UNIVERSITY OF IDAHO
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HORMONES
ANTIBIOTICS
TRANQUILIZERS

for

Young Lambs

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Hormones, Antibiotics, and Tranquilizers for Young Lambs

by

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Many experiments have been conducted to determine the value of various additives in the rations of feeder lambs following weaning. Andrews **et al.** (1); Bell **et al.** (3), (4); Clegg **et al.** (6); and Jordan (11) found that the synthetic hormone stilbestrol, given either in the feed or as an implant, significantly increased the gains of feeder lambs both in the feedlot and on pasture. Increases varied from less than 10 percent to more than 30 percent.

Experimental tests with young lambs still being nursed by their dams have been more limited. England (8), Clegg **et al.** (6), and Perry **et al.** (18) found that stilbestrol, either fed or given as an implant, increased the gain of creep-fed suckling lambs. Jordan (11) reported significantly larger gains when 3½ to 4-month-old suckling lambs were implanted with stilbestrol pellets, but no stimulation was obtained when 2½ to 3-month-old lambs were implanted. Menzies (16) reported no increased gains with either stilbestrol or "Synovex" (estradiol and progesterone) implants in suckling lambs.

The response to antibiotic supplementation has varied in the experimental tests with weaned lambs being fattened for market. Botkin and Paules (5) using aureomycin and terramycin, Hale **et al.** (9) using aureomycin, and Hatfield **et al.** (10) using aureomycin secured greater gains with antibiotic supplementation. Colby **et al.** (7), however, used aureomycin, penicillin, and streptomycin and found that all three depressed lamb gains compared with the unsupplemented controls. Keith and Lehrer (14) reported that feeder lambs supplemented with chlortetracycline gained less than the controls, while those supplemented with Aurofac 2A gained about the same as the untreated controls.

Experimental tests with suckling lambs are more limited. Jordan and Bell (12) obtained slightly larger gains by drenching suckling lambs with aureomycin but the increase was not statistically significant. Smith (19), in a limited trial, obtained small increases in the rate of gain of suckling lambs given aureomycin in their creep feed. Madsen **et al.** (15), however, in extensive tests over a period of several years did not obtain any increase in the rate of gain of suckling lambs supplemented with aureomycin.

Experimental tests with tranquilizers have been limited largely to weaned lambs and the reported results have not been consistent.

Hale **et al** (9), using hydroxyzine, obtained a slight increase in the rate of gain of the treated lambs above the controls. Andrews **et al.** (2), using reserpine, and Jordan and Hanke (13), using chloropromazine, hydroxyzine, trifluomeprazine, and triflorperazine, were not able to produce any beneficial results from the use of these tranquilizers.

Because of the limited and conflicting reports on the use of the hormones, antibiotics and tranquilizers for suckling lambs, studies were initiated with these materials at the Caldwell and Aberdeen Branch Experiment Stations in 1958 and continued for 3 years.

The objectives of the studies were:

1. To determine the effects of stilbestrol implants and antibiotic and tranquilizer supplementation upon the rate and efficiency of gain of suckling, creep-fed lambs, and upon the gains of lambs finished in the dry lot following weaning.
2. To determine the effects of these treatments on live grades and scores as well as on carcass grades and yields.
3. To determine if sex affected the response of lambs receiving the various treatments.

EXPERIMENTAL PROCEDURE

Lambs from the grade Panama flocks at the Caldwell and Aberdeen Branch Stations were used in the studies. They were sired by Panama and Suffolk rams, and were born during December, January and February each year. General feeding and management practices were similar to those of most farm flock operators in southern Idaho. Alfalfa hay and grain were fed to the ewes before and after lambing. A creep feed, consisting of concentrate and alfalfa hay, was supplied to all lambs throughout the nursing period.

All of the lambs at the Caldwell Station, with their dams, were randomly allotted into treatment groups when the majority of the lambs were approximately 1½ months of age and weighed about 35 to 40 pounds. At Aberdeen, however, groups of lambs were allotted into the treatment groups periodically as they reached the desired weights. The treatment groups were as follows:

1958 Tests at Caldwell and Aberdeen

Group I No treatment—controls.

Group II 3 mg. stilbestrol implant—no terramycin.

Group III Terramycin—no implant.

Group IV 3 mg. stilbestrol implant and terramycin.

1959-1960 Tests at Caldwell and Aberdeen

Group I No treatment—controls.

Group II 3 mg. stilbestrol implant—no tranquilizer.

Group III Tranquilizer supplementation—no implant.

Group IV 3 mg. stilbestrol implant and tranquilizer supplementation.

The stilbestrol implant was placed under the skin of an ear of the lambs at the time of allotting. Groups I and II were fed and handled as one unit and Groups III and IV were fed and handled as another unit. In 1958, terramycin was added to the creep rations of Groups III and IV at the rate of 15 mg. per pound of grain fed in the creep ration. Daily grain consumption per lamb ranged from approximately ¾ pound at the start of the tests up to 2 pounds per head per day at the end of the trials. In 1959 and 1960, the lambs in Groups III and IV received approximately 3.25 mg. of "Tran-Q," a commercial tranquilizer supplement, per head daily in their creep rations.

A weaning date was selected at each station each year when most of the lambs were 100 to 130 days of age. Weaning weights and scores were obtained at the time of weaning and those lambs ready for slaughter were sent to market and slaughter data obtained. Lambs not fat or heavy enough for slaughter at the time of weaning were continued on test in the dry lot and their dams sent to pasture. Slaughter data were obtained from these lambs when they completed the dry lot feeding tests.

RESULTS

The number of lambs included in the tests, their initial and weaning weights, and their respective gains are shown for the various treatment groups in Table 1. The average daily gains of the stilbestrol-implanted lambs were higher than the gains of the untreated controls at both stations in all 3 years of the tests. These differences, while relatively small, were statistically significant in all 3 years at both stations.

Several lambs died each year from rectal prolapse in the stilbestrol implanted groups at the Caldwell Station. These losses included 4 ewe and 3 wether lambs in 1958; 7 ewe lambs and 1 wether lamb in 1959; and 1 ewe and 3 wether lambs in 1960. During these years only 1 lamb not implanted with stilbestrol died with prolapse of the rectum. Losses from rectal prolapse were not as great at the Aberdeen Station. Two implanted lambs were lost in 1958; 1 ewe lamb died in 1959, and none of the implanted lambs died of prolapse in 1960.

Table 1. Effect of various treatments upon gains of suckling creep-fed lambs.

	No. of Lambs	Average Initial Weight (lb.)	Average Weaning Weight (lb.)	Average Total Gain (lb.)	Average Daily Gain (lb.)
1958					
Caldwell					
Controls	21	35.3	65.5	30.2	.50
Stilbestrol	22	33.1	66.1	33.0	.54
Terramycin	23	34.3	66.9	32.6	.53
Stilbestrol + Terramycin	25	37.2	73.9	36.7	.60
Aberdeen					
Controls	19	42.5	93.1	50.6	.73
Stilbestrol	17	41.1	97.4	56.3	.81
Terramycin	18	44.0	94.7	50.7	.69
Stilbestrol + Terramycin	19	46.1	97.1	51.0	.79
1959					
Caldwell					
Controls	20	31.9	80.7	48.8	.63
Stilbestrol	20	32.6	82.7	50.1	.65
Tran-Q	20	30.5	80.1	49.6	.64
Stilbestrol + Tran-Q	21	29.1	86.1	57.0	.74
Aberdeen					
Controls	21	39.5	81.9	42.4	.59
Stilbestrol	20	39.3	83.1	43.8	.63
Tran-Q	22	37.1	73.0	35.9	.53
Stilbestrol + Tran-Q	21	38.7	79.5	40.8	.62
1960					
Caldwell					
Controls	25	40.9	73.5	32.6	.69
Stilbestrol	25	40.1	76.4	36.3	.77
Tran-Q	24	43.7	77.8	34.1	.72
Stilbestrol + Tran-Q	22	42.6	79.8	37.2	.79
Aberdeen					
Controls	19	40.8	72.9	32.1	.57
Stilbestrol	19	41.5	82.7	41.2	.66
Tran-Q	18	41.6	80.5	38.9	.67
Stilbestrol + Tran-Q	19	41.9	82.0	40.1	.67

The addition of terramycin to the creep rations increased the rate of gain slightly in the trial at the Caldwell Station in 1958. This increase was not statistically significant. In the test at the Aberdeen Station, however, the addition of terramycin to the creep rations reduced the gains. Again, the difference was small and not statistically significant.

The effects of adding a tranquilizer to the creep rations were not consistent. In 3 of the 4 tests (1960 Caldwell and Aberdeen, and the 1959 Caldwell tests) the lambs receiving the tranquilizer gained more than those not receiving the supplement. These differences were not statistically significant. In the 1959 Aberdeen

tests, however, the lambs receiving the tranquilizer gained significantly less than those that did not receive the material. It appeared in the 1959 Caldwell tests that the implants and the "Tran-Q" may have had complementary effects, as the increased gains of the group receiving both supplementary materials were considerably more than the combined increases produced when the implants and "Tran-Q" were given independently.

Table 2 summarizes the comparative gains of ewe and wether lambs in the various treatment groups in the tests at both the

Table 2. Comparative average daily gains of ewe and wether lambs receiving various treatments prior to weaning.

	Ewe Lambs		Wether Lambs	
	No. of Lambs	Average Daily Gain (lb.)	No. of Lambs	Average Daily Gain (lb.)
1958				
Caldwell				
Controls	10	.47	11	.52
Stilbestrol	11	.53	11	.56
Terramycin	12	.52	11	.54
Stilbestrol + Terramycin	12	.57	13	.63
Aberdeen				
Controls	11	.73	8	.72
Stilbestrol	7	.82	10	.80
Terramycin	13	.65	5	.77
Stilbestrol + Terramycin	9	.80	10	.78
1959				
Caldwell				
Controls	13	.62	7	.65
Stilbestrol	10	.64	10	.66
Tran-Q	11	.64	9	.64
Stilbestrol + Tran-Q	12	.73	9	.75
Aberdeen				
Controls	6	.60	15	.59
Stilbestrol	11	.63	9	.61
Tran-Q	11	.54	11	.54
Stilbestrol + Tran-Q	8	.59	13	.65
1960				
Caldwell				
Controls	14	.66	11	.73
Stilbestrol	14	.75	11	.80
Tran-Q	14	.73	10	.72
Stilbestrol + Tran-Q	13	.76	9	.82
Aberdeen				
Controls	14	.55	5	.63
Stilbestrol	10	.63	9	.68
Tran-Q	12	.65	6	.69
Stilbestrol + Tran-Q	11	.71	8	.62

Caldwell and Aberdeen Stations. In 16 of the 24 comparative tests the wethers gained more than the ewe lambs; in 5 of the comparisons, the ewe lambs out-gained the wethers and in 3 tests the average daily gains were identical. The response to the stilbestrol implants was similar in the ewe and wether lambs. The increased average daily gains in the implanted lambs, above the controls. were nearly identical in both sexes. Because of the lack of consistency in the effect of terramycin and the tranquilizer upon gains, no sex difference in response to these two treatments could be determined.

Table 3 shows the effects of the various treatments upon condition and readiness for market as well as on the carcass grades and yields of the lambs sold at weaning. Readiness for market was primarily determined by weaning weight. Since the implanted lambs gained somewhat faster than those that were not implanted, there was a tendency for a slightly higher percentage of the implanted groups to be ready for market at weaning. This advantage, however, was not consistent in all years of the tests at the two stations.

Condition scores were estimated at the time of weaning at Caldwell in 1959 and 1960 and at Aberdeen in 1960.

The scoring system used was as follows:

High Prime	15
Middle Prime	14
Low Prime	13
High Choice	12
Middle Choice	11
Low Choice	10
High Good	9
Middle Good	8
Low Good	7
High Utility	6
Middle Utility	5
Low Utility	4
High Cull	3
Middle Cull	2
Low Cull	1

In the 1959 and 1960 tests at Caldwell, the condition scores for lambs receiving the stilbestrol implant with no Tran-Q (Group II) were lower than the scores in the other 3 groups. In both years the Tran-Q-supplemented lambs (Group III) had the highest condition scores. In the 1960 Aberdeen tests, the implanted lambs (Group II) had the highest condition scores. However, none of these differences were statistically significant.

COOPERATIVE STUDIES — FARM FLOCKS

A farm flock of grade white-face ewes in the Boise Valley was included in the experimental tests during 1958 and 1959. The lambs, born in late December and January, were sired by Suffolk rams. The lambs were creep fed a mixed-grain ration and alfalfa hay was provided free-choice in the creeps. The ewes were fed 1 pound of mixed grain plus alfalfa hay during the suckling period.

In the 1958 tests the lambs were randomly allotted into two groups when they were approximately 1½ months of age. In one group each lamb was implanted with a 3 mg. stilbestrol pellet. The lambs in the other group were not implanted and served as controls. The two test groups ran together during the period of the study. The lambs were weaned and graded on April 19, 78 days after the start of the tests. The gains and estimated live grades of the lambs are shown in Table 5.

The implanted wethers gained 4 pounds more than the control wethers during the experimental period and the implanted ewe lambs outgained the control ewe lambs by 7.1 pounds. These differences were statistically significant. The estimated live grades were similar in both groups of lambs. Three lambs died in the implanted group. Two ewe lambs died of rectal prolapse which may have been caused or influenced by the stilbestrol implants. The other lamb died because of a broken leg. No lambs were lost in the control group.

Table 5. Gains and estimated live grades of implanted and untreated farm flock lambs (1958).

Treatment groups	No. of lambs	Av. initial wt.	Av. wt.	Av. total gain	Av. daily gain	Grades			
						Pr.	Ch.	Gd.	Ut.
		(lb.) Feb. 1	(lb.) Apr. 19	(lb.)	(lb.)				
Stilbestrol implants (3 mg.)									
Wethers	18	29.1	86.4	56.9	.73	2	4	7	5
Ewes	19	32.7	90.0	57.1	.73	4	8	6	1
All lambs	37	30.9	88.3	57.0	.73	6	12	13	6
Controls, no implants									
Wethers	20	31.1	84.0	52.9	.68	2	5	10	3
Ewes	20	30.1	80.1	50.0	.64	4	6	6	4
All lambs	40	30.7	82.0	51.2	.66	6	11	16	7

In the 1959 tests, 20 lambs selected at random served as controls. Another group of 20 was randomly chosen; each lamb was implanted with 3 mg. stilbestrol. Each group contained approximately equal numbers of ewe and wether lambs. Periodic weights were taken and the lambs were marketed when they reached a desirable weight and finish. Table 6 shows the comparative weights and gains of the lambs.

Table 6. Comparative rates of gain and marketing dates of implanted and control farm flock lambs (1959).

	Av. wt. March 8 (lb.)	Av. wt. April 18 (lb.)	Av. gain (lb.)	No. mktd. Apr. 18	No. mktd. May 17	No. mktd. May 30
Implanted lambs	43.0	72.9	29.9	3	7	10
Controls	42.7	68.9	26.2	0	8	12

As shown in the table, the implanted lambs gained 3.7 pounds more than the control lambs and were ready for market a little earlier than the control lambs. No losses occurred in either group, although 3 lambs in the implanted group were showing some evidence of rectal prolapse at the time of marketing.

RANGE LAMB STUDIES

The effect of stilbestrol implants upon the performance of range lambs was studied in 1958 and 1959. In the 1958 tests, all of the lambs were born on the range during April. One hundred and fifty lambs out of one band were ear tagged and used in the tests. Fifty lambs (25 ewe lambs and 25 wethers) served as untreated controls. Twenty-five wether lambs and 25 ewe lambs were given single 3 mg. implants of stilbestrol. In the other group of 50 (25 wethers and 25 ewes) each lamb received two 3 mg. stilbestrol pellet implants. These lambs were slightly younger and smaller than the lambs in the control group and the ones receiving only the one pellet. Following implanting on June 1, the ewes and lambs were moved to the summer range in the Trinity Lake area north of Mountain Home, Idaho. The lambs were weaned on September 11. The experimental lambs were weighed and graded and the fat lambs were slaughtered at a packing plant in Nampa, Idaho.

Table 7 presents the weight, gains, lambs lost on the range, and live carcass grades of the different groups of lambs.

The implanted ewe lambs gained only slightly more than the controls during the test period. Stimulation of gain was greater in the wethers. The implanted wether lambs gained an average of 4.2 pounds more than the control wether lambs. Apparently one single 3 mg. implant was just as effective as two 3 mg. implants, as the gains of both groups were nearly identical.

Twelve lambs out of the 150 starting the test were unaccounted for at the final weighing. Two of these were from the control group; 3 from the group receiving single implants; and 7 from the group receiving 2 implants. No observed prolapse occurred in any of the groups and none of the losses could be attributed directly to the treatment received. Since the group receiving the 2 stilbestrol pellets included more of the younger, lighter lambs, it is only natural that losses might be higher in that group. A few more

Table 7. Gains, losses, and grades of implanted and control range lambs. (1958).

Treatment groups	No. of lambs	Initial weight (lb.) June 1	Final weight (lb.) Sept. 11	Average gain (lb.)	Average daily gain (lb.)	Live grade (Number)		Carcass Grade of Fats (Number)		
						Fats	Feeders	Prime	Choice	Good
No implant (controls)										
Ewe lambs	25	30.0	84.6	54.6	.53	20	4			
Wether lambs	25	31.7	88.1	56.4	.55	17	7			
All lambs	50	30.8	86.4	55.6	.54	37	11	4	31	2
One 3 mg. stilbestrol implant										
Ewe lambs	25	30.5	85.7	55.2	.54	21	2			
Wether lambs	25	30.7	91.3	60.6	.59	18	4			
All lambs	50	30.6	88.5	57.9	.57	39	6	2	30	7
Two 3 mg. stilbestrol implants										
Ewe lambs	25	27.0	82.0	55.0	.54	13	9			
Wether lambs	25	30.2	90.8	60.6	.59	14	4			
All lambs	50	28.6	86.4	57.8	.57	27	13		16	11

lambs were ready for slaughter in the group receiving the one pellet than in the control group. Fewer lambs were ready for slaughter in the group receiving the two pellets than in the other groups, possibly because it did include more of the younger lambs. When the fat lambs were slaughtered, the control lambs graded the highest, the lambs receiving one pellet graded next best, and those receiving two pellets graded the poorest.

In the 1959 tests, some of the earlier lambs were lambed in sheds and corrals and supplemental hay was given to the ewes. Most of the lambs, however, were dropped out on the range with no supplemental feed being provided. All of the lambs were out of white-face ewes and were sired by Suffolk rams.

Two ewe-and-lamb bands were made up to provide lambs of similar size in both. The lambs in one of the bands were implanted with 3 mg. of stilbestrol on April 17 and the lambs in the other band were not implanted and served as controls. The two bands of ewes and lambs remained on the desert and foothill spring range until June 15 and then were trailed to the summer allotment on the Middle Fork of the Boise River above Atlanta. Both bands were run on the same allotment and had similar feed and herding conditions during the summer months.

The lambs of the control band were shipped on September 8; the band of implanted lambs on September 10.

Table 8 gives the average shipping weights and comparative number and percentages of fat and feeder lambs in the implanted and control groups.

Table 8. Comparative weights and grades of lambs in the implanted and control bands.

	No. of lambs	Average shipping wt. (lb.)	No. of fats and feeders	Percent of fats and feeders	Av. wt. (lb.)
Implanted Band	1081	99.2	874 fats 207 feeders	81 18	103.5 81.3
Check Band	1226	93.5	827 fats 399 feeders	67 33	100.5 80.5

The lambs in the implanted band average 5.7 pounds more at shipping time than the lambs in the untreated check band, and 81 percent of them were fat enough for slaughter, compared to 67 percent in the check band. Lamb loss during the spring and summer was slightly larger (10 more lambs) in the implanted band but this difference may not have been a treatment effect.

Summary and Conclusions

Studies to determine the value of stilbestrol implants and terramycin supplementation in the creep ration of spring lambs were started in 1958 in the grade Panama flocks at the Caldwell and Aberdeen Branch Stations. The hormone studies were continued in 1959 and 1960. Tranquilizer (Tran-Q) supplementation was provided during these 2 years and replaced the terramycin studies. The effects of stilbestrol implants were also studied in a privately owned farm flock and in a range herd during 1958 and 1959. Approximately 2,500 range lambs and 800 farm flock lambs were involved in the tests during the 3 years. The lambs included purebred Panama, grade white-face lambs, and lambs sired by Suffolk rams and out of Panama or grade white-face ewes.

The stilbestrol implants, given alone or in combination with terramycin or the tranquilizer, significantly increased the rate of gain of the lambs during the suckling period. These increases ranged from 10 to 20 percent in the farm flock tests, and from 6 to approximately 15 percent in the range tests. The effect of the hormone implant apparently continued following weaning. Implanted lambs not ready for market at weaning time and finished in the dry lot, generally gained more rapidly than similar lambs that had not been implanted during the suckling period.

Since the implanted lambs gained a little faster than those not implanted, there was a tendency for them to be ready for market a little earlier. However, condition scores and estimated live grades did not show any consistent advantage or disadvantage for the hormone-treated lambs. While some differences in carcass grades and yields between the treated and untreated lambs were seen in some of the tests, the results were not consistent enough to draw any conclusions. There was some indication that the hormone-treated lambs yielded slightly less than the controls. Several lambs in the implanted groups at the Caldwell Station died of rectal prolapse each year. Some symptoms of this trouble were also seen in the untreated groups at Caldwell, but were much less severe. Some evidence of rectal prolapse, in the implanted groups, was also found at the Aberdeen Station and in the other farm flock in which the studies were conducted. No trouble was experienced in the implanted range lambs. Terramycin-supplemented lambs gained slightly more than the controls at the Caldwell Station and slightly less than the controls at Aberdeen, but these effects were not significant. Because of the variability of the results and the relatively small number of lambs involved in the tests, no conclusion could be drawn concerning the effect of terramycin supplementation upon live animal scores, shrinkage to market, and carcass grades and yields.

Response to tranquilizer supplementation varied from station to station and from year to year. Gains were stimulated slightly in 3 tests and significantly depressed in another. There was some

indication that a combination of stilbestrol implants and "Tran-Q" gave an additive effect in stimulating gain. The effects of "Tran-Q" upon carcass grades and yields varied widely and no definite conclusions could be drawn.

In a majority of the tests the wether lambs gained more rapidly than the ewe lambs. Response to the stilbestrol implant was similar in ewe and wether lambs in most of the tests, although in some greater response was shown by the wethers. Because of the variability of the results with terramycin and tranquilizer supplementation, no sex difference in response could be determined.

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