THE COMPARATIVE VALUES OF CORN SILAGE, ALFALFA HAY, BEAN PODS, AND CLOVER HAY FOR WINTERING EWE LAMBS.

THESIS FOR THE DEGREE OF M. S.

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THESIS

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INTRODUCTION.

This experiment is conducted for the purpose of testing various roughages and concentrates for wintering ewe lambs for breeding purpose. Due to the large quantities of bean pods and bean straw on farms this experiment was undertaken to obtain the comparative values of corn silage, alfalfa hay, bean pods, and clover hay as roughages for wintering ewe lambs. The grain of oats was used as the concentrate for the lambs. But owing to the low protein content of bean pods a part of cull beans was used to balance one ration fed to one lot for a comparision of bean pods with oats and oats and cull beans. In testing the feeding value of bean pods this experiment was conducted only for a period of 50 days on account of shortage of bean pods. Then clover hay and corn silage were used as roughages to complete the work of the entire period of this experiment. Therefore this experiment was divided into two parts; one for the comparative values of bean pods and alfalfa hay and the other for the comparative values of corn silage, alfalfa hay, and clover hay for wintering ewe lambs.

OBJECT AND OUTLINES OF THE EXPERIMENT.

A comparision was to be made of the values of bean pods, alfalfa hay, clover hay, and corn silage and combinations of these various roughages for wintering ewe lambs economically and substantially.

Twenty one lambs were divided into three lots as nearly equal in weight and quality as possible. They were weighed individually for two weights in two days and an average weight taken of these two weights as the initial weight and the experiment started on the 25th. of January.

The average weight of each individual lamb and each whole lot shown in the following tables:

Lot 1.

Breeds.	Ear mark numbers.	Average weight.
Hampshire.	No tag.	105.5 pounds.
Dorset horn.	1962.	103. pounds.
Oxford.	1948.	75. pounds.
Hampshire.	1989.	79. pounds.
Shropshire.	2001.	74. pounds.
Rambouillet.	1974.	93.5 pounds.
Shropshire.	1987.	66.5 pounds.
Total---		601.5 pounds.

Lot 2.

Breeds.	Ear mark numbers.	Average weight.
Hampsnire.	No tag.	108.5 pounds.
Dorset Horn.	No tag.	102.5 pounds.
Oxford.	1942.	76.5 pounds.
Oxford.	1940.	84.5 pounds.
Hampsnire.	1923.	89. pounds.
Rambouillet.	1975.	91. pounds.
Snropshire.	1989.	54. pounds.
Total---		604. pounds.

Lot 3.

Breeds.	Ear mark numbers.	Average weight.
Hampsnire.	1929.	94. pounds.
Dorset Horn.	1985.	109.5 pounds.
Oxford.	1953.	74.5 pounds.
Oxford.	1945.	88. pounds.
Snropsnire.	1992.	90.5 pounds.
Rambouillet.	1973.	84. pounds.
Snropsnire.	1991.	85. pounds.
Total---		600.5 pounds.

Tne feeding period extened over a period of 13 weeks and tne entire period was divided into two parts; one for comparision of bean pods and alfalfa and tne otner for corn

silage,alfalfa hay and clover hay as roughages for wintering ewe lambs. The weight was taken every two weeks and the comparative values of the feeds were made on the basis of the results of each weight during the feeding periods. All the three lots were fed under exactly edentical conditions,except as regards feeds. The amount of grain fed to each lot was the same but less roughage fed to lot 3.

STATEMENT OF FEEDS USED.

The ration for lot 1 consisted of bean pods,corn silage and oats. During this period of the experiment the lambs received 1.423 pounds of bean pods,1.423 pounds of corn silage and .357 pound of oats in the first 31 days per head per day with a nutritive ratio of 1:9.25. The ration was increased February 25th and the lambs were receiving 2 pounds of bean pods per head per day but the amounts of oats and corn silage were the same as before. This ration had a nutritive ratio of 1:9.53 and was fed to the 15th.of March,the end of the first part of the experiment.

The ration for lot 2 consisted of bean pods,corn silage, oats and cull beans. During the first 31 days the lambs received 1.423 pounds of bean pods,1.423 pounds of corn silage, .2857 pound of oats and .5714 pound of cull beans per head per day with a nutritive ratio of 1:8.34. From the 25th.of February the ration was increased and then the lambs received 2

pounds of bean pods and the amounts of oats,corn silage and cull beans remained the same. The new ration with a nutritive ratio of 1:7.32 was fed to the end of the first part of the experiment,the March 15th.

The ration for lot 3 consisted of alfalfa hay,oats and corn silage. During the entire period of the first part of the experiment the lambs received 1 pound of alfalfa hay,1.428 pounds of corn silage and .357 pound of oats per head per day. This ration had a nutritive ratio of 1:5.69 and was fed from January 25th.to March 15th,the end of the first part of the experiment.

Oats and cull beans were all fed whole to the three lots throughout the entire period of the experiment.

The seven lambs of each lot were shut in small pens in the sheep barn throughout the entire period of the experiment. They were fed morning and evening and the ration was divided equally between the two feeds. Salt was kept before them all the time and water being given twice a day. It was sometimes found in the lot 1 and lot 2 that some bean stems were left in the troughs,while in lot 3 all the alfalfa hay was eaten up clean.

Composition of feeds.

The analysis of the feeds as follows:

Feeds.	Dry matter %.	Protein %.	Carbonnydrates %.	Fat %.
Alfalfa.	91.4	10.6	39.	.9
Bean pods.	89.5	8.6	42.4	.7
Clover.	87.7	7.9	38.9	1.1
Corn silage.	26.3	1.1	15.	.7
Cull beans.	87.2	13.3	54.3	.3
Oats.	90.3	9.7	52.1	3.3

Tne feeds were cnarged at tne following prices.

Alfalfa.	$15.00	₱ ton.
Clover.	$12.00	₱ ton.
Bean pods.	$ 8.00	₱ ton.
Corn silage.	$ 4.00	₱ ton.
Cull beans.	$15.00	₱ ton.
Oats.	$00.40	₱ bushel.

Part 1.

First feeding period.

January 25.---February 21.

Tne daily rations of tne tnree lots as follows:

Lot 1.

Feeds.	Dry matter.	Protein.	Carbonnydrates.	Fat.
10# bean pods.	3.95	.36	4.24	.09
10# corn silage.	2.68	.11	1.5	.07
6# oats.	5.448	.532	3.126	.223
	17.026	1.052	8.866	.383

Tne total digestible nutrients 10.791 Tne nutritive ratio 1:9.25

Lot 2.

10# bean pods.	3.95	.36	4.24	.09
10# corn silage.	2.68	.11	1.5	.07
4# cull beans.	3.488	.732	2.172	.082
2# oats.	1.316	.194	1.042	.078
	16.884	1.396	8.954	.268

Total digestible nutrients 10.958. Nutritive ratio 1:6.34

Lot 3.

7# alfalfa.	6.398	.742	2.73	.068
10# corn silage.	2.68	.11	1.5	.07
6# oats.	5.448	.532	3.126	.233
	14.476	1.484	7.536	.361

Total digestible nutrients 9.602 Nutritive ratio 1:5.69

Tne rations fed to lct 1 and lot 2 supplied tne same amounts of rougnages and concentrates but differed in kinds of

grains. The nutritive ratios of the three lots could not be worked out nearly the same due to the fact of low content of protein in bean pods. So the ratios varied a great deal as shown in the above tables.

Digestible nutrients per lot per day.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	17.029#	16.334#	14.476#
Protein.	1.052#	1.396#	1.434#
Carbonnydrates.	8.366#	8.954#	7.583#
Fat.	.336#	.268#	.361#

The digestible nutrients consumed by the three lots varied somewhat as shown in the above tables; lot 1 received more pounds of dry matter and less pounds of protein than lot 3 and also lot 1 received more pounds of total digestible nutrients than lot 3,but as the result lot 3 did better in gain.

Digestible nutrients per head per day.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	2.4325#	2.418#	2.068#
Protein.	.1503#	.1993#	.2051#
Carbonnydrates.	1.266#	1.2791#	1.051#
Fat.	.0554#	.0383#	.0516#

Gains.

	Lot 1.	Lot 2.	Lot 3.
Total gain.	30.5 pounds.	16 pounds.	40.5 pounds.

	Lot 1.	Lot 2.	Lot 3.
Average gain per head per day.	.1552#	.08164#	.20663#

Lot 3 gained 40.5 pounds, the largest gain made during this period. Lot 1 ranked second, gainning 30.5 pounds in 28 days. Lot 2 was last, gainning only 16 pounds. The results showed that the combination of alfalfa, silage and oats did the best and the combination of bean pods, silage and oats gave better gain than that of bean pods, corn silage, cull beans and oats.

Feed consumed per pound gain.

Lot 1.		Lot 2.		Lot 3.	
Bean pods.	9.13#	Bean pods.	17.5#	Alfalfa.	4.3895#
Corn silage.	9.13#	Corn silage.	17.5#	Corn silage.	6.9136#
Oats.	5.51#	Oats.	3.5#	Oats.	4.1461#
		Cull beans.	7.#		

In the above table it showed that Lot 1 required 5.51 pounds of grain and 18.26 pounds of roughage to produce one pound of mutton, lot 2 required 10.5 pounds of grain and 35 pounds of roughage and lot 3 required 4.146 pounds of grain and 11.7531 pounds of roughage. As the results lot 2 consumed the largest amount of feed per pound gain.

Cost per pound gain.

Lot 1.	Lot 2.	Lot 3.
11.5¢	13.4¢	10.2¢

Tne cost of lot 1 and lot 3 was much less tnan tnat of lot 2,due to tne larger gains being made during tne 23 days.

Total feed consumed per lot in tne 23 days period.

	Lot 1	Lot 2.	Lot 3.
Pean pods.	230#	230#	
Alfalfa.			198#
Corn silage.	230#	230#	230#
Cats.	168#	56#	168#
Cull beans.		112#	

Total digestible nutrients per lot.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	476.748#	472.752#	405.323#
Protein.	29.456#	29.036#	40.125#
Carbonnydrates.	243.243#	250.712#	205.963#
Fat.	10.384#	7.504#	10.108#

Digestible nutrients per pound gain.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	15.682#	29.547#	10.01#
Protein.	.9686#	2.443#	.9907#
Carbonnydrates.	8.1425#	15.669#	5.085#
Fat.	.3561#	.469#	.2496#

Second feeding period.

From February 22 to 24 tne same rations used in above were fed to tne tnree lots and from February 25 tne rations of lot 1

and lot 2 were increased.

February 25---March 15.

The daily rations of the three lots as follows:

Lot 1.

Feeds.	Dry matter.	Protein.	Acrbonnydrates.	Fat.
14# bean pods.	12.53	.504	5.936	.093
10# corn silage.	2.68	.11	1.5	.07
6# oats.	5.443	.532	3.126	.283
	20.605	1.196	10.562	.396

Total digestible nutrients. 12.849 Nutritive ratio. 1:9.53

Lot 2.

14# bean pods.	12.53	.504	5.936	.093
10# corn silage.	2.68	.11	1.5	.07
4# cull beans.	3.436	.732	3.172	.032
2# oats.	1.816	.194	1.042	.076
	20.464	1.54	10.65	.276

Total digestible nutrients. 12.811. Nutritive ratio. 1:7.32

Lot 3.

7# alfalfa.	6.393	.742	2.73	.063
10# corn silage.	2.68	.11	1.5	.07
6# oats.	5.443	.532	3.126	.263
	14.476	1.484	7.356	.361

Total digestible nutrients. 9.80225. Nutritive ratio. 1:5.69

Digestible nutrients per lot per day.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	20.603#	20.484#	14.476#
Protein.	1.196#	1.54#	1.434#
Carbonnydrates.	10.562#	10.65#	7.356#
Fat.	.396#	.276#	.361#

The digestible nutrients varied a great deal in the three lots. Lot 1 and lot 2 received twice as much roughage as lot 3 and also the different nutrients of lot 3 were lower than those of lot 1 and lot 2 except fat.

Digestible nutrients per head per day.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	2.944#	2.928#	2.068#
Protein.	.1786#	.22#	.2051#
Carbonnydrates.	1.5088#	1.5214#	1.0509#
Fat.	.0566#	.0394#	.0516#

Gains.

	Lot 1.	Lot 2.	Lot 3.
Total gain.	12 pounds.	5.9 pounds.	3.6 pounds.
Average gain per head per day.	.0779#	.0383#	.0553#

The gains made during this period were very poor. The weight was taken by three weeks instead two weeks because during that period the lambs were sheared and shrunk a great deal. How-

ever even the weight was taken in three weeks a poor result was obtained. But it still showed that the combination of alfalfa, corn silage and oats and the combination of bean pods, oats and corn silage were much better than the other.

Feed consumed per pound gain.

Lot 1.		Lot 2.		Lot 3.	
Bean pods.	24.666#	Bean pods.	50.169#	Alfalfa.	17.906#
Corn silage.	13.333#	Corn silage.	37.239#	Corn silage.	25.531#
Oats.	11#	Oats.	7.457#	Oats.	15.343#
		Cull beans.	14.915#		

In the above table it showed that lot 1 required 42.999 pounds roughage and 11 pounds grain to produce one pound of mutton, lot 2 required 37.453 pounds roughage and 22.3738 pounds grain and lot 3 required 43.437 pounds roughage and 15.343 pounds grain. The gains were abnormally low during this period.

Cost per pound gain.

Lot 1.	Lot 2.	Lot 3.
24.32¢	43.02¢	37.73¢

Total digestible nutrients per lot in 22 days.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	442.716#	419.492#	313.352#
Protein.	25.33#	31.314#	31.543#
Carbonnydrates.	227.276#	217.75#	161.382#
Fat.	3.623#	5.152#	7.942#

Total feed consumed in the 22 days.

Lot 1.		Lot 2.		Lot 3.	
Bean pods.	298#	Bean pods	298#	Alfalfa.	154#
Corn silage.	220#	Corn silage.	220#	Corn silage.	220#
Oats.	132#	Oats.	44#	Oats.	132#
		Cull beans.	33#		

Digestible nutrients per pound gain.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	36.393#	71.1#	37.0177#
Protein.	2.1586#	5.3075#	3.8634#
Carbonnydrates.	13.9363#	36.906#	13.3176#
Fat.	.719#	.3732#	.9285#

RESULTS AND SUMMARY.

According to the results obtained it will be seen that the two feeding periods varied a great deal in consumption of feed per pound gain and cost per pound gain. In the first feeding period lot 1 made a gain of .1556 pound per head per day, lot 2 made an average gain of .0818 pound and lot 3 made an average gain of .2068 pound, while in the second period lot 1 made an average gain of .0779 pound, lot 2 made an average gain of .0333 pound and lot 3 made an average gain of .0553 pound. During the first period it cost 11.5¢ per pound gain for lot 1, 13.4¢ for lot 2 and 10.2¢ for lot 3, while in the second period it cost 24.32¢ per pound gain for lot 1, 43.02¢ for lot 2 and 37.73¢ for

lot 3. The low rate gain of the second period was due to the cold weather immediately following shearing.

Since two feeding periods varied a great deal in results the best way is to take the two feeding periods into one period and an average should be taken for the results.

Average daily rations.

Lot 1.		Lot 2.		Lot 3.	
Bean pods.	11.5#*	Bean pods.	11.5#*	Alfalfa hay.	7#
Corn silage.	10#	Corn silage.	10#	Corn silage.	10#
Oats.	6#	Oats.	2#	Oats.	6#
		Cull beans.	4#		

Total feed consumed in 50 days.

Lot 1.		Lot 2.		Lot 3.	
Bean pods.	575#	Bean pods.	575#	Alfalfa hay.	350#
Corn silage.	500#	Corn silage.	500#	Corn silage.	500#
Oats.	300#	Oats.	100#	Oats.	300#
		Cull beans.	200#		

The three lots consumed the same amount of grain and corn silage but lot 3 consumed only a little over two-third as much dry roughage as lot 1 and lot 2. But lot 3 gave the largest gain during the whole period of the 50 days.

Total digestible nutrients.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	919.5#	392.217#	723.63#
Protein.	55.383#	70.53#	71.637#
Carbonnydrates.	475.524#	463.462#	867.3#
Fat.	19.492#	12.652#	13.05#

Total digestible nutrients per lot per day.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	13.39#	17.344#	14.454#
Protein.	1.1087#	1.4116#	1.4327#
Carbonnydrates.	9.5105#	9.26924#	7.356#
Fat.	.3896#	.2531#	.261#

Digestible nutrients per nead per day.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	2.627#	2.5492#	2.0643#
Protein.	.1581#	.2017#	.2047#
Carbonnydrtaes.	1.3568#	1.3335#	1.0509#
Fat.	.0557#	.0362#	.0516#

Gains.

	Lot 1.	Lot 2	Lot 3.
Total gain.	42.5#	21.9#	49.1#
Average gain per nead.	8.0712#	3.1233#	6.9372#
Average gain per nead per day.	.121#	.0624#	.139#

The results of the total gains at the end of the first part of the experiment were; lot 3 was first with a gain of 49.1 pounds, lot 1 was second with a gain of 42.5 pounds and lot 2 was last with a gain of 21.9 pounds. Thus it showed in every case that the combination of alfalfa hay, silage and oats did better than the other two, yet however the combination of bean pods, corn silage and oats gave a fair result and it was considered nearly as a good ration as alfalfa hay combination in this case.

Feed consumed per pound gain.

Lot 1.		Lot 2.		Lot 3.	
Bean pods.	13.553#	Bean pods.	26.3#	Alfalfa hay.	7.123#
Corn silage.	11.762#	Corn silage.	22.39#	Corn silage.	10.13#
Oats.	7.058#	Oats.	4.566#	Oats.	6.11#
		Cull beans.	9.132#		

Owing to the coarser hay of bean pods and low rate of gain of lot 1 and lot 2 the digestible nutrients were much different.

Digestible nutrients per pound gain.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	21.6849#	40.7405#	14.7339#
Protein.	1.302#	3.2223#	1.4599#
Carbonnydrates.	11.1363#	21.3909#	7.4903#
Fat.	.4538#	.5779#	.3676#

Cost per pound gain.

Lot 1. 15.24¢

Lot 2. 25.08¢

Lot 3. 15.08¢

Financial statement.

Lot 1.

Cost of feeds.

578 pounds bean pods.	$6 ₵ ton.	$1.723
500 pounds corn silage.	$4 ₵ ton.	$1.00
800 pounds oats.	$.40 ₵ Bu.	$3.75
		$6.473

Pounds gain. 42.5

Total cost. $6.473

Cost per pound. 15.24¢

Cost per head per day. 1.35¢

Lot 2.

Cost of feeds.

578 pounds bean pods.	$6.00 ₵ ton.	$1.723
500 pounds corn silage.	$4.00 ₵ ton.	$1.00
100 pounds oats.	$ .40 ₵ Bu.	$1.25
200 pounds cull beans.	$15.00 ₵ ton.	$1.50
		$5.473

Pounds gain. 21.9

Total cost. $5.473

Cost per pound gain.	25.03¢
Cost per head per day.	1.565¢

Lot 3.

Cost of feeds.

350 pounds alfalfa.	$15.00	a ton.	$2.625
500 pounds corn silage.	$ 4.00	a ton.	$1.00
300 pounds oats.	$00.40	a Bu.	$3.75
			$7.375

Pounds gain.	49.1
Total cost.	$7.375
Cost per pound gain.	15.02¢
Cost per head per day.	2.11¢

CONCLUSION.

From the above statement it will be seen that during the period of 50 days all the lambs of the three lots were fed in good condition although the gains varied to some extent. Lot 2 in spite of less gain being made and of greater cost per pound gain, required much less cost per head per day than lot 1 and lot 3. The cost per head per day for lot 1 was 1.35¢, for lot 2 was 1.565¢ and lot 3 was 2.11¢. Thus it can be seen that the alfalfa may cost more than bean pods for wintering ewe lambs. However, alfalfa fed to lot 3 made a larger gain than bean pods

fed to lot 1 and lot 2 and still the combination of bean pods, corn silage and oats made a better gain than that of bean pods, corn silage,oats and cull beans as it was indicated in the above tables. So it is safe to say that the combination of bean pods,corn silage and oats and that of alfalfa hay,oats and corn silage were nearly equally good and the cost per pound gain was nearly the same. During this period it showed in every case that cull bean is not a desirable grain to feed in ration with bean pods because smaller gain was made and cost per pound gain was great. But the cull beans are good grains when fed with corn silage as it has been proved in the second part of this experiment that corn silage,oats and cull beans fed in combination to lot 2 with a result of large gain being made and low cost per pound gain and low cost per head per day. However,this experiment proved that varieties of feeds are necessary for wintering ewe lambs because poor gain was obtained from lot 2 fed in combination of bean pods,oats and cull beans. Because of high cost of alfalfa hay and high cost of feed per head per day bean pods become a good roughage on farm for wintering ewe lambs when fed with a combination of corn silage and oats for it can make a larger gain and still lower the cost of feed.

PART 2.

Due to the shortage of bean pods to complete this experiment the new rations were fed to the three lots with clover hay, alfalfa hay and corn silage as roughages.

The lambs were weighed individually on March 15 and 16 and an average taken of these two weights as the initial weight for the last part of the experiment. When the feeding started lot 1 had an average weight of 595.5 pounds, lot 2 had an average weight of 591 pounds and lot 3 had an average weight of 595.5 pounds. The 3 lots of lambs started this period nearly the same weight because of different amount of wool sheared.

The new rations were fed on the 16th of March. The lambs were weighed every two weeks from which the gains were based on for the results. The feeding period of this part extended over a period of six weeks.

Lot 1 and lot 3 received exactly the same amount of hay, corn silage and grain, while lot 2 received 20 pounds of corn silage and 6 pounds of grain, However the amount of corn silage was increased to the lot 2 later.

Ration 1 consisted of clover hay, corn silage and oats. During the entire period of six weeks lot 1 received 9 pounds of clover hay, 10 pounds of corn silage and 6 pounds of oats per day with a nutritive ratio of 1:6.3.

Ration 2 consisted of corn silage, cull beans and oats. During the period from March 16th to 30th lot 2 received 20

pounds of corn silage,4 pounds of cull beans and 2 pounds of oats per day with a nutritive ratio of 1:5.9. Put from March 31st to April 26th it received 35 pounds of corn silage,4 pounds of cull beans and 2 pounds of oats per day with a nutritive ratio of 1:6.6.

Ration 3 consisted of alfalfa hay,corn silage and oats. during this period of the six weeks lot 3 received 9 pounds of alfalfa hay,10 pounds of corn silage and 6 pounds of oats per day with a nutritive ratio of 1:5.46.

Third feeding period.

March 16-----April 26.

The daily rations of the three lots as follows:

March 16----March 30.

Lot 1.

Feeds.	Dry matter.	Protein.	Carbonnydrates.	Fat.
9# clover hay.	7.893	.711	3.321	.099
10# corn silage.	2.66	.11	1.5	.07
6# Oats.	5.448	.582	3.126	.233
	15.971	1.403	7.947	.397

Total digestible nutrients. 10.24825 Nutritive ratio. 1:6.3

Lot 2.

Feeds.	Dry matter.	Protein.	Carbonnyarates.	Fat.
20# corn silage.	5.28	.22	3.00	.14
4# cull beans.	3.438	.782	2.172	.032
2# Oats.	1.818	.194	1.042	.076
	10.536	1.146	6.214	.248

Total digestible nutrients. 7.913 Nutritive ratio. 1:5.9

Lot 3

9# alfalfa hay.	8.226	.954	3.51	.031
10# corn silage.	2.63	.11	1.5	.07
6# Oats.	5.448	.532	3.126	.238
	16.304	1.646	8.136	.379

Total digestible nutrients. 10.685 Nutritive ratio. 1:5.46

In the above tables it will be seen that lot 2 received much less digestible nutrients than the other two and the gain during this period was also very low so the ration was changed and corn silage was increased to the lot 2 while the rations of lot 1 and lot 3 remained the same as before.

Daily rations from March 31 to April 26.

The rations of lot 1 and lot 3 fed the same as before.

Lot 2.

Feeds.	Dry matter.	Protein.	Carbonnydrates.	Fat.
35# corn silage.	9.205	.335	5.25	.245
4# cull beans.	3.433	.732	2.172	.032
2# Oats.	1.818	.194	1.042	.076
	14.509	1.311	8.464	.353

Total digestible nutrients. 10.[illegible]. Nutritive ratio. 1:6.6.

The nutritive ratios of the three lots were better than those in the part 1. Lot 3 had a narrowest ration with a nutritive ratio of 1:5.46,lot 2 had a widest ration with a nutritive ratio of 1:6.6 and lot 1 had a ration with a nutritive ratio of 1:6.3. In fact the total digestible nutrients of the three lots were nearly the same and therefore the results obtain-ed were nearly the same except in case of lot 2 which was under fed during the first two weeks of this period.

Digestible nutrients per lot per day.

	Lot 1.	Lot 2.	Lot 3.
	March 16---March 30.		
Dry matter	15.971#	10.5[illegible]4#	16.304#
Protein.	1.403#	1.146#	1.648#
Carbonhydrates.	7.947#	6.214#	8.138#
Fat.	.397#	.248#	.379#

March 31-----April 28.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	15.971#	14.509#	16.304#
Protein.	1.403#	1.311#	1.648#
Carbonhydrates.	7.947#	3.464#	3.136#
Fat.	.397#	.358#	.379#

Digestible nutrients per head per day.

March 16----March 30.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	2.2816#	1.5091#	2.3291#
Protein.	.2004#	.1687#	.2351#
Carbonhydrates.	1.121	.8377#	1.1632#
Fat.	.0567#	.03543#	.0541#

March 31----April 28.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	2.2816#	2.0727#	2.3291#
Protein.	.2004#	.1872#	.2351#
Carbonhydrates.	1.121#	1.2091#	1.1632#
Fat.	.0567#	.0504#	.0541#

The digestible nutrients consumed by the various lots varied somewhat, especially during the period from March 16 to 31. However the rations were changed after that time and so the digestible nutrients consumed in the last four weeks somewhat nearly the same by the different lots.

Gains.

	Lot 1.	Lot 2.	Lot 3.
Total gain.	93.5#	75.9#	97.3#
Average gain per head.	13.375#	10.848#	13.97#
Average gain per head per day.	.313#	.2533#	.3326#

The lambs of all the lots made larger gains during this part than last one. Lot 3 made the largest gain of 97.3 pounds, lot 1 made a gain of 93.5 pounds and lot 2 made a gain of 75.9 pounds. In this case it also showed that alfalfa hay was a better feed for wintering ewe lambs when the same or nearly the same amount of feed used.

Feed consumed per pound gain.

Lot 1.		Lot 2.		Lot 3.	
Clover hay.	4.043#	Corn silage.	16.4#	Alfalfa hay.	3.365#
Corn silage.	4.492#	Cull beans.	2.213#	Corn silage.	4.223#
Oats.	2.695#	Oats.	1.107#	Oats.	2.577#

Cost per pound gain.

Lot 1. 6.69¢.

Lot 2. 6.32¢.

Lot 3. 6.96¢.

The cost per pound gain was much less during this period

than the first one, due to the largest gains being made during this period of 42 days.

SUMMARY.

Average daily rations for the six weeks.

Lot 1.		Lot 2.		Lot 3.	
Clover hay.	9#	Corn silage.	29.8429#	Alfalfa hay.	9#
Corn silage.	10#	Cull beans.	4#	Corn silage.	10#
Oats.	6#	Oats.	2#	Oats.	6#

Feed consumed per lot.

Lot 1.		Lot 2.		Lot 3.	
Clover hay.	378#	Corn silage.	1245#	Alfalfa hay.	378#
Corn silage.	420#	Cull beans.	168#	Corn silage.	420#
Oats.	252#	Oats.	84#	Oats.	252#

Digestible nutrients consumed per lot.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	670.732#	550.208#	684.768#
Protein.	53.928#	52.537#	69.132#
Carbonnydrtaes.	388.774#	321.738#	341.712#
Fat.	18.664#	13.251#	15.918#

Feed consumed per pound gain.

Lot 1.		Lot 2.		Lot 3.	
Clover hay.	4.034#	Corn silage.	18.4#	Alfalfa hay.	3.365#
Corn silage.	4.492#	Cull beans.	2.213#	Corn silage.	4.228#
Oats.	2.965#	Oats.	1.107#	Oats.	2.577#

Digestible nutrients per pound gain.

	Lot 1.	Lot 2.	Lot 3.
Dry matter.	7.1741#	7.3492#	7.0017#
Protein.	.6802#	.6923#	.7063#
Carbonhydrates.	3.5697#	4.2389#	3.4[illegible]#
Fat.	.1782#	.1748#	.1627#

From the above tables it will be seen that lot 1 required 3.535 pounds of roughage and 2.965 pounds of grain to produce one pound of mutton, lot 2 required 16.4[illegible] pounds of corn silage or roughage and 3.32 pounds of grain and lot 3 required 3.033 pounds of roughage and 2.577 pounds of grain. The digestible nutrients consumed per pound gain produced were also low. When these three rations compared it is also found that alfalfa hay gave a larger and quicker gain but as a whole the three rations did very well throughout the entire period of the six weeks.

Financial statement.

Lot 1.

Cost of feeds.

373 pounds of clover hay.	$12.00	a ton.	$2.263
420 pounds of corn silage.	$ 4.00	a ton.	$0.34
252 pounds of oats.	$00.40	a Bu.	$3.15
			$6.253

Pounds gain.	93.5
Total cost.	$6.253
Cost per pound gain.	6.69¢
Cost per head per day.	2.12857¢

Lot. 2.

Cost of feed.

1245 pounds of corn silage.	$ 4.00	@ ton.	$2.49
84 pounds of oats.	$00.40	@ Bu.	$1.05
168 pounds of cull beans.	$15.00	@ ton.	$1.26
			$4.80

Pounds gain.	75.9
Total cost.	$4.80
Cost per pound gain.	6.32¢
Cost per head per day.	1.68265¢

Lot 3.

Cost of feed.

373 pounds of alfalfa hay.	$15.00	@ ton.	$2.835
420 pounds of corn silage.	$ 4.00	@ ton.	$ .84
252 pounds of oats.	$00.40	@ Bu.	$3.15
			$6.825

Pounds gain.	97.3
Total cost.	$6.825
Cost per pound gain.	6.98¢
Cost per head per day.	2.16¢

CONCLUSION.

For wintering ewe lambs it will be seen in the above statement that the three kinds of roughages of alfalfa hay, clover hay and corn silage are all satisfactory and doing very well during this period of the 42 days. However, alfalfa hay and clover hay made a better gain than corn silage as it was shown by the results during this period that lot 1 fed a combination with clover hay, corn silage and oats made a gain of 98.5 pounds, lot 2 fed a combination with corn silage, oats and cull beans made a gain of 75.9 pounds and lot 3 fed a combination with alfalfa hay, corn silage and oats made a gain of 97.3 pounds. Thus it can be said that clover hay and alfalfa hay are better feed for wintering ewe lambs than corn silage alone. Since larger gains were obtained from the lots fed with clover hay and alfalfa hay so that corn silage should not be fed exclusively to wintering ewe lambs as it was indicated by the result of small gain. Therefore corn silage should be fed in ration with some kind of hay to make a larger gain with a cheaper cost for wintering ewe lambs.