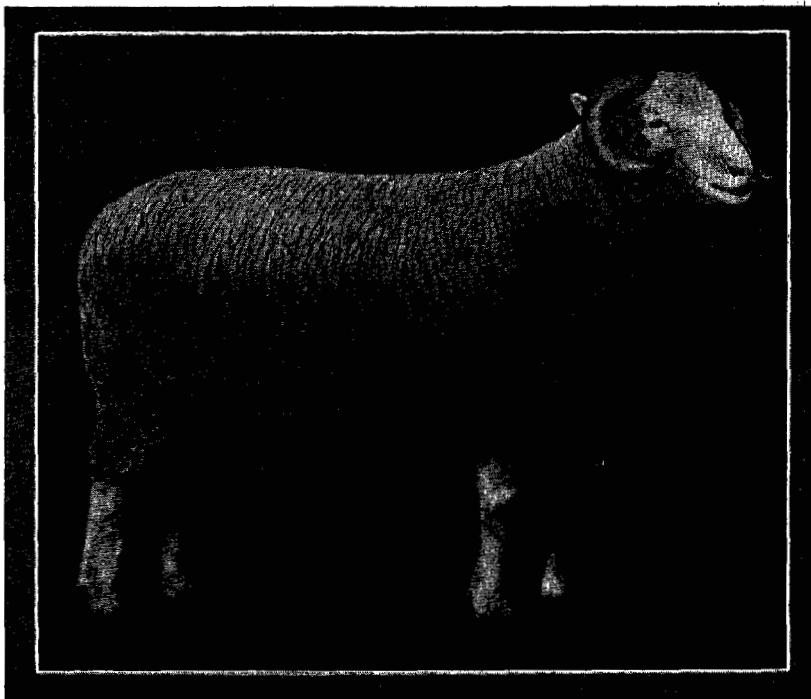


AGRICULTURAL EXPERIMENT STATION

KANSAS STATE AGRICULTURAL COLLEGE
MANHATTAN, KANSAS

DEPARTMENT OF ANIMAL HUSBANDRY



CHAMPION DORSET WETHER, INTERNATIONAL, 1922.

SOME LAMB-FEEDING RESULTS SECURED BY THE KANSAS AGRICULTURAL EXPERI- MENT STATION.¹

A. M. PATERSON.

An increasing interest in the matter of feeding lambs for market in many sections of Kansas and surrounding states has prompted many questions regarding the relative values of feeds available in these various localities. The Kansas Agricultural Experiment Station, in attempting to secure reliable data that will help to

1. Contribution No. 72 from the Department of Animal Husbandry.

answer these questions, has conducted lamb-feeding tests during the past eight years, 1914 to 1922.

For the sake of brevity and convenience, some of the questions most frequently asked are given and the answers supplied from the results of the feeding tests. These questions are as follows: (1) Can whole barley be satisfactorily substituted for shelled corn as the grain portion of the ration in fattening lambs for market? (2) Can whole kafir be satisfactorily substituted for corn or should kafir be ground when fed to fattening lambs? (3) Can lambs be fed grain as economically by hand as by the use of the self-feeder if they have free access to grain and a protein supplement? (4) Can lambs be fed as satisfactorily and as profitably without as with a rich protein supplement? (5) Which is the more satisfactory protein supplement in a lamb-fattening ration, linseed oilmeal or cottonseed meal? (6) Does it pay to feed silage with alfalfa to lambs that are being fattened for market? (7) Can sweet clover hay be used satisfactorily as a substitute for alfalfa hay?

1. Can whole barley be satisfactorily substituted for shelled corn as the grain portion of the ration in fattening lambs for market?

An answer to this question was secured in a test conducted, with two lots of 40 lambs each, which were fed for a period of 64 days. The lambs averaged 56 pounds in weight at the beginning of the test. The results are shown in Table I.

TABLE I. Results of a 64-day lamb-feeding test showing the relative values of whole barley and shelled corn as the grain portion of the ration.

RATION FED.	Shelled corn, alfalfa hay, and silage.	Whole barley, alfalfa hay, and silage.
Daily gain per head.....	<i>Pounds.</i> 0.47	<i>Pounds.</i> 0.43
Grain required for 100 lbs. gain:		
Shelled corn.....	288.38	292.35
Whole barley.....		
Selling price per cwt.....	\$18.40	\$18.20

The results of this test show that the lambs receiving shelled corn made slightly larger average daily gains and sold for slightly more per pound, indicating somewhat better finish, than the lambs fed whole barley. It required 8 per cent less shelled corn than whole barley to make 100 pounds of gain. However, the differences in daily gain, finish, and feed required to make 100 pounds of gain are so small that where barley is grown and corn is an

uncertain crop, or where barley can be bought for 10 per cent less per pound than shelled corn, it will prove to be as satisfactory and economical as shelled corn.

2. *Can whole kafir be satisfactorily substituted for corn or should kafir be ground when fed to fattening lambs?*

Two tests were made during different years in which whole kafir and ground kafir were compared with shelled corn. In the first test 50 lambs averaging 56 pounds were used in each of three lots. They were fed 6 days. In the second test 60 lambs averaging 58.5 pounds were used in each of three lots. They were fed 80 days. In each test the lambs were fed until they were fat enough to sell well. The results secured from these two tests are shown in Table II.

TABLE II. Results of two lamb-feeding tests showing relative values of shelled corn, whole kafir, and ground kafir.

RATION FED.	First test.			Second test.		
	Shelled corn, cottonseed meal, alfalfa, and silage.	Whole kafir, cottonseed meal, alfalfa, and silage.	Ground kafir, cottonseed meal, alfalfa, and silage.	Shelled corn, cottonseed meal, alfalfa, and silage.	Whole kafir, cottonseed meal, alfalfa, and silage.	Ground kafir heads, cottonseed meal, alfalfa, and silage.
Daily gain per head.	Pounds. 0.40	Pounds. 0.35	Pounds. 0.36	Pounds. 0.27	Pounds. 0.27	Pounds. 0.24
Grain required for 100 lbs. gain:						
Shelled corn.	222.13	254.40	250.00	370.68	368.89	471.64
Whole kafir.						
Ground kafir.						
Selling price per cwt.	\$8.05	\$7.90	\$8.05	\$11.10	\$11.10	\$11.00

In the first test a good quality of lambs were fed and those receiving shelled corn make slightly greater daily gains than those receiving either whole or ground kafir, but the difference in the daily gains of those receiving whole kafir and ground kafir was so small that it would not pay the cost of grinding. It required approximately 12½ per cent less corn than either whole or ground kafir to produce 100 pounds of gain. The spread between the selling price of corn-fed and kafir-fed lambs was very narrow, which shows that lambs fed kafir, either whole or ground, will make practically as desirable a market finish as those fed corn.

The second test was conducted with lambs of only ordinary quality, but results so far as the relative values of corn and kafir are concerned were quite similar to those secured in the first test

in the groups where shelled corn and whole kafir were fed, except that the lambs fed whole kafir gained as rapidly and sold for as much per pound as did the lambs fed shelled corn. In the second test ground kafir heads were fed instead of the ground threshed grain as was the case in the first test. The lambs receiving the ground kafir heads did not make as rapid daily gains as did the lambs fed shelled corn or whole threshed kafir grain, but they sold for almost as much per pound indicating practically as satisfactory a finish. When the total amount of ground kafir heads is reduced to the actual amount of grain required to make 100 pounds of gain, it will be noted that the grain actually consumed was as efficient in producing gains as the threshed grain, but, since the lambs fed ground kafir heads did not eat quite as much actual grain their daily gains were not quite as great.

The results of these two tests indicate the practicability of utilizing kafir where available, either ground or unground, as a grain ration for lambs that are being fattened for market.

3. *Can lambs be fed grain as economically by hand as by the use of the self-feeder if they have free access to grain and a protein supplement?*

Two tests were conducted during different years. In the first test two lots of 40 lambs, each averaging approximately 56 pounds, were used. They were fed 64 days. In the second test two lots of 35 lambs, each averaging approximately 73 pounds, were used. They were fed 30 days. In each test the lambs were fed until they had reached a desirable market finish. The results of these tests are shown in Table III.

TABLE III. Results of two lamb-feeding tests showing the value of a self-feeder in feeding lambs having free access both to grain and a protein supplement.

RATION FED.	First test.		Second test.	
	Self-fed shelled corn, linseed oilmeal, alfalfa, and silage.	Hand-fed shelled corn, linseed oilmeal, alfalfa, and silage.	Self-fed shelled corn, linseed oilmeal, alfalfa, and silage.	Hand-fed shelled corn, linseed oilmeal, alfalfa, and silage.
Daily gain per head.....	Pounds. 0.51	Pounds. 0.48	Pounds. 0.55	Pounds. 0.55
Grain required per 100 lbs. gain:				
Shelled corn.....	275.83	260.82	276.27	190.66
Linseed oilmeal.....	108.51	29.42	88.86	41.52
Cost per 100 lbs. gain.....	\$15.82	\$13.27	\$14.42	\$10.95
Selling price per cwt.....	18.75	18.50	18.75	18.25

In both tests daily gains were practically the same. In each case the self-fed lambs ate excessive amounts of linseed oilmeal and required a greater total amount of feed to produce 100 pounds of gain, which explains the greater cost of 100 pounds of gain in greater price per hundred, indicating a slightly better finish, but the greater selling price per hundred did not begin to pay the greater cost of gains.

These results indicate that it is not economical to allow lambs free access to linseed oilmeal, which is usually high priced, because they will eat larger quantities than is necessary properly to balance a fattening ration. They also indicate that where comparatively small numbers are fed it is more economical to hand-feed than to self-feed.

4. Can lambs be fed as satisfactorily and as profitably without as with a rich protein supplement?

A test in which both linseed oilmeal and cottonseed meal, and neither were added to a fattening ration was made with three lots each containing 35 thrifty lambs weighing approximately 65 pounds. The importance of the addition of a protein supplement is shown by the average daily gains per head, cost of gains, and selling prices given in Table IV.

TABLE IV. Results of a 49-day lamb-feeding test showing the value of protein supplements in a ration.

RATION FED.	Shelled corn, linseed oilmeal, alfalfa, and silage.	Shelled corn, cottonseed meal, alfalfa, and silage.	Shelled corn, alfalfa, and silage.
Daily gain per head.....	0.40 lb.	0.34 lb.	0.28 lb.
Cost of 100 lbs. gain.....	\$15.02	\$17.56	\$19.44
Selling price per cwt.....	19.00	18.75	18.50

Each lot received shelled corn, alfalfa hay, and silage. The lot to which linseed oilmeal was added to the ration, gained 0.40 of a pound per head per day; the lot to which cottonseed meal was added to the ration, gained 0.34 of a pound per day; but where neither linseed oilmeal nor cottonseed meal was added, the gain was only 0.28 of a pound per head per day. The cost of 100 pounds gain where linseed oilmeal was fed was \$15.02; where cottonseed meal was fed, \$17.56; and where neither was fed, \$19.44. A further value of adding a protein supplement is shown in the selling price per hun-

dred, as the lambs receiving linseed oilmeal sold for \$19 a hundred, those receiving cottonseed meal, \$18.75, and those receiving neither, \$18.75, indicating a higher degree of finish where the protein supplement was added. These results show very strikingly the value of adding a rich protein supplement to a ration used in fattening lambs for market.

6. Which is the more satisfactory protein supplement in a lamb-fattening ration, linseed oilmeal or cottonseed meal?

Two tests were conducted during different years. The first year 35 lambs were used in each of two lots. They weighed 65 pounds per head and were fed 49 days. The second year 33 lambs were used in each of two lots. They weighed 57 pounds per head and were fed 79 days. Results secured in these two tests are shown in Table V.

TABLE V. Results of two lamb-feeding tests showing the relative values of linseed oilmeal and cottonseed meal as protein supplements in a ration.

RATION FED.	First test.		Second test.	
	Shelled corn, linseed oilmeal, alfalfa, and silage.	Shelled corn, cottonseed meal, alfalfa, and silage.	Shelled corn, linseed oilmeal, alfalfa, and silage.	Shelled corn, cottonseed meal, alfalfa, and silage.
Daily gain per head.	0.40 lb.	0.34 lb.	0.39 lb.	0.40 lb.
Cost of 100 lbs. gain.	\$15.02	\$17.56	\$6.47	\$6.20
Selling price per cwt.	19.00	18.75	9.15	9.00

These results indicate that there is but little difference between linseed oilmeal and cottonseed meal as a protein supplement for lambs except that lambs fed linseed oilmeal usually sell for slightly more per hundredweight than those fed cottonseed meal, indicating that lambs fed linseed oilmeal will show more bloom and finish at the end of a feeding period than those fed cottonseed meal.

6. Does it pay to feed silage with alfalfa to lambs that are being fattened for market?

This is a question that has been discussed very much. The factors that must be taken into consideration aside from the cost of silage are its influence upon gains and the selling price of the finished lambs. In securing data on this question two tests were made. In the first test two lots of 50 lambs each, averaging approximately 57 pounds, were used. They were fed 60 days. In

SOME LAMB-FEEDING RESULTS.

the second test two lots of 75 lambs each, averaging 58½ pounds, were used. These lambs were fed 80 days. The results of these two feeding tests are shown in Table VI.

TABLE VI. Results of two lamb-feeding tests showing the value of adding silage to a ration containing alfalfa hay.

RATION FED.	First test.		Second test.	
	Shelled corn, cottonseed meal, and alfalfa.	Shelled corn, cottonseed meal, alfalfa, and silage.	Shelled corn, cottonseed meal, and alfalfa.	Shelled corn, cottonseed meal, alfalfa, and silage.
Daily gain per head.....	0.39 lb.	0.40 lb.	0.29 lb.	0.27 lb.
Selling price per cwt.....	\$7.90	\$8.05	\$11.15	\$11.10

Very little difference was secured in rate of gain or selling price per hundred, one year's results being slightly in favor of no silage, the other slightly in favor of adding silage, which means that when silage is available and alfalfa hay scarce and high priced, silage may well be used as part of the roughage ration fed to fattening lambs.

7. Can sweet clover hay be used satisfactorily as a substitute for alfalfa hay?

Only one test has been made at this station. Sixty lambs weighing approximately 60 pounds per head were used. They were fed 60 days. The results of this test are shown in Table VII.

TABLE VII. Results of a lamb-feeding test showing relative values of alfalfa hay and sweet clover hay in a ration.

RATION FED.	Shelled corn, alfalfa hay, and silage.	Shelled corn, sweet clover hay, and silage.
Daily gain per head.....	<i>Pounds.</i> 0.39	<i>Pounds.</i> 0.37
Hay required per 100 lbs. gain:		
Alfalfa.....	242.00	272.00
Sweet clover.....		
Selling price per cwt.....	\$17.30	\$17.30

These results indicate that sweet clover hay is a very satisfactory substitute for alfalfa hay in a ration for fattening lambs and may well be used in the many localities where alfalfa does not grow but where sweet clover will grow. The lambs ate the sweet clover with as much relish and apparent satisfaction as they did the alfalfa.

CONCLUSIONS.

The results of these various tests indicate possibilities of feeding lambs for market in practically every section of Kansas. In the northwestern part of the state, barley is a dependable crop; in other portions of the state where corn is not a dependable grain crop one or more of the grain sorghums usually produce a grain crop and all of these crops have practically the same feeding value as corn.

Whatever the locality it must be borne in mind that the best results will be secured when the grain fed is supplemented by either cottonseed meal or linseed oilmeal as a source of protein.

In those sections of the state where alfalfa can not be grown satisfactorily, it is also important to bear in mind that sweet clover hay will serve as well as alfalfa hay as the roughage portion of the ration.

Another point that should be remembered is the fact that a lamb will not properly balance his feed if given free access to both corn and linseed oilmeal or cottonseed meal in a self-feeder. If one desires to use a self-feeder the corn and the protein supplement must be mixed in the proper proportions before being placed in the self-feeder.

