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Sheep Feeding Investigation

Wintering Breeding Ewes

Ninety Day Test
December 29 to March 30

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The care and feeding of the breeding flock will always remain an important consideration in the handling of the general farm flock. The inquiries that come to this office are largely concerning this one phase of production, and especially of the wintering of the breeding ewes.

In order to have some first hand information concerning this subject and to proceed further with a test started last year, the following experiment was conducted:

The state of Oklahoma is well suited to sheep production and more especially to the small scale production or small farm flock method prevalent throughout the corn belt. Until we get the farm flock well established we will not be particularly concerned with the fattening phase of this work.

This test was conducted as far as possible to answer anticipated questions of the beginner. We have so far as possible used feeds that are common to Oklahoma and that are found on every farm. We are attempting to find the best and cheapest rations for feeding ewes. We should bear in mind that too much carbonaceous feed such as corn, kafir and darso if not balanced with a protein feed will result in ewes that are too fat and lambs that are underdeveloped at birth. The protein is a very necessary and expensive ingredient in the ration and should be limited to absolute requirements in order to get a cheap ration.

Sheep will handle roughages very well and we have attempted to cheapen our ration by their use, also to determine the best kind of roughage to feed.

OBJECTS OF EXPERIMENT

1. To determine the value of silage in a ration for breeding ewes.
2. To determine comparative value of kafir corn and darso, fed whole.
3. To determine comparative value of darso silage and corn silage.
4. To determine value of sunflower silage as compared to darso and corn.

ANIMALS USED

Fifty head of black-faced western ewes were bought on the Kansas City market through Clay Robinson Commission Company in October, 1920. These ewes were carried through the summer and were used again in this test.

HANDLING BEFORE TEST BEGAN

These ewes with their lambs were turned on a creek pasture early in the spring and received nothing during the summer months except what they could find in way of weeds and grass.

The lambs were fed grain in creeps and received the same pasture as the ewes. These lambs were sold in the latter part of June, and the ewes continued on the same pasture.

After harvest in the fall the ewes were turned on stubble of kafir, cane, and darso, the forage had been placed in the silo. In addition to this, about October 1st they were allowed to run on alfalfa stubble.

October 1st two purebred rams, the same ones used in our test last year, were put with the ewes and continued with them until December 20th.

These ewes received no feed except what they gathered and no shelter except what the creek afforded until December 20th when they were moved into the barn in preparation for starting this test.

METHOD OF FEEDING AND HANDLING

The ewes were fed twice daily at 7:00 a. m. and 5:30 p. m. The rations were divided equally into two feeds. The combination hay and grain racks were used for feeding. These combination racks consist of hay racks with tight grain troughs at bottom. This reduces waste. Small outside runs were provided for exercise but the feeding was done under cover. The ewes were taken outside and given thirty minutes of exercise each second day.

RATIONS USED

Pen I	Pen II	Pen III
Alfalfa hay	Alfalfa hay	Alfalfa hay
Kafir corn	Darso	Kafir corn (whole)
		Darso silage
Pen IV	Pen V.	
Alfalfa hay	Alfalfa hay	
Kafir corn	Kafir corn (whole)	
Corn silage	Sunflower silage	

AVERAGE PERCENTAGE COMPOSITION OF FEEDS

	Water	Ash	Protein	Fiber	N. Free Extract	Fat
*Sunflower silage	71.96	3.23	2.96	8.67	12.36	0.81
*Darso silage	73.11	1.54	1.91	6.46	16.65	0.34
*Kafir grain	12.8	1.7	11.1	2.3	70.1	3.0
*Darso grain	11.75	1.6	10.94	3.44	65.53	3.74
*Alfalfa hay	8.6	8.6	14.9	28.3	37.3	2.3
**Corn silage	73.7	1.7	2.1	6.3	15.4	0.8

COST OF FEEDS

Alfalfa hay, \$10.00 per ton.
 Darso silage, \$5.00 per ton.
 Kafir grain, .42 per bushel.
 Sunflower silage, \$5.00 per ton.
 Darso grain, .42 per bushel.
 Corn silage, \$5.00 per ton.

*Analysis furnished by Dr. C. T. Dowell, Station Chemist and Director of Experiment Station.

**Henry & Morrison—Feeds and Feeding.

Sunflower Silage.—The sunflower silage was made from Russian tame sunflowers planted in the middle of April. The sunflowers were planted in rows 42 inches apart and 6 inches apart in the row, and were grown on rather poor upland. They were harvested with a corn binder when the head was in the milk stage and were placed in the silo in the usual way. The yield was about 6 tons per acre.

Sunflower silage packs tighter than any of the other silages. The ewes ate the silage very readily and will eat more sunflower than corn or darso silage.

Darso Silage.—Darso is a new sorghum developed and named at the Oklahoma Experiment Station. Its origin is unknown but it is probably a cross between a non-saccharine and a saccharine sorghum. It is a dwarf plant about 4 feet in height

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heavily foliaged with large stalks that are usually tinted red. The forage contains a higher percentage of total sugar in the juice than does kafir or feterita. The yield of forage was about 6 tons per acre. The grain yield was about 40 bushels per acre.

Corn Silage.—The corn silage was made from Indian corn planted on bottom land and made a very heavy yield. There was also a heavy yield of grain.

The following table summarizes the result in a general way:

	Pen I	Pen II	Pen III	Pen IV	Pen V
Number of days on test	90	90	90	90	90
Number of ewes	10	10	10	10	10
Average initial weight	134.3	134.1	133.9	133.7	134.6
Average final weight (when lambing started)	149.8	145.2	155.0	153.3	142.4
Average gain in weight	15.5	11.1	21.1	19.6	* 7.8
Average weight at 90 days	130.6	137.3	143.8	129.7	136.3
Average daily gain per ewe, 65 days .....	.238	.1708	.323	.3001	.12
Feed consumed per head per day:					
Alfalfa hay	3.663	3.663	1.666	1.666	1.666
Kafir .....	.85		.85	.85	.85
Darso grain .....		.85			
Darso silage			4.		
Corn silage				4.	
Sunflower silage					4.
Total feeds					
Alfalfa hay	3296	3276	1489½	1499½	1481½
Kafir	768		756	768	749
Darso grain		768			
Darso silage			3586		
Corn silage				3600	
Sunflower silage					3484
Total cost of feed	\$22.24	\$22.24	\$22.085	\$22.26	\$22.26
Average cost per ewe	\$2.224	\$2.224	\$2.226	\$2.226	\$2.226
Average cost per head per day, in cents	2.47	2.47	2.475	2.475	2.475
Number of lambs	11	13	8	15	4
Weight of lambs	80	31.5	77.5	139.5	38
Average weight per lamb	7.3	10.5	9.7	8.7	9.5
Average weight of lambs at end of test	14.5	15.5	18	15.4	12.2
Percent of lamb crop	110	30	80	150	40

Vigor of lambs—Pens I, II, III and IV, good; Pen V, poor.

TABLE COMPARING RATION CONTAINING KAFIR TO RATION CONTAINING DARSO GRAIN

	Pen I	Pen II
Number of days on test	90	90
Number of ewes on test	10	10
Average initial weight	134.3	134.1
Average final weight (65 days)	149.8	145.2
Average final weight (90 days)	130.6	137.3
Alfalfa hay	3296	2296
Kafir	768	
Darso grain		768
Gain in weight (65 days)	15.5	11.1
Cost per ewe	2.224	2.224
Number of lambs	11	13
Percent of lambs	110	130
Average weight of lambs at birth	* 7.3	10.5
Average weight of lambs at end of test	14.5	15.5

Vigor of lambs, good.

*There was one dead lamb born in Pen I, weight 4 pounds, and it is included in average weight at birth. This accounts for poor showing of Pen I.

The results, judged from amount of gain, is about the same this year as was obtained last year. The ewes receiving darso gained about two-thirds as much as those receiving kafir. The cost was identical in this case but the gains were 15.5 pounds to 11.1 pounds in favor of kafir.

The lambs in Pen I were smaller at birth but gained rapidly after birth. All lambs in both pens were strong and vigorous.

TABLE COMPARING A RATION CONTAINING SILAGE
TO THE ONE WITHOUT SILAGE

	Pen I	Pen III
Number of days on test	90	90
Number of ewes on test	10	10*
Average initial weight	134.3	133.9
Average final weight (65 days)	149.8	155.9
Average final weight (90 days)	130.6	143.8
Alfalfa hay	3296	1489
Kafir	768	756
Darso silage		3586
Gain in weight	15.5	21.1
Cost per ewe	\$2.224	\$2.226
Number of lambs	11	8
Percent of lambs	110	80
Weight of lambs at birth	7.3	9.7

Vigor of lambs, good.

*One ewe died in Pen III, March 9th, weight 156 pounds.

We have mentioned the fact elsewhere that under ordinary conditions silage will cheapen a ration. In our present test, we have figured silage at half the cost of alfalfa hay and as a result there is no advantage as to cost. A study of the results however will show that the pens receiving silage gained more in weight and had larger lambs than those receiving no silage. In this case, silage is worth over half as much as alfalfa hay.

TABLE COMPARING RATION CONTAINING DARSO SILAGE
TO ONE CONTAINING CORN SILAGE

	Pen III	Pen IV
Number of days on test	90	90
Number of ewes on test	10	10
Average initial weight	133.9	133.9
Average final weight (65 days)	155.3	153.3
Average final weight (90 days)	143.8	129.7
Alfalfa hay	1.666	1.666
Kafir .....	.85	.85
Darso silage	4.	
Corn silage		4.
Gain in weight (65 days)	21.1	19.6
Cost per ewe	\$2.226	\$2.226
Number of lambs	8	15
Percent of lambs	80	150
Average weight of lambs at birth	9.7	8.7
Weight at end of test	18	15.4

Vigor of lambs, good.

One lamb in Pen III was born dead, weight 4 pounds. The average weight of living lambs was 10.3 pounds.

The costs were kept the same in these pens and darso silage appears to give slightly better results when we consider gain in weight of ewes and weight of lambs at birth. The feeds recorded in this test will not influence the percent of lambs as these ewes were bred while all together on alfalfa stubble.

TABLE COMPARING RATIONS CONTAINING CORN SILAGE
DARSO SILAGE AND SUNFLOWER SILAGE

	Pen III	Pen IV	Pen V
Number of days on test	90	90	90
Number of ewes on test	10	10	10
Average initial weight	133.9	133.7	131.6
Average final weight (65 days)	155.3	153.3	142.4
Average final weight (90 days)	143.8	129.7	136.3
Alfalfa hay	1.666	1.666	1.666
Kafir .....	.85	.85	.85
Darso silage	4.		
Corn silage		4.	
Sunflower silage			4.
Gain in weight, 65 days	21.1	19.6	7.8
Cost per ewe	\$2.226	\$2.226	\$2.226
Number of lambs	8	15	4
Percent of lambs	80	150	40
Weight of lambs at birth	9.7	6.7	9.5
Weight of lambs at close of test	18	15.4	12.2

The above table shows sunflower silage to be less desirable than either corn silage or darso silage. Gain in weight was not the object in view in conducting this test; but the fact that the same amount of corn and darso silage resulted in considerable heavier gains than in the case of sunflower silage would indicate that the latter is less desirable.

The ewes receiving sunflower silage presented an unthrifty appearance as compared to the other pens.

The four lambs born in Pen V were good sized but thin at birth. The ewes showed very little mother instinct (indicating a lack of milk supply). One lamb weighed 17 pounds when the test ended. The other three lambs were two weeks old and were lighter than they were at birth. They were very thin, showing a general unthrifty appearance. One of these lambs died two days after the test ended.

DISCUSSION OF RESULTS

Most experiment stations including Oklahoma (Station bulletin 125) have obtained good results from the use of silage in a ration for breeding ewes.

When silage of any kind replaces alfalfa hay in the ration for pregnant ewes it will require two to three pounds of silage for each pound of hay replaced. The results usually obtained show that the use of silage cheapens the ration. This is not true this year as it was in former years. Last year on this same work, we charged alfalfa hay at \$22.50 and silage at \$8.00 per ton. This year alfalfa hay is relatively cheap as compared to silage and silage is not as desirable from the standpoint of cheapness as it was formerly.

Alfalfa hay was worth just twice as much per ton as silage. With two pounds of silage replacing one pound of hay, we would fail to cheapen the ration but nevertheless silage is a very desirable form of succulence and the ewes in the silage lots gained more than these without silage.

In a report concerning the wintering of mutton ewes given before the American Society of Animal Production, Mr. Chas. I. Bray of the Colorado Experiment Station says, "The silage lot lambs appeared to come earlier than the lambs in the hay lot. Whether this was a matter of shorter gestation period was not determined."

In the Colorado trial no grain was fed and this might cause different results than in our present test where grain was fed for the entire period.

Pen I received grain and alfalfa hay and produced eleven (11) lambs before the test finished. Pen III receiving alfalfa hay, grain and darso silage produced a total of seven lambs.

Pen V receiving alfalfa hay, grain and sunflower silage produced four lambs before the end of the test.

Pen IV receiving alfalfa hay, grain and corn silage produced a total of 15 lambs. One ewe in Pen I and one ewe in Pen II aborted. There were two (2) ewes in Pen V and one (1) in Pen IV and one in Pen I that were barren. At the end of the test pregnant ewes not having lambed were as follows: Pen V three (3); Pen IV none; Pen III two (2); Pen II two (2); Pen I one (1).

The only pen that would indicate that silage shortens the gestation period is Pen IV but in view of the fact that Pen I was practically as early as Pen IV and considerably earlier than Pen III and V we are justified in concluding that silage does not materially affect the length of the gestation period.

SUMMARY

1. Sunflower silage proved unsatisfactory for wintering breeding ewes.
2. Darso is of less value than kafir for feeding ewes.
3. Ewes wintered on darso silage showed an advantage over those wintered on corn silage.
4. Lambs from ewes on sunflower silage were small and failed to grow after birth.
5. The average cost was as follows:
 - Pen I, \$2.224
 - Pen 2, \$2.224
 - Pen 3, \$2.226
 - Pen 4, \$2.226
 - Pen 5, \$2.226
6. Ewes will come through the winter in good shape on alfalfa hay and whole kafir.