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1. Raising Lambs in Alabama. Maintenance Rations for Ewes.
2. Feeding Cotton Seed Meal to Pregnant Ewes.

BY

DAN T. GRAY AND J. W. RIDGWAY

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PART I.

RAISING LAMBS IN ALABAMA.

By DAN T. GRAY and J. W. RIDGWAY.

When one rides through the State of Alabama and sees the thousands of acres lying idle, growing up in brush and fine grasses, one wonders why there are not more sheep produced in the State than there are. It is usually stated that only 40 per cent of the area of Alabama is being cultivated or used to return wealth to the State. In some counties no more than 15 per cent of the total area is under cultivation. The other 85 per cent is lying idle. Money is tied up in the whole amount, but the farmer, on the average, is making use of but about 40 per cent of his whole capital invested. If sheep and other kinds of live stock were more generally introduced the usable area could be greatly increased, as these animals would make use of the present waste places and hill sides and help develop the pasture side of our farming operations. Even now thousands of acres under cultivation should be put down to permanent pastures and stock placed upon them. Hill-sides which wash should be put down to grass. This could be done without at all decreasing the cultivated area. The sheep need not occupy one foot of our already cultivateable area; he would but be a means of putting more of our land capital to work. The Alabama farmer can surely farm in such a way as to use more than 40 per cent of his land capital. What would we think of the business ability of a banker who used but one-half of his available capital, or the merchant who sold goods from but one side of his store?

Then, in addition to the fact that the sheep is probably the best animal known to put our waste areas to use, Alabama is just suited to sheep production. In any line of live stock production pastures must be made the base, and

Alabama can have permanent pastures for at least ten months in the year by the use of bermuda and burr clover. The remaining two months can be bridged over with temporary winter pastures. The Northern farmer must be contented with a grazing period of not more than six months. Then again our climate is so mild the year through that the lambs can be born in the mid-winter and suffer none from the cold. This permits the Alabama farmer to get the lambs upon the early spring market at the time when high prices are realized. In the North when the lambs come in December or January very expensive care must be given them to keep them from freezing, as they must be kept in a "hot house." In the South the early lamb is free to run at will throughout those months, and can even have green pastures to graze upon.

Still further, when the lamb is ready for the market good prices can be realized upon him. Some there are who claim there are no markets for lambs. But there is a great demand for the early lamb. The farmer should realize that a part of his business consists in finding a market for what he produces. The business man lays in his stock of goods and then looks for a market for it. The farmer must do the same thing. Many Southern cities offer as good a market for early lambs as does the St. Louis market. A following picture shows some spring lambs, that had nothing but their mother's milk and pastures, which sold in Birmingham for 10 cents a pound live weight on April 15th, 1908. Birmingham would use thousands of such lambs. These were good lambs, but no better than any other farmer could produce. They were raised by J. S. Kernachan, of Florence, Alabama. A good market can always be found for good fat stuff. The local market may not furnish a good sale for this class of stuff, but the cities are more than glad to receive it. The express charges do not prohibit the lambs being sent a good ways from home.

The Southern farmer depends too much upon one crop for a living. He is like the man with all his eggs in one

basket—if a mishap befalls the basket all of the eggs are broken and lost. So if the season should happen to be unfavorable for the growing of cotton the man who depends altogether upon cotton for a living finds that, at the end of the season, he has but a limited bank account to carry himself and family through the winter months. If this farmer has some pigs to sell, or a mule colt, or some wool or a few lambs, the short cotton crop will not be of so much importance. The farmer who is interested in more than one farm product suffers very much less in time of unfavorable seasons than the man who grows but the one crop, cotton. Even though it be too wet for the cotton to do its best, it may be, and probably will be, a very favorable season for the pastures, and the man who has a good flock of sheep out on the pastures raising some good fat lambs will not worry so much about the unfavorable season for cotton, as he feels that, although the cotton may be a partial failure, the sheep will bring him excellent returns.

There is yet another advantage in the sheep business. Spring is the time when the average farmer has not a cent coming in. This is the very time when the heavy expenditures must be made for machinery, fertilizers, mules, harness, etc., and to obtain these things the farmer usually asks some merchant to credit him until fall. The sales from the flock of sheep come in just when the money can be used for the above purchases. Both the wool and the early lambs are ready to sell and the money derived from these sales can be used to fit up the farm for spring work. From 100 ewes there could be sold, by the middle of April, from sixty to eighty dollars worth of wool and as many dollars from the early lamb sales, and probably much more from the lambs, provided they were dropped at a very early date.

Objects of Experiment.

Realizing the importance of the sheep industry to the State this Station began, four years ago, some experimental work with the following objects in view:

1. To study early lamb production in Alabama.
2. To study feeds and methods for carrying the pregnant ewe through the winter months.
3. To test cotton seed meal as a feed for pregnant ewes.

By an early lamb the authors mean one that is born in December or early January and ready for the market by the middle of April. Some farmers of the state are so fortunately situated that the second object will have little interest to them, as they already have abundant winter range supplied. The man who has a good winter range, or cane brake, needs no additional feed for the ewes. All such an ewe requires is care and attention and shelter at lambing time. But when sheep are generally introduced into the state, they will be introduced by the small farmer who is not supplied with an unlimited winter range. The small farmer will therefore be interested in knowing what are the best feeds for the winter months and the expense incurred in carrying the animals over the cold months. It might be said, in passing, that the sheep is the ideal animal for the man with the small capital. The business can be entered into with but a small outlay of money and large returns secured upon the outlay within a few months after the investment is made. The poor man cannot wait long for his investment to begin to return dividends. The sheep and the hog are the poor man's animals. Of course large amounts of money can be invested in them if desirable.

The work began in the summer of 1906 with the old flock of ewes which had been kept upon the Station farm for several years previous. This flock consisted of but 16 ewes, of mixed breeding, headed by a pure-bred Southdown ram. The pictures will show the general quality of the animals. Later on, in 1907, there was a flock of 30 scrub ewes added to these, headed by a pure-bred Dorset ram, but the Station is not yet ready to report upon the work done with this scrub flock, except with respect to some winter work in cotton seed meal feeding.

How the Old Flock Was Handled.

During the summer months, while the pastures were green, no attention was given the sheep at all except to see that they had plenty of water and a mixture of tobacco dust and salt before them at all times. The object in feeding the tobacco was to keep down stomach worms, as the worms are the bane of the sheep farmer, and it is claimed that tobacco dust will hold the pest in check. This was given them in proportion of one pint of dust to about four pints of salt. The sheep soon acquired a taste for the tobacco. It is well known that sheep should be changed from pasture to pasture as often as possible, unless the range be exceedingly large. The object in changing the pasture is to hold in check the stomach worms. The Station's pastures, or lots, are small, so the sheep were changed from one to the other as often as the grass became short. There was no regularity followed in making the change.

The period of gestation in the ewe is about five months, so if the lamb is to be dropped in December or the first of January she must be bred in July or early part of August. To be sure that she breeds in these months she should be turned upon a fresh pasture just before the time for breeding and then given a little cotton seed meal daily. As far as possible this plan has been followed with this flock. Of course there will always be a few late lambs, but if the ewes are in good breeding condition, neither too fat nor too poor, throughout July and August, the great majority of them will breed to drop lambs from Christmas to January the 15th.

The Station ram was allowed to run with the ewes at all times. If there had been as many as 50 ewes it would have been wise to have kept him away from the flock during the day time, and turned him in with them at night only. But with the few that we had he could be expected to be a safe breeder when running with the ewes both night and day. Some sheep farmers do not permit the ram to run

with the flock at all through the breeding season, but unless the owner has time to examine the ewes closely every day it is better for the male to be with them at least one-half of the time or the lamb crop will come on irregularly.

Winter Feeding of Ewes.

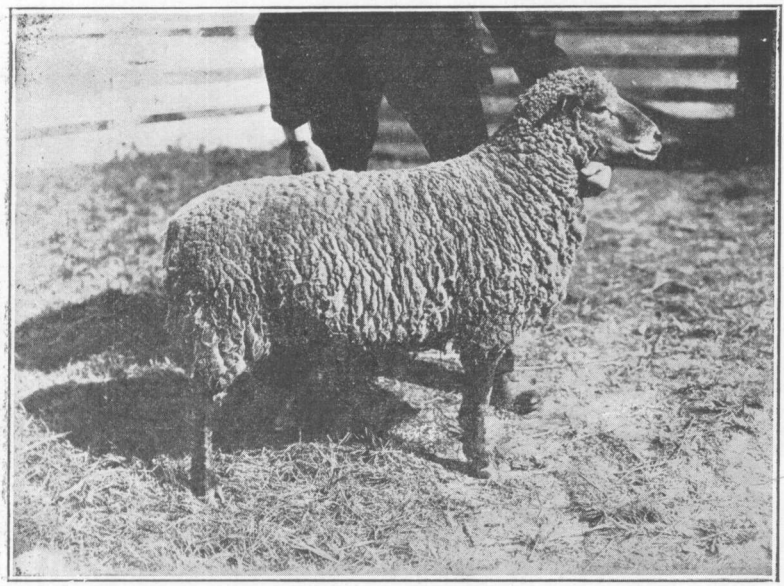
In the fall when the pastures became exhausted the ewes had to be managed as the small farmer would have handled them. There was no open range upon the Station farm so they had to be fed throughout the winter months. The man who has a farm with a winter pasture or range could have avoided this extra expense.

Some farmers in the state feed nothing but cotton seed meal and hulls to the pregnant ewes during the winter months. Others feed nothing but cotton seed. Still others are afraid to feed either cotton seed meal or cotton seed, thinking that cotton by-products are dangerous feeds for sheep. It is often claimed that cotton seed or cotton seed meal will cause blindness, dizziness, etc., and sometimes death when given to ewes. During the winter of 1906-'07 the old flock was divided into two lots of eight ewes each, and one lot was fed upon soy bean hay alone and the other lot upon cotton seed meal and hulls. The soy bean hay was of excellent quality but had no mature beans upon it, as it was cut before the beans were ripened. The cotton seed meal was fresh and bright.

Local conditions determine, to a large extent, the prices of feeds. Any prices that the authors might assume would not meet all conditions, so actual Auburn prices were taken as a basis upon which to rest the financial estimates. The local prices were:

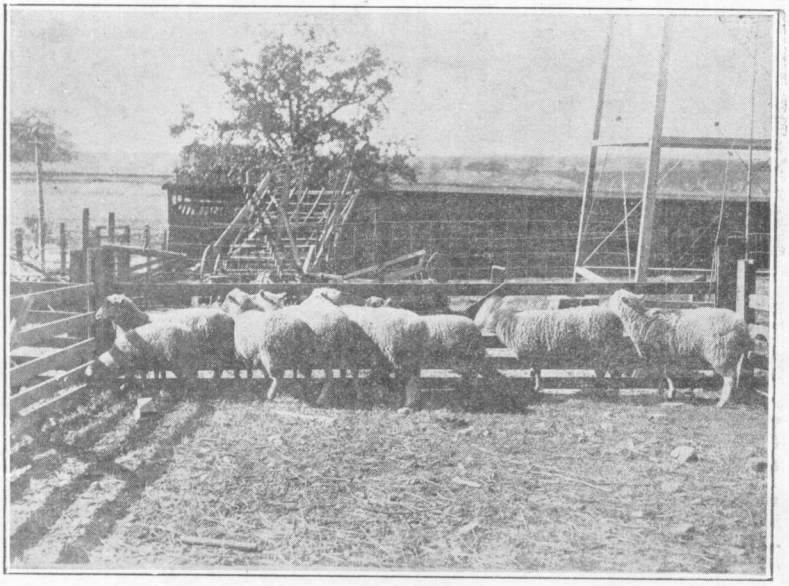
Cotton seed meal	$25.00 per ton.
Cotton seed hulls	$ 6.00 per ton.
Soy bean hay	$12.50 per ton.
Pasture rent per sheep per month	.10
Cotton seed	$12.00 per ton.

During the winter time the animals were enclosed in a small pen, with a shelter across one end, so they could get

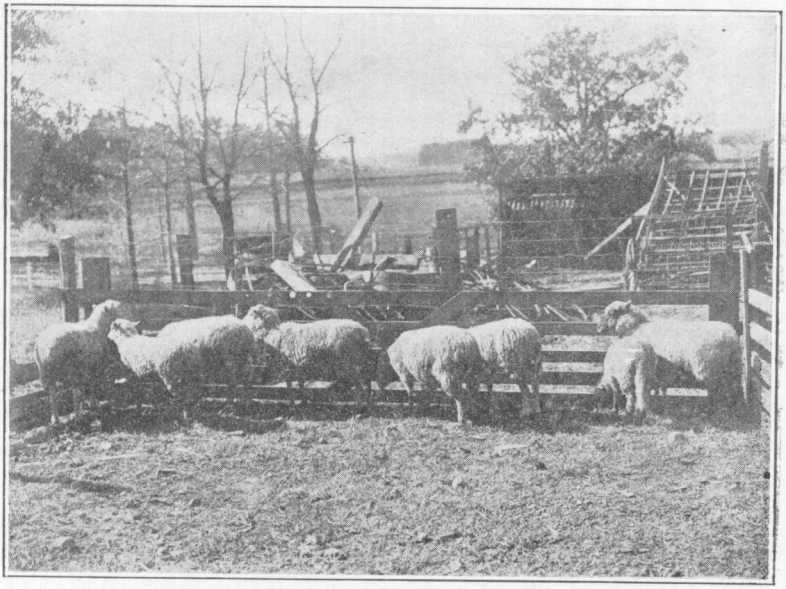


Southdown Ram.

The pure-bred ram quickly improves the flock in both conformation and wool covering.



Lot I—*Wintered on Soy Bean hay.*
Hay per ewe daily, 1.9 *pounds.*
Expense to feed each ewe a month, 35 *cents.*



Lot II—*Wintered on Cotton Seed Meal and Hulls.*
Feed per ewe daily { .5 *pound cotton seed meal.*
1.3 *pound cotton seed hulls.*
Expense to feed each ewe a month, 30 *cents.*

no feed but that which was weighed out to them. Salt and water were kept before them constantly. No tobacco was used throughout the winter months, but perhaps it would have been wise to have used it. They were fed twice daily. The ewes were pregnant, and of course did not all lamb upon the same date. When one dropped a lamb she was taken out of her lot and put into a third lot, where the object was to learn how much the feed must be increased to maintain a ewe while milking.

The following table tabulates the results of the winter work—1906-'07:

Table 1. *Cotton seed meal and hulls versus Soy Bean hay for wintering pregnant ewes.*

Lot.	Ration.	Av No. ewes for 106 days	Feed eaten daily per ewe	Total gain each ewe for 106 days	Cost of feed per ewe per month
			Lbs.	*Lbs.*	*Cts.*
1	Cotton seed meal Cotton seed hulls	5.8	0.5 1.3	1.8	30
2	Soy bean hay	6.4	1.9	1.6	35

The ewes were not, of course, given all they could eat. The object was to feed them only enough to maintain them, that is, to keep them from either losing or gaining in weight throughout the winter months. The above ewes gained between one and two pounds each during the entire winter. It would, no doubt, have been better if they had been given enough feed to have made them gain from six to eight pounds each, as each one had to develop a foetus which weighed from five to nine pounds at birth.

The farmer could have cheapened the ration of lot 1, the cotton seed meal lot, by not feeding as much cotton seed meal as was fed in the test. It would have been cheaper to have cut down the meal and increased the hulls, but a large amount of meal was used in the test so that it would be possible to collect some data upon the effect of rather large daily feeds of cotton seed meal upon the health of the ewes. In this test the cotton seed meal ration was fixed at one-

half a pound daily per ewe and the hull part of the feed was varied so as to hold her at a uniform weight.

The test shows .5 of a pound of cotton seed meal and 1.3 pounds of hulls to be sufficient to maintain these pregnant ewes in the winter time. The ewes averaged about 95 pounds in weight. The animals were given this ration for 106 days and some of them even longer. One and nine-tenths pounds of soy bean hay per ewe per day proved to be sufficient to maintain the other lot. Both lots came through to the lambing period in excellent health and spirits, but the cotton seed meal lot seemed to be more spirited and alert than the soy bean lot. No objection, though, could be brought against either feed as far as their general effects upon the animals were concerned.

When the prices are quoted as heretofore given the cotton seed meal ration proved to be the cheaper of the two. In lot one it cost 30 cents a month to feed each animal, while with lot two the expense was 35 cents a month per ewe. A little change in the price of feeds would alter the financial statement, however. But, taking the above results and quotations as a basis, the soy bean hay proved to be worth $10.68 a ton for carrying the ewes through the winter when compared to the cotton seed meal and hull ration. In some parts of the state that price would be a good one for the hay, but in other portions of the state conditions are such that a farmer could well afford to sell the hay upon the market, and with the proceeds buy cotton seed meal and hulls to use in feeding the sheep. In many points in the state soy bean hay sells for $15.00 to $20.00 a ton. The farmer cannot afford to feed it to sheep, or, in fact, any other kind of live stock, except probably the work animals, when he can secure $20.00 a ton for it after a short haul. Other feeds are cheaper.

Feeding the Milking Ewe.

As stated above, when a ewe brought a lamb she was taken out of her lot and placed in a third lot, where she was given more feed than when dry. After the lamb came

she was a milking animal and had to be treated as such. The cow in milk requires much more feed than does the dry cow, and so the milking ewe must be fed more liberally than the dry one. The most economical thing to have done with the ewe when she dropped the lamb would have been to put her and the lamb out upon green pasture. This date would be around January the first. Green pastures can easily be provided at this time of year, as oats, vetch, rye, wheat, burr clover and barley pastures. The pasture method is the way the farmer should handle his flock for the greatest profit, but the Station wished to learn how much the feed should be increased after the ewe came into milk, and also study the effect of prolonged feeding of cotton seed meal upon the health of the animal, so it was not possible to employ the cheapest methods in this particular test. So the mothers were confined in a third lot and fed upon an increased amount of cotton seed meal and hulls. A small passage was made in the fence leading out into the pasture, which was composed of oats and vetch, and the lambs only were given the freedom of this run.

But it might be that the farmer would not be supplied with a green field when the lambs begin to come, and he would be interested in knowing just how much the feed should be increased when the ewe changes from a dry to a milking animal. The majority of owners allow their ewes, cows, sows and mares to run down rapidly in flesh when they come into milk.

It has been a rule of the writers to increase the feed of a mare or a cow twenty-five per cent. when the young animal was born, thinking that this increase in feed would be sufficient to maintain the mother in as good condition as she was before giving birth to the young animal, but the following data show that an increase of twenty-five per cent. was not sufficient:

Table 2. Amount feed required to maintain a ewe before and after lambing.

Lot	Ration	Am't feed eaten daily	Total gain each ewe for whole period	Cost to carry each ewe for one month
Before lambing:		*Lbs.*	*Lbs.*	*Cts.*
1	Cotton seed meal Cotton seed hulls	0.5 1.3	1.8	35
After lambing:				
2	Cotton seed meal Cotton seed hulls	.88 2.35	1.5	54

At the beginning of the test the feed of those ewes in milk was made just double the amount given the dry ewes so that the animals would be sure to not lose in weight, but it was soon learned, as the ewes begun to increase in weight, that an hundred per cent. increase was more than necessary, so the amount was gradually decreased until it was brought down to the above average figures. They were carried along upon this basis for a period of seventy-three days. The ewes were practically maintained, as far as total weight was concerned, as they gained but one and one-half pounds for the whole time. In the test it required 75 per cent. more cotton seed meal and 81 per cent. more hulls to maintain a ewe when suckling a lamb than when she was dry and pregnant. Of course there are several factors that would be controlling ones in determining the amount of feed required for an animal after lambing, as the amount of milk given, but under conditions as they existed in this test the necessary increase in feed, when the animal came into milk, was not less than 75 per cent. above that which she received when dry.

In some experimental work with grade angus cows, Professor Mumford, of the Illinois University, in bulletin III, says, "In this test it took approximately twice as much feed to maintain a cow suckling a calf as it did during her pregnancy."

Handling and Feeding the Lambs.

As a rule, the farmer feeds the early lamb nothing in addition to its mother's milk and what little pasture it can secure during the winter months. It will pay to feed the lambs though, and to feed them well. Any animal makes its cheapest gains when young. If it has a good pasture of oats and vetch to run upon it will eat but little grain in addition. But it will eat some corn and should have it, because this early lamb, to derive the greatest profit upon him, and at the same time lessen the risk of summer disease, should be pushed to an early market. The first lambs were dropped January the 8th. This was late, which fact gave greater cause for pushing them to an early market. From the sixteen ewes fourteen lambs were raised to a marketable age. Two of the ewes were too young to breed at this time. As soon as the lamb was born he was placed in a third lot with his mother. In the fence of this lot was a small hole which permitted the lambs to creep through and make use of the pasture of oats and vetch. The pasture, which had been fall planted, was ready for grazing by the time they could use it. As stated above, it would have been better and cheaper if the mothers had been allowed the run of this pasture also, but they were kept off for reasons heretofore mentioned. A small pen was also cut off in the corner of the lot where the mothers were kept and a creep made into this pen large enough for the lambs to go through. In this pen coarsely ground corn was kept all the time in a small trough. The pasture and grain should be given the lambs as soon as they are born and they will begin to eat by the time they are ten days old. The lambs did not eat much corn, but what they did eat helped to put the finish on them at an earlier date, so that they sold well upon the market. The 14 lambs ate but 6.6 bushels of corn during the whole winter and early spring. So the lambs had all of the corn, milk and green pastures that they wanted. With this combination of feed they, of course, did well.

They were sold at an average age of 101 days and had attained an average live weight of 51 pounds (Atlanta weights). They made excellent gains to be born of mothers that average only 95 pounds in weight.

It might have been more profitable to have carried them to a heavier weight, but that point could not be determined. If they had been born earlier they could have been fed longer and still been placed upon the early market. The object was to sell them as early in the season as possible and yet have a reasonable size. This is the reason why earliness of birth is such an important question. When warm weather comes on the price of mutton declines, as people do not like mutton during the warm months, so it is to the advantage of the owner to let the lambs go at the earliest possible date. And, too, when they are sold in the early spring the danger of losses from summer diseases is also considerably lessened. The earliest bunch was sent to Atlanta, April 23rd, 1907. The Station has succeeded, during the last two years, in getting some lambs ready for the market by the middle of April. Two of the bunch sold for nine cents a pound live weight, while three sold for eight and one-half cents a pound. The remaining ones were sent on later and sold for but eight cents a pound. The late ones were, in fact, better lambs than the first ones, but the weather was becoming warm and there was not as great a demand for them as there was for the early ones. The best prices prevail just before Easter time. The Station has not been able to secure as good prices for lambs as have some farmers of the state. A picture in another part of the bulletin shows some lambs which were sold, in April, 1908, in Birmingham, for ten cents a pound live weight.

It must be remembered, too, that these lambs were not fancy bred ones. They were just common lambs. In fact, two of them were out of scrub mothers by a pure bred Southdown ram. The others were out of grade mothers.

Salt Fed.

Salt was placed in small boxes and kept before the animals all the time. They are very fond of it, as the following table shows. Each ewe ate at the rate of 15 to 19 pounds of salt yearly, or a flock of 100 ewes would have consumed in one year's time from 1,500 to 2,000 pounds of salt.

Table 3. Salt eaten per month by each ewe.

Lot	Ration	Pounds salt eaten per ewe each month
1 (1906)	Soy bean hay.....	1.35
2 (1906)	Cotton seed meal } Cotton seed hulls }	1.53
1 (1907)	Green sorghum plus mixed hay (summer work).....	1.23
2 (1907)	Cotton seed meal..... Cotton seed hulls (summer work)	1.29

Water Drank.

It is often thought that sheep will not drink much water, and that they will thrive as well without it as with it. Data were collected on the amount of water consumed by some ewes from August 21st to September 9th, 1908, while they were confined in small sheltered lots. The weather was about normal for this time of year.

Table 4. Water drank per ewe per day.

Lot	Ration	Pounds water used by each ewe per day
1	Green sorghum.....	2.5 (.3 gallons)
2	Cotton seed meal and hulls.....	6.1 (.95 gallons)

Financial Statement For Old Flock.
1906-'07.

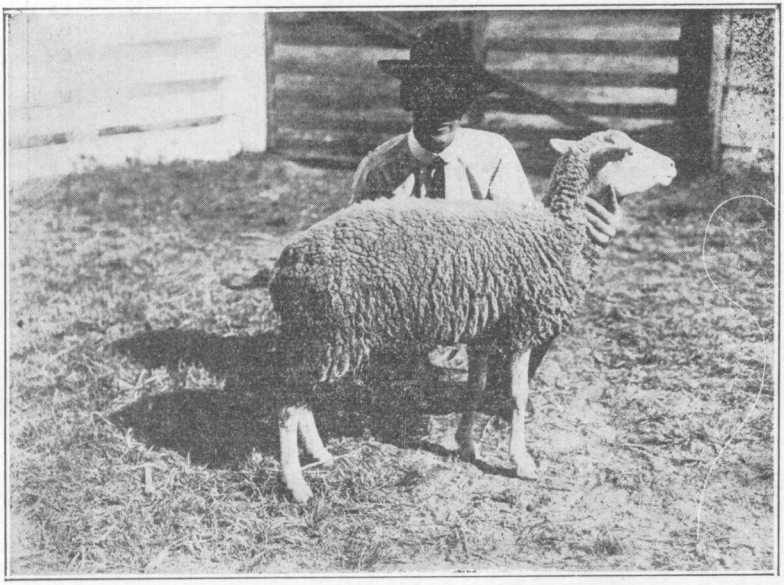
The financial statement includes all the income and expenses upon the old flock of 16 ewes and one ram from October the first, 1906, to October the first, 1907,—a year's time. While the flock was not carried through the year with a view of rendering a financial statement at the end, still the statement points out what profit can be made upon

a small flock if profits be the only point in view. The authors had other questions to solve with the flock, so it was not carried through the year as cheaply as the farmer could have carried it through. If profits had been the only point in view the animals would have been handled more economically by feeding the ewes very little grain after the lambs were born. To secure the greatest returns the mothers should have been turned out into the oat and vetch pasture with the lambs and fed little, if any, concentrated feeds. But owing to the fact that the Station at that time owned no other flock, this same flock had to be used in the spring experiment of 1907, when a study was made of the amount of feed required to maintain a ewe after lambing.

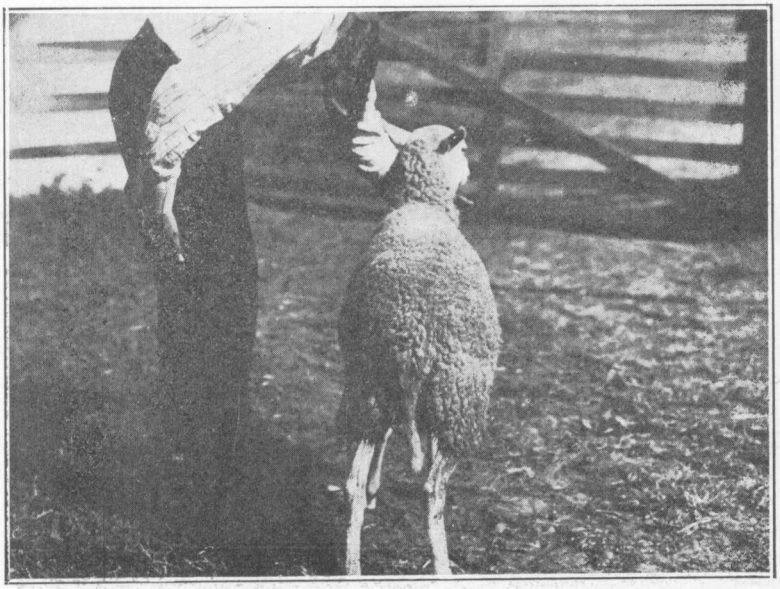
This, of course, ran the expense up very materially—about 30 per cent. more than it should have been. But in the following financial statement all of the expenses have been counted against the flock.

Table 5. Financial statement of old flock—1906-1907.

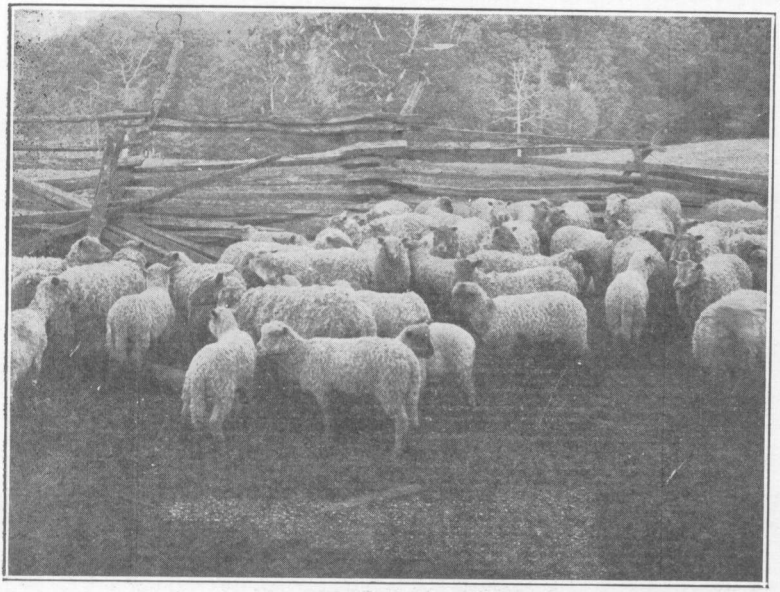
Expenses:		
	Rent on pasture, 10 cts. per sheep per month	$12.24
Lot 1.	1503 lbs. soy bean hay at $12.50 per ton	9.39
Lot 2.	342 lbs. cotton seed meal at $25.00 per ton	4.27
	879 lbs. cotton seeed hulls at $6.00 per ton	2.64
Lot 3. (after lambing)	530 lbs. cotton seed meal at $25.00 per ton	6.62
	1332 lbs. cotton seed hulls at $6.00 per ton	3.99
	198 lbs. cotton seed at $12.00 per ton	1.19
	1 ton green hay at $2.00 per ton	2.00
Lambs	371 lbs. corn at 70 cents per bushel	4.63
	35 lbs. bran at $30.00 per ton	.52
	Death one ewe	3.00
	Express charges to send lambs to Atlanta	7.00
	Express charges to send wool to Atlanta	.60
	Total	$58.09
Receipts:		
	To 14 lambs	$53.56
	To 55 1-2 lbs. wool, 26 1-2 cts. per lb.	14.64
	Total	$68.20



Side view of average Alabama scrub ewe. Price $1.50—$3.00.



These ewes are excellent animals with which to start a flock of sheep. Use pure-bred rams upon them.



16 *lambs of this bunch sold for* 10 *cents a pound, live weight, at Birmingham, April* 15, 1908. *Belonged to J. S. Kernachan.*

Spring lambs running on a pasture of oats and vetch during the winter time.

The above tabulation shows every item of expense against the flock during the entire year except the labor required to look after it. It has been assumed that the value of the manure will offset the labor expenses. After all of these expenses were considered the flock gave a return of $10.11. What do these figures mean? Do they mean that the Station received but $10.11 on the whole flock? No, that is not all they mean. They mean that the Staton realized $12.50 per ton for all the soy bean hay eaten throughout the winter, that the pasture rented for ten cents per sheep per month, that 70 cents per bushel were realized upon the corn used and $12.00 a ton on the cotton seed—and finally, in addition to marketing the farm crops at the above prices, $10.11 were realized. The financial returns were satisfactory, but not as satisfactory as they could have been made if the feed bill had been cut down and pasture made use of after the lambs came. For instance the farmer would have almost entirely dispensed with the feed item of $13.70 for lot 3. Live stock should be looked upon as a means of marketing the farm crops at good prices while, at the same time, the manure is returned to the soil.

Experience of Two Alabama Sheep Farmers.

Many farmers will be interested in the following statements from good farmers who have tried the sheep business and are making a success of it—

Alabama Experimental Station.

Dear Sirs:—

About fifteen years ago I bought six head of ewes and one buck as a start in the sheep business. Up to that time I had never liked sheep, but experience has taught me to be more and more pleased wth them as time goes by. They have been great money makers for me. I kept all the ewe lambs for several years and today have one hundred and forty head of breeding ewes. For the last five years have sold both male and female lambs, keeping just enough ewe lambs to keep up the number where I want it.

I do not know of an investment that will make money faster than will sheep—with proper care and attention. We think an investment is doing wonderfully well if the original capital doubles itself in ten years. But see what the sheep did; if they had increased to twelve only within the ten years they would have doubled the investment. But they did much more than simply double. Within the ten years the ewe part of the flock—that part retained upon the farm—doubled about five times, to say nothing of the number of ewe and male lambs that have been sold from the farm within the ten years. I have realized, in the fifteen years, about one thousand dollars for lambs, while the wool has paid for the keep of the flock every year.

I have never been bothered by dogs. I have always kept the sheep upon my own lands, never allowing them to run upon the commons.

The animals have been perfectly healthy all the time. I have never lost a sheep except from old age. They run upon pasture about nine months of the year without any other feed in addition. The pasture keeps them in fine condition. During the lambing time the ewes need some extra feed, so I then give them some cotton seed—about three bushels to each one hundred ewes—and any good hay that I happen to have on hand.

The lands upon which the sheep have been running will carry twice as many head of stock now as it would ten years ago. The sheep is called the "golden hoofed" animal and I think they are entitled to the name; they have not only brought in the money, but have improved the land. The manure spreader is said to be a paying investment, but sheep are a decided improvement on any manure spreader, as they manufacture and spread the manure too. I have never had trouble arise from running other kinds of stock with the sheep. I keep horses, cattle and sheep in the same pasture all through the grazing season, except when the lambs are young, when I keep them away from all other

stock. The other stock do not object to eating the grass upon which the sheep have grazed.

Yours truly,

J. S. KERNACHAN, Florence, Ala.

Alabama Experiment Station.

Dear Sirs:—

In January, 1904, when we bought our farm, the man of whom we bought it had a small flock of forty-eight head of sheep and was very anxious to leave them with us on shares, but we had always heard that sheep would ruin a pasture, and so were unwilling for them to stay. But finally we agreed to keep the sheep for him for eighteen months on shares; we were to receive one-half of the wool and lambs and bear the expense of pasture and the labor to look after them.

The first year we raised fifty-four lambs and divided up about July first. As he intended to sell his part of the lambs he took the bucks and left us twenty-seven ewe lambs as our part of the first crop of lambs. Now, it is strange, but it is a fact, that the next spring every one of these twenty-seven ewes had lambs and some of them had twins. When we divided up again the next year, about July first, we had about seventy-five sheep, and besides had received some money for our part of the wool. In the meantime we had watched pretty closely and found that, instead of injuring our pastures, the sheep had benefited them by eating weeds and other things which our cattle would not eat.

So far, we were well pleased with our experiment and decided that, by breeding up our sheep, we could make some money, so we ordered two Southdown rams from Kentucky. We decided on the Southdown because, after reading and making inquiry, we thought they would suit us best as we prefer a dual purpose animal—one that would produce both wool and mutton. We have had no cause for regret in making this selection, as they have been very

hardy here and proved to be the ideal sheep for our needs. Every year we have put in new bucks, selected and kept our best ewe lambs, and sold the buck lambs and the old ewes.

Our investment in sheep has never paid us less than one hundred per cent. and many years has paid us even more than that. The higher we grade them up the better they pay us, notwithstanding the fact that the higher they are graded up the greater price we place upon the breeding flock. As evidence of this fact, we have sheared from one hundred and seven sheep six hundred and thirty-three pounds of wool in the grease, but free of burrs and dirt. Although our lambs were unusually late this season, they have been dressed and shipped, having made an average dressed weight of about forty pounds. Their quality has been such as to tax our capacity for supplying them, and we have received the best price we have ever obtained.

The sheep we started with were scrubs—just the ordinary sheep of the county. Our farm is no better than many other farms of the State, yet our sheep have proven to be a better investment to us than money at compound interest. Still it is a fact that some farmers contend that there is no money in live stock on the farm, and that, here in Alabama, we cannot afford to have anything but scrub cattle, sheep and hogs. If the farmer who thinks this will try in but a small way to improve and build up his stock—giving the business the same conservative thought and care that brings success to other undertakings—he will soon have a good balance to the credit of the live stock account, besides having the satisfaction of owning useful and pretty animals.

We try to keep only about one hundred ewes, and carry them in the pasture along with about one hundred and fifty cattle. The sheep benefit the pasture by keeping down weeds. There is no objection to having the sheep and cattle in the same pasture. We make our living from the farm, consequently everything upon the farm must pay its own

way and make something for us besides. We have found, and the Southern farmers who try it will find, that sheep are a paying proposition. They have the following advantages:

They require but a small capital to begin the business.

They will do well on hilly and broken lands.

Their manure is one of the richest animal manures that can be obtained.

The money comes in from them in the spring and early summer when money is scarce.

They subsist on things that other animals will not eat.

They afford us two sources of profit—wool and lambs.

Yours very truly,

J. B. McDaniel, Camden, Ala.

PART II.

FEEDING COTTON SEED MEAL TO SHEEP.

It is generally thought that cotton seed meal has a toxic effect on sheep similar to the effect it often has on hogs. Many farmers will not use it as a sheep feed because of the reported ill results. It is charged with producing illness, blindness, dizziness, etc., after being used for a few weeks. For the last four years this Station has been trying to determine whether cotton seed meal is an injurious feed for sheep or not, and, so far, no ill results have come from its use, with possibly one exception in 1906.

The old flock of ewes has been used in this work together with a flock of scrub ewes which were brought to the farm in the summer of 1907. The animals using the meal have been fed by the side of other animals which were being given rations without cotton seed meal so as to study the effect of the cotton seed meal upon the general health of the animals, even though no deaths should occur as a result of its use. The following table gives the details of the live weight, total cotton seed meal eaten and number of days that each ewe ate the cotton seed meal:

Table 6. Feeding cotton seed meal to sheep.

Ear No.	Live Weight	Total cotton seed meal eaten	Meal eaten daily	No. days on cotton seed meal	REMARKS
1906.	Lbs.	Lbs.	Lbs.		
5	120	68.5	.5	137	Excellent health throughout.
2	125	98.6	.5 for 53 das. .88 for 82 das.	135	Excellent health throughout.
15	90	94.2	.5 for 60 das. .88 for 73 das.	133	Excellent health throughout.
9	106	33.2	.5	66	Became sick; taken out of test, died within four months of stomach worms.

3	120	94.2	.5 for 60 das. .88 for 73 das.	133	Excellent health throughout.
28	47	67.5	.5	135	Excellent health throughout.
123	95	88.3	.5 for 78 das. .88 for 56 das.	134	Excellent health throughout.
61	75	78.8	.5 for 103 das. .88 for 31 das.	134	Excellent health throughout.
1907.					
5	120	105.0	.5	210	Excellent health throughout.
7	102	92.5	.5	185	Died Jan. 31-'08. No blindness, dizziness, etc. Cause of death probably worms, as worms were in stomach.
3	120	105.0	.5	210	Excellent health throughout.
4	132	73.5	.5	147	Died Jan. 11-'08. She seemed blind, staggered, would not eat well when fed in trough. Died fat. Would eat if feed placed before her.
96	32	17.5	.5	35	Died Sept. 19-'08. Death caused by getting head fastened in fence.
33	59	105.0	.5	210	Excellent health throughout.
29	65	105.0	.5	210	Excellent health throughout.
190	65	16.8	.25 for 44 das. .28 for 10 das. .33 for 9 das.	63	Excellent health throughout.
191	75	34.0	.25 for 44 das. .5 for 46 das.	90	Excellent health throughout.
192	65	16.8	.25 for 44 das. .28 for 10 das. .33 for 9 das.	63	Excellent health throughout.
193	83	16.8	.25 for 44 das. .28 for 10 das. .33 for 9 das.	63	Excellent health throughout.
194	85	31.8	.25 for 44 das. .28 for 10 das. .5 for 36 das.	90	Excellent health throughout.
195	65	16.8	.25 for 44 das. .28 for 10 das. .33 for 9 das.	63	Excellent health throughout.

196	70	16.8	.25 for 44 das. .28 for 10 das. .33 for 9 das.	63	Excellent health throughout.
197	54	16.8	.25 for 44 das. .28 for 10 das. .33 for 9 das.	63	Excellent health throughout.
170	74	18.2	.32 for 57 das.	57	Aborted after weigh day.
171	46	18.2	.32 for 57 das.	57	Had been on sorghum; became very weak before putting on cotton seed meal.
174	47	18.2	.32 for 57 das.	57	Had been on sorghum; became very weak before putting on cotton seed meal.
198	35	5.9	.28 for 21 das.	21	Had been on sorghum; became very weak before putting on cotton seed meal.
177	68	18.2	.32 for 57 das.	57	Had been on hay. Gained rapidly when put on cotton seed meal.
181	61	18.2	.32 for 57 das.	57	Had been on hay. Gained rapidly when put on cotton seed meal.
140	52	18.2	.32 for 57 das.	57	Had been on hay. Gained rapidly when put on cotton seed meal.
185	58	18.2	.32 for 57 das.	57	Had been on cotton seed before placed on cotton seed meal.
188	50	18.2	.32 for 57 das.	57	Had been on cotton seed before placed on cotton seed meal.
189	65	18.2	.32 for 57 das.	57	Had been on cotton seed before placed on cotton seed meal.
199	49	18.2	.32 for 57 das.	57	Had been on cotton seed before placed on cotton seed meal.
1908.					
185	95	65.1	.23 for 94 das. .8 for 33 das. .57 for 30 das.	157	Excellent health throughout.
48	100	65.1	.23 for 94 das. .8 for 33 das. .57 for 30 das.	157	Excellent health throughout.

182	110	80.5	.23 for 67 das. .80 for 60 das. .57 for 30 das.	157	Excellent health throughout.
177	96	79.9	.23 for 68 das. .80 for 59 das. .57 for 30 das.	157	Excellent health throughout.
194	84	16.6	.23 for 72 das.	72	Aborted. Taken out of test.
5	109	58.1	.23 for 165 das. .48 for 42 das.	207	Excellent health throughout.
186	100	84.3	.23 for 84 das. .80 for 43 das. .57 for 30 das. .48 for 28 das.	185	Excellent health throughout.
193	90	27.8	.23 for 121 das.	121	Died. No report on death.
58	81	77.1	.23 for 73 das. .8 for 54 das. .57 for 30 das.	157	Excellent health throughout.
190	68	19.8	.23	86	Aborted. Taken out of test.
178	95	77.1	.23 for 73 das. .8 for 54 das. .57 for 30 das.	157	Excellent health throughout.
61	99	74.2	.23 for 78 das. .80 for 49 das. .57 for 30 das.	157	Excellent health throughout.
30	102	65.5	.23 for 106 das. .57 for 30 das. .48 for 50 das.	186	Excellent health throughout.
33	93	31.1	.23	135	Aborted. Taken out of test.
17	60	16.8	.23	73	Taken out of test as she was young and was getting weak.
70	110	91.7	.23 for 71 das. .8 for 56 das. .57 for 30 das. .48 for 28 das.	185	Excellent health throughout.
71	100	101.1	.23 for 73 das. .80 for 54 das. .57 for 30 das. .48 for 50 das.	207	Excellent health throughout.
174	75	97.4	.5 for 71 das. .8 for 56 das. .57 for 30 das.	157	Excellent health throughout.

192	91	38.5	.50 for 77 das.	77	Excellent health throughout.
2	114	114.8	.50 for 93 das. .80 for 34 das. .57 for 30 das. .48 for 50 das.	207	Excellent health throughout.
195	75	98.6	.5 for 67 das. .8 for 60 das. .57 for 30 das.	157	Excellent health throughout.
47	85	47.0	.5 for 94 das.	94	Absorted. Taken out of test.
14	135	106.0	.5 for 109 das. .8 for 13 das. .57 for 30 das. .48 for 50 das.	202	Excellent health throughout.
196	70	118.1	.5 for 82 das. .8 for 45 das. .57 for 30 das. .48 for 50 das.	207	Excellent health throughout.
29	105	97.3	.5 for 116 das. .8 for 11 das. .57 for 30 das. .48 for 28 das.	185	Excellent health throughout.
59	85	102.1	.5 for 100 das. .8 for 27 das. .57 for 30 das. .48 for 28 das.	185	Excellent health throughout.
181	81	109.9	.5 for 74 das. .8 for 53 das. .57 for 30 das. .48 for 28 das.	185	Excellent health throughout.
36	101	102.6	.5 for 155 das. .57 for 2 das. .48 for 50 das.	207	Excellent health throughout.
199	80	105.5	.5 for 124 das. .8 for 3 das. .57 for 30 das. .48 for 50 das.	207	Excellent health throughout.
26	69	102.6	.5 for 162 das. .48 for 45 das.	207	Excellent health throughout.
191	99	104.8	.5 for 91 das. .8 for 36 das. .57 for 30 das. .48 for 28 das.	185	Excellent health throughout.

Sixty-five ewes have been fed upon cotton seed meal for different lengths of time, and in varied amounts and no ill results have occurred with the possible exception of one ewe (Ewe No. 4). After she had been on a cotton seed meal ration for 147 days (in 1907) she staggered and became blind, and finally died. Aside from the blindness and staggering she seemed to be in good health and was very fat when death occurred. There were, during the four years, six cases of abortion among the ewes eating cotton seed meal. Among the check lots (those eating no cotton seed meal) there were as many abortions. The ewes in 1908 were fed upon the same load of cotton seed meal that killed several hogs in the swine experimental work, but not a single ewe suffered any ill results from its use. It is true that the ewes did not receive as much cotton seed meal as did the hogs, per hundred pounds live weight, but still the sheep were kept upon the meal double the length of time the hogs were.

The roughage used in all of the above cases was cotton seed hulls.

While the results are but negative ones, still they seem to warrant the conclusion that there is very little risk to run, if any, in feeding cotton seed meal to ewes, when fed in amounts just sufficient to carry the animal through the winter in good breeding condition.

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