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Response of Feedlot Lambs to
Chlortetracycline and Sulfamethazine

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The objective of this experiment was to test the effects of chlortetracycline and sulfamethazine alone and in combination on feedlot performance and incidence of diseases of lambs weaned at an early age, shipped and finished in drylot with a high-concentrate ration.

Procedures

The 189 lambs (94 ewes and 95 wethers) used in the experiment were sorted from their dams and trucked about 390 miles to Brookings. They arrived in the early evening and were held overnight without feed and water. The following morning, they were weighed and sorted into 12 pens on basis of weight and sex. There were 15 or 16 lambs per pen with ewes and wethers being equalized as near as possible.

Four experimental treatments replicated three times included a control, chlortetracycline, sulfamethazine and a chlortetracycline-sulfamethazine combination. The lambs were fed a complete mixed ration. Composition of the control ration was as follows (%): ground alfalfa hay, 20.0; rolled corn grain, 75.9; soybean meal (44%), 2.5; urea (281%), 0.3; dicalcium phosphate, 0.4; limestone, 0.4 and trace mineral salt, 0.5. Vitamin A was added to provide 500 I.U. per pound of ration. The calculated protein content was 11.5%.

A chlortetracycline or sulfamethazine premix was added to the appropriate mixes to furnish 50 gm. of these drugs per pound of ration and replaced an equal weight of corn grain. For the combination treatment (Aureo S-700), each drug was included at 50 gm. per ton of ration.

The experiment was initiated on June 5. The lambs were started on the experiment at 0.25 lb. of the ration mixes and 1.0 lb. of alfalfa hay per head daily. The hay was removed gradually from the ration over a period of 1 week. The concentrate-hay mixes were increased by approximately 0.12 lb. per lamb daily until they were on full feed. This required about 10 days. Thereafter, the lambs were fed once daily in amounts so feed would be available at all times. The lambs were fed in open pens without access to shade or shelter.

The experiment was terminated after 113 days with the final weighing being made without withholding feed and water. However, the lambs were weighed in early morning before being offered feed.

Statistical analyses were performed on the weight gain data using the method of least squares and feed consumption data by analysis of variance of lot means.

Results

The lambs were not selected for uniformity in age and weight and there was a considerable variation with an average initial weight of 34 lb. They were subjected to considerable stress in handling before and after shipping, the long trip by truck and were without feed and water for about 24 hours. They were raised to a full feed of the high-concentrate in a short time. These stresses appeared severe for the lighter lambs and 9 death losses occurred during the second and third week of the experiment. These losses were from the lighter lambs, most of which weighed only about 20 lb. initially. Only one death loss occurred after the early part of the experiment. One loss occurred in a chlortetracycline-sulfamethazine pen after 89 days. It appeared that these light lambs were not of sufficient size to withstand the stress imposed, and they probably did not consume adequate quantities of the rations for survival. The lambs appeared generally healthy except for the smaller ones and no individual medication was given during the experiment.

The level of feed consumption resulted in an average intake of the additives of 65 to 72 mg. per lamb daily. There was a significant ($P < .01$) difference in rate of gain. Lambs fed sulfamethazine or the combination of chlortetracycline and sulfamethazine gained 15.1 and 18.9% more than the control group. These lambs also consumed more feed and had lower (10.1 and 9.7%) feed requirements than control lambs. Differences in rate of gain between treatment groups were of about the same magnitude as shown in table 1 after 6 weeks on experiment with little change thereafter.

Lambs fed chlortetracycline gained only slightly more than the control group. They consumed less feed but had lower (6.9%) feed requirements than the controls.

Summary

Lambs were weaned at an early age (av. wt. 34 lb.) and fed chlortetracycline, sulfamethazine or a combination of the two drugs at 50 gm. per ton of a high-concentrate (80%) ration. The level of feed consumed resulted in average intakes of 65 to 72 mg. per lamb daily of the additives over the 113-day experiment.

Stress imposed in handling before and after shipping, the long haul and putting on full feed of the high concentrate ration appeared too great for the younger lambs (about 20 lb. in weight). Several death losses occurred from these light lambs and level of feed intake was probably insufficient for survival under the conditions imposed.

Lambs fed sulfamethazine or a combination of chlortetracycline and sulfamethazine gained 15.1 and 18.9% faster than control lambs with 10.1 and 9.9% less feed during the 113-day experiment. Lambs fed chlortetracycline gained only slightly more than the control group but required 6.9% less feed.

Table 1. Chlortetracycline-Sulfamethazine Supplement for Lambs
(June 5, 1969 - September 26, 1969 -- 113 days)

	Control	Chlortetra- cycline ^a	Sulfa- methazine ^a	Chlortetra- cycline ^a and Sulfa- methazine ^a
Number of animals	44	48	43	44
Init. shrunk wt., lb.	35	34	33	34
Final wt., lb.	95	96	103	104
Av. daily gain, lb.	0.53	0.55	0.61	0.62
Av. daily ration, lb. complete mix	2.70	2.62	2.81	2.88
Feed/100 lb. gain, lb. complete mix	507	472	456	462
Death losses	3	0	3	4

^a50 gm. of each drug per ton of ration.