

**Table 10.—Shrink in transit and carcass grades of hormone-treated lambs and untreated lambs.**

Treatment	Number of lambs	% Shrink—Garden City to Manhattan	Carcass grades*					
			C	C-	G+	G	G-	U+
Controls—no treatment ....	10	4.67		4	6			
6 mg. stilbestrol implants ..	10	4.54	2	4	4			
Estradiol-progesterone implants .....	10	5.75			4	5		1
Stilbestrol in the feed (2 mg. daily) .....	10	5.11		3	3	4		

\* C = choice, G = good, U = utility.

#### Observations

In the 1953-54 tests, feeder lambs given either stilbestrol implants or stilbestrol-progesterone implants made larger gains in the feed lot than lambs receiving a similar ration, but receiving no hormone treatment. The hormone-treated lambs, however, yielded between 3.5 and 4.0 percent less than the controls when slaughtered, and the hormone lambs graded nearly a full grade less than the untreated lambs.

The untreated lambs and those receiving the 6 mg. stilbestrol implants in the 1954-55 tests were graded higher on foot than either the lambs receiving stilbestrol in their feed, or those receiving the estradiol-progesterone pellet implants. The lambs receiving the hormones carried their tails higher and some swelling was evident in their rectal region. The swellings were particularly evident in lambs receiving the estradiol-progesterone implants, and some lambs were showing considerable discomfort at the end of the 105-day feeding period.

Based on a sample of 10 lambs from each of the four groups, shrinkage in transit was less on the untreated lambs and those receiving the 6 mg. stilbestrol implants. These lambs also had higher grading carcasses. The estradiol-progesterone treated lambs graded the lowest and had watery, slimy carcasses that failed to harden in the cooler.

Detailed slaughter and carcass studies of hormone-implanted lambs and untreated lambs in the 1953-54 tests showed that the untreated lambs yielded and graded higher with a larger proportion of fat and a lower proportion of bone than the lambs receiving the hormone implants. The hormone-treated lambs had larger livers, kidneys, and hearts and had a greater blood weight than the control lambs.

Cooking and palatability tests did not indicate any consistent differences in cooking losses, palatability, tenderness, or juiciness between the control and treated lambs.

A chemical analysis of the rib eyes, other lean, and fat from rib cuts showed that the hormone-treated lambs had a higher percentage of moisture in all three portions, and had a lower percentage of ether extract or fat.

The hormones, either as implants or given in the feed, have increased the size of the organs of the urogenital systems of wether lambs. Previous work showed that the stimulated growth of the Cowper's glands and of the prostate and urethra may block the urethral passage and cause lethal complications.

The increase in size of the organs is generally associated with the size of the dosage. Inclusion of progesterone in the pellet implant does not prevent the growth stimulation. Differences in the urogenital systems of female lambs given the hormones in the feed or as implants are not so apparent as those shown by the wether lambs. The bladders of the treated ewe lambs are larger than those from untreated lambs. Larger pellet implants of stilbestrol and the implants containing both stilbestrol and progesterone apparently inhibited follicle development in the ovaries.

### The Relationship of Physical Balance in the Utilization of Pelleted and Non-pelleted Rations for Lambs.

#### PROJECT 236

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This project was designed to study the difference between pelleted and non-pelleted rations of different concentrations. Many commercial lamb feeders are pelleting the entire ration and believe it is superior to the same ration hand-fed. At the present time, the extra cost of pelleting varies from \$8-\$12 per ton. This test and others are designed to determine whether there is enough additional gain in weight and feed efficiency to warrant the use of pelleted rations, and to determine the most desirable ratio of roughage to concentrate.

#### Experimental Procedure

Seventy-nine black-faced feeder lambs were used in this study. The lambs were purchased at the Kansas City stock yards and weighed approximately 75 pounds each when purchased. The lambs arrived at the Kansas State College station in early October and were placed in dry lot on arrival. They were fed prairie hay three days and then changed to alfalfa hay. Small amounts of cracked corn were added until the lambs were approximately on full feed. The top 16 lambs by weight were separated and used for digestibility trials corresponding to the same rations used for the feeding tests. The lambs in the remaining group were weighed and lotted randomly into four lots of 10 lambs each and four lots of five lambs each. The four lots, in which the pellets were to be fed, were changed to pellets and for the first few days a limited amount of alfalfa hay was provided. The trial began November 2 and continued 86 days. The rations fed to the lots were as follows:

Lot 1—Pelleted ration (65 percent dehydrated alfalfa hay and 35 percent corn).

Lot 2—Pelleted ration (55 percent dehydrated alfalfa hay and 45 percent corn).

Lot 3—Sixty-five percent chopped alfalfa hay and 35 percent cracked corn.

Lot 4—Fifty-five percent chopped alfalfa hay and 45 percent cracked corn.

Lot 5—Same as Lot 1, individually self-fed.

Lot 6—Same as Lot 2, individually self-fed.

Lot 7—Same as Lot 3, individually self-fed.

Lot 8—Same as Lot 4, individually self-fed.

Lots 1, 2, 3, and 4 received the same amount of total digestible nutrients daily until the latter part of the feeding period, when Lot 2 went off feed and had to have the volume of feed lowered. At this time, Lot 1 was eating all the pellets they would clean up so they were left on the same quantity of feed, but Lots 3 and 4 were raised to a higher level of feed intake.

The alfalfa hay used in this trial was harvested from the same area for the pelleted and non-pelleted feeds. For the pelleted rations, the alfalfa hay was taken from the field as it was cut and then dehydrated. The hay for the unpelleted rations was cured in the field, baled, and then chopped. The corn for all rations was taken from the same bulk at the Manhattan elevator.

The individually fed lambs (lots 5, 6, 7, and 8) were placed in separate feeding pens two hours night and morning. Small self-feeders were used for each lamb. The lambs fed as a group (Lots 1, 2, 3, and 4) were hand-fed twice daily. Water and salt were before the lambs at all times.

Table 11.—Feedlot performance of lambs fed pelleted and non-pelleted rations of varying concentrations.

Lot number	1	2	3	4	5	6	7	8
Ration fed	Pellet, 35% corn, 65% dehydrated alfalfa	Pellet, 45% corn, 55% dehydrated alfalfa	35% cracked corn, 65% chopped hay	45% cracked corn, 65% chopped hay	Same as Lot 1 self-fed	Same as Lot 2 self-fed	Same as Lot 3 self-fed	Same as Lot 4 self-fed
Number lambs per lot	9	9	9	8	5	5	4	5
Days on feed	86	86	86	86	86	86	86	86
Initial wt. per lamb	81.6	81.8	83.9	83.4	83	83	82.5	81.6
Final wt. per lamb	111.5	101.4	108.2	109.6	111.8	107.0	96	101.6
Total gain per lamb	30.3	19.6	24.3	26.2	28.8	24.0	13.5	20.0
Daily gain per lamb	.352	.228	.283	.306	.335	.279	.159	.233
Feed per lamb daily, total	2.92	2.51	3.02	2.93	2.76	2.51	2.51	2.75
Pellet	2.92	2.51			2.76	2.51		
Cracked corn			1.05	1.32			.88	1.24
Chopped hay			1.97	1.61			1.63	1.51
Feed per 100 lbs. gain, total	829	1100.4	1070.0	962.5	824.2	901.0	1600.6	1182.0
Pellet	829	1100.4			824.2	901.0		
Cracked corn			374.0	432.8			560.2	531.9
Chopped hay			696.0	529.7			1040.4	650.1
Feed cost per cwt. gain	\$19.14	\$26.41	\$17.98	\$17.71	\$19.02	\$21.62	\$26.89	\$21.75
Feed cost per lamb	\$ 5.80	\$ 5.18	\$ 4.30	\$ 4.64	\$ 5.48	\$ 5.19	\$ 3.63	\$ 4.35
Live market grade	5.11	6.20	5.75	6.05	5.06	5.20	5.02	5.60
Number lambs died				1			1	
Number lambs removed	1	1	1	1				

Table 12.—Chemical composition of feeds used.

Description	Protein	Ether extract	Crude fiber	Moisture	Ash	N.F.E.	C.H.O.
Pellet (55% alfalfa hay) (45% corn)	15.19	4.07	12.15	7.75	7.20	53.64	65.79
Pellet (65% alfalfa hay) (35% corn)	15.00	3.84	14.86	7.35	7.94	51.01	65.87
Corn	10.75	4.00	2.15	10.19	1.69	71.22	73.37
Hay	13.06	1.78	33.88	5.40	8.22	37.66	71.54

Individual weights were taken at the beginning of the trial, every two weeks during the test, and at the end of the test. The lambs were graded by three college staff members and the results are found in Table 11. The grades were given a numerical value and are as follows:

Top choice 4      Top good 7  
 Middle choice 5    Middle good 8  
 Low choice 6      Low good 9

Average daily gain, feed intake, feed consumed per 100 pounds gain, and financial results are shown in Table 11. Chemical analyses of all feedstuffs are shown in Table 12 on page 16. The results of the digestion trials and balance studies are shown in Table 13.

Table 13.—Digestion and balance studies with lambs receiving pelleted and non-pelleted rations of varying concentrations.

Lot number	A	B	C	D
Ration fed	65% chopped alfalfa, 35% cracked corn	55% chopped alfalfa, 45% cracked corn	Pellet, 35% corn, 65% alfalfa	Pellet, 45% corn, 55% alfalfa
Number of lambs	16	16	15	16
% T.D.N.	62.12	65.75	61.52	67.54
Digestion coefficients:				
Protein	62.03	65.84	66.37	71.76
Ether extract	50.53	63.65	62.07	77.60
Crude fiber	52.18	50.52	25.77	27.47
N.F.E.	80.35	83.32	83.06	86.25
% nitrogen retained	0.19	2.20	15.56	26.26

Results and Discussion

With one exception, the lambs given pelleted rations of similar concentration and similar feeding management made larger and more efficient gains than lambs given the unpelleted rations. This exception was in Lot 2, which went off feed several times; therefore, their gains were lower and less efficient than the gains of group-fed lambs on a similar but unpelleted ration.

Pelleted rations made up of 65 percent alfalfa hay and 35 percent corn gave better results when fed either individually or in groups than did pelleted rations containing 55 percent alfalfa and 45 percent corn, however, unpelleted rations containing 55 percent alfalfa and 45 percent corn produced larger and more efficient gains than the unpelleted rations containing the higher percentage of alfalfa hay.

Despite this greater efficiency of gain obtained by feeding the pellets, the cost of gain was considerably higher when the pellets were fed because of the high cost of pelleting.

There was only one-third of an average grade difference between the highest and lowest grading lots, and this difference is probably not significant.

Two lambs were lost during the trial, one from enterotoxemia and the other from an undetermined cause. Four lambs were removed from the test because of abnormal results which may or may not have been a result of this experiment.

The protein of the pelleted ration was more efficiently digested and the percentage of nitrogen retained was greater than from the unpelleted rations. The fat and ether extract portions were also more efficiently utilized in the pelleted ration than in the unpelleted rations. The fiber, however, was much less completely digested when the pelleted rations were fed, and consequently there was little difference in the amount of total digestible nutrients in the pelleted and non-pelleted rations.