

Table 1
Uncorrected¹ data for 1962-63 lambs sired by 8 Suffolk rams.

Ram no.	1	2	3	4	5	6	7	8
Wt. of rams	197	178	317	192	150	206	257	138
No. of lambs	15	10	14	9	9	12	14	11
Av. days age at slaughter	148.8	150.4	140.3	134.7	143.0	146.7	137.8	127.4
Av. slaughter wt., lbs.	94.9	95.8	97.3	94.2	96.1	96.8	96.4	97.0
Av. loin eye area	2.17	2.25	2.26	2.19	2.29	2.27	2.14	2.19

1. Not corrected for sex or type of birth.

Table 2
Performance data on Hampshire rams tested during 1963-64.

Ram	Date of birth	Birth wt., lbs., type of birth	Lbs. gain 60-188 6/3-9/3	Lbs. feed per cwt. gain	Lbs. gain 37-127/10	Lbs. gain 90 days 12-10-8/10	Lbs. feed per cwt. gain	Wt. 2/10, lbs.	Wt. per day age, lbs.
Abbott 515 ¹	1-15-63	138	35	1011.4	38				
Abtschwede 12	1-19-63	118	35	1005.1	30	42	1309.5	209	.50
Cox 1698	2-7-63	11.3T	53	644.9	30	33	1396.9	191	.48
Eberle 521	1-11-63	118	34	1041.2	33	33	1542.4	188	.44
Eberle 530	2-13-63	138	45	702.0	33	46	1080.4	191	.49
Gilmore 6323	3-15-63	148	41	847.3	32	53	1063.8	215	.60
K.S.U. 6312	1-16-63	7.8T	40	\$16.2	27	48	1141.7	209	.50
K.S.U. 6328	2-4-63	11.58	41	866.2	38	42	1569.0	215	.54
Newell 214	1-19-63	10T/8	47	771.3	32	40	1257.5	214	.52
McCosh 339	1-29-63	138	33	829.2	38	57	978.9	223	.55
McCosh 378	3-4-63	118	40	990.9	41	74	1032.4	233	.63

1. S = single; T = twin, and T/S means born twin, raised single.

2. Died from obstructed intestine 1-1-64.

Animal Fat in Fattening Lamb Rations

C. S. Menzies

Animal fats often are added in small amounts (1-2%) to mixed commercial feeds primarily to reduce dustiness and to lubricate machinery. High-energy poultry rations often contain higher levels of animal fat. This test was conducted to obtain more information on fat's value when added to fattening lamb rations.

Experimental Procedure

Forty-two weaned ewe and wether Rambouillet and Suffolk x Rambouillet crossbred lambs were sheared and divided into two lots. Lambs were self-fed 3/16" pelleted rations. The ration fed Lot 1 consisted of 35% sorghum grain, 45% alfalfa hay, 10% soybean meal, and 10% stabilized animal fat. Lot 2 was fed a ration containing 45% sorghum grain, 45% alfalfa hay, and 10% soybean meal. Fat used was chiefly beef tallow rendered by the meats division of the Animal Husbandry Department. It had been stabilized by adding an antioxidant. Pellets were made by the University feed mill.

There was considerable variation in age and weight (22 pounds to 90 pounds) of lambs at the beginning of the test, June 12. Twenty-three lambs were marketed July 8 after 25 days on feed. Remaining lambs were fed until July 13.

Results and Discussion

Results are presented in Table 3. Lambs fed the ration containing fat ate less, gained just as fast as control lambs, and consequently made more efficient gains (21% less feed required per cwt. gain). There were no digestive disturbances due to added fat. However, this was a very short-term feeding trial (28 days).

Table 3
Results from adding animal fat to lamb fattening rations.

Treatment	10% fat	Control
Days on feed	28.1	28.4
No. of lambs	21	21
Av. initial wt., lbs.	63.1	64.7
Av. final wt., lbs.	76.7	78.1
Av. total gain, lbs.	13.6	13.4
Av. daily gain, lbs.	.482	.471
Daily feed per lamb, lbs.	2.53	3.14
Av. feed per cwt. gain, lbs.	524.6	666.2
Av. feed cost per cwt. gain ¹	\$12.06	\$12.46

1. Feed prices used were: ground sorghum grain, \$1.75 per cwt.; animal fat, 6¢ per lb.; ground alfalfa hay, \$25 per ton; and soybean meal, \$74 per ton. Mixing and pelleting cost, \$3 per ton. With these charges the control pellet cost \$37.40 per ton and the pellet containing 10% fat, \$45.90 per ton.

Effects of Heating and Pelleting of Rations and of Hay Particle Size on Lamb Performance and Ratio of Ruminal VFA (Project 236).

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Recent research indicates that heat treatment of concentrates and roughages and particle size of feed ingredients may affect cattle and sheep feedlot performance by changing the ratio of acetic and propionic acids produced in the rumen. Previous work at this station showed that pelleting complete lamb rations increased gain and improved feed efficiency. Both increased feed consumption of pelleted rations and improved performance from pelleting, with feed consumption nearly equal, resulted

(Kansas Agr. Exp. Sta. Cir. 358). This test was designed to determine the effect of (1) heating grain or roughages, (2) pelleting, and (3) particle size of hay on lamb performance and ratio of acetic, propionic, and butyric acids in rumen contents.

Experimental Procedure

Fine wool ewe and wether feeder lambs produced February 4, 1963, were used. They were drenched for internal parasites and vaccinated for enterotoxemia soon after arrival, and implanted with 3 mgs. stilbestrol,² weighed and divided into 12 lots of 9 lambs per lot February 18 on the basis of sex and weight, and fed the following rations:

Lots 1 and 2—55% ground alfalfa hay, 35% ground sorghum grain, and 10% molasses.

Lots 3 and 4—55% ground alfalfa hay, heated to 180° F., 35% ground sorghum grain, and 10% molasses.

Lots 5 and 6—55% ground alfalfa hay, 35% ground sorghum grain heated to 180° F., and 10% molasses.

Lots 7 and 8—Pelleted ration of 55% ground alfalfa hay, 35% ground sorghum grain, and 10% molasses.

Lots 9 and 10—Pelleted and then reground ration of 55% ground alfalfa hay, 35% ground sorghum grain, and 10% molasses.

Lots 11 and 12—55% fine ground alfalfa hay, 35% ground sorghum grain, and 10% molasses.

One lot of lambs on each of the six basic rations was self-fed and the other was hand-fed twice daily. Hand-fed lambs were fed the amount of feed consumed by the hand-fed lot eating the least amount of feed. Salt was supplied free choice to all lots.

Particle size of hay in rations fed all lots except 11 and 12 was equal to a 1/8-inch grind. Feed for Lots 11 and 12 was ground through a 1/16-inch screen.

Feed ingredients in the pelleted rations or pelleted and reground rations were heated to 180° F. in the pelleting process. This was the same temperature used for the other heated feeds.

Approximately five weeks after starting lambs on test, rumen samples were obtained by means of a stomach tube and vacuum pump. Samples were taken in the early afternoon and frozen until analyzed for total acid and for acetic, propionic, and butyric acids by column chromatography.

Results and Discussion

Results are reported in Table 4.

Self-fed lambs ate more feed and made highly significant ($p < .01$) faster gains than hand-fed lambs. Efficiency of gain, however, was not necessarily correlated with rate of gain. Carcasses from self-fed lambs graded approximately one-third grade higher than hand-fed carcasses.

There was no significant difference in rate of gain due to ration treatment. However, hand-fed lambs in Lots 7 and 9 fed the reground pelleted ration and the pelleted ration made faster, more efficient gains than other hand-fed lots. Self-fed lambs fed these two rations also made very efficient gains.

Ration preparation had no significant effect on ratio of acetic and propionic acids in rumen samples. However, butyric acid concentration was increased ($p < .01$) by heating either hay (Lots 3 and 4) or grain (Lots 5 and 6). Butyric acid also tended to be higher in Lot 6 fed the fine ground alfalfa hay. It is also evident that rumen samples from hand-fed lambs contained higher total VFA mm. per 100 ml. than those from self-fed lambs. Time of sampling after feeding possibly affected this.

² Supplied by Chas. Pfizer and Co., Inc., Terre Haute, Ind.

Table 4
Lamb performance and proportions of VFA and total VFA in rumen samples, February 18, 1963, to May 6, 1963—77 days.

	No. lambs	Av. daily gain, lbs.	Daily feed per lamb, lbs.	Feed per cent. water, lb.	Av. carcass grade	Molar % VFA			Total VFA mm./100 ml.
						Acetic	Propionic	Butyric	
Control									
1 hand-fed	9	.471	3.49	741.0	9.0	65.0	20.6	14.3	11.2
2 self-fed	9	.579	4.19	723.7	10.0	64.1	20.2	14.1	9.4
Hay heated									
3 hand-fed	9	.438	3.49	796.8	9.1	65.5	17.7	16.7	8.9
4 self-fed	9	.568	4.24	746.5	10.5	65.2	18.3	16.5	11.6
Grain heated									
5 hand-fed	9	.469	3.49	744.1	8.9	65.2	17.6	17.3	8.6
6 self-fed	9	.573	4.72	823.7	9.7	67.3	17.5	14.8	7.5
Pelleted and reground									
7 hand-fed	8	.573	3.48	607.3	9.1	67.0	19.0	14.1	12.6
8 self-fed	9	.588	4.07	652.2	9.8	66.6	18.8	15.1	8.3
Pelleted									
9 hand-fed	9	.516	3.42	662.8	9.6	66.2	19.4	14.3	14.6
10 self-fed	9	.622	4.02	646.3	10.2	65.1	21.2	13.7	7.4
Fine ground hay									
11 hand-fed	9	.461	3.43	744.0	9.3	66.9	17.4	15.7	12.9
12 self-fed	9	.545	4.14	759.6	9.7	64.8	18.6	16.6	9.0

1. USDA carcass grade based on prime, 14; choice, 13; good, 8; utility, 6; and cutt., 5.