Salinomycin Levels for Feedlot Steers

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Story in Brief

A new feed additive, salinomycin, was fed to 140 finishing steers (initial weight of 788 lb) for 110 days. Salinomycin was fed at 0, 5, 10, 15 and 30 g per ton of an 89 percent whole shelled corn, 5 percent cottonseed hull diet. Averaged across salinomycin levels, gain was increased 9.4 percent, and efficiency of feed use was increased 7.8 percent. Feed intake was increased 1 percent by salinomycin. At the optimum drug level in this trial, 10 g per ton of feed, gain and feed efficiency were increased by 12.9 and 9.5 percent. Feces tended to be drier and contain more starch when the drug was fed. Carcass measurements were not changed by salinomycin feeding. This drug shows excellent promise for improving efficiency and rate of gain of feedlot steers.

Introduction

Feed additives of a class called ionophores have proven to increase efficiency of feed use by feedlot cattle. Monensin, lasalocid and salinomycin are three ionophores. Monensin is fed widely today, and approval for lasalocid is expected shortly. Salinomycin has been evaluated previously in one study in Virginia. In that trial, gain and efficiency increases of 21 percent for beef steers fed a 20 percent roughage diet were reported. In this trial, salinomycin was fed at five levels to finishing steers to examine its effect on rate and efficiency of gain.

Materials and Methods

Steers of mixed breeding which had commonly grazed pasture in Purcell, Oklahoma were sorted, vaccinated for bovine rhinotracheitis, leptospirapomona, bovine virus diarrhea, parainfluenza 3, blackleg and malignant edema and trucked to Stillwater. On arrival, steers were held on pasture for 3 weeks and were then divided into four weight groups. Steers within each weight group were randomly allocated to one of five pens and the five levels of salinomycin, 0, 5, 10, 15 and 30 g/ton of feed, and were randomly assigned to pens within each weight group. Cottonseed hulls and corn comprised 94 percent of the ration, with the percentage hulls in the ration sequentially decreasing from 40 to 30 to 20 to 12.5 and 5 percent at 3-day intervals at the start of the trial until the final ration (Table 1) was being fed. Steers had access to feed from self-feeders throughout the 124-day trial. Steers were weighed following withdrawal of feed and water at the start of the trial and on day 110. Other weights were taken full. Three steers were removed from the experiment due to sudden death and chronic health problems.

Table 1. Feed and pellet compositions, dry matter basis[a]

Ingredient	Percent	Pellet ingredient[b]	Percent
Corn, whole shelled	89.0	Soybean meal	57.0
Cottonseed hulls	5.0	Limestone	16.0
Pelleted supplement	6.0	Urea	7.75
		KC1	6.25
		Salt	4.75
		Alfalfa meal	4.50
		Dicalcium phosphate	3.50
		Trace minerals	0.25
		Vitamin A-30	0.18

[a]Average analysis: 90.2% dry matter, 11.8% protein, ME = 2.80 on as fed basis.
[b]0, 83, 167, 333 or 500 g active drug added per ton of pelleted supplement.

Table 2. Performance data

Item	Salinomycin level, g/ton 0	5	10	20	30	SE
Weight, lb						
Initial[a]	779	786	795	786	792	8.7
28 days[b]	912	907	924	922	922	12.0
56 days[b]	1002	1018	1040	1020	1021	12.0
84 days[b]	1084	1108	1128	1110	1107	14.5
110 days[a]	1121[b]	1158[ab]	1180[a]	1155[ab]	1158[ab]	14.4
124 days[b]	1177[b]	1214[ab]	1231[a]	1209[ab]	1208[ab]	14.1
125 days[c]	1169	1205	1215	1204	1190	13.9
Daily gains, lb						
0-56 days	3.08	3.23	3.44	3.27	3.18	.15
57-110 days	3.13[b]	3.54[a]	3.56[a]	3.45[ab]	3.49[a]	.11
0-110 days	3.10[b]	3.38[ab]	3.50[a]	3.36[ab]	3.33[ab]	.10
0-125 days	3.14	3.38	3.39	3.37	3.20	.07
Feed/Intake, lb/day, dry matter						
0-56 days	20.4	20.9	21.2	20.9	19.4	.55
57-110 days	20.1	20.3	20.2	19.7	20.6	.40
0-110 days	20.2	20.6	20.7	20.3	20.0	.44
0-124 days	19.9	20.3	20.3	20.2	20.2	.50
Feed/gain, dry matter						
0-56	6.68	6.49	6.17	6.39	6.14	.22
57-110 days	6.42[a]	5.76[b]	5.71[b]	5.71[b]	5.97[ab]	.17
0-110 days	6.53[a]	6.09[b]	5.91[b]	6.05[b]	6.05[b]	.14
0-125 days	6.34	6.02	5.99	6.03	6.27	.13
Metabolizable energy[d], mcal/kg	2.81[b]	2.93[ab]	3.01[a]	2.95[a]	2.98[a]	1.2

[a]Shrunk weights.
[b]Full weights x .95.
[c]Carcass weight /.62.
[d]Calculated from gain and feed intake, as fed basis.

On day 106, fecal samples were obtained for analysis. Salinomycin was withdrawn from the pelleted supplement on day 110 and on day 124, and steers were trucked to Booker, Texas, for slaughter and carcass evaluation.

Results

Daily gain and feed intake were increased with salinomycin added to the diet (Table 2). Efficiency of feed and energy use was maximized when intake was maximum with 10 g per ton salinomycin. With this diet, gain and feed efficiency were improved by 12.9 and 9.5 percent. Higher salinomycin levels gave slightly less response.

Feces of steers fed the 10 g per ton salinomycin diet were drier and contained more starch than feces of steers fed the control diet (Table 3). Carcass characteristics, obtained 15 days after withdrawal of the drug, were unchanged with salinomycin supplementation (Table 4) although the incidence of liver abscesses tended to increase with this drug. Increased incidence of liver abscesses has occasionally been reported when monensin has been supplemented as well. Though performance and efficiency responses were less than observed in the trial reported from Virginia, comparison with other ionophores (Table 5) suggests that this compound has promise as a feed additive for feedlot steers. Responses to drugs differ with ration composition, environment and feeding conditions so reponses from experiment stations will differ. The summary indicates that for feed savings, feeding an ionophore to feedlot cattle is consistently beneficial.

Table 3. Feces composition

	Salinomycin, g/ton					
Item	0	5	10	20	30	SE
Dry matter, %	23.9[b]	24.9[b]	30.7[a]	23.2[b]	28.4[a]	1.0
Starch, % of DM	17.0[c]	24.5[ab]	27.2[a]	17.9[bc]	21.9[abc]	2.3
pH	5.95	5.95	5.94	5.95	5.92	0.22

[abc]Means in a row with different superscripts differ significantly ($P<.05$).

Table 4. Carcass characteristics

	Salinomycin, g/ton					
Item	0	5	10	20	30	SE
Carcass weight, lb	724	747	753	746	738	8.6
Dressing percent	64.2	64.1	63.8	64.3	63.7	.37
Liver conditions						
Abscesses						
Incidence, %	29	43	36	43	41	8.3
Severity	1.9	1.9	1.8	1.6	1.5	0.3
Flukes, %	3.6	0	7.1	0	5.0	3.3
Rib eye area						
sq. in.	12.9	13.4	13.1	12.9	13.0	.33
sq. in./cut carcass	1.78	1.80	1.73	1.74	1.77	.002
Fat thickness, in.	.54	.58	.54	.59	.59	.033
KHP, %	2.69	2.75	2.84	2.79	2.63	.090
Marbling score	13.7	13.5	13.6	14.5	13.7	.41
Federal grade	12.8	12.8	12.9	13.1	12.9	.11
Cutability	49.8	49.7	49.5	49.3	49.3	.43
Percent choice	61	71	64	68	64	9.1

Table 5. Ionophore comparisons from feedlot trials at Oklahoma State

Ionophore	Cattle fed	Trials	Daily gain			Feed efficiency		
			Control	Drug	Response	Control	Drug	Response
			lb	lb	%	lb	%	
Monensin	800	7	3.33	3.33	0.0	5.82	5.53	5.0
Lasalocid	84	1	3.38	3.40	0.6	5.75	5.31	7.7
Salinomycin	140	1	3.10	3.39	9.4	6.53	6.02	7.8

Lasalocid for Feedlot Steers

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Story in Brief

Lasalocid and monensin were supplemented at 0, 20 or 30 grams per ton with a shelled corn diet and fed to 140 steers (initial weight 679 lb) for 119 days. Rate of gain tended to be greater with the higher level of lasalocid than the higher level of monensin addition to the feed. Feed intake was reduced by 4.1 percent with lasalocid and 2.0 percent with monensin. Efficiency of gain was improved by 5.9 percent with addition of either drug and was slightly greater (7.6 percent vs 4.3 percent) with lasalocid than monensin. Calculated metabolizable energy was increased with either drug (3.8 percent) and greater with lasalocid than monensin (5.1 vs 2.4 percent). Fecal starch tended to be lower with lasalocid than with monensin feeding. Fat thickness tended to be lower with drug feeding, and percent of carcasses graded choice was significantly greater for steers fed lasalocid than those fed monensin due to slightly higher marbling score. Results indicate that lasalocid increases efficiency of feed use by feedlot steers to a level equal to or greater than monensin. The lower feeding level (22 ppm) proved as effective as the higher level of either drug. When legally cleared for feedlot cattle, lasalocid should be a useful feed additive.

Introduction

Monensin is fed widely to feedlot cattle to improve efficiency of feed use. A summary of six trials in Oklahoma (Witt et al., 1980) indicated that at 33 ppm, monensin depressed rate of gain very slightly but reduced feed intake (19.2 vs 18.2 lb/day) and improved feed efficiency by 4.8 percent. Monensin is cleared for feeding in the range of 5 to 30 grams per ton. In one previous trial (Gill et al., 1978), monensin was fed to steers at 15 or 30 grams per ton with a high-moisture corn diet. Gains and feed efficiencies with the 0, 15 or 30 grams per ton monensin diets were 3.22, 3.20 and 3.17 lb/day and 5.51, 5.36 and 5.33 lb feed/lb gain.