Table 34

Preliminary 1960-61 data on ten yearling Hampshire rams and their lambs as of March 9, 1961.

Ram number	1	2	3	4	5	6	7	8	9	10
Ram type score[1]	80	78.8	71.6	92.1	78.8	82.3	86.8	86.8	78.3	60.0
Wt. of ram, lbs. 9-2-60	198	161	163	270	189	229	224	222	170	147
Ram probe fat depth at 2nd lumbar, in.	.30	.40	.40	.35	.30	.40	.30	.20	.30	.20
Ram probe loin eye depth at 2nd lumbar, in.	1.75	1.60	1.40	2.15	1.60	1.50	1.90	2.10	1.70	1.20
Ram loin eye depth per cwt., in.	.92	.99	.85	.92	.84	.65	.84	.94	1.00	.816
Total number of lambs	12	11	13	10	10	8	7	12	11	10
Number twin lambs	6	4	6	4	2	2	2	6	4	2
Av. birth wt., lbs.[2]	10.8	9.2	9.0	10.7	9.9	10.6	10.4	9.6	10.0	8.9
Av. daily gain, lbs.[2]	.786	.762	.801	.819	.773	.785	.756	.823	.755	.761

1. Average general type score, with perfect score, equals 100.
2. Not corrected for sex or type of birth.

gether. Preliminary data on rams used in 1960-61 and on their lambs are reported in Table 34. There was considerable variation among rams in regard to type score, weight, probe fat depth, and probe loin eye depth. Lamb birth weight and gain differ; however, these have not been corrected for type of birth or sex.

A more complete report on the 1960-61 lambs will be made in the 1962 Feeders' Day Report.

Effects of Exercise and Cooling on Reproductive Efficiency of Ewes Bred During Summer Months (Project 441).

H. G. Spies, C. S. Menzies, W. H. Smith, and S. P. Scott

Failure of ewes to conceive during summer is one of the biggest problems affecting the early spring lamb producer. Workers at other stations have reported that 90° F. temperatures lowered reproductive performance. This study was designed to determine the effects of forced exercise and temperature on reproductive performance of ewes.

Experimental Procedure

Forty-eight five- to six-year-old western ewes of Rambouillet breeding were sheared, drenched, and grazed on brome pasture plus ½ pound of grain per head daily until they were placed in either an air-conditoned room or a control pen. Each group was fed equal quantities of grain and hay during the treatment period. Twenty-four were maintained under a confined, but otherwise normal, outdoor environment and 24 were placed in a temperature-controlled room (60-64° F.) on the seventh day of the first detected estrous cycle until day 3 or 25 of pregnancy. Twelve ewes of each group were exercised on a mechanical exerciser for 30 minutes each day from day 10 of the first detected estrous cycle until day 3 or 20 of pregnancy. Exercised ewes walked about 1.4 miles each day. Two Hampshire rams were used to breed each ewe, on the second detected estrus (first estrus of the experimental period). Rams were kept in a cooled room prior to and throughout the breeding season. Twenty-four ewes (6 exercised and cooled, 6 exercised and not cooled, 6 not exercised and cooled, and 6 not exercised and not cooled) were slaughtered at day 3 of gestation, and 24 ewes given similar treatments were allowed to lamb.

Results and Discussion

Summer temperature, although mild in 1960 (average temperature 77° F. with a range of 48-99° F.) appeared to be detrimental to reproductive efficiency of western ewes. The number of normally cleaved ova at the third day of gestation was lower in noncooled ewes than in cooled ewes (57% vs. 80%). Also the number of ewes returning to heat following breeding and the number of services per conception was higher in the noncooled ewes (50% vs. 0% and 1.8% vs. 1.0%, respectively; see Table 35). Body temperature and respiration rate were used as indicators of physiological stress. Average body temperature and respiration rate of cooled ewes were 102.4° F. and 33.4 respirations per minute compared with 102.5° F. and 64.8 respirations per minute, for the noncooled ewes. Although these differences are not so great as some workers have reported, they were significant. Forced exercise resulted in significantly lower numbers of normal ova at three days postbreeding compared with nonexercise (57% vs. 80%; Table 35). However, since there were no differences in the number of ewes returning to heat between exercised and nonexercised groups (17% compared with 17%; Table 35), the effect of 30 minutes of exercise daily on reproductive efficiency may be questioned. More study is needed before definite conclusions are drawn. The exercised ewes were placed under some physiological stress as indicated by comparisons of body temperature and respiration rate. Exercise caused an average increase of 1.6° F. in body temperature and 79 respirations per minute. Ewes' body temperature and respiration rate returned to normal within one day.

Table 35

The effects of cooling and exercising on fertilization and conception rate.

Treatment group[1]	Fertilization rate %	Ewes returning to heat %	Services per conception for 24 ewes lambing
Cooled	80	0	1.0
Noncooled	57[2]	50[2]	1.8[2]
Exercised	57[3]	17	1.4
Nonexercised	80	17	1.4

1. Each of the four treatment groups contained 12 ewes.
2. Significantly different from the cooled ewes.
3. Significantly lower than the nonexercised group.

Garden City Lamb Feeding Experiments, 1960-61 (Project G.C. 111).

Carl Menzies and A. B. Erhart

Lambs

The 600 head of Rambouillet wether feeder lambs used in these tests were received at Menard, Texas, October 10, 1960. They were sorted from 1100 wether lambs raised by Page Brothers of El Dorado, Texas. Average purchase weight was 75.1 pounds. Purchase price was $14.50 per cwt. The lambs were sheared at Menard, averaging 3.9 pounds of wool that sold for 41½¢ per pound. Lambs weighed 62.7 pounds off trucks at Garden City October 12. Total trucking cost was $482.40.

General Procedure

During the pre-test period, chopped alfalfa hay and sorghum silage were fed. All lambs were drenched with 7 cc. of trivermol October 31. Lambs were weighed, ear tagged, implanted with 3 mgs. stilbestrol, lotted, and started on test November 1. Final weights were taken January 28, 1961, after 88 days on test.

Comparisons of sorghum, corn, and grain sorghum silages were made between lots 2, 3, 10, 11, and 12. Lambs were fed all the silage they would consume. Lambs in lot 10 did not receive additional grain above that supplied in the silage. Those in lots 11 and 12 were fed sorghum grain after 60 days on test.

The grain sorghum silage was made from sorghum hybrid RS610 grown on winter-irrigated land. It produced about 5 tons of silage per acre with 50 bus. of grain. Forage sorghum silage consisted of two hybrids grown on winter-irrigated land. They made about 7½ tons per acre which contained 45 to 50 bus. of grain. The corn silage was hybrid 904W grown under full irrigation. It produced 21 tons per acre with an estimated yield of 80 bus. of grain per acre.

Whole sorghum grain, whole barley, ground pelleted sorghum grain, ground pelleted barley, or a mixture of ½ barley and ½ sorghum grain was fed as carbonaceous concentrates in lots 2, 9, 5, 6, and 8 respectively. All 5 lots received equal levels of grain, protein supplement, and alfalfa hay. Lambs were fed all the sorghum silage they would consume.

Lambs in lot 1 were self-fed a complete pelleted ration of 35% sorghum grain and 65% alfalfa hay. A mixed self-fed ration consisting of a whole sorghum grain and dehydrated alfalfa pellets was fed to lot 7. A ration of 25% grain and 75% alfalfa pellets was fed at the start of the test. The grain was gradually increased over about a 50-day period to a ration of 45% grain and 55% alfalfa pellets. Alfalfa straw was supplied free choice to lots 1 and 7.

One half pound dehydrated alfalfa pellets was substituted for ¾ pound alfalfa hay in lot 4.

Lambs in lot 13 were grazed on volunteer wheat pasture.

One half the lambs in each lot were given a 5-gm. cobalt bullet each that contained 90% cobalt oxide.

Table 36

Sorghum, corn, and grain sorghum silages compared for fattening lambs.

Lot number	2	3	10	11	12
Treatment	Sorghum silage	Corn silage	Grain sorghum silage, no sorghum grain	Grain sorghum silage, sorghum grain after 60 days on test	Corn silage, sorghum grain after 60 days on test
Number of lambs	44	43	44	44	43
Days on feed	88	88	88	88	88
Av. initial wt., lbs.	72.9	74.0	72.5	72.1	72.7
Av. final wt., lbs.	109.0	113.5	104.3	107.7	102.0
Av. total gain, lbs.	36.1	39.5	31.8	35.6	29.3
Av. daily gain, lb.:	.410	.449	.361	.404	.333
No cobalt	.391	.455	.364	.415	.327
Cobalt	.430	.443	.357	.395	.339
Daily feed per lamb, lbs.:					
Whole sorghum grain	1.31	1.31	.....	.40[3]	.40[3]
Alfalfa hay	.74	.74	.74	.74	.74
Forage sorghum silage	3.81	.....	.....	.....	.....
Grain sorghum silage	.....	.....	5.32	5.11	.....
Corn silage	.....	4.43	.....	.....	5.39
Cottonseed meal	.10	.10	.10	.10	.10
Salt	.020	.022	.024	.017	.015
Av. lbs. feed per cwt. gain:					
Whole sorghum grain	319.3	291.5	.....	98.3	119.2
Alfalfa hay	180.7	165.0	205.3	183.4	222.5
Forage sorghum silage	928.5	.....	.....	.....	.....
Grain sorghum silage	.....	.....	1472.3	1264.3	.....
Corn silage	.....	986.0	.....	.....	1617.7
Cottonseed meal	24.4	22.3	27.7	24.8	30.0
Salt	4.8	4.9	6.6	4.2	4.5
Av. feed cost per cwt. gain[1]	$10.25	$10.10	$10.75	$10.56	$11.23
Av. feed cost per lamb[1]	$ 3.70	$ 3.99	$ 3.42	$ 3.76	$ 3.29
Cost per lamb start of test	$10.69	$10.85	$10.63	$10.57	$10.66
Av. total cost per lamb[1 2]	$14.39	$14.84	$14.05	$14.33	$13.95
Av. total cost per cwt.[1 2]	$13.20	$13.07	$13.47	$13.31	$13.68

1. Includes cost of stilbestrol implant @ 9¢ but does not include cost of drench or cobalt bullets.
2. Does not include cost of lamb loss.
3. Grain consumption given as an average over the 88-day test, but no grain was feed for first 60 days.