

Colby Branch Agricultural Experiment Station, Colby, Kansas.

Investigations of Milk-fat Lamb Production Practices for Western Kansas. Results for 1962-63 Creep-feeding Tests and 1963 Ewe Preflushing and Flushing Tests.

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Experimental Sheep

One hundred fifty yearling ewes were added to the flock in May, 1963, so the ewe flock now consists of approximately 450 two-, five-, and six-year-old fine-wool ewes. All were purchased in southwest Texas as yearlings. Purebred Hampshire rams were used.

General Procedure

This flock is handled in an early-lambing program, with the breeding season starting the last of May and extending to September 1. All lambs are sold as milk-fat lambs during spring and early summer.

Three separate tests are conducted during the year. The first attempts to determine the effect that varying the energy intake of ewes during a preflushing period has on lambing performance has on lambing performance. The second compares various rations for flushing ewes, and the third studies various management practices and rations for ewes and lambs.

Lamb Feeding Tests (Winter 1962-63)

Procedure: To determine the value of various rations, early weaning, and castrating male lambs, ewes and lambs were divided into six lots on the basis of lamb age, single ewe lambs, single male lambs, twin lambs, and prior ewe treatment. A 7- to 10-day adjustment period was allowed after lambs were born before ewes and lambs were placed in respective lots. Lambs were docked and castrated during the adjustment period. One half of the single male lambs in each lot were not castrated. All lamb creep rations were self-fed from the time lambs were placed in respective lots until marketed. Lambs were marketed in six shipments at either Denver or Omaha. The first shipment was March 19, 1963, and the last June 29. Lambs were shipped at approximately 100 pounds. All lambs not weaned early or marketed by March 19, 1963, were weaned at that time.

Treatments and rations fed various lots were:

Lot no.	Daily ewe ration	Lamb creep ration and treatment
1	Standard ration ¹	Standard ration ²
2	Standard ration	Dry rolled sorghum grain, alfalfa hay
3	Standard ration	Dry rolled sorghum grain containing 10% soybean oil meal, alfalfa hay
4	Standard ration	Dry rolled sorghum grain containing 5% salt, alfalfa hay
5	Rye pasture + standard ration when snow covered pasture	Standard ration, rye pasture
6	Standard ration until lambs were weaned, then maintenance ration ³	Standard ration, lambs weaned 8 to 10 weeks of age.

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²1. Ewe standard ration: 1 lb. whole sorghum grain, 1 1/4 lbs. alfalfa hay and full feed of sorghum silage (approximately 19 lbs.) per ewe per day.

³2. Lamb standard creep ration: whole sorghum grain and alfalfa hay in separate feeders.

⁴3. Ewe maintenance ration: 1 lb. alfalfa hay and 6 lbs. sorghum silage per ewe per day.

Table 6
Lamb performance and cost of gains by treatments, Fall 1962 and Spring 1963.

Lot no.	1	2	3	4	5	6
Treatment	Whole sorghum grain, alfalfa hay	Rollod sorghum grain, alfalfa hay	Rollod sorghum grain containing 10% SODM, alfalfa hay	Rollod sorghum grain containing 5% salt, alfalfa hay	Rye pasture, whole sorghum grain, alfalfa hay	Early weaned, whole sorghum grain, alfalfa hay
No. lambs	56	50	41	57	61	52
Av. market wt., lbs. ¹	101.0	104.9	102.0	103.2	107.3	100.8
Av. total gain, lbs. ²	90.6	91.3	91.5	92.7	97.3	90.2
Av. daily gain, lbs.	.529	.544	.557	.550	.572	.494
Av. market age, days	171	168	164	169	145	183
Daily feed per lamb, lbs.:						
Grain mix	1.35	1.26	1.32	1.21	1.37	1.30
Alfalfa hay	.55	.52	.29	.65	.18	.84
Av. lbs. feed per cwt. gain:						
Grain mix	254.8	231.8	236.6	220.6	204.2	263.8
Alfalfa hay	103.5	95.7	52.0	118.5	26.8	170.4
Total	358.6	327.5	288.6	339.1	231.0	434.2
Lamb feed cost per cwt. gain ¹	\$ 5.76	\$ 5.50	\$ 5.63	\$ 5.57	\$ 3.77	\$ 6.91
Ewe feed cost to 3/19/63 per cwt. gain ¹	\$ 8.68	\$ 9.28	\$ 10.64	\$ 8.28	\$ 2.14	\$ 7.08
Total feed cost per cwt. gain	\$ 14.44	\$ 14.78	\$ 16.27	\$ 13.85	\$ 5.91	\$ 13.99

1. Weight of lambs at station before shipment to market.

2. Market weight minus birth weight.

3. No charge made for rye pasture. This was charged to ewe feed cost at 1 1/2 cents per day.

4. Includes cost of feeding nursing ewes and dry ewes having lambs weaned early up to March 19, when all lambs were weaned. Also includes feed cost for ewes having lambs removed from lots due to sickness or death.

Results and Discussion

Performance and cost of gains of lambs from the six treatment groups are reported in Table 6 (lamb death losses and treatments are reported in Table 7), and performance of single ewe, wether and ram lambs is reported in Table 8.

Lambs fed the standard sorghum grain and alfalfa creep on rye pasture made considerably faster and cheaper gains than lambs in other lots, which confirms results of past tests. However, these lambs had a lower average market price per cwt. (approximately \$0.56 to \$1) than the other lambs, because they reached market weight earlier in the season when lamb prices were somewhat lower.

Creep rations containing dry rolled sorghum grain, or dry rolled sorghum grain containing 10% soybean oil meal or 5% salt in Lots 2, 3, and 4, respectively, produced gains at approximately the same rate as the standard creep ration fed Lot 1. Salt apparently slightly reduced grain consumption; however, this lot of lambs consumed more hay.

As in last year's test, lambs weaned at 8 to 10 weeks of age (Lot 6) gained slightly less than control lambs (Lot 1). The weaned lambs ate more hay than nursing lambs (nonweaned lambs ate some feed with ewes). The saving in ewe feed cost offset the higher lamb feed cost for early-weaned lambs. This resulted in approximately \$0.50 less total feed cost per cwt. gain for early-weaned lambs.

Urinary calculi developed in all lots and enterotoxemia in all lots except Lot 5 (rye pasture). Considerably more trouble from these two conditions was experienced in Lot 3 receiving the creep containing 10% soybean meal. Salt did not completely prevent urinary calculi in Lot 4; however, there were only three cases in that lot compared with six and seven in Lots 1 and 2 fed similar rations without salt. All lots had free access to salt.

Ram lambs gained faster and consequently reached market weight at an earlier age than wether lambs. However, they were discounted \$1 per cwt. in all instances on the market.

Ewe lambs gained as fast as wether lambs. This is contrary to most research reports, since wether lambs usually rank between ewe and ram lambs in rate of gain. Possibly the high incidence of calculi showed gains of wether and ram lambs.

Eleven ewes in the rye pasture group (Lot 5) produced lambs sired by lambs in this lot before ram lambs were sold or weaned March 19.

Table 7
Lamb diseases and death losses by lots.

Lot no.	Urinary calculi	Founder and enterotoxemia	Lameness and stiffness	Scours	Other causes	Death loss ¹
1	6	6	1	1	4	4
2	7	7	1	2	1	5
3	11	12	2	..	5	10
4	3	2	..	..	..	2
5	5	..	..	..	1	2
6	4	6	..	2	1	6
Total	36	33	4	5	12	29

1. Urinary calculi was cause of death of 11 lambs; enterotoxemia, 13 lambs; and 5 lambs died from various other causes.

Table 8
Performance of single ewe, wether and ram lambs, Fall 1962 and Spring 1963.

Lot no.	Single ewes		Single wethers		Single rams	
	No.	Av. daily gain, lbs.	Av. sale age, days	No.	Av. daily gain, lbs.	Av. sale age, days
1	16	.615	147	9	.505	177
2	18	.573	159	7	.588	151
3	15	.619	152	6	.602	153
4	18	.593	155	8	.614	152
5	18	.692	141	10	.711	136
6	17	.504	178	9	.542	162
Total	102	.599	155.4	49	.595	155.1

Following is some marketing information on lambs sold during 1963:

Number of lambs	361
Av. marketing date	4/29/63
Av. barn weight	102.3
Av. sale weight	96.9
% shrink to market	5.25
Av. selling price per cwt.	\$21.21
Trucking cost per cwt. ¹	\$.85
Other marketing costs per cwt. ¹	\$.70
Total marketing costs per cwt.	\$ 1.50
Av. return per lamb ²	\$19.10
Av. lamb return per ewe ²	\$20.51

Preflushing Test—Spring 1963

Procedure: 296 four- and five-year-old ewes were divided into four groups on the basis of number of lambs produced the previous year. Following were the four preflushing treatments:

- Lot A—Low-energy ration, April 27-May 14 (17 days)
- Lot B—Maintenance ration, April 27-May 14 (17 days)
- Lot C—Low-energy ration, April 10-May 14 (34 days)
- Lot D—Maintenance ration, April 10-May 14 (34 days)

The low-energy ration consisted of 2 lbs. alfalfa hay per ewe per day and the maintenance ration 2 lbs. alfalfa hay, ¼ lb. whole sorghum grain and 3 lbs. sorghum silage per ewe per day.

All ewes were fed a ration of 6 lbs. sorghum silage and 1 lb. alfalfa hay from March 19, when all lambs not already sold were weaned. Ewes in Lots A and B were continued on this ration until the start of their 17-day treatment.

At the end of preflushing equal numbers of ewes from each group were placed in each of six lots and fed various flushing rations. (See flushing tests 1963, page 15.) Ewes were exposed to rams 17 days after being placed on flushing rations.

Results and Discussion

Weight changes of ewes during preflushing and subsequent flushing are reported in Table 9. Lambing performance of preflushed ewes is found in Table 10.

Ewes fed the low-energy rations for either 17 or 34 days lost approximately the same amount of weight during the preflushing period and made about the same gains during the following 34-day flushing period. Ewes fed the low-energy ration for 34 days did not lose as much weight

1. Lambs were marketed at Denver and Omaha.

2. Gross lamb return minus marketing costs. Does not include incentive payment for unshorn lambs.

during the second 17-day period as they did the first 17 days. Possibly some of the initial loss of weight in the two low-energy groups was due to a loss in feed content of the digestive tract.

The maintenance ration just about maintained weight in both the 17-day and 34-day preflushing periods. These ewes gained less weight during the following flushing period than the low-energy fed ewes.

There seemed to be no difference in earliness of lambing between preflushed groups. However, the ewes preflushed with the low-energy ration for 34 days had fewer twins and consequently a lower lambing percentage.

Table 9
Weight changes of ewes during preflushing and subsequent 34-day flushing period.

Preflushing ration	No. of ewes	Ac. preflushing gain or loss per ewe, lbs.			Ac. flushing gain per ewe, lbs.
		First 17 days	Second 17 days	Total	
Low energy (17 days)	73		-11.37	-11.37	11.68
Maintenance (17 days)	76		-1.06	-1.06	4.64
Low energy (34 days)	72	-7.88	-2.43	-10.31	12.61
Maintenance (34 days)	75	.84	.81	1.65	4.51

Table 10
Lambing performance of preflushed ewes.

Preflushing ration	No. of ewes	Cumulative % ewes lambing				Total	% lamb crop ¹
		10	20	30	40		
Low energy (17 days)	73	6.9	29.2	75.0	88.9	98.6	133.3
Maintenance (17 days)	76	1.4	27.4	76.7	94.5	97.2	138.4
Low energy (34 days)	72	6.9	23.6	76.8	95.8	97.3	116.7
Maintenance (34 days)	75	5.4	20.2	77.0	87.8	96.0	127.0

1. Includes all ewes exposed to rams and all lambs born.

Ewe Flushing Test, Spring 1963

Procedure: May 14, 1963, the four groups of 296 preflushed ewes were divided into six lots on the basis of number of lambs produced the previous year and preflushing treatment. The 150 yearling ewes purchased May 7 were randomly allotted to the six flushing treatments. Ewes were fed flushing rations for 34 days.

Flushing rations were as follows:

Lot 1—Cereal crop pasture 34 days.

Lot 2—Cereal crop pasture plus 1 lb. whole sorghum grain 34 days.

Lot 3—Buffalograss pasture only for 34 days.

Lot 4—Buffalograss pasture plus 1 lb. whole sorghum grain 34 days.

Lot 5—Buffalograss pasture plus 2 lbs. whole sorghum grain 34 days.

Lot 6—Buffalograss pasture plus 2 lbs. whole sorghum grain for 17 days, then buffalograss only for 17 days.

Eighteen Hampshire rams were used. Breeding season started June 1, 17 days after ewes were started on flushing rations. The 18 rams were divided into six groups of three each. Each group of rams was rotated to a different ewe lot twice a week. Rams were with the ewes during nights

but were separated during the day. Breeding season ended September 1.

At the end of the 34-day flushing period, June 18, all ewes were turned together and grazed together on buffalograss and available cereal crop and sudan pasture. Buffalograss pasture was supplemented with about $\frac{3}{4}$ lb. of alfalfa hay per ewe from July 10 to August 2. Starting September 14 ewes were fed $\frac{1}{4}$ lb. barley per ewe per day, which was increased to $\frac{3}{4}$ lb. within two weeks. Barley was later replaced with sorghum grain. Silage and alfalfa hay feeding was started October 22 and was gradually increased to 3 lbs. silage and 1 lb. hay per ewe per day. Ewes remained on buffalograss pasture until lambing.

Results and Discussion

Gains and lambing performance for 4- and 5-year-old ewes are reported in Tables 11 and 12 and for yearling ewes in Tables 13 and 14.

Older ewes responded to flushing treatments by producing more multiple births than yearlings. Most of the difference in percentage lamb crop among the yearling ewe treatments was due to number of ewes lambing, not to multiple births. Yearling ewes also lambed considerably later in the season than older ewes.

Among the older ewe groups ewes flushed on cereal crop pasture, cereal crop pasture plus 1 lb. sorghum grain per ewe per day, or buffalograss pasture plus 2 lbs. sorghum grain per ewe per day produced more twin lambs. Both yearling and mature ewes flushed on these three rations also lambed earlier than ewes flushed on other rations. As in past years additional grain improved lambing percentage of mature ewes flushed on cereal crop pasture.

Lambing records for the ewe flock by years is reported in Table 15. This is not part of any experiment, but information should be of interest.

Table 11
Gains and lambing performance of 4- and 5-year-old ewes fed six flushing rations, May 14 to June 18, 1963—34 days.

Lot no.	No. of ewes	Average total gain per ewe, lbs.	No. ewes lambing	No. total lambs	No. sets of twins	% lamb crop ¹
1	47	6.60	47	63	16	134.0
2	49	12.85	48	72	24	146.9
3	51	3.54	50	59	9	115.7
4	47	8.71	45	57	10 + 1 triplet	121.3
5	47	13.84	46	66	18 + 1 triplet	140.4
6	56	4.94	47	58	9 + 1 triplet	116.0
Total	291	8.27	283	375	86	128.9

1. Includes all ewes exposed to rams and all lambs born.

Table 12
Cumulative % 4- and 5-year-old ewes lambing by periods after first lamb birth, October 21, 1963.

Lot no.	Days after October 21				
	10	20	30	40	50
1	4.3	29.8	80.9	97.9	100
2	8.2	46.9	87.8	91.8	95.9
3	2.0	11.8	66.7	90.2	95.7
4	4.3	25.5	66.0	91.5	95.7
5	6.4	17.0	78.7	93.6	97.9
6	6.0	20.0	70.0	86.0	94.0

Table 13
Gains and lambing performance of yearling ewes fed six flushing rations, May 14 to June 18, 1963—34 days.

Lot no.	No. of ewes	Average total gain per ewe, lbs.	No. ewes lambing	No. total lambs	No. sets of twins	% lamb crop ¹
1	25	6.98	25	26	1	104.0
2	25	8.37	22	23	1	92.0
3	25	7.52	23	24	1	96.0
4	25	10.37	20	20	0	80.0
5	25	11.04	24	25	1	100.0
6	25	9.02	19	20	1	80.0
Total	150	8.74	133	138	5	92.0

1. Includes all ewes exposed to rams and all lambs born.

Table 14
Cumulative % yearling ewes lambing by periods after first lamb birth, October 21, 1963.

Lot no.	Days after October 21				
	10	20	30	40	50
1	4.0	12.0	56.0	64.0	96.0
2	12.0	24.0	60.0	72.0	88.0
3	8.0	8.0	32.0	68.0	88.0
4	.....	8.0	32.0	52.0	80.0
5	.....	20.0	68.0	76.0	96.0
6	4.0	8.0	40.0	40.0	76.0

Table 15
Flock lambing records 1959-1962.

Year	No. ewes	% ewes lambing	% lamb crop born	% lamb loss prior to 10 days of age	% lamb loss after 10 days of age	% lamb crop marketed
1959 ¹	151	96.7	109.3	4.8	4.2	99.3
1960 ¹	350	94.6	109.4	3.7	2.6	102.6
1961	340	95.3	118.4	3.0	2.5	112.1
1962	324	96.0	124.7	3.7	6.9	111.4
Total						
Average	1165	95.4	116.3	3.6	4.1	107.4

1. All ewes lambing in 1959 were yearlings and approximately 260 ewes lambing in 1960 were yearlings.

Lamb Feeding Tests (1963-64)

Procedure: To determine the value of various rations and the practice of early weaning, ewes and lambs were divided into eight lots on the basis of lamb age and type of lamb birth (single or twin). A 7- to 10-day adjustment period was allowed, following lamb birth, before ewes and lambs were placed into respective lots. Lambs were docked and castrated during the adjustment period. All lamb creep rations were self-fed.

Following are the 1963-64 treatments:

Lot no.	Daily ewe ration	Lamb creep ration and treatment
5	Standard ration ¹	Standard ration ²
2	Rye pasture + standard ration when weather demands	Rye pasture + standard ration
7	Standard ration	Ground sorghum grain + 5% salt, alfalfa hay

8	Standard ration	Ground sorghum grain + 1.5% ground limestone, alfalfa hay
4	Standard ration	Ground mixed ration of 45% sorghum grain and 55% alfalfa hay
6	Standard ration	Ground mixed ration of 35% sorghum grain, 10% soybean oil meal and 55% alfalfa hay
1	Standard ration until lambs are weaned, then maintenance ration ³	Lambs weaned 8-10 weeks of age, ground mixed ration of 45% sorghum grain and 55% alfalfa hay
3	Standard ration until lambs are weaned, then maintenance ration ³	Lambs weaned 8-10 weeks of age, pelleted ration of 45% sorghum grain and 55% alfalfa hay

Results of the above test in progress will be reported in the 1964 Annual Report.

1. Ewe standard ration: 1 lb. whole sorghum grain, 1½ lbs. alfalfa hay and full feed of sorghum silage.

2. Lamb standard creep ration: whole sorghum grain and alfalfa hay in separate feeders.

3. Ewe maintenance ration: 1 lb. alfalfa hay and 6 lbs. sorghum silage.

Garden City Branch Kansas Agricultural Experiment Station, Garden City, Kansas, Lamb Feeding Experiments, 1963-1964.*

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Lambs and Pretest Treatment

Delivery of 602 fine-wool feeder lambs was accepted at Menard, Texas, October 16, 1963. They were sorted from 700 lambs and averaged 67.3 lbs. each with a 3% shrink. Purchase price was \$16.25 per cwt. Immediately 197 were injected (intramuscular) with ½ cc. of an emulsified solution supplying 250,000 I.U. of vitamin A, 37,500 I.U. vitamin D, and 25 I.U. of vitamin E. All lambs were shorn (average fleece, 3.7 lbs.) and then shipped to Garden City on a triple-deck truck. They arrived at the Experiment Station at 8 a.m. October 18, having lost approximately 4 lbs. per lamb in transit. Lambs were weighed on arrival, divided into pens of approximately 50 head each and fed about 40 lbs. of medium-quality ground alfalfa hay and 45 to 60 pounds of green chopped grain sorghum stubble per lot until October 22 when they were moved to buffalo pasture. November 4 they were placed in dry lot and fed alfalfa hay and chopped sorghum stubble ration until started on test.

Experimental Procedure

November 8, lambs were weighed, implanted with 3 mgs. stilbestrol lotted with equal numbers of vitamin-injected lambs (17 in each lot) and started on test rations.

Following are treatments for the 11 lots:

Lot no.	Treatment	How fed
1	Standard ration of whole sorghum grain, .75 lb. chopped alfalfa hay, .10 lb. 41% cottonseed meal and sorghum silage.	Hand
2	Standard ration plus an additional .10 lb. cottonseed meal.	Hand
5	Standard ration plus Terramycin.	Hand
7	Sorghum silage replaced by corn silage in standard ration.	Hand

* Contribution No. 391, Department of Animal Husbandry, Kansas State University, Kansas Agricultural Experiment Station, and No. 71, Garden City Branch Agricultural Experiment Station.