

Table 39
Results of lamb-feeding tests during 1958-59, Kansas.

Lot number	7	9	10	2
Treatment ^{1, 2}	Control	Hygromycin	Tran-Q tranquilizer	Double drench
Number lambs per lot	50	50	50	50
Days on feed	108	108	108	108
Av. initial wt. per lamb, lbs.	75.8	75.4	76.0	75.4
Av. final wt. per lamb, lbs.	112.3	111.9	111.6	111.6
Av. total gain per lamb, lbs.	36.5	36.5	35.6	36.2
Av. daily gain per lamb, lbs.	.338	.338	.329	.335
No hormone	.291	.298	.273	.270
3-mg. stilbestrol implant	.386	.378	.386	.399
Daily feed per lamb:				
Whole grain sorghum	1.06	1.06	1.06	1.06
Sorghum silage	3.96	3.70	3.96	3.96
Alfalfa hay	.72	.72	.72	.72
Cottonseed meal	.10	.10	.10	.10
Salt	.023	.020	.024	.023
Hygromycin, mgs.		30		
Tran-Q activity, mgs.			2.5	
Av. lbs. feed per cwt. gain:				
Whole grain sorghum	312.7	313.0	321.1	316.3
Sorghum silage	1169.8	1093.1	1201.4	1183.2
Alfalfa hay	212.9	213.1	218.7	215.4
Cottonseed meal	29.3	29.3	30.1	29.6
Salt	6.8	6.0	7.3	6.8
Av. feed cost per cwt. gain ⁴	\$11.96	13.56	12.89	12.09
Av. feed cost per lamb ⁴	\$ 4.37	4.95	4.59	4.37
Cost per lamb per test				
(10-27-58) ⁵	\$16.23	16.11	16.27	16.17
Av. total cost per lamb ^{4, 5}	\$20.60	21.06	20.86	20.54
Av. total cost per cwt. ^{4, 5}	\$18.34	18.82	18.69	18.41
Lot	Jackpot	Jackpot ⁶		
Treatment	Control ³	Cobalt bullet ³		
Number of lambs per lot	15	15		
Days on feed	44	44		
Av. initial wt. per lamb, lbs.	84.8	84.8		
Av. final wt. per lamb, lbs.	98.3	101.0		
Av. total gain per lamb, lbs.	13.4	16.2		
Av. daily gain per lamb, lbs.	.306	.369		

1. Twenty-five lambs in each lot implanted with 3 mgs. stilbestrol.
2. Lambs in all lots except 9 were drenched with 6 cc. Trivermol at the beginning of test. Lambs in lot 2 received a second drench 16 days later.
3. Fifteen of 30 lambs in the "jackpot" lot were treated with one cobalt bullet per lamb, 12-30-58.
4. Includes cost of stilbestrol implants (\$0.09 per implant) hygromycin (\$0.67 per lamb) and Tran-Q (\$0.22 per lamb).
5. Includes cost of drench (\$0.03 per lamb per treatment).
6. Extra lambs not used in the regular feedlot and wheat pasture tests.

Table 40
Results of combination wheat pasture and feedlot tests.

Lot number	5	6
Treatment ^{1, 2}	Volunteer wheat pasture 64 days, then to feedlot for 44 days	Feedlot for 64 days, then to volunteer wheat pasture for 44 days
Number lambs per lot	50	48
Days on feed	108	108
Wheat pasture	64	64
Feedlot	44	44
Av. initial wt. per lamb, lbs.	75.4	75.3
Av. final wt. per lamb, lbs.	107.6	109.0
Av. total gain per lamb, lbs.	32.2	33.7
Av. daily gain per lamb, lb. (all lambs):	.298	.311
No hormone	.263	.263
3-mg. stilbestrol implant	.332	.360
Wheat pasture period (all lambs)	.258	.264
Feedlot period (all lambs)	.356	.344
Av. daily feed per lamb (feedlot):		
Whole grain sorghum	1.05	1.02
Sorghum silage	4.56	3.55
Alfalfa hay	.72	.72
Cottonseed meal	.10	.10
Salt	.024	.019
Av. daily feed per lamb (w. pasture):		
Whole grain sorghum	0	.43
Alfalfa hay	.15	.43
Salt	.012	.011
Av. lbs. feed per cwt. gain:		
Whole grain sorghum	143.7	250.0
Sorghum silage	623.4	685.3
Alfalfa hay	128.0	194.0
Cottonseed meal	13.4	18.7
Salt	5.5	5.1
Av. feed cost per cwt. gain ³	\$ 8.12	10.02
Av. feed cost per lamb ³	\$ 2.61	3.43
Cost per lamb on test, 10-27-58 ⁴	\$16.14	16.12
Number lambs died	0	2
Cost of lamb loss	\$ 0	.71
Av. total cost per lamb ^{3, 4, 5}	\$18.75	20.26
Av. total cost per cwt. ^{3, 4, 5}	\$17.43	18.59

1. Twenty-five lambs in each lot implanted with 3-mg. stilbestrol.
2. Because of poor pasture, lambs in lot 6 were fed grain sorghum and alfalfa hay during the 44 days they were on wheat pasture.
3. Includes cost of stilbestrol implants (\$0.09 per implant).
4. Includes cost of drench (\$0.03 per lamb per treatment).
5. Includes cost of lamb loss.

I. Concentrate:Roughage Ratios in Pelleted Rations for Fattening Lambs. II. 3-mg. Stilbestrol Implants for Lambs Fed Pelleted Rations. Project 236.

C. S. Menzies, D. Richardson, and R. F. Cox

A summary of three years' study of the relationship of physical balance to the utilization of pelleted and nonpelleted fattening lamb rations was reported in Circular 358. Results of this work indicated the following: (1) the optimum ratio in nonpelleted lamb-fattening rations was 45 percent concentrate to 55 percent roughage; (2) pelleted rations produced faster, more efficient gains than nonpelleted rations; (3) pelleted rations consisting of 40 percent concentrate and 60 percent roughage produced gains as fast and as efficiently as pelleted rations

of 50 percent concentrate and 50 percent roughage; and (4) field-cured alfalfa hay produced faster and more economical gains than dehydrated alfalfa when mixed and pelleted with a concentrate. This year's test was concerned primarily with finding the optimum concentrate to roughage ratio for pelleted lamb fattening rations and with determining the value of feeding loose hay with a complete pelleted ration for lambs. The value of 3-mg. stilbestrol implants also was studied.

Experimental Procedure

One hundred twenty Texas Rambouillet wether lambs were used. Lambs were shown before starting on test. Three weeks after arrival from the range they were weighed, divided into six lots of 20 lambs each and fed as follows:

Lot 1. Changing ratio: Lambs were started on a 20 percent sorghum grain and 80 percent alfalfa hay pellet. After three weeks they were changed to a 30 percent grain sorghum and 70 percent alfalfa hay pellet. After three more weeks they were changed to and finished on, a 40 percent grain sorghum and 60 percent alfalfa hay pellet.
Lot 2. 20 percent sorghum grain and 80 percent alfalfa hay pelleted.
Lot 3. 30 percent sorghum grain and 70 percent alfalfa hay pelleted.
Lot 4. 40 percent sorghum grain and 60 percent alfalfa hay pelleted.
Lot 5. 40 percent sorghum grain and 60 percent alfalfa hay, pelleted.
Lot 6. 50 percent sorghum grain and 50 percent alfalfa hay, pelleted.

Lambs in all lots, except those in lot 5, were fed 0.25 pound of chopped alfalfa hay per lamb per day. Pelleted rations were self-fed from the start. Half the lambs in each lot were implanted with 3 mgs. of stilbestrol 21 days after starting on test.

Alfalfa hay used in this test was good-quality hay cut from the same field as that which was pelleted. The sorghum grain was purchased in bulk from a Manhattan mill. The hay was ground through a $\frac{1}{4}$ -inch screen and the sorghum grain was coarsely ground. The hay and sorghum grain were mixed in the various ratios and steam pelleted into 3/16-inch pellets.

Feed prices and processing charges used in determining feed cost per cwt. grain were: ground sorghum grain, \$1.70 per cwt.; baled alfalfa hay, \$14 per ton; grinding hay for pellets, \$5 per ton; chopping hay that was fed loose, \$3 per ton; mixing, pelleting, and sacking, \$6 per ton. With these prices and charges the 20 percent sorghum grain and 80 percent alfalfa hay pellet cost \$28 per ton, the 30 percent sorghum grain and 70 percent alfalfa hay pellet, \$29.50 per ton; the 40 percent sorghum grain and 60 percent alfalfa hay pellet, \$31 per ton; and the 50 percent sorghum grain-50 percent alfalfa hay pellet, \$32.50 per ton.

Results and Discussion

The average daily gain, feed intake, feed consumed per cwt. gain, feed cost per cwt. gain, and carcass grades of the pellet study are shown in Table 41. Results of digestion trials using the rations fed in this test will be reported later. Results of the stilbestrol implant study are summarized in Table 42.

Lambs in all lots made good gains. Lamb gains were not made in relation to grain consumption. The daily grain consumption in pounds based on average pellet consumption for lots 1 through 6, respectively, was 1.20, 0.87, 1.37, 1.64, 1.78, and 1.95. Gains were more closely related to the total net energy consumption, using estimated net energy values for feeds fed as listed in Morrison's "Feeds and Feeding." However, this was not true in every case, as lambs in lot 3 consumed approximately the same estimated net energy as lambs in lot 5, yet lot 3 lambs gained considerably faster.

The pelleted ration fed to lot 3, consisting of 30 percent sorghum grain and 70 percent alfalfa hay, produced faster, more efficient, and cheaper gains than rations fed to the other lots. These results indicate that the concentrate-to-roughage ratio may affect the efficiency of pelleted rations. Results of a digestion study, conducted in connection with the feedlot test, have not been calculated.

There was little difference in rate of gain between lot 4, fed a 40

(60)

percent sorghum grain and 60 percent alfalfa hay pellet plus 0.25 pound of loose alfalfa hay, and lot 5, fed the same pelleted ration but no loose hay. Lambs in lots 4 and 6 consumed their loose hay more readily than those in lots 1, 2, and 3. Lambs in lot 2 quite often did not eat the stummy portion of the 0.25 pound loose hay supplied them.

There were some digestive disturbances in lot 6 at the start of the test. Several lambs went off feed and became stiff. One lamb in lot 4 also went off feed at the first of the test. The lambs were not vaccinated for enterotoxemia. No death loss occurred.

No ill effects due to the pelleted nature of the ration were noted. Stomachs from all lambs in lots 2, 5, and 6 and a few from the other three lots were obtained at the packing plant. The mucus membrane lining the rumen and reticulum appeared normal in all cases.

There was little difference in the USDA carcass grades of the lambs fed the different rations. Lambs implanted with 3 mgs. of stilbestrol gained considerably faster than those not implanted. Feed efficiency could not be calculated, as implanted and nonimplanted lambs were fed together. There was no relationship between ration and lamb response to stilbestrol. Implanted lambs graded about the same as nonimplanted lambs.

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Table 41
Concentrate-to-roughage ratios in pelleted rations for fattening lambs, Kansas, 1958-59.
 November 5, 1958, to January 6, 1959—62 days.

Lot number	1	2	3	4	5	6
Ration fed ^{1 2 3}	Changing ratio ⁴	20% sorghum grain, 80% field-cured alfalfa hay	30% sorghum grain, 70% field-cured alfalfa hay	40% sorghum grain, 60% field-cured alfalfa hay	40% sorghum grain, 60% field-cured alfalfa hay	50% sorghum grain, 50% field-cured alfalfa hay
Number lambs per lot	20	20	20	20	20	20
Days on feed	62	62	62	62	62	62
Initial wt. per lamb, lbs.	73.5	73.1	74.2	73.2	74.9	74.7
Final wt. per lamb, lbs.	108.6	107.5	119.9	112.5	112.7	110.7
Total gain per lamb, lbs.	35.1	34.5	45.7	39.3	37.8	36.0
Av. daily gain per lamb, lbs. ....	.565	.556	.737	.634	.610	.580
No. hormone implant ⁵ .....	.422	.461	.602	.537	.520	.473
3-mg. stilbestrol implant ⁵ .....	.661	.615	.788	.673	.641	.620
Lbs. feed per lamb daily:						
Pellet	4.28	4.33	4.57	4.10	4.44	3.69
Chopped alfalfa hay .....	.24	.24	.24	.24		.24
Total feed	4.52	4.57	4.81	4.34	4.44	3.93
Lbs. feed per cwt. gain:						
Pellet	757.2	779.1	620.2	647.3	728.7	635.6
Chopped alfalfa hay	42.8	43.5	32.8	38.2		41.7
Total feed	800.0	822.6	653.0	685.5	728.7	677.3
Feed cost per cwt. gain	\$11.55	11.28	9.43	10.36	11.29	10.68
Av. USDA carcass grade ⁶	7.4	7.1	7.5	7.6	7.9	7.7

1. Ten lambs in each lot were implanted with 3 mgs. stilbestrol 21 days after the lambs went on test.
2. Pelleted rations were fed free choice from the beginning of the test.
3. Lambs in all lots except No. 5 received approximately 0.25 pound chopped alfalfa per lamb per day in addition to the pelleted rations.
4. Received a pellet consisting of 20% sorghum grain, 80% alfalfa hay for the first 21 days; then changed to a 30% sorghum grain-70% alfalfa hay pellet for the next 21 days; and for the last 20 days received a 40% sorghum grain-60% alfalfa hay pellet.
5. Figured for a 41-day period.
6. USDA grade was based on prime, 14; choice, 11; good, 8; utility, 5; and cull, 2.

Table 42
Three mgs. stilbestrol implants for fattening lambs fed pelleted rations.¹
 November 26, 1958, to January 6, 1959—41 days.

	Number lambs	Days on test	Initial wt. per lamb, lbs.	Final wt. per lamb, lbs.	Total gain per lamb, lbs.	Av. daily gain per lamb, lbs.	Av. USDA carcass grade ²
No implant	60	41	88.3	108.9	20.6	.502	7.6
3 mgs. stilbestrol implant	60	41	87.7	115.0	27.3	.666	7.4

1. Ten lambs in each of the six lots listed in Table 41 were implanted with 3 mgs. stilbestrol 21 days after the pelleted ration test began.
2. USDA grade was based on prime, 14; choice, 11; good, 8; utility, 5; and cull, 2.

Table 43
Chemical analysis¹ of feeds used in Garden City lamb feeding trials, 1958-59.

Sample	% dry matter	% moisture	% ash	% ether extract	% crude fiber	% protein	% N.F.E.
1. Irrigated wheat	25.79	74.21	3.62	0.83	4.94	7.39	9.01
2. Dryland wheat	30.65	69.35	3.45	1.14	5.36	7.76	12.94
3. Sorghum silage	27.51	72.49	2.08	0.51	8.00	1.44	15.48
4. Alfalfa hay	88.36	11.64	9.63	1.37	26.82	17.56	32.98
5. R.S. Milo 650	90.98	9.02	1.58	2.81	3.04	9.95	73.60
6. Westland milo	91.22	8.78	1.72	2.86	3.77	8.19	74.68

1. On an as-fed basis.

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(63)

Kansas Swine Improvement Association Testing Facility

The swine testing station was built and put into operation during the past year. The facilities are located on Kansas State University property about three miles northwest of the Animal Industries building. Members of the Animal Husbandry Department staff are managing the station and providing necessary technical assistance.

The station was entirely built and paid for by private funds contributed to the Kansas Swine Improvement Association. Swine producers, feed companies, equipment manufacturers, banks, cooperative associations, market foundations and other interested individuals and firms cooperated in making construction of the station possible. As it stands today the station represents approximately \$8,000 in cash contributions, plus approximately \$4,000 in donated equipment and building materials.

Thirty-seven of the forty pens were filled in the first test, which was completed in March, 1959. In the first test average feed efficiency for all boars completing the test was 305 pounds of feed per 100 pounds of gain, with a high of 344 pounds and a low of 270 pounds. Average daily gain was 1.98 pounds per day with a high of 2.54 pounds and a low of 1.55 pounds per day. And average backfat thickness of the boars was 1.09 inches with a high of 1.61 inches and a low of 0.68 inch.

All boars with an overall index of 100.0 or more were offered in the sale on March 28, 1959. The 66 boars sold for an average price of \$158.02 with a top of \$550.

The second test is under way and every pen has been reserved. The next sale of tested boars will be sometime late in August.

Feed Prices Used in Beef Cattle Tests¹

	1957-58	1958-59
Sorghum grain, cwt., ground	\$ 2.00	\$ 2.10
Sorghum grain pellets, cwt.		2.25
Corn, cwt., ground	2.30	2.25
Soybean meal, ton	67.00	80.00
Alfalfa hay, ton	16.00	11.00
Alfalfa hay pellets, ton		23.00
Prairie hay, ton	14.00	11.50
Wheat straw, ton	12.00	11.00
Molasses, ton	40.00	40.00
Urea molasses, ton	80.00	80.00
Ammoniated blackstrap molasses, ton	45.00	45.00
Forage sorghum silage, ton		5.00
Dehydrated forage sorghum pellets, ton (est.) (grinding and pelleting—\$12, dehydrating—\$8, silage—\$5)		25.00
Grain sorghum silage, ton		10.00
Dehydrated grain sorghum pellets, ton (\$30, processing)		50.00
Bluestem pasture, summer, per head:		
Yearling	16.00	14.00
Two-year-old	20.00	18.00
Bluestem pasture, winter, per head per month:		
Calf .....	.50	.50
Yearling .....	.75	.75
Salt, cwt.	1.20	1.10
Ground limestone, cwt.	1.00	1.00
Bonemeal	6.00	6.15
Aurofac 2A, per pound .....	.60	.60
Stilbestrol implants .....	.09	.09
Tran-Q, per gram of tranquilizer .....		.80

1. The prices reported here were used in calculating beef cattle feed costs unless otherwise stated in individual reports.