LEAD STEERS AS A MANAGEMENT TOOL FOR STRESSED STOCKER CATTLE

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Story in Brief

Six trials involving 721 newly received steer and bull calves averaging 375 pounds were used in a study to evaluate the effects of lead steers (LS) on health and performance during a 28-d receiving period. The cattle were randomly sorted into pens of which contained a lead steer, a steer that was familiar with feed and water sources. There was a variable interaction between lead steers and loads of cattle. In some cases they were helpful and at other times very detrimental. It appeared that with light weight cattle which suffered high rates of morbidity that lead steers were detrimental. They tended to be helpful with the heavier, low morbidity cattle. Overall, lead steers did not influence the weight gains, or gain to feed ratio of stressed cattle. However, there was a significant decrease in feed intake (13.45 vs 13.91) as well as an increase in required medical treatments per head (3.67 vs 3.27) and morbidity (57.73 vs 53.71%) in the lead steer group over the controls. Among those cattle that became sick, lead steer pens tended to require more medical treatments (4.80 vs 4.37) as well as significantly increasing repulls as sick (26.66 vs 15.65). Due to the fact that lead steers could not have affected the performance of the cattle that were sick at processing, the data were analyzed excluding animals detected as sick during the first three days. There was no effect on daily gains, but an increase in both the medical treatments required and repulls as sick.

(Key Words: Lead Steer, Health, Performance, Stressed Stocker Cattle)

Introduction

Stress is a component of the bovine respiratory disease complex (BRDC). Weaning, the mixing of calves and changes in environment and nutrition all are perceived as stressful in calves (Phillips, 1982). Calves are subjected to additional stress when transported and processed. This reduces subsequent performance and increases disease susceptibility.

Newly received cattle are subjected often to additional stressors. Many young calves have never been exposed to feed bunks, water troughs and the complete diets associated with receiving programs in drylot facilities. Therefore, these groups of cattle go through a period of adjustment. It was hypothesized that if new cattle exposed to new surroundings had an animal acquainted with the surroundings, a lead steer (LS), adjustment might be less stressful and animal performance improved. Hence, this study was designed to evaluate the effects of a LS on the health and performance of newly received calves.

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Materials and Methods

Seven hundred twenty one head of cattle were assembled by order buyers and shipped to Pawhuska, Oklahoma in 1987 and 1988. The origin, arrival date and weight, number of head and transit shrink for each load is summarized in Table 1. Upon arrival, cattle were weighed individually, ear tagged and randomly placed in one of four to eight pens. Half of the pens contained a LS which had been exposed to the pen and the diet for a minimum of two weeks. LS were selected to be similar in age and weight to newly received cattle when possible.

Cattle in trials 1, 2 and 6 had free access to prairie hay and were fed 2 lb/head/day a pelleted feed supplement (Table 2) for the first 21 days. The amount of supplement was decreased to 1 lb/head/day during days 22 to 28. In trial 3, 4 and 5, cattle had ad libitum access to a 70% pelleted concentrate (Table 3) and received 2 lb prairie hay per head daily. There were no lead steers in the hospital pens.

On the morning following arrival, individual cattle in each pen were processed as follows:

1. Body temperature and time were recorded.

Table 1. Origin, arrival date, number of head, arrival weight and intransit shrink for each load of cattle.

	Origin	Arrival Date	Number of Head	Arrival Wt., lb	% Shrink
Trial 1	KY	2-16-1987	86	514	4.46
Trial 2	KY	2-20-1987	92	488	7.83
Trial 3	AL	7-12-1987	135	322	3.99
Trial 4	AL	9-07-1987	134	334	NA[a]
Trial 5	NC	9-16-1987	174	231	NA[a]
Trial 6	AR	1-22-1988	100	526	7.41

[a]NA=not available.

Table 2. Composition of feed supplement--Trial 1, 2, 6

Ingredient	% As Fed
Soybean meal	88.94
Cottonseed meal	5.00
Salt	3.00
Dicalcium phosphate	2.75
Vitamin A-30,000 IU/g	.11
Bovatec 68[a]	.15
Rovimix E 50% SD[b]	.09

[a]To provide 100 mg lasalocid per lb.
[b]DL-alpha-tocopherol acetate, to provide 200 IU/lb Vitamin E, Hoffmann-La Roche, Inc., Nutley, NJ 07110.

Table 3. Composition of feed supplement--Trial 4, 5

Ingredient	% As Fed
Corn, #2 ground	20.72
Soybean hulls	19.65
Wheat middlings	27.47
Cottonseed hulls	9.94
Rice meal-run by-products	9.94
Soybean meal	6.16
Cane molasses	4.77
Calcium carbonate	.95
Salt	.28
Vitamin A-30,000 IU/g	.01
Zinpro-100[a,b]	.08
Rovimix E 50% SD[c]	.01
Bovatec 68[d]	.02

[a]not included in control diet.
[b]Zinpro, Inc., Chaska, MN 55318.
[c]DL-alpha-Tocopherol acetate, to provide 50 IU/lb Vitamin E, Hoffman-La Roche, Inc., Nutley, NJ 07110
[d]To provide 15 mg of lasalocid per lb.

2. Cattle were vaccinated with IBR-PI3 (MLV) intermuscularly, Leptospira pomona bacterin, and Clostridia chavoei, septicum, novyi and sordellii bacterin and dewormed with Ivomec[6].

3. Cattle with clinical signs of illness or a body temperature of 104F or greater received antibiotic treatment and sick animals were placed in the hospital pen and healthy animals were returned to their home pen.

Cattle were checked twice daily for signs of illness. Sick animals were moved to the processing area where body temperature was measured and severity of illness was clinically appraised. If body temperature exceeded 104 F the animal was considered sick. Sick animals received a medical treatment based on a specified sequence of antimicrobial drugs (Table 4). Sick animals were treated initially with the first drug in the sequence. If body temperature decreased within 24 h, this drug was continued for two more days. If no improvement was apparent within 24 h, the next drug in the sequence was administered. This process was repeated until a health improvement was detected.

Least squares analysis of variance were performed on data for all response criteria. Variables other than LS were superimposed across all trials and considered in the analysis. LS consumed supplement and hay at an approximate rate of 3% of their body weight. Total daily feed consumption for cattle in pens containing a LS was corrected by this amount. The initial model for weight gains, medical treatment, morbidity, feed intake, feed efficiency and repulls included trial (truck load), lead steer treatment and trial by lead steer treatment

[6]MSD Agvet, Rahway, NJ 070650

Table 4. Sequence of drugs used for treatment of BRDC.

Treatment No.1:[a]	Spectinomycin (Spectam)[b] -5 mg/lb.
Treatment No.2:[a]	Erythromycin (Gallamycin)[c] deep in the muscle -10 mg/lb.
Treatment No.3:[a]	Procain Penicillin G[d] subcutaneously -30,000 IU/lb.
Treatment No.4:	Oxytetracycline (Biomycin-C)[e] subcutaneously-5mg/lb. Plus Sulfamethazine Boluses (Sulmet-15gm)[f] 1 bolus/150 lb on day 1. 1 bolus/300 lb on subsequent days.

[a]Certain antimicrobial drugs used in this study were used for extra-label purposes or at extra-label dosages and require a veterinarian-client-patient relationship before use.
[b]Ceva Laboratories, Ft Scott, KS 66701.
[c]Ceva Laboratories, Ft Scott, KS 66701.
[d]Pfizer, Inc., Lee Summit, MO 64063.
[e]Boeringer-Ingelheim Animal Health, Inc., St Joseph, MO 64502.
[f]American Cyanamid, Co., Wayne, NJ 07470.

interaction as class variables. All models, excluding lead steer treatment, were reduced when sources of variation had observed significance levels greater than .20.

Results and Discussion

The effects of LS on daily gains, medical treatment and morbidity across all cattle are presented in Table 5. Daily Gains were similar for control cattle (2.01) and for calves in pens containing a LS (1.99). However, there was increased medical treatments required (3.67 vs 3.27) and higher morbidity (57.73% vs 53.71%) for the LS group.

Feed intake and gain to feed ratio averaged across pens are reported in Table 6. Feed intakes were significantly different (P<.04) with lead steer group intake depressed (13.45 vs 13.91) while gain to feed ratios were similar (0.143 and 0.142) for contol and LS groups respectively.

Performance of the cattle that became sick during the 28-d study are reported in Table 7. Again, LS cattle gained similar and tended to

Table 5. Effect of lead steers on weight gains, morbidity and mortality in stressed cattle.

Treatment	Control	LS
Number of head	356	345
Number of head never sick	133	115
Arrival weight, lb	384	381
Daily gain, lb[a]	2.01	1.99
Daily gain of head never sick, lb[a]	2.21	2.25
Medical treatments per head[a]	3.27	3.67
Morbidity, %[a]	53.71	57.73
Total Mortality, %	2.20	3.36

[a]Expressed as least square means.

Table 6. Effects of lead steers on feed intake and gain to feed ratio.

	Control	LS
Number of pens	20	20
Feed intake, lb[a,b]	13.91[c]	13.45[d]
Gain/feed[a]	.143	.142

[a]Expressed as least square means.
[b]Corrected for LS intake by removing 3% LS body weight per day.
[c,d]Means with different superscripts differ (P<.04)

Table 7. Effect of lead steers on daily gains and medical treatment in sick cattle.

	Control	LS
Number of head	223	230
Average daily gain, lb[a]	1.63	1.63
Medical treatments per head[a]	4.37	4.80
Repulls as sick %[a]	15.65[b]	26.66[c]

[a]Expressed as least square means.
[b,c]Means with different superscripts differ (P<.01)

Table 8. Effects of lead steers on daily gains, medical treatment, and morbidity in stressed cattle with sick head detected during first three days excluded.

	Controls	LS
Number of head	213	216
Arrival weight, lbs.	389	382
Average daily gain, lb[a]	2.10	1.99
Medical treatments per head[a]	1.31	1.71
Morbidity, %[a]	30.65	37.57

[a]Expressed as least square means.

(p=.19) increase medical treatments (4.80 vs 4.37) compared to controls. Repulls as sick were also significantly higher (p<.01) in the LS group (26.66%) vs the non LS group (15.65%).

Several cattle were treated for sickness at the time of processing. Because the lead steer treatment could not have influenced the initial illness of the cattle, the data also were analyzed excluding those treated as sick during the first three days of the trial (84 for controls and 75 for LS). The gains, medical treatments required per head and morbidity for this group of calves are reported in Table 8. Although gains were similar for LS and control calves (1.63 and 1.63 lb/day respectively), again there were more medical treatments required per morbid calf among the LS calves (1.71) compared with the controls (1.31). Addtionally, morbidity tended (P=.18) to be higher for the LS calves (37.57%) as compared with the controls (30.65%).

Weight gains, medical treatments and repulls as sick of the cattle that became sick during the trial with animals detected as sick during the first 3 days excluded are reported in Table 9. Repulls as sick among the control cattle were significantly lower (P<.03) than in the LS cattle (12.50% vs 22.77% respectively).

Under the conditions of this study, lead steer treatment had no effect on daily gains but tended to increase morbidity and medical treatments required per head. The possibility exists that when cattle from lead steer pens become sick and are removed from the lead steers, that this is a negative factor on performance. Additional trials with lead steers are needed to further evaluate their effects on performance and health. Additional data is being analyzed and will be reported in the future. In comparing individual trials, there is a current indication that lead steer treatment of heavier, low morbidity cattle may benefit performance and health.

Table 9. Effect of lead steers on daily gains, medical treatment and repulls as sick in sick cattle with head pulled on first 3 days excluded.

	Controls	LS
Number of head	80	101
Average daily gain, lbs.[a]	1.45	1.43
Medical treatments per head[a]	3.42	3.86
Repulls as sick, %[a]	12.50[b]	22.77[c]

[a]Expressed as least square means.
[b,c]Means with different superscripts differ (P<.03).

Literature Cited

Phillips, W.A. 1982. Factors associated with stress in beef cattle. Proc. Symposium on Management of Food Producing Animals. Volume II. Purdue Univ., p.640.