The Response of Feeder Cattle to Chlortetracycline and Sulfamethazine During Conditioning and Finishing

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Summary

Two experiments using 100 cattle each were conducted to evaluate the use of Aureomycin-Sulmet or Aureomycin at varying levels. The combinations of Aureomycin and Sulmet produced greater gains on cattle going directly onto a finishing ration, due to greater average daily feed intake that was maintained later in the feeding period. Either the Aureomycin-Sulmet or the Aureomycin alone produced greater overall gains on calves that were conditioned for about 150 days and then finished. These differences were not significant at the 5 percent probability level. Calves fed cubed alfalfa during the conditioning period gained significantly faster ($P<.01$) for that period. This advantage was great enough so that the overall gains of the cube-fed cattle were also significantly greater ($P<.01$) than those of the silage-fed cattle. The feed conversions favored the silage-fed cattle resulting in lower costs of gain. The cube-fed cattle also carried slightly more condition at slaughter. Liver condemnations were few and could not be attributed to any particular treatment.

Introduction

Much of the data reported concerning the effectiveness of chlortetracycline-sulfamethazine combinations in cattle feeding has come from short-term experiments. While it is true that the initial period in a new environment is most critical, carry-over effects and total performance cannot be overlooked or discounted.

The two experiments reported herein were designed to study in detail long-term responses of feeder cattle to combinations of chlortetracycline-sulfamethazine under either a conditioning or finishing program.

Materials and Methods

Experiment 1

One hundred yearling steers averaging 678 pounds were stratified as to weight and randomly allotted to one of 10 pens of 10 animals each. There were two pens on each of five Aureomycin-Sulmet treatments: (1) control; (2) 350 mg. Aureomycin per head daily; (3) 350 mg. Aureomycin and 350 mg. Sulmet per head daily for 28 days, followed by 70 mg. of Aureomycin per head daily; (4) 350 mg. Aureomycin and 350 mg. Sulmet for 14 days, followed by 350 mg. Aureomycin for 46 days, followed by 70 mg. of Aureomycin; and (5) 70 mg. of Aureomycin per head daily. All steers were taken off the antibiotic 48 hours prior to slaughter. Twenty-eight-day weights were taken without actual shrink, but a 4 percent pencil shrink was used in calculating average daily gain (ADG), pounds of feed per pound of gain, and cost per hundredweight of gain. Carcass data and liver abnormalities were also collected.

Experiment 2

One hundred steer calves averaging 460 pounds were stratified as to weight and randomly allotted to 10 pens of 10 head each. There were two pens on each of the Aureomycin-Sulmet treatments described in Experiment 1. One pen of each of the medicated treatments was wintered on a ration based on corn silage and the others were wintered on alfalfa cubes. The medicant was mixed with 1 pound of ground barley for the calves on cubes and 2 pounds of two-thirds ground barley and one-third cottonseed meal for those on corn silage. This difference in the amount of carrier used was an effort to equilibrate gains during the conditioning period.

All cattle were finished on the same concentrate (25 percent steam-rolled barley, 50 percent steam-rolled wheat, 10 percent beet pulp, 10 percent alfalfa, and 5 percent molasses).

Results and Discussion

Experiment 1

The steers on treatments 3 and 4 gained more rapidly than those on 1 and 5, which in turn gained more rapidly than those on treatment 2 (Table 1). These differences were non-significant at the 5 percent level. The differences in gains were a reflection of daily feed intake. The level of feed intake was not due to animals adapting to the finishing ration more rapidly, but due to a more sustained appetite toward the end of the feeding period. The feed per pound of gain produced was negatively related to average daily gain and feed intake. The feed costs of gain varied somewhat due to the costs of the antibiotics and sulfamethazine used. These were priced at 19 and 25 cents* per pound for the antibiotic and antibiotic-sulmet crumbles, respectively.

Although the steers on treatment 3 were carried to somewhat heavier weights, yielding heavier carcasses, the carcass characteristics were quite similar (Table 2). The average estimated yield of trimmed retail cuts was 50.3 percent equalling the USDA yield grade of 2.9.

Liver condemnations were small with 3, 4, 3, 2, and 2 being condemned for treatments 1 through 5, respectively.

Experiment 2

The calves fed alfalfa cubes gained significantly faster ($P<.01$) than those fed silage during the conditioning period (Table 3). They ate more feed per day, but were

*Current prices are 16.9 and 21.3 cents per pound, respectively.

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Table 1. Feedlot Performance (Experiment 1)

Treatment	Initial wt.	Final wt.	Ave. daily gain	Daily feed intake	Feed/ lb. of gain	Cost/ cwt. of gain
	lb.	*lb.*	*lb.*	*lb.*	*lb.*	
1	679	1060	2.72	21.8	8.03	$18.96
2	678	1045	2.61	21.3	8.17	19.94
3	679	1085	2.84	22.4	7.92	19.04
4	679	1037	2.87	22.1	7.70	18.57
5	677	1055	2.68	21.8	8.53	20.48

Table 2. Carcass Characteristics (Experiment 1)

Treatment	Warm carcass wt.	Marbling score[1]	USDA grade[2]	Backfat	Rib-eye area	Yield of trimmed cuts
	lb.			*in.*	*sq. in.*	*%*
1	628	14.2	16.6	.41	11.1	50.2
2	622	13.0	16.2	.43	11.2	50.2
3	643	13.6	17.0	.43	11.2	50.0
4	627	13.7	16.4	.44	11.5	50.5
5	636	13.6	16.3	.41	11.5	50.0

[1] 12 = small, 15 = modest.
[2] 14 = good, 17 = choice.

Table 4. Carcass Characteristics (Experiment 2)

Treatment	Warm carcass wt.	Marbling score[1]	USDA grade[2]	Backfat	Rib-eye area	Yield of trimmed cuts
	lb.			*in.*	*sq. in.*	*%*
			SILAGE			
1	534	12.9	16.1	.35	11.0	51.3
2	561	13.4	16.3	.40	11.1	50.8
3	568	12.4	16.1	.34	12.6	52.2
4	543	11.2	15.7	.34	11.6	51.6
5	528	13.0	16.2	.41	11.0	50.8
Average	547	12.6	16.1	.37	11.5	51.3
			CUBES			
1	528	12.6	16.1	.43	11.1	50.9
2	572	12.2	16.1	.45	11.7	50.9
3	554	14.7	16.7	.41	11.7	51.3
4	568	13.6	16.6	.46	11.9	51.0
5	572	14.0	16.4	.41	11.6	51.1
Average	559	13.4	16.4	.43	11.6	51.0
			TREATMENT AVERAGE			
1	531	12.8	16.1	.39	11.1	51.1
2	566	12.8	16.2	.43	11.4	50.9
3	561	13.1	16.4	.38	12.2	51.8
4	551	12.4	16.2	.40	11.8	51.3
5	550	13.5	16.3	.41	11.3	51.0

[1] 12 = small, 15 = modest.
[2] 14 = good, 17 = choice.

Table 3. Conditioning, Finishing and Overall Gains, Feed Intake, Feed Efficiencies, and Cost of Gains (Experiment 2)

	Conditioning				*Finishing*				*Overall*			
Treatment	ADG	Av. daily intake	Feed/ lb. gain	Cost/ cwt. gain	ADG	Av. daily intake	Feed/ lb. gain	Cost/ cwt. gain	ADG	Av. daily intake	Feed/ lb. gain	Cost/ cwt. gain
	lb.	*lb.*	*lb.*		*lb.*	*lb.*	*lb.*		*lb.*	*lb.*	*lb.*	
						SILAGE						
1	1.73	14.9	8.50	$16.58	2.74	21.6	7.68	$18.30	2.07	16.9	8.16	$17.28
2	1.82	14.9	8.13	17.52	3.01	21.9	7.21	17.18	2.18	17.0	7.74	17.38
3	1.84	14.9	8.05	16.08	3.08	20.7	6.71	16.36	2.21	16.6	7.49	16.19
4	1.74	14.8	8.44	17.24	2.93	20.1	6.84	16.97	2.10	16.4	7.77	17.12
5	1.76	14.7	8.30	16.57	2.76	21.0	7.65	18.23	2.06	16.6	8.04	17.24
Average	1.78	14.8	8.28	16.80	2.90	20.9	7.22	17.40	2.12	16.7	7.84	17.04
						CUBES						
1	1.70	17.5	10.33	17.01	2.84	21.5	7.59	18.25	2.03	18.7	9.18	17.53
2	1.97	20.5	10.38	18.78	2.88	21.3	7.35	17.99	2.30	20.8	9.00	18.41
3	1.86	18.2	9.76	16.69	2.82	22.6	7.91	18.99	2.21	19.8	8.90	17.77
4	1.87	19.3	10.31	17.91	2.91	21.9	7.46	18.17	2.25	20.2	8.98	18.03
5	2.02	19.6	9.68	16.39	2.89	22.8	7.77	18.89	2.35	20.7	8.81	17.52
Average	1.88**	19.0	10.09	17.36	2.87	22.0	7.62	18.46	2.23**	20.0	8.97	17.85
						TREATMENT AVERAGE						
1	1.72	16.2	9.42	16.80	2.79	21.6	7.64	18.28	2.05	17.8	8.67	17.41
2	1.90	17.7	9.26	18.15	2.95	21.6	7.28	17.59	2.24	18.9	8.37	17.90
3	1.85	16.6	8.91	16.39	2.95	21.7	7.31	17.68	2.21	18.2	8.20	16.98
4	1.81	17.6	9.38	17.57	2.92	21.0	7.15	17.57	2.18	18.3	8.38	17.58
5	1.89	17.2	8.99	16.48	2.83	21.9	7.71	18.56	2.21	18.4	8.43	17.38

** Calves fed alfalfa cubes gained significantly faster ($P<.01$) than those fed silage for the conditioning and overall feeding periods.

less efficient in their conversion of feed to gain. The lack of efficient feed conversion increased the cost of gains for the cube-fed cattle.

When the conditioning and finishing periods were combined, the cube-fed cattle gained significantly faster ($P<.01$). They also ate over 3 pounds of additional feed per day and required an additional pound of feed per pound of gain at an additional cost of 80 cents per hundredweight of gain.

Treatment 3 produced the cheapest gains, but the greatest overall gains were made by treatment 2, with a trend toward greater gains for antibiotic-treated cattle during the conditioning and overall periods.

The difference in cost would be attributed to the difference in length of time on the high level of antibiotic. The antibiotic treatments at any level stimulated greater feed intake.

The carcass characteristics were quite similar regardless of treatment. The cube-fed cattle had somewhat heavier carcasses and had more fat both externally and intramuscularly. Only one pen on treatment 4 and silage failed to average low choice or better (Table 4). The average for treatment 4 on silage and cubes was well above the minimum low choice requirement.

There were 13 livers condemned, with 4, 3, 2, 2, and 2 for treatments 1 through 5, respectively.

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