

Investigations of Milk-fat Lamb Production Practices for Western Kansas, Colby.\*

Results for 1964-65 Creep-feeding Tests and 1965 Ewe Preflushing and Flushing Tests.

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### Experimental Sheep

A flock of approximately 450 commercial finewool ewes is maintained at the Colby Branch Experiment Station. Ewes are purchased in southwest Texas as yearlings and replaced after producing their sixth lamb crop. The current flock is made up of ewes that have produced their first, third, and sixth lamb crops. Purebred Hampshire rams were used.

### General Procedure

The ewe flock is handled in an early lambing program with the breeding season beginning around June 1 and ending September 1. All lambs are sold as milkfat lambs during the spring and early summer.

Two separate tests were made during 1965-66. (1) a study to determine the value of different rations for creep-feeding lambs and (2) a study determining the various treatments and rations for flushing ewes.

### Lamb Feeding Tests, 1964-65

Procedure: To study values of various creep-feeding rations with milk-fat lambs for a spring market, ewes and lambs were divided into 8 test groups. Allotment was based on type of lamb birth (multiple or single) and lamb age. Lambs were docked and castrated during a 7 to 10 day adjustment period before being placed in test groups.

All ewes, except those on rye pasture in lot 2, received a uniform nursing ration until lambs were weaned, then they were fed a standard maintenance ration. Lambs in all lots had access to a self-fed creep ration as soon as assigned to test groups.

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Lamb and ewe treatments follow:

<u>Lot No.</u>	<u>Lamb ration and treatment</u>	<u>Ewe treatment</u>
1	Mixture: 10% soybean meal 35% ground sorghum grain 55% ground alfalfa hay weaned 8-10 weeks of age	Standard ration* until lambs were weaned, then main- tenance ration**
2	Rye pasture Mixture: 45% ground sorghum grain 55% ground alfalfa hay weaned 8-10 weeks of age	Rye pasture until lambs were weaned, then maintenance ration
3	Mixture: 45% ground sorghum grain 55% ground alfalfa hay weaned 8-10 weeks of age	Standard ration until lambs were weaned, then main- tenance ration
4	Mixture: 45% ground sorghum grain 55% ground alfalfa hay	Standard ration
5	Whole sorghum grain Alfalfa hay	Standard ration
6	Whole sorghum grain Alfalfa hay $\frac{1}{4}$ oz. ammonium chloride	Standard ration
7	Mixture: Changing ration (see Table 33)	Standard ration
8	Mixture: 65% ground sorghum grain 35% ground alfalfa hay	Standard ration

\* Standard ewe ration - 1 lb. sorghum grain, 1.25 lb. alfalfa hay, full feed of sorghum silage (av. consumption, approximately 10 lb./day).

\*\* Maintenance ration - 1 lb. alfalfa hay and 6 lb. sorghum silage.

Table 31

## Lamb performance and feed cost by treatments, 1964-1965.

Lot No.	1	2	3	4	5	6	7	8
	Ground Mixture: 10% S.B.M. 35% sorg. gr. 55% alf. hay (weaned 8-10 weeks)	Rye pasture Ground Mixture: 45% sorg. gr. 55% alf. hay (weaned 8- 10 weeks)	Ground Mixture: 45% sorg. gr. 55% alf. hay (weaned 8- 10 weeks)	Ground Mixture: 45% sorg. gr. 55% alf. hay	Whole sorg. grain, alf. hay	Whole sorg. grain, alf. hay NH <sub>4</sub> Cl <sub>1</sub>	Ground Mixture: Changing ration <sub>2</sub>	Ground Mixture: 65% sorg. gr. 35% alf. hay
Treatment								
No. lambs	65	63	64	67	61	66	68	61
Av. market wt., lb. <sup>3</sup>	109.2	105.7	106.3	105.3	101.3	101.2	106.6	106.7
Av. total gain, lb. <sup>4</sup>	98.4	95.0	95.8	94.5	90.6	90.1	95.9	95.8
Av. daily gain, lb.	.65	.60	.60	.61	.53	.53	.62	.60
Twin lambs, lb.	.60	.56	.57	.55	.48	.47	.54	.55
Av. market age, days	154	159	161	159	177	177	159	163
Av. Daily feed/lamb, lb.								
Mixture	2.51	1.82	2.49	2.02			2.03	1.85
Sorghum grain					1.37	1.36		
Alfalfa hay					.34	.37		
Av. lb. feed/cwt. gain								
Mixture	393.0	304.5	418.6	339.9			336.5	314.8
Sorghum grain					267.7	267.1		
Alfalfa hay					66.4	72.7		
Total	393.0	304.5	418.6	339.9	334.1	339.8	336.5	314.8
Lamb feed cost/cwt. gain <sup>5</sup>	\$ 8.65	\$ 5.88	\$ 8.09	\$ 6.56	\$ 6.35	\$ 6.82	\$ 7.67	\$ 6.39
Ewe feed cost to 4-5-65 per cwt. gain	\$ 5.84	\$ 3.09	\$ 6.01	\$ 3.32	\$ 8.67	\$ 8.80	\$ 8.13	\$ 8.27
Total feed cost/cwt. gain <sup>5</sup>	\$14.49	\$ 8.97	\$14.10	\$14.88	\$15.02	\$15.62	\$15.80	\$14.66

1. Ammonium chloride was fed beginning 12-10-64 at 1/8 oz. per lamb per day for each lamb over 20 days of age; increased to 1/4 oz. on 1-6-65 when youngest lamb became 20 days old.
2. See table 2 for details.
3. Weight at station prior to shipment.
4. Market weight minus birth weight.
5. Based on these prices: sorghum grain, \$2.00/cwt., alfalfa hay \$30/ton, soybean meal \$95/ton, grinding \$2/ton, mixing \$2/ton and rye pasture at 1½ cents per ewe per day. Ammonium chloride fed lot 6 cost 35¢/lamb.

Table 32  
Shrink and Carcass Data By Treatments, 1964-1965.

Lot no.								
% shrink to market <sup>1</sup>	8.6	5.4	3.2	4.2	4.7	5.9	6.8	7.9
Dressing.% <sup>2</sup>	52.0	52.8	50.8	51.5	52.8	54.0	52.8	53.3
U.S.D.A. carcass grade								
% Prime	66	71	51	73	93	87	90	84
% Choice	34	29	49	27	7	13	10	16
No. lambs graded	55	48	45	52	29	31	1	44

1. Based on weight at station and selling weight at Denver, Colorado. Lambs were marketed in 5 shipments. Equal numbers from each lot were not marketed at the same time.

2. Not obtained on all lambs marketed.

Table 33. Rations fed lot 7

Period <sup>1</sup>	1st 60 days	60 to 90 days	90 to 120 days	120 days to market
<u>Ration</u>				
% soybean meal	20	15	10	10
% gr. sorghum grain	70	60	50	35
% gr. alfalfa hay	10	25	40	55
Av. daily feed/lamb, lb.	0.41	1.32	2.31	3.13
Cost of ration/cwt.	\$ 2.81	\$ 2.49	\$ 2.28	\$ 2.20

1. Calculated on days from birth of first lamb.

Table 34. Lamb weights at 8 to 10 weeks of age.

Lot no.	1	2	3	4	7
No. lambs	65	63	64	67	68
Av. weaning age, days <sup>1</sup>	66	66	66	66	66
Av. weaning wt., lb. <sup>1</sup>	52.0	55.3	47.8	48.0	52.6
Single wethers	59.5	61.5	57.9	56.3	59.5
Single ewes	54.7	58.9	49.3	52.6	56.2
Twins	44.9	48.2	41.4	39.7	45.5

1. Lambs in lots 1, 2, and 3 were weaned, while those in lots 4 and 7 were weighed at a corresponding age, but were not weaned until later.

Table 35. Number of lambs affected and number lost to indicated disease by lots.

Lot No.	Urinary Calculi	Enterotoxemia	Death Loss	Removed from lot for Other Causes
1	-	-	-	2
2	-	1	1	-
3	-	-	-	1
4	-	-	-	-
5	4	-	1	1
6	-	-	1	1
7	-	-	-	-
8	1	1	1	3

Lambs were marketed in Denver, Colo. when they weighed approximately 105 lb. at the station. Five separate shipments were made.

Results and Discussion: Performance and cost of gain for various rations are reported in table 1. Lambs weaned when 8 to 10 weeks of age (lot 3), gained equally as fast, ate more feed, and reduced ewe feed cost so cost per cwt. of lamb gain was 78 cents less than lambs weaned at a later date (lot 4). Replacing 10% of the sorghum grain with soybean meal for early weaned lambs (lot 1) increased rate of gain and cost of gains. Early weaned lambs on rye pasture (lot 2) ate less creep feed, gained equally as fast, and made considerably cheaper gains than early weaned lambs fed a similar ration in the dry lot (lot 3). Rye pasture stimulated milk production in ewes as lambs in this lot weighed approximately 7.5 lbs. more at weaning than lambs in lots 3 or 4 fed similar creep rations in dry lots (see Table 34).

Lambs in lots 5 and 6 fed whole sorghum grain and alfalfa in separate troughs made slower, more expensive gains than those in lot 4 fed a ground-mixed ration. Adding ammonium chloride (lot 6) did not affect feed consumption or lamb performance while reducing urinary calculi compared with lambs on the control ration (lot 5, Table 35).

Urinary calculi has been a serious problem in previous years with wether lambs fed a ration of grain and hay in separate troughs. Not a single case of calculi has been noticed with lambs fed a mixed ration containing at least 55% alfalfa. Lambs in lots 5 and 6 (table 31) ate only around 1/3 pound of alfalfa per day while those

in lots receiving the mixed rations ate around 1 1/3 pound of hay per day.

Starting young lambs on a high protein-high concentrate ration and periodically reducing the protein and concentrate levels with their age (as they became ruminant animals) was not economical at feed costs used; however, the lambs performed well. Ration composition used at various periods is reported in table 2.

Increasing the grain level to 65% in lot 8 did not improve rate of gain, however, the lambs made slightly more efficient and cheaper gains than those in lot 4 fed a 45% grain ration. Incidence of calculi, enterotoxemia and prolapsed rectums was somewhat higher in the lot fed 65% concentrates.

Table 36. Market information on lambs sold during 1965.

Number of lambs . . . . .	532
Market dates and number sold:	
April 5, 1965 . . . . .	165
April 26, 1965 . . . . .	201
May 17, 1965 . . . . .	88
June 7, 1965 . . . . .	49
June 28, 1965 . . . . .	29
Av. feedlot wt. at market date . . . . .	105.1
Av. sale wt. . . . .	99.16
Av. shrink to market (feed lot wt. to market wt.) . . . . .	5.65%
Av. selling price/cwt. . . . .	\$ 27.19
Trucking cost/cwt. . . . .	.62
Other marketing costs/cwt. . . . .	.80
Total marketing costs/cwt. . . . .	1.42
Av. return/lamb after marketing costs . . . . .	\$ 25.59
Av. gross lamb return/ewe (1) . . . . .	30.80
Av. gross return/ewe (2) . . . . .	35.78
Net lamb sales after market expense . . . . .	\$13,612.64
Wool income . . . . .	1,797.29
Wool and lamb incentive payments (estimated) . . . . .	45.00
	<u>\$15,814.93</u>

(1) Wool and government incentive payments not included.

(2) Includes estimated wool and government incentive payments.

#### Ewe Flushing Test, Spring 1965.

Procedure: The 421 ewes (128 yearlings and 293 four and seven year old ewes) were weighed and assigned to six groups May 14, 1965. The six groups received the following flushing treatments:

Lot 1 - Cereal crop pasture - 34 days (c.c.p.)

Lot 2 - Cereal crop pasture plus 1 lb. whole sorghum grain per ewe per day - 34 days (c.c.p. + 1# gr.)



Lot 3 - Dry lot ration of 2 lb. whole sorghum grain and 2 lb. alfalfa hay per ewe per day. - 34 days. Sixty mg. of the synthetic progestin hormone Medroxyprogesterone acetate (repromix)<sup>1</sup> was fed per ewe per day from May 17 to May 31 (15 days). One fourth of the grain was ground and mixed with Repromix and fed once daily before ewes were fed remainder of their grain. (repromix)

Lot 4 - Dry lot ration of 2 lb. whole sorghum grain and 2 lb. alfalfa hay plus 1/7 oz. wheat germ oil per ewe per day - 34 days. Wheat germ oil was mixed with the daily grain ration (w.g. oil)

Lot 5 - Dry lot ration of 2 lb. whole sorghum grain and 2 lb. alfalfa hay per ewe per day - 34 days. (control)

Lot 6 - Dry lot ration of 2 lb. whole sorghum grain and 2 lb. alfalfa hay per ewe per day - 34 days. Ewes exposed to 4 vasectomized rams from the beginning of the flushing period, May 14, to the beginning of the breeding period, June 1 (17 days). (teaser rams)

During the breeding season (June 1 - September 1) 18 purebred Hampshire rams were used. Breeding season began 17 days after ewes were placed on flushing treatment and 17 days before flushing rations were stopped. The rams were randomly assigned to six groups of 3 rams and each group was rotated to a different ewe lot twice each week. Rams were placed with ewes at night only and were removed during the day.

At the end of the 34-day flushing period, June 18, ewes were individually weighed and turned together. The 18 rams were turned with the ewes as a group until September 1. After flushing, ewes were grazed on buffalo grass and sudan pasture. In addition to pasture, ewes were fed 3/4 lb. of sorghum grain and 1/4 lb. dehydrated alfalfa pellets during the last 3 to 4 weeks before lambing season started.

1. Donated by Upjohn Company, Kalamazoo, Mich. This orally active synthetic progestin hormone prevents estrus and ovulation. It can, therefore, be used to synchronize estrus in cycling ewes.

Table 37. Gains and lambing performance of ewes allotted to one of the indicated flushing treatments, spring, 1965.

Lot No.	No. of ewes	Total gain	No. ewes lambing	Total No. lambs	% lamb crop <sup>1</sup>	% lamb crop <sup>2</sup>
First lamb crop ewes						
1 (c.c.p.)	22	6.1	21	23	104.6	109.5
2 (c.c.p. + 1# gr.)	22	8.0	19	22	100.0	115.8
3 (Repromix)	21	11.2	18	20	95.2	111.1
4 (w.g. oil)	24	13.6	23	25	104.2	108.7
5 (Control)	19	11.8	17	19	100.0	111.8
6 (Teaser rams)	20	13.2	19	19	95.0	100.0
TOTAL	128		117	128	100.0	109.4

Third and sixth lamb crop ewes

1 (c.c.p.)	50	.9	50	68	136.0	136.0
2 (c.c.p. + 1# gr.)	49	6.6	49	63	128.6	128.6
3 (Repromix)	50	15.7	48	65	130.0	135.4
4 (w.g. oil)	50	15.0	47	65	130.0	138.3
5 (Control)	50	15.2	50	71 <sup>3</sup>	142.0	142.0
6 (Teaser rams)	51	14.9	49	73 <sup>3</sup>	143.1	149.0
TOTAL	300		293	405	135.0	138.2
GRAND TOTAL	428		410	533	124.5	130.0

1. Includes all ewes exposed to rams and all lambs born.
2. Includes only ewes lambing and all lambs born.
3. Two sets of triplets in each lot.

Table 38. Effect of flushing treatment on cumulative percentage of ewes lambing. Spring, 1965.

Lot No.	<u>Days after first lamb birth</u>					Total lambing
	10	20	30	40	90	
	First lamb crop ewes					
1 (c.c.p.)	27.3	36.4	72.7	86.4	95.4	95.4
2 (c.c.p. + 1# gr.)	18.2	36.4	68.2	77.3	86.4	86.4
3 (Repromix)	61.9	71.4	85.7	85.7	85.7	85.7
4 (w.g. oil)	20.8	45.8	91.7	91.7	95.8	95.8
5 (Control)	10.5	31.6	57.9	79.0	89.5	89.5
6 (Teaser rams)	20.0	30.0	75.0	75.0	95.0	95.0

  

Lot No.	<u>Third and sixth lamb crop ewes</u>					Total lambing
	2.0	12.0	74.0	86.0	98.0	
1 (c.c.p.)	2.0	12.0	74.0	86.0	98.0	100.0
2 (c.c.p. + 1# gr.)	---	16.3	75.5	91.8	98.0	100.0
3 (Repromix)	42.0	52.0	94.0	96.0	96.0	96.0
4 (w.g. oil)	2.0	16.0	80.0	88.0	94.0	94.0
5 (Control)	8.0	20.0	90.0	92.0	100.0	100.0
6 (Teaser rams)	13.7	23.5	78.4	84.3	96.1	96.1

Table 39. Number of ewes breeding by periods following onset of breeding season as recorded from breeding marks.<sup>1</sup>

Lot No.	No. of ewes	Period		
		6-1-65 to 6-9-65 (9 days)	6-10-65 to 6-17-65 (8 days)	6-18-65 to 6-25-65 (8 days)
1 (c.c.p.)	72	13	10	34
2 (c.c.p. + 1# gr.)	71	5	15	35
3 (Repromix)	71	49	0	16
4 (w.g. oil)	74	12	15	38
5 (Control)	69	10	16	35
6 (Teaser rams)	71	17	9	35

Results and Discussion: Results of lambing performance and gains of ewes receiving the various flushing treatments are presented in Table 37 and 38. The number of ewes bred by periods following onset of breeding season is reported in Table 39.

Ewes in the four lot (3, 4, 5, 6) receiving the dry lot flushing ration of 2 lb. sorghum grain and 2 lb. alfalfa hay gained considerably more during the 34-day flushing period than those on cereal crop pasture (Lots 1 and 2). Adding 1 lb. of sorghum grain per ewe per day on cereal crop pasture materially increased gains, but failed to improve lambing performance. Similar results were obtained last year. (See Report of Progress 103 for summary of the past 6 years' flushing data).

Yearling ewes produced fewer multiple births and a proportionately larger number failed to lamb compared with older ewes. There appeared to be no material difference due to flushing treatment as measured in percentage lamb crop produced.

Ewes synchronized prior to breeding with Repromix had an earlier average lambing date (Table 38) compared with ewes receiving other treatments. Sixty-two percent and 42 percent of the yearling and older Repromix-fed ewes, respectively, lambled within the first 10 days of lambing season. This accounted for most of the ewes bred during the first estrus after Repromix was removed from the ration: 69% of the ewes in this lot bred during the first 9 days of the breeding season (Table 39). Ewes exposed to teaser rams also tended to lamb somewhat earlier than controls and yearling ewes fed wheat germ oil also lambled earlier than controls.

Lamb Creep Feeding Tests, 1965 - 1966

Procedure: Lambs born during the fall of 1965 were allotted to eight test groups. After lambing, the ewes with their lambs were given a 7 to 10 day adjustment period. Lambs were docked and castrated and assigned, on the basis of type of birth and age, to various test lots. All creep rations were self-fed.

Lamb and ewe treatments for the various lots follow:

<u>Lot No.</u>	<u>Lamb creep ration</u>	<u>Ewe nursing ration</u>
1	Mixture: 55% ground alfalfa hay 40% ground sorghum grain 5% molasses	Standard ration <sup>1</sup>
2	Rye/pasture weaned 8 to 10 wks. of age	Rye/pasture until lambs weaned, then maintenance ration <sup>2</sup>
3	Mixture: 55% ground alfalfa hay 40% ground sorghum grain 5% soybean meal	Standard ration
4	Mixture: 55% ground alfalfa hay 35% ground sorghum grain 10% soybean meal	Standard ration
5	Free Choice: Alfalfa hay Ground sorghum grain	Standard ration
6	Free Choice: Alfalfa hay Ground sorghum grain con- taining 1½% ammonium chloride until oldest lamb is 80 days - then reduced to 1% ammonium chloride	Standard ration

1. Standard nursing ration: 1 lb. whole sorghum grain, 1.25 lb. alfalfa hay, and sorghum silage fed to limit of appetite (approximately 10 lb.) per ewe daily.
2. Maintenance ration: 1 lb. alfalfa hay, 6 lb. sorghum silage per ewe daily.

7	Mixture: 55% ground alfalfa hay 45% ground sorghum grain	Standard ration
8	Mixture: 55% ground alfalfa hay 45% ground wheat	Standard ration

Results and Discussion: This test will be concluded in 1966 and reported in 1967.