weight gains were similar (P=0.36) for cattle with or without access to tubs (43 and 38 lb, respectively). The addition of tubs also did not affect the number of cattle treated (P=0.48) or percent death loss (P=0.61); however, there was a numerical decrease in death loss for cattle with access to tubs (2.7 vs 1.8%). Tub consumption (0.245 lb/day) based on beginning and ending weights of the tubs, was below the desired level of 0.5 lb/day. Low tub consumption may have compromised any potential for improved performance or overall health response for cattle offered free access to cooked molasses tubs.

Keywords
Cattlemen's Day, 2001; Kansas Agricultural Experiment Station contribution; no. 01-318-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 873; Beef; Receiving; Cattle; Cooked molasses tubs

EFFECT OF COOKED MOLASSES TUBS ON PERFORMANCE AND HEALTH OF NEWLY RECEIVED STOCKER CALVES

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Summary

Eight paired comparisons conducted at three field sites with 1059 newly-received lightweight stocker calves were used to determine the effect of free-choice cooked molasses tubs designed for receiving cattle on 28-day receiving period performance, percentage of cattle treated for respiratory disease, and death loss. At all sites, cattle received similar management with the exception that cooked molasses tubs were added to half of the pens immediately following initial processing. Weight gains were similar (P=0.36) for cattle with or without access to tubs (43 and 38 lb, respectively). The addition of tubs also did not affect the number of cattle treated (P=0.48) or percent death loss (P=0.61); however, there was a numerical decrease in death loss for cattle with access to tubs (2.7 vs 1.8%). Tub consumption (0.245 lb/day) based on beginning and ending weights of the tubs, was below the desired level of 0.5 lb/day. Low tub consumption may have compromised any potential for improved performance or overall health response for cattle offered free access to cooked molasses tubs.

(Key Words: Receiving, Cattle, Cooked Molasses Tubs.)

Introduction

A recent Kansas survey estimated that 65% of cattle entering Kansas originate in the Southeastern U.S. Additionally, more than 75% of stocker operators keep newly received cattle in confinement for a minimum of 7 days. Feed intake by these stressed calves is low, creating short-term nutritional deficiencies that could affect immune function and increase susceptibility to disease. However, few operations adjust rations for low feed consumption during this period. Providing additional vitamins and minerals may reduce morbidity, depending on previous nutritional status. Our objective was to determine if adding Rangeland Health Care Provider Stress Tubs (Farmland Industries, Inc.) to pens of newly-received cattle would improve receiving period weight gains and(or) reduce morbidity.

Experimental Procedures

Eight paired comparisons were conducted on three producer sites across Kansas between November 4, 1999 and February 16, 2000. Receiving periods ranging from 27 to 32 days. In all cases, cattle arrived on the same day and were randomly assigned to two pens. One of the pens received free-choice access to vitamin and trace mineral-fortified cooked molasses tubs provided by Farmland Industries, Inc. Tubs were placed with cattle immediately after initial processing at a rate of no more than 20 head/tub, with tubs placed throughout the pen. Health programs differed slightly across sites, but cattle with or without tubs received similar management at each location.

To determine whether providing Stress Tubs improved cattle's ability to respond to disease, performance data for each pen were

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further divided into two groups: 1) cattle that had never been treated for respiratory disease, and 2) cattle treated at least once for respiratory disease.

Results and Discussion

Cattle without access to Stress Tubs were slightly heavier (P=0.17; Table 1) than steers receiving tubs (433 vs 415 lb). This difference was maintained throughout the feeding period, and final weights of cattle without tubs tended (P=0.07) to be heavier than those with access to tubs. Total weight gain and daily gains were similar ($P \geq 0.36$) for both groups, although daily gains were numerically higher for cattle receiving tubs (1.28 vs 1.46 lb/day). Morbidity and death loss was similar ($P \geq 0.22$) for cattle with or without access to tubs. Daily supplement intakes were below the recommended 0.5 lb/day, despite an adequate number of tubs and unlimited access. Due to site difference in initial weights, tub intakes on a percent BW basis are also reported. Additional work is needed to determine if achieving desired intakes would produce a greater response in animal performance and decreased morbidity.

Performance and health differences at each site mainly reflect the type of cattle purchased, management prior to arrival, and environmental conditions during the receiving period. Initial weights were different (P<0.01; Table 2) for each site. Site 1 purchased heavier calves from a regional salebarn. Sites 2 and 3 purchased lighter calves from the Southeastern U.S. Weight gain during the receiving period was similar (P=0.84) for all three sites, resulting in different (P<0.01) final weights. Among sites, total number of cattle treated, or overall morbidity, bordered on significance (P=0.08); however, there were differences in treatment duration among sites. Percentages of cattle treated only once were similar (P>0.05) for Sites 1 and 3, and both were lower (P<0.05) than Site 2. Percentage of cattle treated twice were lower (P<0.05) for Site 3 than Site 2, while Site 1 was intermediate. Although there were no differences (P=0.20) in percentages of cattle treated three times, Sites 1 and 2 had the lowest percentage of chronics with 0 and 2%, respectively. Both were lower (P<0.05) than Site 3. Finally, death loss was lower (P<0.05) at Site 2 than Site 3, with Site 1 intermediate. The greater number of chronics and higher death loss associated with Site 3 may be partially attributed to the lighter weights of cattle at this site, as well as the fact that many of the cattle received at Site 3 were intact males that were castrated during initial processing.

Tub intakes by site show that only Site 1 achieved the recommended intake of 0.5 lb/day. Site 2 (0.31 lb/day) and Site 3 (0.11 lb/day) tub intakes were considerably lower than target. At all sites, tubs were placed near feed and water and at the recommended rate of not less than 1 tub per 20 steers. Because purchased steers were used at all three sites, previous exposure to molasses tubs is not known. Additional factors that could have affected tub intake include calf size and origin (Sites 2 and 3 purchased predominately lighter calves from Southeastern U.S.), as well as differences in receiving management.

To determine whether access to the cooked molasses tubs influenced the animals' ability to handle a disease challenge and respond to treatment, data from each pen was further divided between: 1) cattle that had never been treated and 2) cattle that had been treated a minimum of one time (deads removed). There were no interactions ($P \geq 0.50$) between treatment history and access to cooked molasses tubs; however, there was a site by treatment history interaction for all performance variables, so site-specific means are presented in Table 3.

Site means broken down by treatment history indicate that health management strategies may have been different for Site 1 as compared to Site 2 and 3. Receiving period weight gain for cattle treated at least once was considerably lower (P<0.05) at Site 1 than the other two sites, suggesting that disease exposure may have been more serious at Site 1. Actual within-pen means at each site (not shown) suggest that treated cattle at Site 1 with access to the tubs lost less weight than treated cattle without tubs (based on only 1 rep); however, this trend

was not evident at Sites 2 and 3. Our results suggest that management and environment play a big role in an animal's ability to recover from disease, and do not rule out the possibility that nutritional supplements may also play a role in overall health.

Table 1. Receiving Health and Performance Data of Cattle With or Without Cooked Molasses Tubs

Item	No Tubs[a]	Stress Tubs	SE	P-value
Number, deads in (pens)	532 (8)	527 (8)		
Initial wt, lb[b]	433	415	6.1	0.17
Final wt, lb[c]	471	459	2.5	0.07
Receiving period wt gain, lb[d]	38	43	3.0	0.36
Daily gain, lb/day	1.28	1.46	0.113	0.38
Observed sickness, %				
Total treated	36.7	36.7	0.77	0.48
Treated once (1X)	24.1	26.1	1.88	0.53
Treated twice (1X not included)	5.4	4.2	0.52	0.25
Treated 3X (1 and 2X not included)	2.4	2.0	0.54	0.65
Chronics (treated more than 3X)	2.0	3.4	0.55	0.22
Deads	2.7	1.8	1.00	0.61
Daily tub intake, lb/head	--	0.245	--	--
% BW	--	0.075	--	--

[a]Least squares means using pen as the experimental unit.
[b]Treatment by site interaction P=0.02.
[c]Final weight calculated using an unshrunk liveweight minus a 4% pencil shrink.
[d]Receiving period for sites 1, 2 and 3.

Table 2. Receiving Health and Performance Data of Cattle by Site

Item	Trial Location[a]			SE	Overall P-value
	Site 1	Site 2	Site 3		
Number, deads in (pens)	107 (2)	445 (8)	507 (6)		
Initial wt, lb[b]	533	414	325	2.4	<0.01
Final wt, lb[c]	570[g]	456[f]	368[e]	5.4	<0.01
Receiving period wt gain, lb[d]	39	42	40	2.9	0.84
Daily gain, lb/day	1.45	1.45	1.21	0.096	0.14
Observed sickness, %					
Total treated	29.0	43.1	39.4	3.00	0.08
Treated once (1X)	20.6[e]	31.9[f]	22.9[e]	1.55	<0.01
Treated twice (1X not included)	4.7[ef]	7.6[f]	2.2[e]	0.72	<0.01
Treated 3X (1 and 2X not included)	2.8	0.9	3.0	0.94	0.20
Chronics (treated more than 3X)	0[e]	2.0[e]	6.2[f]	1.06	0.02
Deads	0.9[ef]	0.7[e]	5.1[f]	1.10	0.03
Daily tub intake, lb/head	0.54	0.31	0.11	–	--
% BW	0.107	0.080	0.038	–	--

[a]Least squares means using pen as the experimental unit .
[b]Treatment by site interaction, P=0.02.
[c]Final weight calculated using an unshrunk liveweight minus a 4% pencil shrink.
[d]Receiving periods ranged from 27 to 32 days for sites 1, 2, and 3.
[e,f,g]Means within a row with different superscripts differ (P<0.05).

Table 3. Receiving Health and Performance Data of Cattle by Treatment History and Site

Item	Site 1		Site 2		Site 3		SE
	Healthy	Treated	Healthy	Treated	Healthy	Treated	
Number (groups)[a]	76 (2)	31 (2)	253 (8)	192 (8)	307 (6)	200 (6)	
Initial wt, lb	526[g]	550[g]	417[f]	410[f]	339[e]	302[d]	5.6
Final wt, lb[b]	581[h]	543[g]	461[f]	447[f]	391[e]	324[d]	6.2
Weight gain, lb	57[g]	-4[d]	44[fg]	37[f]	51[g]	19[e]	5.3
Daily gain, lb/day	2.09[g]	-0.14[d]	1.55[fg]	1.29[f]	1.54[fg]	0.60[e]	1.70
Day of 1st treatment[c]	0	8.7[d]	0	7.7[d]	0	12.7[e]	0.81

[a]Data analyzed using group means for healthy and treated cattle within each pen.
[b]Final weight calculated using an unshrunk liveweight minus a 4% pencil shrink.
[c]Upon arrival, cattle at Site 3 received metaphylactic treatment using tilmicosin phosphate.
[d,e,f,g,h]Means within a row with different superscripts differ (P<0.05).