

## Lamb Feeding Experiments, Garden City, 1965-66<sup>1</sup>

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### Lambs and Pretest Treatment

Lambs used were finewool wethers purchased from the Zuni Indian Reservation near Gallup, New Mexico. Average purchase weight of 699 head was 63.8 lbs.; cost was \$23.50 per cwt. plus 15 cents per head commission. Lambs were trucked to Garden City, arriving October 15. Shrinkage during shipment was 5.8 lbs. (9.10%). Chopped grain sorghum stubble and alfalfa hay were fed until lambs went on test.

### Experimental Procedure

November 1, 1965, lambs were randomly divided into 13 lots of 50 lambs each and started on the following rations:

<u>Lot No.</u>	<u>Treatment</u>	<u>How Fed</u>
1	Standard ration of sorghum silage, whole sorghum grain, .75 lb. dehydrated alfalfa pellets, .10 lb. C.S.M. (cottonseed meal)	Hand
2	Sorghum silage in standard ration replaced by corn silage.	Hand
3	Mixture of 35% whole sorghum grain and 65% dehydrated alfalfa pellets.	Self
4	Mixture of 35% whole sorghum grain, 32.5% dehydrated alfalfa pellets and 32.5% dehydrated sorghum stubble pellets.	Self
5	Mixture of 35% whole sorghum grain, 20% dehydrated alfalfa pellets and 45% dehydrated sorghum stubble pellets.	Self
6	Mixture fed to lot 5 ground and made into a 3/16" pellet.	Self
7	Mixture of 35% whole sorghum grain and 65% sun-cured alfalfa pellets	Self

1. Contribution No. 343, Department of Animal Husbandry, and No. 83, Garden City Branch Station, Kansas Agriculture Experiment Station, Kansas State University.

<u>Lot No.</u>	<u>Treatment</u>	<u>How Fed</u>
8	.10 lb. C.S.M. in standard ration (lot 1) replaced by .10 lb. of mixture of 13% urea and 87% ground sorghum grain (approximately equal to C.S.M. in crude protein).	Hand
9	.05 lb. C.S.M. in standard ration (lot 1) replaced by .05 lb. of mixture of 13% urea and 87% ground sorghum grain.	Hand
10	Ration fed to lot 8 plus 35 mg. copper sulfate per lamb per day.	Hand
11	Volunteer wheat pasture - irrigated.	Pasture
12	Drilled wheat pasture - irrigated.	Pasture
13	Alfalfa pasture - irrigated.	Pasture

All lambs were vaccinated by Dr. J.E. Dale with 5 cc. Clostridium perfringens Type D Bacterin October 28, and were re-vaccinated December 6, because of death losses from enterotoxemia. Each lamb was implanted in the lower jaw with a 3 mg. stilbestrol implant November 19. Half the lambs in each lot (25 head) were treated with 45 ml. of "Tiguvon" pour-on parasiticide at the start of the test. Internal parasite egg counts were made on fecal samples collected from lambs in lot 1 November 1, and again November 10.

The volunteer wheat pasture consisted of rank growth, irrigated volunteer Scout wheat. Irrigated drilled wheat was Scout seeded August 28 at 68 lbs. per acre. The irrigated alfalfa pasture (14 acres) was regrowth following last cutting September 23. It was estimated that alfalfa pasture that remained was equal to around 17,000 lbs. of hay. Because of snow and limited alfalfa pasture lambs on alfalfa were fed 1 lb. dehydrated alfalfa pellets per day the last 24 days on pasture and on January 11 (71 days after start of test) they were placed in dry lot and self-fed a mixture of approximately 40% whole sorghum grain and 60% dehydrated alfalfa pellets.

Final weights were taken February 11 after 102 days on test.

Table 40

Value of corn silage, sorghum silage, urea,  
cottonseed meal and copper sulfate in hand fed lamb rations  
November 1, 1965 to February 11, 1966 -- 102 days

Lot No.	2	1	9	8	10
Treatment	Corn silage C.S.M.	Sorg. silage C.S.M.	Sorg. silage $\frac{1}{2}$ C.S.M. $\frac{1}{2}$ Urea	Sorg. silage Urea	Sorg. silage Urea CuSO <sub>4</sub> <sup>1</sup>
No. lambs	48	48	42	49	46
Av. initial wt., lbs.	63.4	63.3	62.7	63.0	64.9
Av. final wt., lbs.	110.3	106.1	105.3	104.8	105.8
Av. total gain lbs.	46.9	42.8	42.6	41.8	40.9
Av. daily gain, lbs.	.460	.420	.418	.410	.401
Tiguvon <sup>2</sup>	.474	.432	.452	.383	.396
Control	.443	.408	.387	.438	.404
Daily feed/lamb, lbs.					
Sorghum grain	1.34	1.34	1.34	1.34	1.34
Sorghum silage		3.95	3.95	3.93	3.95
Corn silage	3.95				
Dehy. alf. pel.	.72	.72	.72	.72	.72
41% C.S.M.	.10	.10	.05		.10
Urea mix			.05	.10	
Copper sulfate					35 mg.
Salt	.027	.025	.022	.023	.024
Feed/cwt. gain, lbs.					
Sorghum grain	291.3	319.0	320.6	326.8	334.2
Sorghum silage		940.5	945.0	958.5	985.0
Corn silage	858.7				
Dehy. alf. pel.	156.5	171.4	172.2	175.6	179.6
41% C.S.M.	21.7	23.8	12.0		
Urea mix			12.0	24.4	24.9
Salt	5.9	6.0	5.3	5.6	6.0
Av. feed cost/cwt. gain	\$12.21	\$12.89	\$12.82	\$12.93	\$13.24
Av. feed cost/lamb	\$ 5.73	\$ 5.52	\$ 5.46	\$ 5.40	\$ 5.42
Av. cost/lamb on test <sup>3</sup>	\$17.02	\$17.00	\$16.83	\$16.91	\$17.42
Av. total cost/lamb	\$22.75	\$22.52	\$22.29	\$22.31	\$22.84
Av. total cost/cwt.	\$20.62	\$21.22	\$21.17	\$21.29	\$21.59

1. Copper Sulfate

2. 25 lambs in each lot treated with 45 ml. Tiguvon parasiticide poured on.

3. Includes cost of stilbestrol implants at 10 cents and enterotoxemia vaccination at 7 cents.

Table 41

Value of dehydrated alfalfa, suncured alfalfa and  
sorghum stubble pellets in self-fed rations.  
November 1, 1965 to February 11, 1966 -- 102 days

Lot No.	7	3	4	5	6
Treatment	Mix: 35% whole sorg. gr. 65% sun- cured alf. pel	Mix: 35% whole sorg. gr. 65% dehy. alf. pel.	Mix: 35% whole sorg. gr. 32.5% dehy. alf. pel. 32.5% milo stubb. pel.	Mix: 35% whole sorg. gr. 20% dehy. alf. pel. 45% milo stubb. pel.	Pelleted: 35% sorg. gr. 20% dehy. alf. 45% milo stub.
No. lambs	48	47	50	49	45
Av. initial wt., lbs.	64.4	63.7	62.6	64.8	64.4
Av. final wt., lbs.	112.2	109.9	103.2	100.9	94.2
Av. total gain, lbs.	47.8	46.2	40.6	36.1	29.8
Av. daily gain, lbs.	.469	.453	.398	.354	.292
Tiguvon <sup>1</sup>	.470	.450	.401	.368	.279
Control	.465	.456	.394	.341	.302
Daily feed/lamb lbs.					
Mix or pellets	4.06	3.52	3.65	3.42	2.93
Salt	.027	.017	.022	.033	.052
Feed/cwt. gain, lbs.					
Mix or pellets	865.7	777.0	917.1	966.1	1003.4
Salt	5.8	3.8	5.5	9.3	17.8
Av. feed cost/cwt. gain	\$15.04	\$14.26	\$15.65	\$16.04	\$20.26
Av. feed cost/lamb	\$ 7.19	\$ 6.59	\$ 6.35	\$ 5.79	\$ 6.04
Av. cost/lamb on test <sup>2</sup>	\$17.29	\$17.10	\$16.81	\$17.39	\$17.29
Av. total cost/lamb	\$24.48	\$23.69	\$23.16	\$23.18	\$23.33
Av. total cost/cwt.	\$21.82	\$21.56	\$22.44	\$22.97	\$24.77

1. 25 lambs in each lot treated with 45 ml. Tiguvon parasiticide poured on.

2. Includes cost of stilbestrol implants at 10 cents each and enterotoxemia vaccination at 7 cents.

Table 42

Drilled and volunteer wheat and  
alfalfa pastures as fattening lamb rations  
November 1, 1965 to February 11, 1966 -- 102 days<sup>1</sup>

Lot No.	11	12	13
Treatment	Volunteer Wheat Pasture	Drilled Wheat Pasture	Alfalfa Pasture
No. lambs	49	50	46
Av. initial wt., lbs.	62.7	63.5	65.3
Av. final wt., lbs.	93.3	96.0	104.3
Av. total gain, lbs.	30.6	32.5	39.0
Av. daily gain, lbs.	.300	.319	.382
1st 71 days, lbs. <sup>1</sup>	.318	.382	.362
last 31 days, lbs.	.258	.174	.429
Daily feed/lamb lbs.			
Dehy. alf. pellets <sup>2</sup>	.14	.09	.33
Mixed ration <sup>2</sup>			2.98
Salt	.015	.016	.018
Feed/cwt. gain, lbs.			
Dehy. alf. pel.	46.7	28.2	199.3
Sorghum grain			101.7
Salt	5.0	5.0	4.7
Av. feed cost/cwt. gain	\$ 4.27	\$ 3.72	\$ 9.95
Av. feed cost/lamb	\$ 1.31	\$ 1.21	\$ 3.88
Av. cost/lamb on test <sup>3</sup>	\$16.84	\$17.05	\$17.53
Av. total cost/lamb	\$18.15	\$18.26	\$21.41
Av. total cost/cwt.	\$19.45	\$19.02	\$20.53

1. Lambs in lot 13 were placed in drylot after 71 days and self-fed a mixed ration of 40% whole sorghum grain and 60% dehydrated alfalfa pellets.

2. Fed pellets only when snow covered pasture. Daily consumption of mixed ration fed lot 13 is based on 31-day feeding period. Supplemental dehydrated alfalfa pellet consumption based on the 71-day pasture period.

3. Includes cost of stilbestrol implants at 10 cents each and enterotoxemiz vaccination at 7 cents.

### Observations

Hand-fed silage rations produced considerably cheaper lamb gains than did self-fed complete pelleted rations or mixtures of whole sorghum grain and pelleted roughages. However, labor costs involved in feeding were omitted.

Corn silage produced both faster and cheaper gains than sorghum silage, even though valued at \$1 more per ton.

Lambs fed urea in place of half or all of the cottonseed meal performed equally as well as those fed supplemental cottonseed meal. The .10 lb. of urea mix or cottonseed meal supplied only approximately 10% of the crude protein in the ration. However, the sorghum grain, sorghum silage and dehydrated alfalfa supplied an estimated .32 lb. of crude protein and the National Research Council recommendations for an 80 lb. fattening lamb is only .35 lb. Adding copper sulfate to the urea ration produced no differences at the level fed.

A mixture of whole sorghum grain and sun-dried alfalfa pellets was more palatable and produced slightly faster gains than a similar mix containing sorghum grain and dehydrated alfalfa pellets. However, lambs fed dehydrated alfalfa pellets made considerably more efficient gains at less cost per unit gain. Replacing 50% or 70% of the dehydrated alfalfa pellets in the mixed ration with dehydrated sorghum stubble pellets (lots 4 and 5) reduced the rate of gain and increased both feed costs and amount of feed required to produce a unit of gain. Replacing 70% of the dehydrated alfalfa with dehydrated sorghum stubble in a complete pelleted ration (lot 6) gave even poorer results. This ration was so unpalatable that lambs ate about one half pound less feed per day. The poor feed efficiency and higher cost of processing resulted in highest feed cost per unit gain of all rations fed in this year's test.

Lambs grazed on wheat pasture gained more slowly than in past years. Results (reported in Table 42) indicate that rate of gain declined in the later part of the test, especially for lambs on drilled wheat pasture. Even so, wheat pasture produced cheap gains. Very few wheat pastured lambs were fat enough to market at the end of the test.

Alfalfa pasture produced gains as fast as most drylot rations. Figuring the gain produced on the 14 acres of alfalfa as 1250 lbs. and the value at \$27.00 per cwt., the pasture was worth \$337.50. The estimated 17,000 lbs. of hay would have been worth \$255 minus the cost of harvesting (at \$30 per ton). The alfalfa was quite green and had received only a light frost when lambs were first turned in, however, only one lamb died from bloat.



Tiguvon did not improve rate of gain. Considering lambs in all lots, control lambs gained an average of .404 lb. per day and the Tiguvon treated lambs gained .410 lb. per day. Worm egg counts on fecal samples obtained from lambs in lot 1 at the time of treatment and again 10 days later were: treated - 861 and 492, and control - 528 and 392. This compound is reportedly effective against head grubs (larvae of oestrus ovis fly), however, there was no evidence of such infestations in any of the lambs, so the compound could not be evaluated against head grubs.

Thirty-three lambs died during the tests; 16 from enterotoxemia, even though all lambs were vaccinated before being placed on test. Seven died from the disease after receiving a second vaccination. Urinary calculi caused death of 4 lambs. Others died of various causes. Heavy infestations of fringed tapeworms were reported in lambs posted by Dr. Dale.

#### Acknowledgments

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Archer-Daniels Midland, Holcomb, Kans. - milo stubble pellets and part of the dehydrated alfalfa pellets.  
Charles Pfizer and Company, Terre Haute, Ind. - stilbestrol implants.  
Chemagro Corporation, Kansas City, Mo. - Tiguvon.  
Corvel Inc., Omaha, Nebr. - enterotoxemia vaccine.  
Dr. J.E. Dale, Garden City, Kans. - veterinarian services  
Garden City Co-op. Equity Exchange, Garden City, Kans. - feed processing.

Table 43

Feed prices, processing charges, and miscellaneous costs for tests reported here were:

	<u>Per Ton</u>
Dehydrated alfalfa pellets	\$38.00
Suncured alfalfa pellets	35.00
Milo stubble pellets	30.00
Sorghum grain	34.00
Sorghum silage	7.00
Corn silage	8.00
Salt	22.00
41% cottonseed meal	72.00
Urea	128.00
Urea (13%) and gr. sorghum grain (87%) supplement	51.22

	<u>Per Lamb</u>
Pelleted ration of 35% sorghum grain, 20% dehy. alfalfa, 45% milo stubble	40.00
Grinding and mixing	5.00
Grinding and pelleting	7.00

	<u>Per Lamb</u>
Enterotoxemia vaccination	.07
3mg. stilbestrol implant	.10
Wheat or alfalfa pasture	.01 per day