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

early part of the breeding season and it is also possible that the artificially induced estrus or heat was not accompanied by conditions necessary for successful conception.

In Table 24 it may be seen that the untreated ewes lambed a little earlier than the ones receiving the estrogenic material, "E.C.P." Three ewes failed to lamb in the treated group compared with one in the controlled group.

These tests further indicate the difficulty in securing earlier and more uniform lamb crops by use of hormones.

The Effect of Cottonseed Meal and Soybean Oilmeal Fed Separately and Together upon the Digestibility of a Ration Fed to Lambs, 1953.

D. Richardson

There is a variation in the digestibility of protein in the various concentrates fed to livestock. It has been shown that the digestibility of nutrients in a ration with a mixture of protein concentrates is closely related to the proportion of the various protein sources in the ration. However, opinions differ on the effect of single and mixed proteins upon the digestibility of protein and other nutrients in the ration of cattle and sheep. This preliminary study was to evaluate further the nutritive value of single and mixed protein concentrates in the lambs' ration.

Hampshire, Shropshire, and Rambouillet wether lambs that averaged about 100 pounds each were used. Sorghum stover, ground in a hammer mill, was used as the roughage. In addition to the stover, each lamb received a daily ration of 1 pound of yellow corn, 1/10 pound of dehydrated alfalfa pellets, 1/10 pound of ground limestone, and ¼ pound of cottonseed meal, or its equivalent in protein from soybean meal or a mixture of ½ each cottonseed meal and soybean meal.

The results of this preliminary study are shown in Table 25.

Table 25.—The Effect of Cottonseed Meal and Soybean Oilmeal Fed Separately and Together Upon the Digestibility of a Ration Fed to Lambs.

	Percent apparent digestibility of—				
	Crude protein	Ether ext.	Crude fiber	N-free ext.	Percent total dig. nutr.
Lamb	Cottonseed meal as protein supplement				
2	52.31	72.43	34.07	79.60	44.87
3	52.97	73.99	28.91	81.52	49.02
6	55.41	75.12	40.63	82.74	47.15
8	58.37	77.29	42.26	81.10	48.75
Average	54.76	74.69	36.77	81.23	47.32
Lamb	Soybean oilmeal as protein supplement				
1	66.11	73.09	45.55	83.71	49.74
4	60.69	70.30	38.20	81.77	46.87
7	66.12	74.47	50.87	84.07	48.72
Average	63.81	72.11	43.24	82.94	48.34
Lamb	Cottonseed meal plus soybean oilmeal as protein supplement				
2B	64.76	69.38	45.27	82.64	47.85
3B	57.23	73.33	31.79	80.72	47.14
6B	66.63	78.44	56.38	84.05	49.91
8B	58.95	76.19	45.44	76.63	45.10
Average	61.92	74.35	45.16	81.01	47.50

Observations

1. The digestibility of protein and total nutrients was lowest when cottonseed meal was used in the ration.

2. The digestibility of protein and total nutrients was highest when soybean oilmeal was used in the ration.

3. The digestibility of protein and total nutrients in the ration using a mixture of cottonseed meal and soybean oilmeal was greater than for cottonseed meal alone but less than for soybean oilmeal alone. This agrees with previous work with cattle and sheep at other experiment stations.

Adaptability of Breeds of Rams and Breed-Types of Range Ewes to Market Lamb Production in Kansas.

PROJECT 347

T. Donald Bell and Lewis Holland*

Western ewes of the three predominant types (Texas ewes or fine wools, Blackface crossbreds, and Northwestern Whiteface crossbreds) commonly found in Kansas were secured as ewe lambs in the fall of 1951 and bred to Hampshire, Suffolk, Shropshire, and Southdown rams two seasons. A different set of yearling rams has been used each year and the ewes are being rotated so that the same ewes are not bred to the same breed of ram each year. Lamb production and wool production records are being obtained from the different types of ewes, and lamb production figures are being obtained for the four sire groups.

Results

Lamb production figures for the 1952-53 lamb crop are presented in Table 26.

Table 26.—Lamb production by ewes of different types and from sires of different breeds in 1953.

Ewe types	No. ewes bred	No. lambs weaned	% lambs weaned	Av. weaning weight	Lbs. lamb weaned per ewe bred
Finewools	43	40	93	87	81
Northwest Whiteface	45	39	87	84	73
Northwest Blackface	52	49	94	81	76
Sire groups					
Hampshire	35	31	88	92	81
Suffolk	35	36	103	91	94
Southdown	35	28	80	82	65
Shropshire	35	33	94	70	66

* Much assistance in collecting and summarizing the data for this experiment was given by Arthur W. Gardner, a graduate student in animal husbandry.