THE EFFECT OF LAIDLOMYCIN PROPIONATE ON THE PERFORMANCE AND CARCASS MERIT OF FEEDLOT STEERS AND HEIFERS

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Story in Brief

Laidlomycin propionate was fed to feedlot steers and heifers at levels of 0, 5, 12.5 or 20 grams per ton. Gains by heifers were improved by 13 percent with 12.5 g/ton. Laidlomycin propionate decreased feed needed per pound of gain by steers by 6 percent. This ionophore does not depress feed intake. It tended to increase marbling score and decrease external fat. It appears to be useful as an additive in cattle diets. Additional tests will be required to establish its optimum feeding level.

(Key Words: Laidlomycin Propionate, Feedlot Steers, Heifers, Ionophore.)

Introduction

Ionophores are widely fed to improve the efficiency of feedlot cattle. Presently, two ionophores are approved by the Food and Drug Administration for addition to feedlot diets: monensin, and lasalocid. Effects of an ionophore may be altered by chemically modifying the ionophore molecule. It may be possible to modify a less active molecule to improve its effect on feed efficiency while retaining the wide safety margin of the less potent compound. Laidlomycin propionate differs from the cleared ionophores by addition of a propionate group which increases its potency. The usefulness of this designer ionophore must be evaluated in performance and safety trials.

Materials and Methods

Two hundred twenty four Angus and Hereford X Angus crossbred steers and heifers from Montana, selected for uniformity from a larger group wintered on wheat pasture, were used. The 96 heifers were blocked by weight into three blocks. Each block contained four pens of eight animals. The 128 steers were allocated into 16 pens using initial weights to equalize weights between the pens. With the steers, four pens were randomly assigned to each treatment. The experiment, conducted in the Bull Test barn at Panhandle State University, began with the animals being placed on feed in late March of 1986. All cattle were vaccinated with IBR-PI_3 (MLV) IM, *Leptospira Pomona* bacterin and *Clostridia chauvoei*, *septicum*, *novyi* and *sordellii* bacterin and were dewormed with ivermectin. No implants were used. Cattle were fed twice daily a ration based on whole corn (Table 1). The cattle were moved

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Table 1. Composition of diets on a dry matter basis.

Ingredient	Ration				
	Starter	70	80	90	Final
Whole shelled corn	52.55	62.55	72.55	82.55	87.55
Cottonseed hulls	20.00	15.00	10.00	5.00	5.00
Suncured alfalfa pellets	20.00	15.00	10.00	5.00	0.00
Supplement pellets[a]	7.45	7.45	7.45	7.45	7.45

Calculated composition of the final ration:

Nutrients	Ration Composition		Supplement Composition	
	DM, %	As Fed, %	DM, %	As Fed, %
NEm, mcal/cwt	95.75[b]	83.77	54.95	50.52
NEg, mcal/cwt	61.86	54.13	35.26	33.35
Crude protein, %	11.75	10.28	46.75	42.98
Crude fiber, %	5.19	4.54	7.93	7.29
K, %	0.65	0.57	3.68	3.38
Ca, %	0.50	0.44	6.35	5.84
Phosphorus, %	0.34	0.30	1.14	1.05
Dry matter, %	100.00	87.50	100.00	91.93

[a]Supplement composition: Calcium carbonate 14.82%, salt 4.04%, urea 6.06%, vitamin A-30,000 IU/gram 0.30, trace mineral 0.17%, soybean meal 23.58%, potassium chloride 4.99%, cottonseed meal 39.57%, cane molasses 3.77%, dicalcium phosphate 2.69% and laidlomycin propionate premix as required.

[b]Ration ME composition was 3.10 mcal/kg.

through the sequence of rations shown in Table 1. The heifers were on full feed in 25 days and the steers in 23 days. The initial weights of the cattle were obtained off the truck after cattle had been transported about 50 miles to the facility. Period weights were taken full while final live weights were obtained after withdrawal of feed and water overnight. Because of a drug withdrawal limitation for laidlomycin propionate, all cattle were fed an additive-free diet for ten days following the final live weight, transported to Booker, Texas, and slaughtered. Total feeding time before slaughter was 133 days for the steers and 122 days for the heifers. One steer and one heifer died in the course of the trial and two heifers were removed from the test due to prolapse and were slaughtered in the meat lab at Panhandle State University. Causes of death appeared unrelated to treatment.

Results and Discussion

In contrast to effects of several other ionophores, laidlomycin propionate did not reduce feed intake while it improved feed efficiency (Tables 2 and 3). It improved feed efficiency as much at a level of 5 g/ton as at higher levels, though rate of gain for steers tended to be fastest at the 12.5 g/ton level. At this level, gains were increased by 8%. Averaged across the levels tested, laidlomycin propionate increased

Table 2. Effects of laidlomycin propionate on steer performance.

	Laidlomycin Propionate Level (Grams/Air Dry Ton)			
	0	5	12.5	20
Steers, number	32	31	32	32
Weights:				
Starting	684	684	672	688
56 days	1035	1034	1026	1039
124 days	1094	1113	1110	1130
Carcass (119 days)	691	702	705	710
Gain, lb/day:				
0-56 days	4.14	4.21	4.45	4.32
56-124 days	2.63	2.85	2.77	2.95
0-124 days	3.31	3.46	3.53	3.57
Adjusted live[a]	3.24	3.37	3.50	3.44
Dry matter intake, lbs/day:				
0-56 days	20.73	20.80	21.19	21.16
56-124 days	18.33	18.34	18.78	18.24
0-124 days	19.42	19.45	19.86	19.56
0-slaughter (133[d])	19.31	19.42	19.83	19.57
Feed/gain:				
0-56 days	5.01	4.96	4.76	4.90
56-124 days	7.04[b]	6.45[bc]	6.79[bc]	6.26[c]
0-124 days	5.86[b]	5.62[bc]	5.63[bc]	5.49[c]
0-slaughter (133[d])	5.96	5.76	5.67	5.70
Calculated diet ME, mcal/kg	3.08	3.17	3.18	3.20

[a]Based on carcass weight divided by .62.
[bc]Means with different superscripts differ (P<.05).

gain and efficiency of feed use by 6.1 and 4.2% for steers and by 10.0 and 6.4% for heifers.

Carcass characteristics tended to be altered slightly with laidlomycin propionate (Tables 4 and 5). Steers graded very well. The drug tended to increase marbling score and percent of carcasses grading choice, as might be expected with heavier carcass weights. However, external fat cover and kidney-heart-pelvic fat were not increased as one might expect with heavier carcasses. Perhaps this drug, through altering ruminal end-products being absorbed, alters the site of fat deposition more than other ionophores do. Though average feed savings (ME) of 3.3 to 4.2% were apparent with laidlomycin propionate, increased gains, feed intakes and marbling scores with this compound and its presumed lower toxicity make it a desirable alternative to other ionophores for specific feeding conditions. More research is needed to pinpoint ideal feeding levels and further examine effects of this ionophore on carcass marbling and fat distribution.

Table 3. Effects of laidlomycin propionate on heifer performance.

	Laidlomycin Propionate Level			
	0	5	12.5	20
Heifers, number	22	24	24	23
Weights:				
Starting	659[b]	659[a]	658[ab]	660[a]
56 days	855[b]	882[a]	866[ab]	879[a]
113 days	958[b]	980[a]	971[b]	976[a]
Carcass (119 days)	596[b]	618[a]	604[b]	620[a]
Gain, lb/day:				
0-56 days	2.89[b]	3.37[b]	3.08[ab]	3.29[ab]
56-113 days	2.40	2.33	2.46	2.32
0-113 days	2.64[b]	2.84[a]	2.77[ab]	2.80[a]
Adjusted live[c]	2.47[b]	2.77[a]	2.59[b]	2.79[a]
Dry matter intake, lbs/day:				
0-56 days	17.94[b]	18.37[a]	18.01[ab]	18.22[a]
56-113 days	14.69[b]	15.34[a]	15.24[ab]	15.73[a]
0-113 days	16.33	16.84	16.62	16.99
0-Slaughter	16.05	16.41	16.29	16.65
Feed/gain:				
0-56 days	6.21[a]	5.46[b]	5.86[ab]	5.54[b]
56-113 days	6.12	6.58	6.27	6.19
0-113 days	6.18	5.92	6.01	6.08
0-Slaughter	6.48	5.93	6.30	5.97
Calculated ME, mcal/kg	3.12	3.30	3.17	3.28

[ab]Means with different superscripts differ (P<.05).
[c]Based on carcass weight divided by .62.

Table 4. Effect of laidlomycin propionate on steer carcass characteristics.

	Laidlomycin Propionate Level			
	0	5	12.5	20
Dressing percentage	63.27	63.05	63.54	62.79
Rib eye area, sq in	11.53[d]	12.24[c]	11.71[cd]	11.87[cd]
Fat thickness, inches	.57	.53	.56	.57
KHP fat, %	2.01	1.95	2.05	2.05
Marbling score[c]	14.45	14.46	15.53	15.00
Percent choice	87.50	81.25	93.75	93.75
Yield grade	3.26	2.99	3.25	3.22
Liver abscess:				
Score[d]	1.71	2.09	2.06	1.82
Incidence, %	18.8	25.9	31.3	34.4

[ab]Means with different superscripts differ (P<.01).
[c]Small=14; small plus=15.
[d]Mean score; none=0; one or several small abscesses=1.0; moderate abscesses=2.0; severe=3.0.
[cd]Means with different superscripts differ (P<.05).

Table 5. The effect of laidlomycin propionate on heifer carcass parameters.

	Laidlomycin Propionate Level			
	0	5	12.5	20
Dressing percentage	62.23[d]	63.05[cd]	62.15[d]	63.52[c]
Rib eye area, sq inches	11.83	11.82	11.68	12.08
Fat thickness, inches	.61[c]	.56[cd]	.53[cd]	.47[d]
KHP fat, %	1.92	2.02	1.92	1.88
Marbling score[c]	11.98	12.83	13.33	12.34
Percent choice	40.50	66.70	62.50	51.20
Yield grade	2.88	2.86	2.77	2.53
Liver abscess:				
Score[d]	2.76	3.33	1.99	2.00
Incidence, %	18.5	37.5	33.3	27.4

[ab]Means with different superscripts differ (P<.05).
[c]Slight plus=12; small minus=13.
[d]Mean score; none=0; one or several small abscesses=1.0; moderate abscesses=2.0; severe=3.0.