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Bulletin 250 September, 1930

Raising Early Lambs from Aged Western Ewes

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SUMMARY

1. Cutting alfalfa hay for aged pregnant ewes increased the feed consumption, increased the gains, and decreased the amount of feed required for 100 pounds of gain.
2. Lambs fed a high-protein grain mixture gained .04 pound per head daily more before weaning and .08 pound after weaning than similar lambs fed a grain mixture relatively low in protein.
3. Over twice as much grain was required for 100 pounds of gain by early lambs after weaning as was required before weaning.
4. Each ewe consumed, in approximately six months, 5.6 bushels of ear corn, ground; 10 pounds of cottonseed meal; 209 pounds of corn silage; 230 pounds of cut alfalfa; and 57 pounds of alfalfa hay. During this time each ewe gained 20 pounds.
5. Each lamb marketed ate 1.4 bushels of shelled corn, ground; 11 pounds each of linseed meal and bran; and 74 pounds of alfalfa hay.
6. Of the 216 lambs marketed, 121 were from 100 ewes bred in Nebraska and 95 from 100 ewes bred in Colorado. The Colorado-bred lambs averaged 65 pounds and brought $11.52 per hundredweight at Omaha, while the Nebraska-bred lambs averaged 71 pounds and sold at $11.28 per hundredweight. Time of marketing was responsible for the difference in selling price; 34 per cent of the Colorado-bred lambs were sold before Easter, while less than 5 per cent of the Nebraska-bred lambs were ready for market at that time.
7. The Colorado-bred ewes lambed seven days earlier, on the average, than the Nebraska-bred. As a result, more of them were sold in April at a higher price than was paid for fat ewes in May and June.
8. Single lambs weighed more at birth and gained more rapidly than twins.
9. Wool returned enough to pay for only 17 per cent of the feed consumed by the ewes.

Raising Early Lambs from Aged Western Ewes

A. D. WEBER

Many farm flocks in Nebraska are comprised of aged western ewes. They are easily obtained because of the state's geographical position with reference to the sheep-producing sections of the West and the leading feeder lamb markets. Nebraska ranks second in number of western lambs fed. This also tends to acquaint farmers with range sheep.

FACTORS AFFECTING EARLY LAMB PRODUCTION

AGE OF EWES

Farm flocks in Nebraska are largely on a one-year basis. In other words, ewes culled from range flocks because of their age, poor teeth, and, unfortunately for beginners, emaciation and spoiled udders, are purchased in the fall and marketed the following spring or summer after their lambs are weaned. Where this method is followed the ewe lambs are marketed because they sell for more per head than old ewes cost. Furthermore, aged ewes produce two marketable products the first year, lambs and wool. Ewe lambs, on the other hand, produce only wool the first year since it is not advisable, in view of the danger of losses from difficult parturition, to breed them to lamb before they are two years old.

TIME OF LAMBING

These old ewes are commonly known as "one-year" or "broken-mouthed" ewes. Widely different methods are used in handling them. Some farmers feed grain liberally while others depend chiefly upon coarse roughages and pasture. Altho the time of lambing ranges from January to May, early lamb production is increasing in popularity. Early lambs are born in January and February and marketed before June 15. Many outstanding lamb producers follow this method.

It is obvious that early lambs have advantages over late lambs. They are marketed before midsummer heat and stomach worms affect them. They are usually out of the way before corn plowing, harvesting, and haying, when it is difficult to give livestock close attention. The pasture problem is also eliminated inasmuch as early lambs are raised in dry lots.

SPRING LAMB PRICES

Early lambs are marketed after most of the fed "westerns" have been sold and before the new crop of range lambs begins to arrive in large numbers. As a result, these youngsters, termed spring lambs at the markets, sell at comparatively high prices. Their position is strengthened by the Greek holiday festivities during April, which increase the demand for lamb. Spring lamb is considered a delicacy in the East and is especially in demand at Easter.

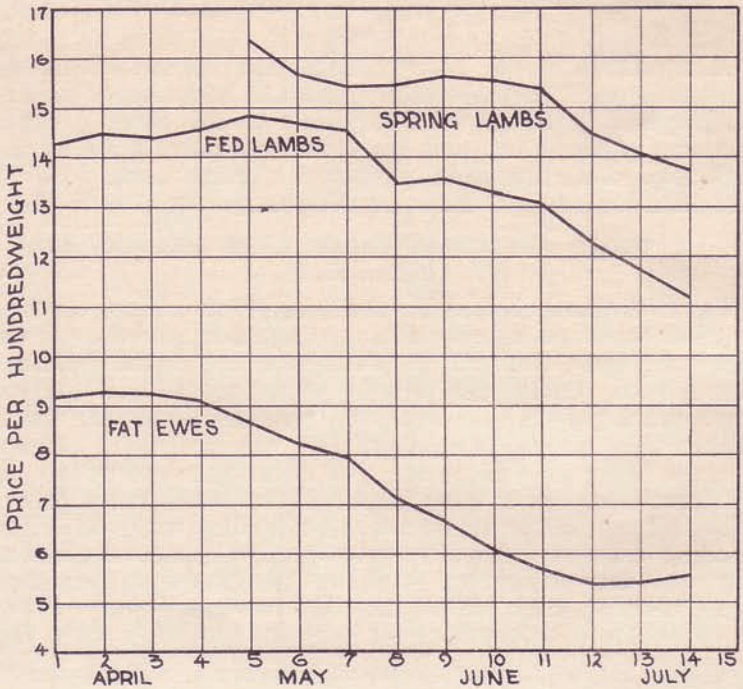

FIG. 1.—Average weekly top prices of fat ewes and lambs at Omaha, April to July, 1921-1930—price quotations after May 15 on a shorn basis.

Altho spring lambs sell at attractive prices during April, Figure 1 shows that, while prices recede somewhat, they remain at a relatively high level until June 15. It was not possible to include April price quotations for spring lambs in the ten-year average given in Figure 1 because only occasional sales during that month were made at Omaha from 1921 to 1927. However, they sold at a premium whenever offered.

Beginning with the first market day in June, fed lambs are classed as yearlings and spring lambs are called fat lambs. By referring again to Figure 1, it can be seen that the spread in price between these two classes gradually widens after June 1, altho the trend is downward in both cases.

DATE OF BREEDING

It is not an easy matter to produce lambs for the Easter market. One reason is that often it is impossible to buy good range ewes on the open market in time to get them bred for January lambing. Even when available, they may not breed in August if the nights are exceedingly hot. In order to

obviate this possibility, a few large operators buy ewes on the range and take them to a high altitude in Colorado for the summer where they are bred to lamb in December and January. Western sheepmen cannot afford to sort and sell small bunches. In recent years, however, dealers have made small lots of bred ewes available by selling them at auctions in September or October.

FAT EWE PRICES

But irrespective of the time and place bred, these old ewes are seldom fat enough in the fall to attract packer competition. As a matter of fact, from 1922 to 1929 they sold for considerably more as breeders than they would have brought for slaughter purposes. Many of them would be classed as "canners" or "throw-outs" from a carcass standpoint. Unless fattened by the time they are sold, the following spring or summer they sell at cull ewe prices. Whether or not it is better to fatten the ewes after lambing is an undecided question. Obviously it is difficult to fatten a ewe suckling a lamb.

Fattening the ewes is not the only problem, however. There is a time limit which must be taken into account if fat ewes are to yield the greatest monetary return. Figure 1 shows very clearly the average drop in the price of fat ewes which occurred after May 15 at Omaha for the ten-year period from

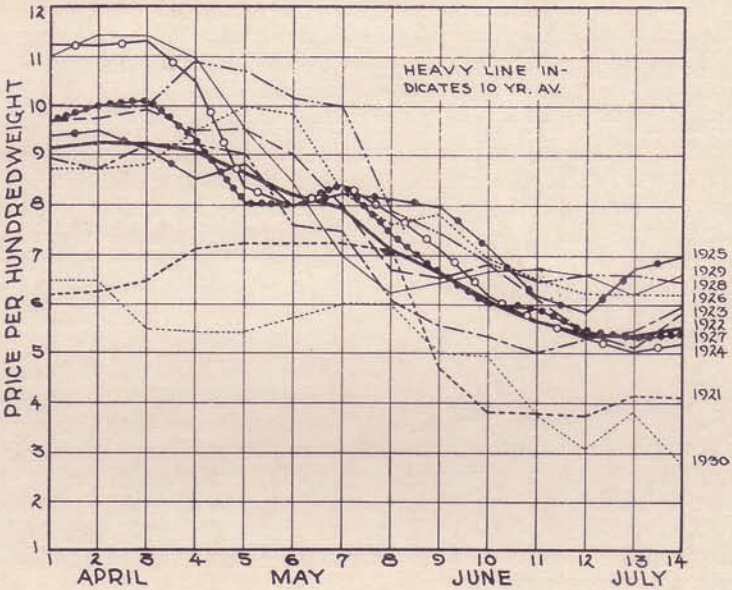

FIG. 2.—Average weekly top prices by years of fat ewes at Omaha, April to July—price quotations after May 15 on a shorn basis.

1921 to 1930. The price, which is for good to choice ewes, remained above $8.50 per hundredweight until the first week in May. From that time until the middle of June it receded to $5.30. In other words, the top price for fat ewes at Omaha dropped practically fifty cents a week for seven weeks beginning May 1. Thus good 130-pound fat ewes returned, as an average for the ten years, $10.90 each May 1, but only $6.90 each June 15. It should be noted, however, that prices are on a wooled basis until May 15.

Figure 2 shows that, while yearly prices fluctuated greatly, the same general trend was observed each year. The decline started early in April in 1922 and 1924. In 1921 and 1930, prices remained fairly constant until the last of May. But in spite of slight deviations from the average trend, the low mark for each of the ten years was reached about the middle of June.

Early lamb production is a specialized business in Nebraska because of the intensive methods of feeding that are necessary to take advantage of the favorable prices in April and May. It is really a combined breeding and feeding proposition. When the ewes are bred in Colorado, feeding is the primary consideration except for a few weeks at lambing time. Even then the judicious use of feeds plays a prominent part.

OBJECTS OF THE EXPERIMENT

Numerous inquiries have been received by the Nebraska Agricultural Experiment Station for information relative to the amount and kind of feed necessary when early lambs are raised from "one-year" or "broken-mouthed" western ewes. But very little experimental work has been done in an attempt to answer such questions. It was deemed advisable, therefore, to feed and care for the ewes and lambs in the experiment reported herein in much the same manner followed by successful sheepmen. It is believed that the data are parparticularly valuable from the standpoint that they show what can be expected from this method of producing early lambs. It should be clearly understood that no attempt has been made to find a method that excels the one now generally used.

Since the success or failure of an undertaking of this kind is thought to depend upon whether the ewes are fat or thin when marketed, they were fed grain liberally, both before and after lambing. The feed records and notes on performance are first in importance. However, it is believed that helpful information was obtained from the following tests, the objects of which were:

1. To compare ewes bred in Colorado with ewes bred in Nebraska,

2. To determine whether cut or whole alfalfa should be fed with ground ear corn to pregnant ewes,
3. To compare a high-protein grain mixture with one relatively low in protein when fed with alfalfa hay to suckling lambs.

EXPERIMENTAL PROCEDURE

SHEEP USED

On August 27, 1929, 100 aged white-faced Idaho ewes were purchased on the Omaha market. They averaged 123 pounds and cost $9.48 each laid down at Lincoln. They were bred to three purebred Hampshire rams raised in the University flock.

Another group of 100 aged white-faced ewes was purchased at an auction on October 2, 1929. These ewes originated in Wyoming, but with their lambs were taken to Colorado about the middle of June where they were grazed the remainder of the summer. Black-faced rams were with these ewes from July 15 to September 20. The lambs were marketed August 15. Each ewe was charged into the experiment at $8.68, the average price paid for 1,500 head at this auction.

The two groups were similar in type and conformation. Practically all were high-grade Rambouillets, with the exception of two ewes purchased at auction. These were black-

FIG. 3.—Lot 1 ewes. These ewes were fed ground ear corn and alfalfa hay during pregnancy.

FIG. 4.—Lot 2 ewes. These were fed ground ear corn and cut alfalfa hay during pregnancy.

faced and showed the influence of mutton sires. On the whole, the ewes purchased at auction were hardly as uniform or rugged as those purchased at Omaha. The ewes and their lambs are designated "Nebraska-bred" and "Colorado-bred" in the discussion of results.

QUALITY OF FEEDS

Yellow ear corn was fed. During the first 60 days it averaged 18.2 per cent moisture and for the remainder of the experiment 15 per cent. The shelled corn was mostly white and averaged 15.8 per cent moisture. The silage, made from corn averaging thirty bushels per acre, was of excellent quality. The alfalfa was good leafy, third-cutting hay. The minimum protein content of the other feeds used was guaranteed by the manufacturers to be as follows: bran 15 per cent, cottonseed meal 43 per cent, and linseed meal 34 per cent.

FEED PRICES

The total feed requirement of each ewe and lamb is of much greater importance in an experiment of this kind than the cost of gain, either total or for any given period. For this reason, feed cost by periods is not included. Altho the total feed cost is given, it is probably of doubtful value because the price of feeds fluctuates widely from year to year. The flock owner will derive the greatest benefit from these data if he interprets them in accordance with his own conditions. Feed costs can be easily calculated by multiplying the feed requirements by existing prices.

The feed prices used in this experiment were:

Ground ear corn	$ 1.10	per hundredweight
Ground shelled corn	1.35	per hundredweight
Linseed meal	60.00	per ton
Cottonseed meal	50.00	per ton
Bran	25.00	per ton
Corn silage	6.00	per ton
Cut alfalfa	17.12	per ton
Alfalfa	15.00	per ton

SHELTER PROVIDED

No shelter was provided until October 23. On this date the ewes were divided into two groups of 100 each. Each group was fed in a lot 30 by 100 feet and had access to an open shed facing south, with shed space 22 by 30 feet. Beginning at lambing time the shed and lot areas were doubled. A closed lambing room 20 by 30 feet was available during cold weather.

METHOD OF FEEDING

The ewes were fed grain and roughage in bunks in the open. The lambs were fed in creeps under the shed. All rations were hand-fed regularly at 7:30 A. M. and 4:30 P. M.

WEIGHING AND MARKETING

Individual weights of each ewe and lamb were taken on three consecutive days at the beginning and conclusion of each phase of the experiment. The averages of these weights were considered as the initial and final weights respectively. Two exceptions occurred. The weights of the ewes taken before lambing were the averages of three group weights taken on consecutive days. The birth weights of the lambs represent single weighings taken soon after each lamb was born.

In every case the ewes and lambs were shipped on the evening of the day the last experimental weight was taken. Shrinkage in shipment was calculated from the average of the three final experimental weights.

EXPERIMENTAL DATA

The figures in each phase of an experiment of this kind are of value only when analyzed in the light of data available at the conclusion of the experiment. So far as possible, the information is presented in the order in which it was obtained and its significance expressed in terms of the final results.

PASTURE PERIOD

The Nebraska-bred ewes were pastured on blue grass and also on weeds and quack grass that had made a luxuriant growth in a stubble field until October 24, or 59 days. The three purebred Hampshire rams were with them until October 17. No grain was fed during this period.

The Colorado-bred ewes were in the same pasture from October 5 until October 24, or 19 days. Ewes bred in Colorado are generally purchased later than those bred in Nebraska, which reduces the time they must be kept on the farm. Ram charges are eliminated since they are bred before they arrive, but this may be a disadvantage in view of the fact that the farmer has never seen the rams.

The ewes remained thrifty thruout the pasture period. No deaths occurred.

FEEDING DURING PREGNANCY

On October 23 the 200 ewes were divided into two equal lots, each containing an equal number from the original groups. They were fed for 60 days on the following rations:

Lot 1—Alfalfa hay and ground ear corn,

Lot 2—Alfalfa cut in one-half inch lengths and ground ear corn.

The old saying, "A sheep which can't grind its own feed isn't worth keeping," is probably true in the case of lambs. Most of the so-called one-year breeding ewes, however, have very poor teeth. Some of the ewes in this experiment were known as "gummers" because their incisors were worn down to the gums or had dropped out. The molars, used in grinding, were badly worn. This ration test was an attempt to determine whether cutting the hay would prove beneficial when fed to broken-mouthed ewes.

TABLE 1.—*Comparison of cut alfalfa and whole alfalfa when fed to pregnant ewes, October 24 to December 23—60 days*

	Lot 1	Lot 2
	Ground ear corn and alfalfa hay	Ground ear corn and cut alfalfa hay
Number of ewes	100	100
	Pounds	*Pounds*
Average initial weight	125	125
Average final weight	144	152
Average gain	18	27
Average daily gain	.306	.445
Average daily ration:		
Ground ear corn	1.58	1.58
Alfalfa hay	1.91	.....
Cut alfalfa	.....	2.17
Feed required for 100 pounds gain:		
Ground ear corn	518	355
Alfalfa hay	623	.....
Cut alfalfa	.....	488

The detailed results are given in Table 1. The average initial weight was 125 pounds in both lots. At the end of the 60-day feeding period, the ewes in Lot 2, which had received cut hay, averaged 152 pounds as contrasted with an average weight of 144 pounds in Lot 1 where whole hay was fed. Cutting the hay apparently caused an 8-pound greater gain in 60 days.

This difference in gain was made in spite of the fact that the average daily ration of ground ear corn was the same in both lots, 1.58 pounds. However, the ewes in Lot 2 consumed approximately one-fourth pound more cut alfalfa per head daily than Lot 1 consumed of whole hay. This greater total feed consumption perhaps explains the larger gains made by Lot 2. It should be noted that it was impossible to get the ewes in Lot 1 to eat as much whole hay as Lot 2 consumed of cut alfalfa.

The feed required for 100 pounds of gain was lower in both lots than we would ordinarily expect with aged ewes. In fact, Lot 2 required no more feed for 100 pounds of gain than is usually required by western lambs. The data indicate that cutting alfalfa hay increased the feed consumption, increased the gains, and decreased the amount of feed required for 100 pounds of gain. Altho this test was only 60 days long, the number of ewes in each lot should strengthen our belief that cutting the hay paid. But before accepting the results as conclusive evidence that this is true, let us observe what the

TABLE 2.—*Gains and lambing records of ewes fed different rations before lambing and identical rations after lambing*

	Lot 1—100 ewes	Lot 2—100 ewes
Ration before lambing	Ground ear corn and whole alfalfa	Ground ear corn and chopped alfalfa
Gain per ewe (*pounds*)	18	27
Ration after lambing	Ground ear corn, cottonseed meal, corn silage, cut alfalfa	Ground ear corn, cottonseed meal, corn silage, cut alfalfa
Gain or loss per ewe (*pounds*)	+2	—4
Total gain per ewe (*pounds*)	20	23
Average lambing date	January 29	January 25
Number of ewes lambed before January 15	5	13
Number of lambs dropped	134	127
Number of lambs raised	109	107

two groups did following this test when they were fed identical rations.

Table 2 shows that Lot 1, fed whole hay before lambing, made an average gain of 2 pounds from before lambing until marketed. Lot 2, on the other hand, lost 4 pounds during the same period. In other words, Lot 2 weighed only 3 pounds per head more when marketed, whereas the difference was 8 pounds prior to lambing. Cutting 130 pounds of hay, therefore, increased the gain 3 pounds. A charge of $2.12 per ton was made for cutting, which means that it cost 14 cents to cut 130 pounds. The 3 pounds extra gain was worth approximately 16 cents. Hence, so far as cost of gain is concerned, the difference between the two lots is not significant.

It will be noted from Table 2 that the average lambing date for Lot 1 was January 29, while it was January 25 for Lot 2. This, together with the fact that only 5 ewes lambed in Lot 1 prior to January 15 as against 13 in Lot 2, is probably responsible for a part of the greater gain made by Lot 2 in the 60-day period before lambing.

Averaging the gains made by the two lots, we find that each ewe weighed 3 pounds more before lambing than she did when marketed. This should not be construed to mean that a loss in weight was registered during the suckling period, since each ewe lambing gave birth to approximately 14 pounds of lamb. The average gain during lactation was 11 pounds, if we take the weights of lambs at birth into consideration, while the gain before lambing was 11.5 pounds. These figures indicate that liberal feeding before lambing helps to get the ewes ready for market. The results also show that cutting the hay may help in attaining this end, particularly if the ewes have poor teeth or are unusually thin.

LAMBING PERIOD

Beginning December 23, the ewes were fed together. The first ewe, a Colorado-bred, lambed December 31. The ewes were fed as indicated in Table 1 until they lambed. Most of them lambed in a closed shed and were kept there three or four days. At no time were the ewes with lambs allowed to run with those that had not lambed. They were brought to a full feed at an average of approximately two weeks after parturition. The standard ration fed all ewes at that time was: ground shelled corn, 3 pounds; cottonseed meal, .15 pound; corn silage, 2 pounds; and cut alfalfa, 1 pound.

The lambing records are given in Table 3. The Nebraska-bred ewes gave birth to 143 lambs, 7 of which were dead at birth. Of the 118 lambs dropped by the Colorado-bred group, 10 were dead at birth. There were 5 barren Nebraska-bred ewes, while 11 of the Colorado-bred failed to lamb, which

TABLE 3.—*Lambing records*

	100 Nebraska-bred ewes	100 Colorado-bred ewes
Average date of lambing	January 31	January 24
Number of ewes that lambed	95	89
Number of lambs dropped:		
Singles	47	62
Pairs of twins	48	25
Sets of triplets	0	2
Total lambs dropped	143	118
Average weight at birth (*pounds*)	9.58	10.68
Number of lambs dead at birth	7	10

partly accounts for the difference in lambing percentages. It will be noted, however, that 50 per cent of the Nebraska-bred ewes gave birth to twins while only 28 per cent of the other group dropped twins.

It is difficult to explain this difference. Some believe that

FIG. 5.—Apply docking pincers at a dull red heat.

FIG. 6.—Searing the wound prevents loss from bleeding.

FIG. 7.—Cut off the lower one-third of the scrotum.

FIG. 8.—Testicles exposed.

FIG. 9.—Pulling testicles with the teeth is commonly done by western sheepmen because this method is faster. Small flock owners often use forefinger and thumb.

the lambs were mostly singles because the rams were with the Colorado ewes while the previous crop of lambs was still nursing. The lambing records support this contention; very few twins were born before January 20. It is also possible that the succulent pasture provided for the Nebraska-bred ewes put them in better condition. Regardless of the reasons for this difference, it has been noted in other bands of ewes handled in a like manner and may be significant.

Altho the Nebraska-bred ewes did not start lambing until January 21, the average date of lambing was January 31, or only seven days later than for the Colorado-bred ewes. Whether as uniform a bunch of lambs as this from the standpoint of age can be expected over a period of years is not known.

DOCKING AND CASTRATING

The lambs were docked when from seven to ten days old. Pincers, applied at a dull red heat, were used as illustrated in Figures 5 and 6. As a precautionary measure, some flock owners prefer to use a board with a hole in it the size of a lamb's tail. The tail is pulled thru this hole and the hot pincers applied next to the board. This eliminates the possibility of burning the lambs but is not necessary after one has had a little experience in performing the operation. There is considerable difference of opinion as to the proper method of docking lambs. Some use a pocket knife; others prefer sheep shears or a hatchet. Altho the wound heals more slowly when hot pincers are used, the searing reduces losses from bleeding. The important thing, however, is not the method used but that the tails be removed.

Lambs that are docked present a squarer and more attractive appearance when marketed. They sell at enough higher price than long-tailed ones to more than pay for the trouble involved.

The lambs are castrated when about two weeks old. The methods used by Shepherd Esry are illustrated in Figures 7, 8, and 9. There is no discrimination against buck lambs until the first day in June when spring lambs are called fat lambs. On that date bucks sell at $1.00 per hundredweight under similar wether lambs. It is a good plan to castrate all the ram lambs, however, because it is impossible to tell at the time a lamb should be castrated just when he will be ready for market. It is sometimes necessary to carry a few lambs until August or September. Ram lambs become coarse and lack finish by that time and are severely discriminated against by both packers and feeders.

RATIONS FOR CREEP FEEDING

Lambs begin to nibble at grain when from ten days to two

weeks old. It is believed that when fed grain in a creep where the ewes cannot enter, lambs gain more rapidly than if they are wholly dependent upon their mother's milk. All of the lambs in this experiment were creep fed. In order to determine whether a grain mixture high in protein excels one low in protein, two lots were fed the following rations, by weight, for 112 days:

Lot 1—Ground shelled corn, 14 parts; bran, 2 parts; linseed meal, 1 part; and alfalfa hay.

Lot 2—Ground shelled corn, 12 parts; bran, 2 parts; linseed meal, 3 parts; and alfalfa hay.

TABLE 4.—*Comparison of rations for creep-fed lambs, February 11 to June 3—112 days*

	Lot 1	Lot 2
	Ground shelled corn.....14 Bran..... 2 Linseed meal and alfalfa hay... 1	Ground shelled corn.....12 Bran..... 2 Linseed meal and alfalfa hay... 3
Number of lambs.....	67	63
Average initial age (*days*).....	15	14
	Pounds	*Pounds*
Average initial weight.....	17	17
Average final weight.....	70	76
Average gain.....	54	59
Average daily gain.....	.478	.530
Average daily ration:		
Ground shelled corn.....	.84	.76
Bran.....	.12	.13
Linseed meal.....	.06	.19
Alfalfa hay.....	.70	.71
Feed required for 100 pounds gain:		
Ground shelled corn.....	177	143
Bran.....	25	24
Linseed meal.....	13	36
Alfalfa hay.....	146	134
	Per cent	*Per cent*
Dressing percentage.....	48.4	48.9
	Number	*Number*
Carcass grades:		
Choice.....	2	6
Good.....	37	30
Medium.....	25	24
Cull.....	3	3

The dams of the lambs in both lots were fed similar rations. In allotting the lambs, the large early lambs and the late ones were not used.

The results of this ration test are given in Table 4. The test started when the lambs were two weeks old and averaged 17 pounds in weight. The total feed consumed was practically the same for both lots. However, the average daily ration in Lot 2 contained three times as much linseed meal as the one in Lot 1, or .19 pound and .06 pound respectively. At the close, Lot 2 had made an average gain of 59 pounds as compared with 54 pounds in Lot 1. Thus, the liberal feeding of linseed meal increased the average daily gain .05 of a pound.

FIG. 10.—Feed early lambs grain in a creep where ewes cannot enter.

Lot 2, fed the high-protein grain mixture, required less feed for 100 pounds of gain than was required by Lot 1, fed the low-protein mixture. The difference was not great, 23 pounds of linseed meal taking the place of 34 pounds of ground shelled corn, 1 pound of bran, and 11 pounds of alfalfa hay. There was no significant difference between the two lots in dressing percentage. The carcass grades, furnished thru the courtesy of Swift and Company, show that a higher percentage of good and choice carcasses was produced in Lot 2. The lots were sold separately, and it may be of interest to sheep-

men to learn that Lot 2, the high-protein group, brought 10 cents per hundredweight more than Lot 1. This advantage in price indicates that the Lot 2 lambs were fatter than those in Lot 1.

The lambs in these two lots were weaned after being creep-fed 84 days. They were continued on the same rations 28 days longer. The average daily gain in Lot 2 was .04 pound more than in Lot 1 before weaning and .08 pound more after weaning. One pound of linseed meal replaced .94 pound of ground shelled corn, and .44 pound of alfalfa hay while the lambs were suckling, but after weaning the replacement value increased to 2.6 pounds of ground shelled corn, .2 pound of bran, and .7 pound of alfalfa hay. These data indicate that a high-protein mixture gave greater returns when fed after weaning than before, doubtless because of the amount and quality of protein in ewes' milk.

Table 5 shows that over twice as much grain is required for 100 pounds of gain after weaning as before. But the

TABLE 5.—*Comparison of the gains and feed requirements of lambs before and after weaning*

	Lot 1		Lot 2	
	Ground shelled corn.....14 Bran..... 2 Linseed meal and alfalfa hay... 1		Ground shelled corn.....12 Bran..... 2 Linseed meal and alfalfa hay... 3	
Periods	Before weaning-84 days	After weaning-28 days	Before weaning-84 days	After weaning-28 days
Number of lambs	67	64	63	60
Average initial age (*days*)	15	99	14	99
	Pounds	*Pounds*	*Pounds*	*Pounds*
Average initial weight	17	59	17	62
Average final wieght	58	71	61	77
Average gain	41	12	45	15
Average daily gain	.489	.442	.531	.526
Average daily ration:				
Ground shelled corn	.62	1.59	.58	1.35
Bran	.09	.23	.10	.23
Linseed meal	.04	.11	.14	.34
Alfalfa hay	.59	1.05	.60	1.11
Feed required for 100 pounds gain:				
Ground shelled corn	126	359	109	257
Bran	18	51	18	43
Linseed meal	9	27	27	66
Alfalfa hay	120	238	112	210

figures are misleading unless we realize that a considerable portion of the ewes' ration goes to make milk and should, therefore, be charged to the lambs. When viewed in this way it would seem logical, because of the rate and economy of gains made by the lambs weaned when 100 days old, to sell the ewes about May 1 when prices average relatively high. Not only will the total feed cost be reduced if this is done, but the lambs sell practically as well June 1 as May 1. (See Figure 1.)

TABLE 6.—*Comparison of the rate and economy of gains made when ewes suckling lambs were fed 84 days on similar rations*

	Lot 1—50 ewes	Lot 2—50 ewes
	Pounds	*Pounds*
Average initial weight	135	134
Average final weight	146	144
Average gain	11	10
Average daily gain	.128	.118
Average daily ration:		
Ground ear corn	3.01	3.02
Cottonseed meal	.15	.15
Corn silage	2.37	2.40
Cut alfalfa	.96	1.04
Feed required for 100 pounds gain:		
Ground ear corn	2350	2568
Cottonseed meal	118	129
Corn silage	1852	2041
Cut alfalfa	749	884

Altho complete feed records were kept for all the sheep in the experiment, Table 6 is included because it illustrates the costly gains made by ewes suckling lambs. The ewes in these two lots were the dams of the lambs used in the creep-feeding test just discussed. No attempt was made to allot the ewes on the basis of weight or conformation, altho they were quite similar in these respects. Thrift and ability to do a good job of suckling a lamb were given close attention, however. The average daily ration was approximately the same: ground ear corn, 3 pounds; cottonseed meal, .15 pound; corn silage, almost 2.4 pounds; and cut alfalfa, 1 pound. Despite the similarity in the rations, Lot 1 gained .01 pound more per head daily than Lot 2. As a result of this greater gain, Lot 1 required less feed for 100 pounds of gain. These differences in rate and economy of gain of ewes fed similar rations illustrate their inherent variability, and may explain, in part, the striking differences sometimes obtained when dissimilar feeds are compared.

FIG. 11.—Lot 1 lambs: creep-feeding test.

FIG. 12.—Lot 2 lambs: creep-feeding test.

There is a lesson in these figures. Averaging the feed required for 100 pounds of gain we get: ear corn, ground, 35 bushels; cottonseed meal, 124 pounds; corn silage, 1,947 pounds; and cut alfalfa, 817 pounds. The amount required can perhaps be appreciated better if we consider that western lambs gain 100 pounds on approximately 7 bushels of corn and 450 pounds of alfalfa hay.

The costly gains made by ewes suckling lambs indicate that it is good management to full-feed the lambs in a creep. The

amount of feed consumed by these youngsters per unit of gain is surprisingly low when compared with that required by old ewes.

As was stated previously, it is a common practice to feed one-year ewes heavily on grain during lactation. But does it pay? It is hoped that the answer will be found in the results of experiments which will be conducted during the next few years at this station. Until a better and more economical method is found, however, it would seem logical to use the one followed in this experiment.

FEED DATA ON ALL LAMBS

The lambs from the Nebraska-bred and Colorado-bred ewes were fed similar rations and given the same treatment in every respect. Table 7 gives the data on both bunches of lambs. All lambs were started on grain in a creep at the same time. The lambs from the Colorado-bred ewes averaged seven days older than those from the Nebraska-bred ewes, which accounts for their greater weight at the time they were started on grain. Being older, they ate more grain at the start, and as a result the average daily ration was kept the same.

Table 7 shows that the Nebraska-bred lambs made an average daily gain of .52 pound while it was .02 pound less, or .50 pound, for the Colorado lambs. Since they were fed grain 14 days longer than the Colorado-bred lambs, the

TABLE 7.—*Feed data for all lambs*

	Nebraska-bred	Colorado-bred
Number of lambs started on grain	124	102
Number of lambs marketed	121	95
Average number of days fed grain	102	88
	Pounds	*Pounds*
Average initial weight	19	21
Average final weight	72	65
Average gain	53	44
Average daily gain	.52	.50
Average daily ration:		
Ground shelled corn	.79	.79
Bran	.12	.12
Linseed meal	.10	.10
Alfalfa hay	.74	.74
Feed required for 100 pounds gain:		
Ground shelled corn	152	159
Bran	22	24
Linseed meal	20	21
Alfalfa hay	143	150

greater daily gain made by the Nebraska-breds is of doubtful significance. Neither was there much difference in the feed required for 100 pounds of gain.

Here again the feed per unit of gain is surprisingly low, which further emphasizes the wisdom of creep feeding early lambs. Of course, the feed consumed directly by the lambs is only a small part of the total cost of getting them ready for market. But since this is true it would certainly be unwise not to use such an inexpensive aid in crowding lambs for the early market.

EFFECT OF SEX AND TWINNING

The data found in Table 8 were compiled in the belief that they might be of interest, but they are probably of little practical value. The single lambs not only weighed more at birth but gained almost one-tenth of a pound per head daily more than the twin lambs. They weighed as much as the twins when marketed in spite of the fact that they averaged three weeks younger. A few flock owners feed the ewes with twins separately from those with singles. These men also report that very few of the twin lambs are ready for the Easter market. Altho in this experiment the singles and twins were fed together, these data indicate that it might be advisable to feed them separately.

TABLE 8.—*The effect of sex and twinning on weight at birth, on gains, and on age when marketed*

	Twin lambs		Single lambs		All lambs[1]	
	Wethers	Ewes	Wethers	Ewes	Wethers	Ewes
Number of lambs marketed....	45	57	52	48	104	112
Age when marketed (*days*).....	125	122	105	105	115	115
Weight per lamb (*pounds*):						
At birth.....	9.78	9.18	11.56	10.65	10.60	9.77
When marketed.....	72	67	74	71	73	69
Total gain.....	62	58	62	60	62	59
Daily gain.....	.49	.48	.59	.57	.54	.52

[1]Includes the single survivors of 14 pairs of twins.

The ram lambs averaged heavier at birth than the ewe lambs and also gained more rapidly. The difference was small but appears significant since the twins and singles performed the same in this respect.

DATA ON ALL EWES

Referring to Table 9, one sees that the Nebraska-bred ewes gained only 4 pounds per head more than the Colorado-bred group from October 24, when they were started on grain, until all of the ewes were marketed. The total gain per head was exceedingly low in view of the fact that for approximately

six months the ewes in both lots received an average daily ration of 2.21 pounds of ground ear corn, .06 pound of cottonseed meal, 1.18 pounds of corn silage, 1.30 pounds of cut alfalfa, and .32 pound of alfalfa hay. The small gain, coupled with heavy feeding over a long period, was responsible for the large amount of feed required per 100 pounds of gain. Altho the Nebraska-bred ewes made more economical gains, the significance of the difference becomes more apparent when we note that they raised 26 more lambs than were raised by the Colorado-bred group. This, together with the fact that of the 12 ewes that died 8 were Colorado-bred, leads to the conclusion that the Nebraska-bred ewes were stronger and made better use of their feed. It is possible, however, that the reverse might be true another year.

As a matter of fact, the importance of the figures in Table 9 is not in the difference between the two groups, but is rather that over 25 bushels of ear corn ground, not to mention roughages and cottonseed meal, was required for 100 pounds of gain. It is apparent that the gains would probably never, under any set of price conditions, pay for the feed required to make them.

TABLE 9.—*Feed data for all ewes (from October 23, 1929, until marketed)*

	Nebraska-bred	Colorado-bred
Number of ewes purchased	100	100
Number of ewes marketed	96	92
Death loss (*per cent*)	4	8
Average number of days fed grain	185	171
	Pounds	*Pounds*
Average initial weight	125.5	125
Average final weight including wool	148	144
Average gain	22.5	19
Average daily gain	.122	.114
Average daily ration:		
Ground ear corn	2.21	2.21
Cottonseed meal	.06	.06
Corn silage	1.18	1.18
Cut alfalfa hay	1.30	1.30
Alfalfa hay	.32	.32
Feed required for 100 pounds gain:		
Ground ear corn	1806	1939
Cottonseed meal	46	49
Corn silage	963	1034
Cut alfalfa hay	1061	1139
Alfalfa hay	261	281

It would be a mistake, therefore, to feed grain liberally for such a long period solely for the increase in weight made by the ewes before and after lambing. This method of feeding is advocated by sheepmen, however, on the grounds that (1) it puts the ewes in good condition for lambing and is conducive to a heavy flow of milk and (2) most of the ewes fed in this manner can be sold fat on or before May 15 when prices average $3.50 per hundredweight higher than seven weeks later.

TOTAL FEED CONSUMED

Carrying the study of feed records one step further we find, by referring to Table 10, that each ewe purchased was charged with 5.6 bushels of ear corn, ground; 10 pounds of cottonseed meal; 209 pounds of corn silage; 230 pounds of cut alfalfa; and 57 pounds of alfalfa hay. It is believed that these figures represent about the maximum amount required when early lambs are produced by the method used in this experiment.

In addition to the feed consumed by the ewes, each lamb marketed ate 1.4 bushels of shelled corn, ground; 11 pounds each of linseed meal and bran; and 74 pounds of alfalfa hay. Considering the total feed consumed by ewes and lambs, it would seem that approximately 7 bushels of corn, 350 pounds of alfalfa, 210 pounds of corn silage, 20 pounds of protein supplement, and 10 pounds of bran should be supplied on the basis of each ewe purchased, anticipating, of course, a 100-per cent lamb crop. It is interesting to note that these figures agree remarkably well with estimates of feed consumption furnished the writer by several farmers who bought ewes in

TABLE 10.—*Total feed consumed by both groups of ewes and lambs (for entire experiment)*

	Ewes	Lambs
Number of animals started on feed	200	226
Number of animals marketed	188	216
Feed consumed per animal:[1]		
Ear corn, ground (*bushels*)	5.6	.....
Shelled corn, ground (*bushels*)	.....	1.4
Cottonseed meal (*pounds*)	10	.....
Linseed meal (*pounds*)	.....	11
Bran (*pounds*)	.....	11
Corn silage (*pounds*)	209	.....
Cut alfalfa (*pounds*)	230	.....
Alfalfa hay (*pounds*)	57	74
Feed cost per head[1] (*dollars*)	$7.58	$2.08

[1]Based on ewes purchased and lambs marketed.

the fall of 1929 and marketed them with their lambs in April and May, 1930.

WOOL PRODUCTION

All of the ewes, with the exception of the 23 head marketed February 27, were shorn between March 24 and April 3. In Nebraska, most of the ewes marketed with their lambs in April and May are shorn in March if possible. It is believed by farmers that ewes gain more rapidly after the wool is removed, even tho the weather is unusually cool at that time. No comparison was made in this test, however. Table 11 shows that the Nebraska-bred ewes averaged 1.5 pounds more wool than the Colorado-bred lot. The wool from the two bunches of ewes was sold as one lot at 14½ cents per pound. It is obvious that it did not pay for the feed consumed by the lambs, to say nothing of that eaten by the ewes.

TABLE 11.—*Wool production*

	Nebraska-bred	Colorado-bred
Number of ewes shorn	89	82
Fleece weight per ewe (*pounds*)	9.54	8.05
Selling price per pound (*cents*)	14.5	14.5
Value of wool per ewe (*dollars*)	1.38	1.17

WOOL GRADES

The wool was consigned to the Mid-West Wool Marketing Corporation, Kansas City, Missouri. The grades given in Table 12 were obtained thru the courtesy of that organization. Over one-half, or 58 per cent, graded fine clothing, while 29 per cent was one-half blood clothing. The grades indicate clearly the fine wool breeding of the ewes. The high percentage of short or clothing wool was doubtless partly due to the fact that the fleeces represented less than twelve months' growth.

TABLE 12.—*Wool grades—all ewes*

Grade	Pounds	Percentage of total
Fine clothing	881	58.38
One-half blood combing	81	5.37
One-half blood clothing	430	28.50
Three-eighths blood combing	57	3.78
Three-eighths blood clothing	60	3.98
Total combing	138	9.15
Total clothing	1371	90.85

MARKETING DATA ON ALL EWES

The first ewes were marketed February 27. They had either failed to lamb or had lost their lambs. The price obtained was $5.50 per hundredweight. Because of the expensive gains made by old ewes, it is a good plan to market those not raising lambs as soon as possible after the lambing season closes. Only one ewe, a Colorado-bred, was sold as a "throw-out" or "canner". It is doubtful if anything is gained by trying to fatten ewes that show unmistakable signs of lack of thrift, as this ewe did. She weighed only 80 pounds and brought $2.00 per hundredweight less than the others.

The next bunch, as indicated in Table 13, was marketed April 10, ten days before Easter. Only eight out of the 45 sold on this date were Nebraska-bred, since 32 of the 38 lambs marketed were singles from the Colorado-bred group. It will be noted that five of the Colorado-breds were classed as "throw-outs" and sold at $4.00 per hundredweight.

TABLE 13.—*Marketing data on all ewes*

Date marketed	Price per cwt.	Nebraska-bred ewes		Colorado-bred ewes	
		Number marketed	Average weight	Number marketed	Average weight
	Dollars	*Number*	*Pounds*	*Number*	*Pounds*
February 27	5.50	9	133	11	134
February 27	3.50	..	...	1	80
April 10	5.75	8	133	30	140
April 10	4.00	..	...	5	110
May 8	5.25	68	130	35	127
May 8	3.50	6	111	7	108
June 5	4.50	5	128	3	120
Average price per hundred-weight		$5.19		$5.25	

The largest bunch was marketed May 8, at which time the lambs were weaned. The price obtained was 50 cents less per hundredweight than April 10, a month earlier. This approximates very closely the average drop in top ewe prices from 1921 to 1930. (See Figure 1.)

Only eight ewes that either lambed late or had small unthrifty lambs were left to be marketed when the lambs were sold June 5. These ewes brought 75 cents less per hundredweight than those marketed a month earlier, and $1.25 less than those marketed April 10. The Colorado-breds averaged $5.25 per hundredweight, or six cents more than was realized for the Nebraska-breds. This difference was due to the fact that more of the Colorado-breds were marketed early when prices were slightly higher than later in the spring.

Mention was made previously of the large amount of corn consumed by these ewes during lactation. Apparently this corn was responsible for the fact that only 11 per cent of the Nebraska-bred and 16 per cent of the Colorado-bred ewes sold as "throw-outs". Had they been fed little or no grain, it is quite likely that the majority of them would have brought from $2.00 to $3.00 per head less than they did, provided they had been marketed at the same time. Of course, had they been marketed thirty to forty days later, they would have brought that much less, even tho they had been fed grain. Obviously time of marketing and condition of ewes may materially affect financial returns.

MARKETING DATA ON ALL LAMBS

The first lambs, 6 Nebraska-bred and 32 Colorado-bred, were sold April 10 at $13.00 per hundredweight. Both groups averaged 62 pounds, which is a popular weight prior to Easter. On May 8, six lambs were slaughtered in the station abattoir.

The remainder of the lambs were sold June 5, the tops bringing $12.00 per hundredweight for both the Colorado- and Nebraska-bred groups and the throw-outs $8.40 and $8.20 respectively. Table 14 shows that of the 216 lambs marketed, 24 per cent were "throw-outs". To state it differently, based on the 200 ewes purchased, the lamb crop was 82 per cent good to choice lambs. It will be recalled that a 108 per cent lamb crop was marketed.

TABLE 14.—*Marketing data on all lambs*

Date marketed	Price per cwt.	Nebraska-bred lambs		Colorado-bred lambs	
		Number marketed	Average weight	Number marketed	Average weight
	Dollars	*Number*	*Pounds*	*Number*	*Pounds*
April 10	13.00	6	62	32	62
May 8	12.00	5	69	1	62
June 5	12.00	81	75	39	72
June 5	8.40	..	..	23	60
June 5	8.20	29	60	..	..
Average price per hundred-weight		$11.28		$11.52	

The 52 "throw-out" lambs averaged 60 pounds. With two exceptions, they were thrifty and doubtless would have graded good to choice had they been kept 60 to 80 days longer. All lambs were sold, however, in order to secure definite information on what can be expected when the ewes and lambs are marketed before June 15. This is also in keeping with the practice followed by many producers of early lambs. In order to carry lambs thru the summer, pasture must be provided, which often involves more trouble and expense than

the extra returns from the lambs would seem to justify. That, at least, is the opinion of practical farmers, and since we have no data as yet on the question, we hesitate to make a general recommendation. It is obvious that profits depend largely upon the percentage of good to choice lambs marketed before June 15.

Altho the percentage of "throw-out" lambs was the same in both groups, the Colorado-bred lambs averaged 24 cents per hundredweight more than the Nebraska-bred. Table 14 indicates that this difference was due to the fact that 34 per cent of the Colorado-breds were sold on the Easter market as compared to only 5 per cent of the Nebraska-breds. This is probably the greatest advantage to be had from breeding in Colorado over breeding in Nebraska. The lambs arrive earlier; consequently, more of them attain a marketable weight and finish in time to be sold for the Easter trade when prices are relatively high. All of the lambs marketed prior to Easter were singles, and as was mentioned previously, practically all of the Colorado-bred lambs arriving before January 20 were singles. Furthermore, Table 8 shows that the singles were larger at birth and gained more rapidly than the twins.

Referring again to Table 14, it will be seen that the good to choice lambs marketed June 5 averaged 10 to 13 pounds more than those sold April 10. This is in keeping with market demands, for as the season advances the average weight of top spring lambs gradually increases until it reaches the standard for fat lambs at 85 to 90 pounds. This should not be construed to mean that all the "throw-outs" marketed at from $8.20 to $8.40 on June 5 would have graded good on April 10 and brought $13.00. Probably some of them would have, but the majority were large framed; hence, lack of finish was their main drawback from a carcass standpoint.

Then, too, these "throw-outs" averaged only about 30 pounds April 10, which means that most of them would have sold as culls at that time. The upshot of the whole thing is that early lambs should be sold sometime between April 1 and June 15. More weight is required as the season advances, but top prices are obtained only for fat lambs irrespective of the date and weight marketed.

SHRINK IN SHIPMENT TO MARKET

As stated previously, all ewes and lambs were shipped by rail the evening of the day the final experimental weight was taken. Each shipment was loaded at 4:30 P. M. and was unloaded in Omaha about 7:30 the following morning. Shrink in transit was calculated in every case from final experimental weight.

TABLE 15.—*Shrink in shipment to market*

	Nebraska-bred		Colorado-bred	
	Ewes	Lambs	Ewes	Lambs
Weight at Lincoln (*pounds*)	140.09	72.95	139.62	67.60
Weight at Omaha (*pounds*)	129.08	70.72	129.49	65.44
Shrink (*pounds*)	11.01	2.23	10.13	2.16
Shrink (*per cent*)	7.86	3.06	7.26	3.20

The figures given in Table 15 are averages calculated from the weights obtained on four shipments. The figures are doubly interesting, since the shrink was approximately the same each time for all groups.

Both groups of ewes averaged approximately 140 pounds at Lincoln and 130 pounds at Omaha. The shrink was 11.01 pounds, or 7.86 per cent, for the Nebraska-bred ewes, while it was 10.13, or 7.26 per cent, for the Colorado-bred.

The Nebraska-bred lambs averaged 72.95 pounds at Lincoln and 70.72 pounds at Omaha—a shrink of 2.23 pounds, or 3.06 per cent. The Colorado-bred lambs, on the other hand, weighed five pounds less, or 67.60 pounds, at Lincoln. They shrank 2.16 pounds, or 3.20 per cent.

The most interesting thing in connection with Table 15 is that on a percentage basis the ewes shrank over twice as much as the lambs. Neither the ewes nor the lambs received special preparation for shipping. They were fed their regular feeds in the morning, and had access to water until loaded in the evening.

TABLE 16.—*Financial statement*

	100 Nebraska-bred ewes	100 Colorado-bred ewes
Initial cost of ewes	$948.00	$868.00
Interest on investment—8 per cent	59.02	46.81
Pasture charge (½ cent per head daily)	29.00	9.50
Ram charge	20.00	.....
Feed cost—ewes	787.77	727.89
Feed cost—lambs	263.33	186.94
Cost of marketing—ewes	38.40	36.80
Cost of marketing—lambs	36.30	28.50
Returns from ewes	643.39	625.91
Returns from lambs	964.94	716.32
Returns from wool	123.11	95.70
Total cost	2181.82	1904.44
Total returns	1731.44	1437.93
Loss per lot	450.38	466.51
Loss per ewe purchased	4.50	4.66

FINANCIAL STATEMENT

The financial statement given in Table 16 reflects price conditions prevailing during 1929 and 1930. As stated previously, the flock owner should interpret the results of this experiment in accordance with his own conditions, since prices of feed and sheep fluctuate from year to year.

Excluding labor and equipment charges, the Nebraska-bred ewes lost $4.50 each, while the average loss for the Colorado-bred lot was $4.66. In other words, the Nebraska-bred group would not have shown a loss had they been purchased at $4.98 per head instead of $9.48. The Colorado-bred ewes, figured on the same basis, were worth $4.02 instead of $8.68 each. The loss incurred in both lots was largely due to the unusual decline in sheep and lamb prices which occurred early in 1930. The low price of wool was also a contributing factor. It is obvious, therefore, that this system of early lamb production is not profitable when the ewes are purchased on a high market in the fall and marketed with their lambs on a low market the following spring.

[5M]