

3:00 p.m.

Adjournment

6:30 p.m.

Block and Bridle Banquet for visiting stockmen and parents

FOR THE LADIES

Friday, April 30, 1965

6:30 p.m.

Dinner, Gillett Hotel

Saturday, May 1, 1965

9:30 a.m.

Coffee, Justin Hall, Animal Husbandry ladies

10:30 a.m.

Demonstrations, College of Home Economics

12:00 noon

Lunch, Animal Husbandry Arena

6:30 p.m.

Block and Bridle Banquet (See general program)

Sheep

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

Results for 1963-64 Creep-feeding Tests and 1964 Ewe Preflushing and Flushing Tests.

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Henry Elliott, Livestock Project Leader, Colby Branch Station

Experimental Sheep

A flock of approximately 450 commercial finewool ewes is maintained at the Colby Branch Experiment Station. They have produced second, fifth and sixth lamb crops. The ewes were purchased in southwest Texas as yearlings, and have been in production since. Purebred Hampshire rams are used.

General Procedure

The ewe flock is handled in an early-lambing program with the breeding season beginning June 1 and terminating September 1. Lambs are creep-fed and sold as milk-fat lambs during spring and early summer.

Three separate tests are conducted during the year. (1) The effects of varying levels of energy intake by ewes, during a preflushing period, on lambing performance. (2) Testing various rations for flushing ewes and ration effects on lambing performance. (3) A study of different management practices and rations for creep-feeding lambs.

Lamb Feeding Tests, 1963-1964

Procedure: To study effects of various creep-feeding rations and management practices on lamb gains and production of milk-fat lambs for a spring market, ewes and lambs were divided into eight test groups. The division into groups was based on type of lamb birth (multiple or single) and lamb age. After ewes lambed, ewes and lambs were given an adjustment period of 7-10 days. Lambs were docked at 1-2 days of age with rubber bands and were knife castrated when 7 to 10 days of age.

After being allotted to test groups, all ewes received a uniform nursing ration until lambs were weaned, except that Lot 2 ewes received rye pasture only. The lambs in Lots 1 and 2 were weaned when 8 to 10 weeks old. Ewes in those two lots then were fed a maintenance ration. Lambs in the various lots had access to a creep as soon as assigned to test groups. Lamb rations were self-fed in an open trough.

Lamb and ewe treatments follow:

Lot no.	Lamb ration and treatment	Ewe treatment
1	Mixture: 45% dry-rolled sorghum grain 55% ground alfalfa hay Weaned 8 to 10 weeks of age	Standard nursing ration ¹ until lambs were weaned, then maintenance ration ²
2	Rye pasture Whole sorghum grain Alfalfa hay	Rye pasture—Nov. 6, '63, through April 6, '64, except Feb. 15 through Feb. 21 and March 19 through April 6. Fed 1 pound alfalfa and silage free choice during those periods in addition to pasture

* Contribution No. 330, Department of Animal Husbandry, Kansas State University, Kansas Agricultural Experiment Station, and No. 15, Colby Branch Agricultural Experiment Station.

1. Standard nursing ration—1 pound sorghum grain, 1.25 pounds alfalfa hay, full feed of silage (average consumption per ewe per day, 9.8 pounds).

2. Maintenance ration—1 pound alfalfa hay plus 6 pounds sorghum silage.

Lot No.	Lamb ration and treatment	Eye treatment
3	Complete pellet: 45% dry-rolled sorghum grain 55% ground alfalfa hay Weaned 8 to 10 weeks of age	Standard nursing ration until lambs were weaned, then maintenance ration
4	Mixture: 45% dry-rolled sorghum grain 55% ground alfalfa hay	Standard nursing ration
5	Whole sorghum grain Alfalfa hay	Standard nursing ration
6	Mixture: 35% dry-rolled sorghum grain 10% soybean oil meal 55% ground alfalfa hay	Standard nursing ration
7	Mixture: 95% dry-rolled sorghum grain 5% salt Alfalfa hay (free choice)	Standard nursing ration
8	Mixture: 98.5% dry-rolled sorghum grain 1.5% ground limestone Alfalfa hay (free choice)	Standard nursing ration

Lambs were marketed in five shipments at Denver or Omaha. First shipment was April 6, 1964; last, June 29, 1964. The lambs were marketed at approximately 100 pounds each.

Results and Discussion: Performance and cost of gain for various treatment groups are shown in Table 1. As in past years, lambs on rye pasture receiving the standard creep ration of whole sorghum grain and alfalfa hay (Lot 2) produced higher and more economical daily gains than lambs in other lots. Lambs in the dry lot fed a creep ration of a mixture containing 10% soybean meal, 35% ground sorghum grain, and 55% ground alfalfa hay made gains almost equal to those in Lot 2. Those two groups also had the youngest average market age, 160 days.

Adding 5% salt to ground sorghum grain fed free choice with alfalfa hay reduced grain consumption and lowered daily gain.

Feed consumption per lamb and feed required to produce 100 pounds of gain were higher for lambs weaned at 8-10 weeks of age than for lambs receiving the same ration and remaining with their mothers. However, reduced feed costs for ewes of the early weaned group resulted in a slight advantage for the early weaned group in total feed cost per 100 pounds lamb gain. Although the difference is small, it has been consistent in all instances of early weaning. Feeding a pelleted ration resulted in more daily gain and more efficient feed conversion than was produced by the same ration in ground-mixed form. Feed cost per 100 pounds lamb produced was higher for the pelleted ration.

Urinary calculi developed in all lots except those fed concentrates and hay in a ground mixture or pellet. Lambs fed ground-mixed or pelleted rations were forced to eat considerably more alfalfa hay than lambs consumed when grain and hay were fed separately. Highest incidence of calculi occurred in the group on rye pasture. In past tests lambs on rye pasture showed lower incidence of urinary calculi than lambs in the dry lot.

(4)

Table 1
Lamb performance and feed cost of gain by treatments, 1963-1964.

Lot no.	1	2	3	4	5	6	7	8
Mixture: 45% dry-rolled sorghum grain 55% ground alfalfa hay (weaned 8-10 weeks)	.....	.....	.....	.....	.....	.....	.....	.....
Mixture: 10% soybean meal 35% ground sorghum grain 55% ground alfalfa hay	.....	.....	.....	.....	.....	.....	.....	.....
Whole sorghum grain Alfalfa hay	.....	.....	.....	.....	.....	.....	.....	.....
Mixture: 35% dry-rolled sorghum grain 10% soybean oil meal 55% ground alfalfa hay	.....	.....	.....	.....	.....	.....	.....	.....
Mixture: 95% dry-rolled sorghum grain 5% salt Alfalfa hay (free choice)	.....	.....	.....	.....	.....	.....	.....	.....
Mixture: 98.5% dry-rolled sorghum grain 1.5% ground limestone Alfalfa hay (free choice)	.....	.....	.....	.....	.....	.....	.....	.....
No. lambs per lot	58	44	58	55	52	54	52	56
Av. market wt., lbs. ¹	101.98	104.88	102.99	102.83	102.65	104.01	102.48	103.30
Av. total gain, lbs. ²	91.17	94.61	92.45	92.15	91.96	93.16	92.68	92.34
Av. daily gain, lbs. ³	.52	.54	.54	.56	.51	.58	.49	.54
Av. market age, days	175	160	171	165	181	160	190	171
Av. daily feed per lamb, lbs. ⁴	.....	.....	.....	.....	.....	.....	.....	.....
Mixture	2.34	.....	.....	1.88	.....	1.88	.....	.....
Pelleted ration	.....	1.23	2.22	.....	1.24	.....	1.12	1.30
Grain mix or sorghum grain	.....	.....	.....	.....	.....	.....	.....	.....
Alfalfa hay	.....	.19	.....	.....	.51	.....	.70	.48
Av. lbs. feed per cwt. gain:	.....	.....	.....	.....	.....	.....	.....	.....
Mixture	449.2	.....	410.6	333.0	.....	322.89	.....	.....
Pelleted ration	.....	208.0	.....	.....	244.1	.....	229.6	240.7
Grain mix or sorghum grain	.....	32.1	.....	.....	112.2	.....	143.5	85.9
Alfalfa hay	.....	.....	.....	.....	.....	.....	.....	.....
Total	449.2	240.1	410.6	333.0	356.3	322.89	373.1	329.6
Lamb feed cost per cwt. gain ⁵	.....	\$3.51 ⁶	\$8.83	\$5.89	\$5.71	\$6.68	\$6.31	\$5.74
Ewe feed cost to 4/6/64 per cwt. gain ⁷	.....	\$6.14	\$6.23	\$8.82	\$9.00	\$8.58	\$8.78	\$8.72
Total feed cost per cwt. gain	.....	\$14.14	\$15.06	\$14.71	\$14.71	\$15.26	\$15.09	\$14.46

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

2. Market weight minus birth weight.

3. Based on following prices: sorghum grain, \$1.65 per cwt.; alfalfa hay, \$30 per ton; soybean oil meal, \$95 per ton; salt, \$1 per cwt.; limestone, \$1.15 per cwt.; grinding, \$0.10 per cwt.; and mixing, \$0.10 per cwt. Processing pelleted ration, \$6.50 per cwt.; freight on same, \$0.10 per cwt.

4. Includes cost of feed for ewes nursing lambs and dry ewes having lambs weaned up to April 6, 1964, when all lambs were weaned.

5. Does not include any charge for rye pasture. This was charged to ewe feed cost at 1% cents per day.

(5)

Following is some market information on lambs sold during 1964:

Number of lambs	496
Av. market date	5/9/64
Av. feed lot wt. at market date	101.23
Av. sale wt.	96.75
% shrink to market (feed lot wt. to market wt.)	4.43%
Av. selling price per cwt.	\$23.41
Trucking cost per cwt. ....	.82
Other marketing costs per cwt. ....	.71
Total marketing costs per cwt.	1.53
Av. return per lamb (after marketing costs)....	21.48
Av. lamb return per ewe	24.16

Table 2
Number of lambs affected and number lost to indicated disease, by lots.

Lot no.	Urinary calculi	Founder and enterotoxemia	Lameness and stiffness	Scours	Other causes	Death loss ¹
1	....	....	14	3	2	2
2	12	2	9	....	2	5
3	....	....	11	2	1	1
4	....	....	16	3	4	1
5	3	....	15	3	3	4
6	....	....	10	3	1	2
7	2	2	6	....	3	3
8	2	....	10	1	1	....

1. Five lambs died due to urinary calculi; 2, enterotoxemia; 1, scours; and 10, various other causes.

Preflushing Test, Spring 1964

Procedure: 431 commercial finewool ewes were divided into four groups for the preflushing test. Division was on type of lamb birth the previous lambing season. Ewes were assigned to respective groups April 10, 1964, and treated as follows:

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

The low-energy ration consisted of 2 pounds alfalfa hay per ewe per day; the maintenance ration, 2 pounds of alfalfa hay, $\frac{1}{4}$ pound of whole sorghum grain, and 3 pounds of sorghum silage per ewe per day. From the time lambs were sold or weaned until April 10, ewes received a maintenance ration of 1 pound alfalfa hay and 6 pounds sorghum silage per ewe per day. Lots A and B were fed this ration until April 27, when they were placed on test.

Ewes were weighed April 10, April 27, and May 14 to check weight changes due to various treatments.

Results and Discussion: Effects of preflushing treatment on weight change during preflushing and flushing periods and on lambing performance are reported in Tables 3 and 4. Ewes receiving a low-energy ration for 34 days lost 11.30 pounds. They lost about 50% less during the second 17 days than during the first 17 days. A weight loss of 6.90 pounds resulted from feeding the maintenance ration 17 days. Ewe weight was maintained for the 17-day preflushing period by feeding the maintenance ration (Lot B), but ewes on that ration for 34 days lost 2.53 pounds each (average). Ewes fed the low-energy ration preflushing gained more during the flushing period than did ewes fed the maintenance ration.

Ewes on the maintenance ration had a slight advantage for earliness in lambing and percentage of ewes lambing. Also they produced more multiple births and, consequently, a higher lamb crop percentage. The lot receiving the maintenance ration for 17 days had a larger lamb crop than ewes fed the same ration for 34 days.

A year-by-year summary of results of preflushing treatments for 5 years is presented in Table 5.

Table 3
Effect of preflushing treatment on weight changes of ewes.

Preflushing treatment	No. of ewes	Av. preflushing gain or loss per ewe, lbs.			Av. flushing gain per ewe
		1st 17 days	2nd 17 days	Total	
Low energy (17 days)	108		-6.90	-6.90	13.53
Maintenance (17 days)	108		-0.50	-0.50	8.72
Low energy (34 days)	108	-7.81	-3.49	-11.30	13.95
Maintenance (34 days)	107	-2.00	-0.53	-2.53	8.60

Table 4
Lambing performance of ewes on different preflushing rations.

Preflushing treatment	No. of ewes	Cumulative % ewes lambing Days after first lamb birth				Total % lambing	% lamb crop ¹
		10	20	30	40		
Low energy (17 days)	108	9.26	36.11	84.26	91.66	95.37	123.15
Maintenance (17 days)	108	8.33	34.26	85.18	91.67	97.22	129.63
Low energy (34 days)	108	4.63	25.93	84.26	87.96	91.66	121.30
Maintenance (34 days)	107	4.67	30.84	86.92	92.53	97.20	126.17

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

Ewe Flushing Test, Spring 1964

Procedure: The 431 ewes included in the preflushing test were assigned to six groups May 14, 1964, after the preflushing test was completed. They were divided on number of lambs produced the previous year and on preflushing treatment. The six groups were fed these rations 34 days:

- Lot 1—Cereal crop pasture.
- Lot 2—Cereal crop pasture + 1 lb. whole sorghum grain.
- Lot 3—Buffalograss pasture.
- Lot 4—Buffalograss pasture + 2 lbs. whole sorghum grain.
- Lot 5—2 lbs. alfalfa hay + 2 lbs. whole sorghum grain.
- Lot 6—4 lbs. alfalfa hay.

During the breeding season (June 1-September 1) 18 purebred Hampshire rams were used. The rams were randomly assigned to six groups of 3 rams and each group was rotated to a different ewe lot twice each week. The rams were put into the ewe lots 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. Then the 18 rams were turned with the ewes as a group. After being flushed, ewes were grazed on buffalograss pasture, supplemented with cereal crop and sudangrass pasture, until lambing. Beginning August 28, ewes were fed $\frac{1}{4}$ pound of barley which was increased to $\frac{3}{4}$ pound by September 2. Later, the

Table 5
Summary of preflushing treatments, 1960-1964.

Preflushing ration ¹	No. of ewes	M. pre-flushing factor ²	M. flushing path ³	Days after first lamb birth			Total	St. of ewe	% lamb crop
				10	20	30			
1960									
A	75	-12.0	16.2	10.57	26.67	40.47	96.00	24	131
B	75	-7.8	14.2	6.67	29.33	38.00	93.33	19	124
1961									
A	171	-2.0	13.1	2.92	18.13	80.70	91.23	42	120
B	168	+4.0	9.0	4.33	20.17	79.29	86.39	35 1 triplet	117
1962									
A	161	-11.65	14.61	16.77	48.45	91.30	93.17	42	123
B	163	+2.4	4.98	16.56	44.75	87.73	92.62	49 1 triplet	126
1963									
A	72	-11.36	11.70	6.94	29.17	75.00	88.89	25	133
B	73	-1.08	4.55	1.37	27.40	76.71	94.52	26 2 triplets	138
C	72	-10.34	12.51	6.94	23.61	70.83	95.83	14	117
D	74	-1.73	4.31	5.41	20.27	77.03	87.84	21 1 triplet	127
1964									
A	108	-6.90	13.53	9.26	36.11	84.26	91.66	30	123
B	108	-0.50	8.72	8.33	34.26	85.18	91.66	34	130
C	108	-11.30	13.95	4.63	25.93	84.26	87.94	28 2 triplets	121
D	107	-2.53	8.69	4.57	30.84	86.52	92.53	31	126

1. A—Low-energy ration, 2 pounds alfalfa hay, 17-day period.
 B—Maintenance ration, 3/4 pound sorghum grain, 3 pounds alfalfa hay, 3 pounds sorghum silage, 17-day period.
 C—Low-energy ration, 34-day period.
 D—Maintenance ration, 34-day period.

barley was replaced with sorghum grain. Silage was fed at 2 pounds per ewe each day, beginning October 2. Alfalfa was fed beginning October 10 and was gradually increased to 1 pound per head per day. Silage and grain were increased to 3 and 1 pound per head per day, respectively, and the ewes continued on buffalograss until they lambed.

Results and Discussion: Results of lambing performance and gains of ewes fed various flushing rations 34 days the spring of 1964 are presented in Tables 6 and 7.

Table 6
Gains and lambing performance of ewes fed one of indicated flushing rations, spring 1964.

Lot no.	No. of ewes	Total gain	No. ewes lambing	Total no. lambs	No. sets of twins	% lamb crop ¹
1	72	4.78	69	92	23	127.78
2	71	10.82	68	85	17	119.72
3	72	11.42	71	90	26	137.50
4	72	16.81	67	91	24	126.39
5	72	15.83	68	90	22	125.00
6	72	7.58	68	82	12	113.89

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

Table 7
Effect of flushing ration on cumulative percentage of ewes lambing.

Lot no.	Days after first lamb birth					Total lambing
	10	20	30	40	90	
1	9.72	34.72	87.50	93.06	95.83	95.83
2	5.63	33.81	85.98	90.21	95.85	95.85
3	6.94	33.33	88.89	95.83	98.61	98.61
4	5.56	33.33	83.33	87.50	93.06	93.06
5	4.17	22.22	75.00	87.50	94.44	94.44
6	8.33	33.33	90.28	91.67	94.44	94.44

Ewes receiving buffalograss pasture only as a flushing ration produced a larger lamb crop than any other group. In previous years ewes flushed on buffalograss generally ranked below (in lamb crop produced) ewes fed cereal crop pasture plus grain or cereal crop pasture only. Table 8 summarizes all flushing rations fed during 6 years and performance of ewes on each ration, measured by percentage of lamb crop produced. Also, ewes flushed on cereal crop pasture only produced a larger lamb crop than did ewes flushed on 1 pound of sorghum grain and cereal crop pasture. The lowest lamb crop percentage resulted from feeding 4 pounds of alfalfa hay per ewe per day during the flushing period. However, that flushing ration resulted in one of the earliest lambing groups. Lots 3 and 1 ewes grazed on buffalograss only and cereal crop pasture only, respectively, also lambed earlier than other ewes.

Table 8
Summary of 6 years of tests showing percentage lamb crop for ewes on various flushing rations by years.

Flushing ration	1959	1960	1961	1962	1963	1964
Cereal crop pasture	102 ¹	102	128	133	124	128
¾ lb. whole sorghum grain 1¼ lbs. alfalfa hay						
Full feed of silage	98	110	109	107		
Buffalograss pasture	128	114	119	126	109	138
¾ lb. whole wheat grain 1¼ lbs. alfalfa hay						
Full feed silage		102				
Cereal crop pasture						
½ lb. sorghum grain		121	127	155		
Buffalograss pasture						
½ lb. sorghum grain		109	109			
¾ lb. sorghum grain						
Full feed alfalfa hay			119			
1½ lbs. sorghum grain 1¼ lbs. alfalfa hay						
Full feed silage				117		
¾ lb. sorghum grain ½ lb. soybean pellets						
Full feed silage				109		
Cereal crop pasture						
1 lb. sorghum grain					128	120
Buffalograss pasture						
2 lbs. sorghum grain					104	
Buffalograss pasture						
2 lbs. sorghum grain					126	126
Buffalograss pasture						
1 lb. sorghum grain					107	
2 lbs. sorghum grain						
3 lbs. alfalfa hay						125
4 lbs. alfalfa hay						114

1. Cereal crop pasture first 13 days only—supplemental or substitute ration afterward (primarily green chopped cereal crop).

2. 2 pounds sorghum grain first 17 days only; no grain for remainder of 34-day period.

Lamb Feeding Tests, 1964-1965.

Procedure: Lambs born during the fall of 1964 were allotted to eight test groups. After lambing, the ewes and lambs were given a 7- to 10-day adjustment period. The lambs were docked at 1 to 2 days of age and castrated at 7 to 10 days of age. They were then assigned, on the basis of type of birth and age, to various test lots. Creep feed was made available thereafter. All creep rations were self-fed.

Lamb and ewe treatments for the various lots follow:

Lot no.	Lamb creep ration	Ewe nursing ration
1	Mixture: 35% ground sorghum grain 10% SBOM 55% ground alfalfa hay Lambs weaned (8 to 10 weeks of age)	Standard nursing ration ¹ until lambs are weaned, then maintenance ration ²

1. Standard nursing ration: 1 pound whole sorghum grain, 1.25 pounds alfalfa hay, sorghum silage fed to limit of appetite per ewe daily.

2. Maintenance ration: 1 pound alfalfa hay, 6 pounds sorghum silage per ewe daily.

Lot no.	Lamb creep ration	Ewe nursing ration
2	Cereal crop pasture Mixture: 45% ground sorghum grain 55% ground alfalfa hay Lambs weaned (8 to 10 weeks of age)	Cereal crop pasture (standard nursing ration when necessary) until lambs are weaned—then maintenance ration
3	Mixture: 45% ground sorghum grain 55% ground alfalfa hay Lambs weaned (8 to 10 weeks of age)	Standard nursing ration until lambs are weaned, then maintenance ration
4	Mixture: 45% ground sorghum grain 55% ground alfalfa hay	Standard nursing ration
5	Standard ration ¹	Standard nursing ration
6	Standard ration ¹ + NH ₄ Cl—starting Dec. 10, ¼ oz. per head per day for each lamb 20 days of age or older	Standard nursing ration
7	High concentrate to lower concentrate ²	Standard nursing ration
8	Mixture: 65% ground sorghum grain 35% ground alfalfa hay	Standard nursing ration

3. High concentrate to lower concentrate:

	SBOM	Ground sorghum grain	Ground alfalfa
First 30 days on test	20	70	10
Second 30 days on test	15	60	25
Third 30 days on test	10	50	40
Ninety days to market	10	35	55

4. Whole sorghum grain, alfalfa hay free choice.

Ammonium chloride added to the ration at low levels, as for Lot 6 above, is recommended to prevent urinary calculi in feed lot lambs and steers by Dr. H. R. Crookshank of the USDA, ARS. Mixing that chemical, a fine salt, with whole grain has been a problem. Simply mixing ammonium chloride with whole dry grain allowed the ammonium chloride to "sift out" too rapidly. Mixing it with a small quantity of ground grain and placing the mixture over whole grain also let it "sift out." Sprinkling an aqueous solution of ammonium chloride on the grain has resulted in even distribution of the additive throughout the feed for uniform consumption.

Results and Discussion: This test will be concluded in 1965 and the results and summary will appear in the 1966 report.

Grazing Studies

Field grazing of forage-producing crops has been investigated to a limited extent.

Procedure: Cereal crops planted for pasture were on preirrigated land—a condition similar to summer fallow. Winter wheat, rye, and barley were planted in August for fall and winter grazing by ewes and lambs. Spring barley, winter wheat, and winter rye were planted in April for grazing in May and June by ewes only—during the flushing period and immediately after it.

Limited data were collected during the 1964-65 fall and winter grazing season on estimates of feed available per acre by weighing clippings. Clippings were taken from each plot when grazing began and the amount of dry matter per acre was computed.

Pounds of forage clippings per acre and grazing production are presented in the following table.

Crop	Date of clipping	Green forage wt. per acre, lbs.	Dry matter per acre, lbs.	Av. ewe and lamb grazing days per acre	Av. gain per ewe, lbs.
Will barley	11-11-64	18,068	4,580	533	3.2
Scout wheat	12-15-64	8,467	3,793	477	2.4
Balbo rye	1-6-64	4,082	3,463	— ¹	—

1. Grazing data not available.

Results and Discussion: Table 9 shows average amount of grazing produced by certain crops over a period of years. Each crop listed produced very good grazing results.

Table 9
Grazing production of various crops.

Crop	Planting time	No. of years in average	Season grazed	Av. grazing days per acre
Balbo winter rye	August	3	Fall	597 ewe
Balbo winter rye	August	3	Fall and winter	469 ewe and lamb
Mefmi winter barley	Early April	3	Late May through June	516 ewe
Otis spring barley	Early April	4	Late May to early June	484 ewe
Scout winter wheat	August	1	Fall	477 ewe and lamb ²
Will winter barley	August	1	Fall	533 ewe and lamb ²
Buffalograss ¹	(native)	2	Summer and fall	284 ewe

1. Taken from pasture which had been lightly grazed.

2. From Dec. 2, 1964, until lambs were weaned (at 8-10 weeks of age). Nursing ewes grazing cereal crop pasture (Lot 2) increased in weight 6.49 pounds while nursing ewes in dry lot lost weight (Lot 3: -1.31 pounds; Lot 4: -3.22 pounds). Lambs in all lots received the same creep ration.

The following are equations that might be used as "rules-of-thumb" to estimate potentials of cereal crop pasture or other pasture where the average number of grazing days per acre is available.

$$\frac{\text{No. of acres of pasture} \times \text{average grazing days per acre}}{\text{Grazing period (in days)}} = \text{number of ewes that can be grazed for the period}$$

$$\frac{\text{Grazing period (in days)} \times \text{no. of ewes in flock}}{\text{Average grazing days per acre}} = \text{acres of pasture required for flock for period}$$

$$\frac{\text{Acres of pasture available} \times \text{average grazing days per acre}}{\text{No. of ewes in flock}} = \text{period of grazing to expect}$$

Lamb Feeding Experiments, Garden City, 1964-1965.¹

C. S. Menzies, K.S.U., and A. B. Erhart, Garden City

Lamb and Pretest Treatment

Delivery of 601 finewool, wether feeder lambs was accepted at Menard, Texas, October 8, 1964. Average weight was 68.9 pounds; cost, \$19.25 per cwt. Lambs were shorn (average fleece weight, 3.2 pounds) and shipped 543 miles to Garden City on a triple-deck truck. They arrived October 9, a.m., weighing an average of 66.4 pounds. They were divided into groups of about 50 lambs and fed a ration of medium-quality alfalfa hay and chopped sorghum stubble until started on test.

Experimental Procedure

Half the lambs were vaccinated October 14 with *Clostridium perfringens* (type D) toxoid for enterotoxaemia. October 22 all lambs, except 50, were drenched with Thibenzole, weighed, implanted with 3 mgs. stilbestrol, and allotted with equal numbers of vaccinated and non-vaccinated lambs in each lot November 2.

Treatments for the 11 lots follow:

Lot no.	Treatment	How fed
1	Standard ration of sorghum silage, whole sorghum grain, .75 pound sun-cured alfalfa pellets, .10 pound C.S.M.	Hand
2	Sorghum silage in standard ration replaced by corn silage	Hand
3	Mixture of 35% whole sorghum grain and 65% sun-cured alfalfa pellets	Self
4	Pelleted ration of 35% sorghum grain and 65% sun-cured alfalfa	Self
5	Pelleted ration of 26% sorghum grain, 9% animal fat and 65% sun-cured alfalfa	Self
6	Pelleted ration of 32% sorghum grain, 3% animal fat and 65% sun-cured alfalfa	Self
7	Mixture of 35% whole sorghum grain and 65% dehydrated alfalfa pellets	Self
8	Ground mixed ration of 35% sorghum grain and 65% sun-cured alfalfa	Self
9	Pelleted high concentrate ration plus 9% animal fat. (See Table 1)	Self
10	Pelleted high concentrate ration—no added fat. (See Table 1)	Self
11	Same as Lot 4 (pelleted ration of 35% sorghum grain and 65% sun-cured alfalfa)—not drenched for internal parasites	Self

Lambs in Lots 9 and 10 were adjusted to the final rations over a 5-week period. Rations fed in Lots 9 and 10 by periods are listed in Table 1.

All other self-fed lambs received their rations from the start of the test. Those in Lots 1 and 2 were fed twice daily starting with 15 pounds whole sorghum grain, 18 pounds sun-cured alfalfa pellets and 2.5 pounds cottonseed meal poured on top and mixed with 75 pounds silage to each lot of 50 lambs per feeding. This amounted to a starting daily ration per lamb of .60 pound sorghum grain, .72 pound alfalfa, .10 pound cottonseed meal and 3 pounds silage. Amounts of cottonseed meal and alfalfa remained constant throughout the test. Sorghum grain was in-

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