

Table 21 (Continued).

Number of lambs finishing tests	47	48	46
Av. initial wt.	93.9	93.1	99.6
Av. final wt.	98.3	95.3	100.5
Av. fleece wt.	6.9	7.4	7.7
Total gain per lamb plus fleece wt.	11.3	9.6	8.6
Daily gain per lamb30	.26	.23
Feed cost per cwt. gain	\$16.14	\$17.29	\$31.87
Total gain both periods	38.2	35.9	40.4
Av. daily gains for both periods	.28	.25	.28

Observations

The lambs were shorn late in February and early in March. Stormy and cold weather during the shearing period may have affected the later shorn ones more than those shorn earlier. Because of the difficulty in securing representative weights before Lamb Feeders' Day at Garden City March 20, tests were summarized as of February 23 and the data presented in the Garden City Lamb Feeders' Day bulletin. This information on the initial feeding period of 105 days is shown in the first portions of Tables 19, 20, and 21. Information on the feeding period following February 23 is presented in the second portions of the same tables. Total gain and average daily gain for the entire feeding period of 142 days are shown on the last two lines of each table.

No lambs died during the initial feeding period but nine died during the second period. Six died from exposure; two, with enterotoxemia; and one, with urinary calculi.

Largest gains over the entire feeding period were made by lambs receiving the beet top silage, followed by those receiving stilbestrol and stilbestrol-progesterone implants.

As in past years the carcass yields and grades of the hormone-treated lambs this year were much lower than the yields and grades of lambs receiving the same rations but receiving no hormones. The carcass grades and yields for the two hormone-treated lots and the control lot are shown below. Abnormal development of the accessory reproductive glands was found in the hormone-treated lambs again this year.

Treatment groups	Yield	Carcass grades			
		Choice	Good	Utility	Good
Controls	50.07 %	5	31	10	1
Stilbestrol treated ..	46.5 %		11	28	5
Stilbestrol and Progesterone treated	46.10 %		12	31	2

The lambs on the steam-rolled milo went off feed several times during the early part of the test but gained rapidly during the second feeding period. Gains of .29 pound per head daily were made by the lambs receiving steam-rolled and ground milo compared with .25 pound by lambs receiving the unground milo.

When sorghum silage replaced a portion of the sorghum fodder, the rates of gain were slightly reduced and the cost of gain increased. The gains also were slightly lower when sorghum silage replaced the sorghum fodder fed with alfalfa hay as roughage. The cost per pound of gain increased when the silage was fed. In previous years, silage has generally produced slightly larger gains, but at higher costs than roughage entirely of sorghum stover. In this year's tests, fodder was used instead of stover. While the grain content of the fodder was low, it still may have been enough to cause some variation in results from previous years.

Alfalfa hay replacing part of the sorghum fodder or all of the fodder

when fed with silage increased the rate of gain. The gains were also a little cheaper when alfalfa hay was fed as part of the roughage.

Lambs receiving antibiotics made slightly larger gains than lambs on the same ration without antibiotics. The lambs receiving the completely pelleted ration also gained a little more than lambs receiving the unpelleted ration, but the cost of the pelleting processes made the cost of gains much higher for lambs receiving pellets.

The Relationship of Physical Balance and Energy Value in Sheep Rations, Summer, 1953.

PROJECT 236

T. Donald Bell, Draytford Richardson, J. S. Hughes, and D. B. Parrish*

Lamb-fattening rations varying in proportions of roughage to concentrates have been studied in this project for several years. Experimental evidence shows that a ratio of 55 percent roughage and 45 percent concentrates has been most efficient in the utilization of feed nutrients. In recent years much interest has been shown by feeders in rations that are ground, mixed, and the entire ration put into a pellet.

Objects of the 1953 studies:

1. To determine if a ration of corn and alfalfa hay would produce larger and more economical gains when fed as pellets than when the hay was fed long and the corn was unground.

2. To determine if certain proportions of roughages to concentrates were more desirable than others in the completely pelleted ration.

Table 22.—Physical Balance in Lamb Fattening Studies. Pelleting Trials, June 27-August 24, 1953

	Lot 1 Pellets Corn 45 % Hay 55 %	Lot 2 Whole corn 45 % Long hay 55 %	Lot 3 Pellets Corn 35 % Hay 65 %	Lot 4 Whole corn 35 % Long hay 65 %
Number of lambs per lot	10	10	10	9
Initial wt. per lamb	70.5	71.6	71.1	70.1
Final wt. per lamb	95.2	92.0	93.0	89.0
Total gain per lamb	24.7	20.4	21.9	18.9
Average daily gain36	.30	.33	.27
Pounds of feed daily per lamb .	2.6	2.6	2.6	2.6
Feed per cwt. gain	716	867	807	971
Feed cost per cwt. gain*	17.80	16.34	18.94	17.04
Initial cost of lamb at \$17 per cwt.	11.98	12.17	12.09	12.03
Total cost of lambs and feed	16.38	15.51	16.23	15.12
Final cost per cwt.	17.21	16.79	17.46	17.01
Return over cost per lamb—selling price, \$21.50 cwt.	4.09	4.27	3.76	3.99

* Corn, \$1.60 per bushel; Alfalfa hay, \$25 per ton; Cost of pellet preparation (hauling, grinding, and pelleting), \$12 per ton.

* Grateful acknowledgement is given to Morris Johnson, graduate student in animal husbandry, for his help in summarizing these data.

Plan of Feeding

Lot 1—Pelleted ration (pellets of 55 percent alfalfa hay and 45 percent corn).

Lot 2—Long alfalfa hay, 55 percent, whole corn, 45 percent.

Lot 3—Pelleted ration (pellets of 65 percent alfalfa hay and 35 percent corn).

Lot 4—Long alfalfa hay, 65 percent and whole corn, 35 percent.

Summary

Results of the tests are summarized in the accompanying table and indicate:

1. The pelleted rations produced larger average daily gains (.06 of a pound more per lamb in each pelleted lot) than the same ration fed as long hay and whole corn.

2. About 150-160 pounds less feed was required to put on 100 pounds of gain with pelleted rations than with unpelleted rations.

3. Despite greater efficiency of gain obtained by feeding the pellets, the cost of gain was considerably higher when the pellets were fed because of the high cost of pelleting.

4. A ratio of 55 percent roughage and 45 percent concentrates produced greater and more efficient gains than the 65-35 ratio in both the pelleted and unpelleted rations.

The Effect of Different Hormone Treatments upon the Breeding and Lambing Performance of Ewes.

PROJECT 347

T. Donald Bell, Walter H. Smith, and Morris Johnson

Glowing reports of the successful use of hormones in producing earlier and more uniform lamb crops have periodically appeared in the press. Unfortunately, experimental tests and further use of the hormone preparations in commercial flocks have failed to show that they can be expected to produce beneficial results regularly and uniformly. Some tests have indicated that the hormones may actually interfere with normal reproductive activities.

In 1951 and 1952 experimental work at the University of Wisconsin and at the University of Kentucky indicated that a combination of two hormones—progesterone and the gonadotrophic hormone from pregnant mare serum (often called P.M.S.)—would cause ewes to breed and conceive during their normally quiet breeding period. Because of these encouraging results, field tests with three commercial flocks near Manhattan were undertaken during the spring and summer of 1953. A commercial estrogenic material, E.C.P., had been receiving a great deal of publicity, and tests with this material were made in the College Rambouillet flock during the spring and summer of 1953.

Experimental Procedure

Approximately 350 ewes, largely of western origin, were included in three outlying experimental flocks. Approximately one-third of each flock received a series of five injections of progesterone* (30 mg. each) at three-day intervals and an injection of 500 IU of P.M.S. material, either "Gonaden"*** or "Gonadogen," three days following the last injection of progesterone. One group of ewes in the larger flock received only four injections of progesterone before receiving their P.M.S. injection.

* The progesterone, as well as the "Gonadogen" and "E. C. P.," was supplied by the Upjohn Company, Kalamazoo, Mich.

** The "Gonaden" was supplied by the Cutter Laboratories of Berkeley, Calif.

Approximately one-third of the ewes in each flock received a single injection of P.M.S. material, either "Gonaden" or "Gonadogen," while one-third of each flock remained untreated and served as controls.

Care was taken to randomly distribute the ewes into the three groups according to age, stage of lactation, and breed type. The ewes were paint branded for individual identification and rams equipped with marking harnesses were turned in with the ewes following the final hormone injection.

Eighteen mixed age Rambouillet ewes were injected with one mg. of the estrogenic material, "E.C.P.," and their subsequent breeding and lambing performance compared with 18 similar aged untreated ewes.

Results

Apparently, between 60 and 80 percent of the ewes receiving the series of progesterone injections, followed by an injection of P.M.S. material, came into heat and bred within eight to 10 days following the last injection. About 40 to 50 percent of the ewes receiving the single injection of "Gonaden" or "Gonadogen" were bred within eight to 10 days following treatment, while virtually none of the untreated ewes came into heat.

Of the 18 College ewes treated with E.C.P., 16 came into heat within one to three days and remained in heat from two and one-half to 72 days. During the same period five of the 18 ewes serving as controls came into heat with estrual periods ranging from 28 to 40 hours.

Lambing Results

Since lambing performance was similar in the three outlying experimental flocks, the lambing information has been grouped and summarized in Table 23.

Table 23.—Percentage of Treated and Untreated Ewes Lambing by Indicated Dates.

	Oct. 15	Oct. 30	Nov. 15	Nov. 30	Dec. 15	Dec. 30	Jan. 15
Progesterone and P.M.S.	0	5	28	32	53	66	81
P.M.S. alone ..	0	0	8	28	53	65	80
Untreated controls	1	2	8	34	52	69	81

Table 24.—Percentage of Untreated Ewes and Ewes Receiving E.C.P. Lambing by Indicated Dates.

	Dec. 1	Dec. 15	Dec. 30	Jan. 15	Jan. 30	Feb. 15
Untreated	0	13	16	50	86	94
E.C.P. treated	0	0	14	36	79	83

Discussion

It may be seen from Table 23 that the progesterone-P.M.S. therapy did encourage somewhat earlier lambing, since 28 percent of the progesterone-P.M.S. treated ewes had lambed by November 15 compared with 8 percent of the untreated controls. However, by November 30, more control ewes had lambed than had the treated groups. Rate of lambing then remained similar in the treated and untreated groups for the remainder of the lambing period. It is not known why a higher percentage of the treated ewes that bred following lambing did not conceive. It is possible that the fertility of the rams was low during the