

LASALOCID AND TERRAMYCIN FOR FEEDLOT STEERS

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Story in Brief

One hundred fifty-nine yearling steers were fed whole shelled corn diets 1) without additives or with 2) Terramycin (75 mg/head daily), with 3) lasalocid (30 g/ton of feed), with 4) both Terramycin and lasalocid or with 5) monensin (25 g/ton of feed) plus tylosin (90 mg/head daily) added in a 103 day finishing trial. Gains and efficiency of feed use tended to be improved by added lasalocid (7.4 and 5.9 percent, respectively). The incidence of liver abscesses was low, tended to be greater with added lasalocid but was reduced when Terramycin was added to the lasalocid diet. Terramycin did not improve gain or efficiency in this trial. Gains and efficiencies were slightly greater with lasalocid-Terramycin than monensin-tylosin feeding (6.5 and 6.0 percent, respectively) but benefits of added monensin-tylosin in this trial were considerably less than observed previously from feeding of monensin alone. Combining results of this trial with results from three previous studies with lasalocid indicate that lasalocid increased efficiency of feed use a mean of 5.0 percent.

Introduction

Monensin (Rumensin®) and lasalocid (Bovatec®) are widely fed to improve efficiency of gain of feedlot cattle. These ionophores may increase the incidence of liver abscesses which will result in more liver condemnation at slaughter. Several antibiotics including chlortetracycline (Aureomycin), oxytetracycline (Terramycin) and tylosin (Tylan) will reduce the incidence of liver abscesses, probably by reducing the population of pathogenic bacteria which may escape from the rumen and embed in the liver to start an abscess. In addition, certain antibiotics have been reported to increase gain and feed efficiency of feedlot cattle.

The objective of this experiment was to determine the effect of Terramycin and lasalocid alone and in combination on performance and carcass characteristics of feedlot steers as compared with both a negative control and a positive control of monensin plus tylosin. The combination of Terramycin with lasalocid is not approved as yet by the FDA.

Materials and Methods

One hundred sixty yearling crossbred steers with some Brahman breeding were selected from a group of 500 steers which had received routine feedlot vaccinations, a Compudose® implant and ear tags at Hitch Feedlot, Guymon, OK. Steers were adapted to a starting feedlot diet in a

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single pen for 30 days prior to trucking 6 miles to Goodwell, OK on May 21, 1983.

On arrival, steers had a shrunk weight of 760 pounds. They were allocated to 5 treatments in 20 pens in 2 barns, with one replication in the "steer" barn and three replications in the "bull" barn at Panhandle State University. One steer died during the trial from causes not related to dietary treatment. Compositions of the adaptation and finishing diets are presented in Table 1. Steers received diet 1 for 2 days, diet 2 for 2 days, diet 3 for 5 days, diet 4 for 7 days, diet 5 for 7 days and diet 6 for the remainder of the trial. Steers were weighed full on days 28, 56, 84 and 103.

Table 1. Diet composition, dry matter basis^a.

Ingredient	Percentage
Corn, whole shelled	88.14
Corn silage	4.00
Soybean meal	3.71
Cottonseed meal	2.00
Limestone	1.00
Urea	.45
Molasses	.38
Salt	.30
Premix ^b	.02

^a To provide 11.78 percent protein, .43 percent calcium, .34 percent phosphorus, .49 percent potassium and 3.23 mcal ME/kg dry matter.

^b Pelleted supplement (7.86 percent of the diet) for specific treatments contained .478 percent Terramycin 10 (theory 96.64 g / ton, found 70 g / ton), .2816 percent Bovatec 68 (theory 383 g / ton, found 369.5 g / ton), or .2652 percent Rumensin 60 (theory 318.37 g / ton, found 312.5 g / ton) plus .5739 percent Tylan 10. Vitamin A-30 also included at .281 percent of the supplement. These were formulated to supply lasalocid at 30 g or monensin at 25 g per ton ton of air dry feed, Terramycin at 75 mg per head daily or Tylan at 90 mg per head daily (assuming a daily feed intake of 20 pounds of dry matter per head).

Silage was substituted for whole corn to get the cattle on feed. Diet 1 contained 40 percent corn silage, Diet 2 30 percent, diet 3 20 percent, Diet 4 15 percent, Diet 5 10 percent, and the final ration 4 percent as indicated in the table.

Additives being tested in addition to 1) an additive-free diet included 2) Terramycin at 75 mg per head daily, 3) lasalocid at 30 g per ton of feed, 4) Terramycin plus lasalocid and 5) monensin at 25 g per ton of feed plus tylosin at 90 mg per head daily. Cattle being fed compounds currently approved by the FDA were slaughtered on either day 103 or 110, while the FDA test groups were switched to an additive-free diet for 9 days prior to slaughter on day 110. Steers were trucked 70 miles to Booker, TX for slaughter on day 103 or 110 of the trial and slaughter and carcass data were obtained. Weights are reported on a full basis while gains and feed efficiencies were calculated using a 5 percent pencil shrink. Gains and feed efficiencies for the total trial were calculated from hot carcass weights assuming a dressing percentage

of 62. After removal of barn effects, treatment means for performance and carcass data were compared using the statistical analysis package of SAS (Barr and Goodnight, 1976) and Duncan's Multiple Range Test.

Results and Discussion

Performance and carcass data are presented in Tables 2 and 3. Daily gains during the first half of the feeding period tended to be greater with added ionophores though differences were not significant. Gains with the monensin-tylosin combination were slightly less than with the lasalocid-Terramycin diet, especially during the first half of the trial. This is similar to the response observed in our previous trials. Averaged across antibiotic levels, lasalocid increased carcass adjusted weight gains by 7.4 percent while increasing intake by 1.3 percent which increased efficiency of feed use by 5.9 percent. Corresponding figures on a live weight basis were 8.0 percent, 1.8 percent, and 5.5 percent, respectively. Apparent metabolizable energy of the diet was increased by 3.7 percent by lasalocid. These values would correspond well with previous benefits noted for lasalocid in trials at OSU presented in Table 4. Averaged across these trials, efficiency responses have been very close to the 7 trial summary values for monensin of a 5 percent response in feed efficiency (Owens and Gill, 1982b) but an increase in rate of gain was not observed in the monensin trials.

Table 2. Steer performance with ionophores and antibiotics.

Ionophore Antibiotic	None None	None Terramycin	Lasalocid None	Lasalocid Terramycin	Monensin Tylosin
Pens of steers	4	4	4	4	4
Steers	32	32	32	32	31
Weights					
Initial	754	758	760	758	768
56 days	929	933	953	962	956
103 days	1061	1059	1079	1090	1096
Daily gains, lb					
0-56	2.30 ^b	2.29 ^b	2.60 ^{ab}	2.78 ^a	2.52 ^{ab}
57-103	2.68	2.54	2.56	2.58	2.83
0-103	2.47	2.41	2.58	2.69	2.66
0-slaughter	2.91 ^{ab}	2.74 ^a	2.96 ^{ab}	3.11 ^b	2.92 ^{ab}
Daily feed, lb.					
0-56	19.5	19.1	19.2	20.3	19.8
57-103	18.6	18.4	18.5	19.2	19.2
0-103	19.1	18.8	18.9	19.7	19.5
0-slaughter	19.0	18.7	18.8	19.4	19.4
Feed/gain					
0-56	8.57 ^a	8.42 ^{ab}	7.46 ^{bc}	7.28 ^c	7.90 ^{abc}
57-103	7.02	7.28	7.30	7.51	6.82
0-103	7.74	7.86	7.37	7.37	7.35
0-slaughter	6.55	6.86	6.37	6.25	6.65
Metabolizable energy mcg/kg	2.98 ^{ab}	2.92 ^b	3.04 ^{ab}	3.08 ^a	2.97 ^{ab}

^{ab} Means in a row with different superscripts differ ($P < .05$).

Table 3. Slaughter and carcass data of steers fed ionophores and antibiotics.

Ionophore Antibiotic	None None	None Terramycin	Lasalocid None	Lasalocid Terramycin	Monensin Tylosin
Carcass weight	656 ^b	648 ^b	663 ^{ab}	682 ^a	665 ^{ab}
Dressing %	64.8	64.2	64.5	64.7	63.7
Liver abscess					
Incidence ^c , %	3.1 ^b	3.1 ^b	18.8 ^a	9.4 ^{ab}	3.6 ^b
Severity	2	1	1	1	1
Rib eye area,	12.3	12.3	12.2	12.3	12.3
Kidney-heart- pelvic fat, %	1.50 ^b	1.48 ^b	1.53 ^{ab}	1.73 ^a	1.62 ^{ab}
Fat over rib					
Fat over rib, in.	.36	.36	.38	.43	.42
Marbling score	10.2	10.1	10.7	10.8	11.5
Cutability, %	51.6	51.6	51.3	50.8	51.0
Percent choice	15.6 ^{ab}	3.1 ^a	18.8 ^{ab}	13.8 ^{ab}	28.6 ^b

^{a, b} Means in a row with different superscripts differ ($P < .05$).

^c 1 = small size; 2 = many or moderate sized abscess.

^d 10 = slight minus; 11 = average slight.

Table 4. Effects of Lasalocid feeding in trials at Oklahoma State.

Reference	Lasalocid Level	Daily Gain	Feed Intake	Effects (%)		Abscess Incidence	Steers/ Treat.
				Feed/ Gain	ME		
Owens & Gill	20	-.3	-5.1	0	4.8	0	28
1982a	30	1.2	-3.0	3.9	5.5	+23%	28
1983 (elsewhere in this publication)							
	30	12.1	+3.3	7.8	3.3	-5%	39
This article	30	7.4	+1.3	5.9	3.7	+11%	64
Weighted Ave.		+6.1	-.1	+5.0	+4.1	+7%	

Terramycin alone tended to decrease feed intake and rate and efficiency of gain, but when added with lasalocid, Terramycin tended to increase gains. However, this interaction was not significant. Averaged across lasalocid levels, Terramycin decreased carcass adjusted weight gains by .3 percent while increasing feed intake by 1.3 percent for a decrease in efficiency of feed use of 1.5 percent and apparent metabolizable energy of the diet by .3 percent. Corresponding figures on a live weight basis were 1.0 percent, 1.3 percent, and .8 percent, respectively. No benefit of antibiotic feeding on gains or efficiencies were noted.

Carcass weight differences correspond with differences in rate of gain discussed above. Dressing percentages were all high. The incidence of liver abscesses was greater with steers fed lasalocid (14.1 vs 3.1 percent) in this trial. Though addition of lasalocid tended to increase the incidence of liver abscesses, adding Terramycin to the lasalocid diet reduced the incidence of liver abscesses. Marbling scores tended to be greater with diets containing both an ionophore and an antibiotic, and percent choice carcasses, small in all treatments probably due to the short duration of the trial, was greatest for the cattle fed monensin plus tylosin.

Literature cited

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