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ALABAMA

AGRICULTURAL EXPERIMENT STATION

STEER FEEDING IN ALABAMA

1. Fattening Steers on Cottonseed Meal, Hulls, Silage and Johnson-grass Hay.

2. Wintering Steers Preparatory to Summer Fattening on Pasture.

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4. Early Compared with Late Fattening of Steers on Pasture.

Investigations in co-operation with the Bureau of Animal Industry, Washington, D.C.

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Part I.

Winter Fattening of Steers on Cottonseed Meal, Cottonseed Hulls, Corn Silage, and Johnson-Grass Hay.

INTRODUCTION.

Cottonseed meal and cottonseed hulls, the two feeds which in the past have been used almost exclusively during the winter months for fattening cattle in the South, have advanced in price very materially during the last three or four years. This advancement in price has forced the southern farmers to seek feeds with which to supplement the cottonseed meal and hulls. In the experiment here reported silage and Johnson-grass hay were used as supplementary feeds to the hulls. Cotton seed meal was the only concentrated feed employed.

Since the inauguration of the cooperative beef work between the Alabama Experiment Station and the Bureau of Animal Industry, some results have been published relative to winter fattening of steers,* but silage and Johnson-grass hay were not introduced into any of the former rations. It should be understood that this bulletin is only a report of the progress of the cooperative beef work, as the experiments are being continued.

OBJECT OF THE EXPERIMENT.

This experiment was planned with the following objects in view:

1 To determine the profit, if any, in fattening a good grade of cattle in the winter time on high-priced feeds.

2. To compare a ration of cottonseed meal and hulls alone with a second ration of cottonseed meal, hulls and silage, and with a third ration of cottonseed meal, hulls and Johnson-grass hay.

*Bureau of Animal Industry Bulletin 103.

The steers were divided into three lots of 20 in each, and were given the following feeds:

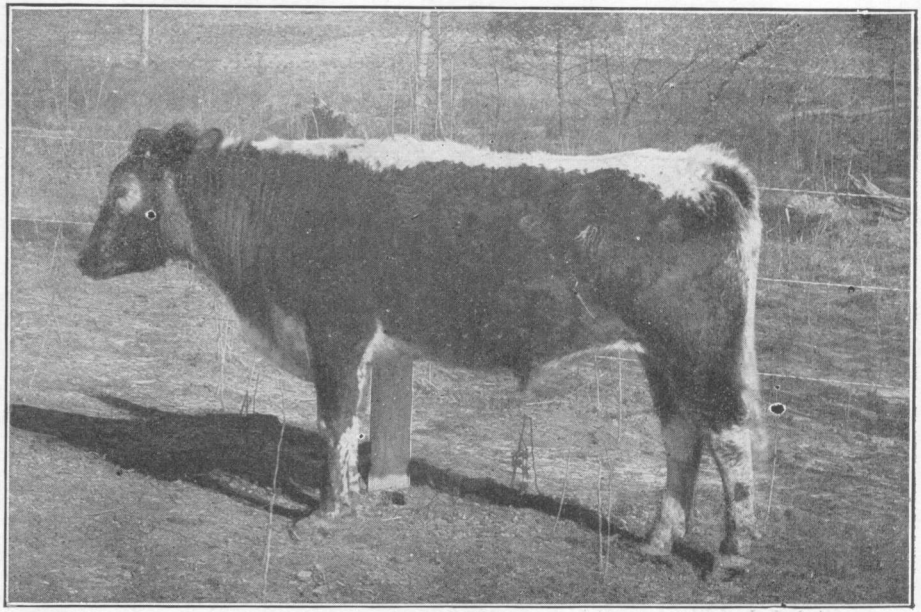
Lot 1:—Cottonseed meal.
Cottonseed hulls.
Corn silage.

Lot 2:—Cottonseed meal.
Cottonseed hulls.
Johnson-grass hay.

Lot 3:—Cottonseed meal.
Cottonseed hulls.

THE CATTLE.

The various pictures show that the cattle were better than the average cattle of the South. They were all purchased in Sumter and neighboring counties during the



This animal represents one of the average steers of the test. The above photograph was taken about the middle of the test.

fall of 1909, and were the best of a herd of about 300 head of improved cattle. None of them was pure bred, but all had been graded up by the use of Hereford, Aberdeen-Angus and Shorthorn sires. They varied from 2 to 3 years in age. The average weight of each animal at the beginning of the test was approximately 830 pounds, so they were larger than the average southern cattle. This increased size was due to the improved beef blood.

As these cattle were better than the average cattle of the State they cost more in the fall than is usually paid for Alabama cattle. They were valued at 3¼ cents a pound when test began, December 1, 1909.

METHOD OF CONDUCTING THE WORK.

The cattle were fed under average farm conditions. Mr. F. I. Derby, a farmer and stockman of Sumter County, Alabama, agreed to cooperate with the Alabama Experiment Station and the Bureau of Animal Industry in this work, and the feeding was all done upon his farm. Mr. Derby furnished the cattle and the feed, and the work was planned and the feeding carried on under the supervision of the authors of the bulletin. Mr. J. W. Ridgway, was stationed upon the farm and had personal supervision of the experiment.

No artificial shelter was provided for the cattle and no trees were in the feed lots, so they did not even have the protection which trees afford. They were fed in the open fields, as no shelter is needed in Alabama for mature fattening cattle. As Mr. Derby's main object in feeding cattle is to enrich his farm, the cattle were fed on areas which were to be subsequently planted in either cotton or corn. The cattle were fed upon fields consisting of about 10 acres of land to each lot of 20 cattle. While no account was kept of the amount of manure made, still it is known from subsequent work that the 60 head of cattle made at least 1 ton of manure each day, or 84 tons for the whole feeding period of 84 days. The manure, of course, added very much to the fertility of the land upon which it was dropped.

Many of the clay soils of the State would be ruined by tramping if the cattle were permitted to stay on them during the wet winter weather. The soil of Mr. Derby's farm is a light sandy one, so the tramping of the cattle did not injure it materially. However, since this work was done, Mr. Derby has come to the conclusion that the winter tramping injures even a sandy soil, so hereafter he intends to feed in sheds and barns and haul the manure to the fields.

The steers were fed twice each day in open troughs located in the fields. The troughs were made so that they could be moved from place to place, thus insuring an even distribution of manure, and avoiding too much packing of the soil in one place. The steers were fed in such amounts that the feed was all eaten within a few hours after it was put before them. Many feeders keep feed in the troughs constantly, but more satisfactory results are secured when the steers are required to clean the troughs after each meal. An abundance of pure water and salt was provided all the time.

At the close of the test the cattle were shipped to the Louisville market for sale. The experimental farm was located four miles from Whitfield, Alabama, the nearest railroad station, and the cattle were driven to that point to be loaded on the cars.

PRICE AND CHARACTER OF FEEDS.

In work of this character the financial statement is not as satisfactory as could be wished, because the price of feeds, as well as of cattle, fluctuate considerably from year to year. Therefore the financial outcome of a particular experiment may not be duplicated by the cattle feeder owing to the different conditions under which he is operating. The prices listed in this bulletin were the actual prices paid for the feeds (except silage which was made on the farm) and the actual prices realized for the cattle. This test was conducted during the winter of 1909-10; prices have not changed materially since that date. The following were

the prices of the feeds, that on silage being an estimated one:

Cottonseed meal	$26.00 a ton
Cottonseed hulls	7.00 a ton
Johnson-grass hay	11.00 a ton
Silage (produced on farm)	2.50 a ton

All of the above feeds were of good quality. The Johnson-grass hay had been cut at the proper stage and was of excellent quality. The cattle ate it with considerable relish. The silage, after the first few days, was also of good quality as far as brightness and taste were concerned. The corn from which the silage was made did not have a heavy development of ear as the stand was thick and the planting was not made until June. Probably 30 bushels of corn to the acre would have been secured if it had been gathered. The cottonseed meal was fresh, bright and of a high grade.

PRELIMINARY FEEDING.

Some of the steers were bought as early as November 1, 1909. Mr. Derby was getting his cattle together for winter feeding, so the experimental steers were placed in the feed lots with the general herd of feeding cattle until conditions were ready for the experiment to begin. On November 6 the cattle were all started on a small amount of cottonseed meal and hulls. This amount was gradually increased and they were receiving a full ration of the meal and hulls by November 15. This full feeding of cottonseed meal and hulls was continued until the experimental work began. On December 1, the 60 steers to be used in the experimental work were selected from the general herd of probably 300 steers; they were divided into three lots of 20 steers each, tagged, weighed, placed in their respective fields, and the experiment proper begun. The period previous to December 1 was considered a preliminary period; this period was introduced so that the cattle would have an opportunity to become accustomed to the surroundings and the feeds before the inauguration of the test.

DAILY RATIONS.

Many farmers injure their cattle and get them "off fed" by increasing too rapidly the cottonseed meal part of the ration. These cattle had been in a preliminary feeding period for 24 days before the real test began, yet each steer was fed only 4 pounds of cottonseed meal daily at the inauguration of the erperiment, December 1. Of course, the amount was increased from time to time as the cattle would take it without scouring, but at no time did the steers receive more than 8 pounds of cottonseed meal daily. Many farmers would have had these steers on a daily ration of 10 pounds of cottonseed meal within ten days after the feeding began. Scours, dizziness, stiffness and occasional cases of blindness are almost sure to follow a heavy feeding of cottonseed meal. In the event of such troubles occurring the feeder is often compelled to sell under unfavorable circumstances, as the steers cannot be held profitably. When marketed the buyer is almost sure to discriminate against them because of their poor condition and they consequently sell at a disadvantage when offered to the packer or butcher.

The following table outlines, by periods of 28 days each, the amount of feed given each steer daily:

TABLE 1.—*Average Daily Ration For Each Steer, By Months.*

RATIONS	LOT 1 Cottonseed meal Cottonseed hulls Corn silage	LOT 2 Cottonseed meal Cottonseed hulls Johnson-grass hay	LOT 3 Cottonseed meal Cottonseed hulls
	Pounds	Pounds	Pounds
First 28 days	4.64 cottonseed meal 14.88 cottonseed hulls 22.57 corn silage	4.64 cottonseed meal 13.58 cottonseed hulls 9.43 Johnson-grass hay	4.64 cottonseed meal 26.53 cottonseed hulls
Second 28 days	6.00 cottonseed meal 15.27 cottonseed hulls 19.49 corn silage	6.00 cottonseed meal 15.11 cottonseed hulls 8.87 Johnson-grass hay	6.00 cottonseed meal 29.43 cottonseed hulls
Third 28 days	7.73 cottonseed meal 24.79 cottonseed hulls	7.73 cottonseed meal 14.21 cottonseed hulls 7.03 Johnson-grass hay	7.73 cottonseed meal 23.96 cottonseed hulls

During the first 28 days each steer received an average of only 4.64 pounds of cottonseed meal each day. The cattle feeder would not, as a rule, expect to secure good gains when the daily allowance of cottonseed meal was only 4.64 pounds, but the data show that these animals made excellent gains during the first 28 days. During the first period each steer in Lot 1 (the silage-fed lot) received 14.88 pounds of cottonseed hulls and 22.57 pounds of corn silage each day, along with the 4.64 pounds of cottonseed meal. The cottonseed meal was sprinkled over the hulls and silage and thoroughly mixed by hand. During the first period of 28 days each steer in Lot 3, the lot to which nothing was fed except the cottonseed meal and hulls, ate 26.53 pounds of cottonseed hulls along with the 4.64 pounds of meal. At the end of the test, when the cottonseed meal was increased to 7.73 pounds for each steer daily, as many pounds of hulls were not consumed as at the beginning, so the daily allowance was cut down to 23.96 pounds for each steer. In Lot 2, the lot in which Johnson-grass hay was used to supplement the cottonseed meal and hulls, each steer, during the first period, ate 13.58 pounds of hulls and 9.43 pounds of the hay each day along with the 4.64 pounds of cottonseed meal; they were given as much hay each day as they would clean up. The hay was fed in racks and none of it was trampled under foot and wasted.

During the second period of 28 days each steer ate an everage of 6 pounds of cottonseed meal each day. With the exception of a small increase, the roughage part of each ration was maintained practically as it was in the first period. Each steer in Lot 3 ate practically 30 pounds of cottonseed hulls each day. The average cattle of the South, which are not as large as the ones used in this test, will not consume 30 pounds of hulls per steer per day. In some former beef feeding work done by this Station and the Bureau,* steers which average 816 pounds in weight at the close of the test ate only 19.9 pounds of cottonseed hulls daily.

*See Bureau of Animal Industry, bulletin 103.

Unfortunately for the test and the cattle, the supply of silage lasted only 56 days, so no silage was fed the steers in Lot 1 during the last period of 28 days. Cottonseed hulls replaced the silage. During the last period each steer ate 7.73 pounds of cottonseed meal daily; they would have eaten a larger amount if it had been placed before them. The roughage part of the ration was decreased as the amount of cottonseed meal was increased; the steers themselves regulated the amount of roughage so they were given only as much as they would clean up after each meal.

The above table should be closely studied by the cattle feeder. There is no doubt that the average southern farmer feeds too much cottonseed meal to his fattening cattle. When the allowance of meal is kept down to a reasonable amount the cattle will feel better and make gains more economically than when 9 to 10 pounds are fed to each steer daily. At the same time, the owner will not be forced to sell at unfavorable times because of scours and sickness.

DAILY AND TOTAL GAINS.

The gains as given here are not fictitious in any sense. No "fill" is included, as the cattle had been on feed for 24 days before the test began. The gains would have been considerably larger if the "fill" had been included.

TABLE 2.—*Average Weights And Gains.*
(Dec. 1, 1909—Feb. 23, 1910)
(84 days.)

Lot	Number of steers	RATION	Average initial weight of each steer	Average final weight of each steer	Average total gain of each steer	Average daily gain of each steer
			Pounds	Pounds	Pounds	Pounds
1	20	Cottonseed meal Cottonseed hulls Corn silage	811	962	151	1.80
2	20	Cottonseed meal Cottonseed hulls Johnson-grass hay	820	949	129	1.54
3	20	Cottonseed meal Cottonseed hulls	851	995	144	1.71
		Results for first 56 days—while silage was fed.				
1	20	Cottonseed meal Cottonseed hulls Corn silage	811	915	104	1.86
2	20	Cottonseed meal Cottonseed hulls Johnson-grass hay	820	900	80	1.43
3	20	Cottonseed meal Cottonseed hulls	851	957	106	1.89

All of the cattle made satisfactory, but not unusual gains. In the first part of Table 2 it is seen that the silage-fed steers (Lot 1), made the largest gains, making an average daily gain of 1.8 pounds for the whole period of 84 days. In the lower part of Table 2 are found the results of the first 56 days of the test, or the period when corn silage was fed to the cattle in Lot 1. When the second part of the table is studied it is seen that the cattle which ate silage did not make as large daily gains as did those which were fed nothing but cottonseed meal and hulls. Durng the first 56 days, each steer in Lot 1 (the silage lot) made an average daily gain of 1.56 pounds, while during the same period each steer in Lot 3 (cottonseed meal and hulls only) gained 1.89 pounds

each day. However, the reader should not come to the conclusion that the daily gains measure the success of a feeding operation altogether. It is, of course, necessary for good gains to be secured, but the final profits are not determined entirely by the daily gains. Other factors, as the price of the feeds and the selling price of the cattle, must be taken into consideration.

The cattle which were fed a partial ration of Johnson-grass hay made the most satisfactory gains, making a daily gain per steer of only 1.54 pounds during the whole period of 84 days. As far as gains were concerned the Johnson-grass hay proved to be unsatisfactory, as cottonseed meal and hulls, when fed alone, produced greater gain than when the two were combined with Johnson-grass hay. The hay was of good quality and the cattle ate it with considerable relish. Oftentime Johnson-grass is cut at such a late stage of maturity that it is stiff, woody, and unpalatable, but the hay used in this test was cut and harvested at the proper stage.

The supply of silage was exhausted at the end of 56 days, so this lot of cattle (Lot 1) was continued to the end of the test on cottonseed meal and hulls, the hull part of the ration being increased sufficiently to take the place of the silage. After the feeding of silage was discontinued the cattle still continued to make good gains, as each steer made a gain of 47 pounds during the last 28 days of the test. During this same period each steer which was eating Johnson-grass hay (Lot 2) made a gain of 49 pounds, while each steer in Lot 3 gained only 38 pounds. As a matter of fact, it was expected that small gains would be secured after the discontinuance of the silage, but the change was made gradually and the steers did not seem to notice the substitution of hulls for the silage. Cottonseed meal and hulls make an extremely palatable combination of feeds; in fact, it is difficult to find a combination of feeds more palatable than a mixture of these two southern feeds.

At the end of the experiment the steers in Lots 1, 2 and 3 averaged 962, 949, and 995 pounds, respectively, in weight; they made average total gains of 151, 129, and 144 pounds in the respective lots.

QUANTITY AND COST OF FEED REQUIRED TO MAKE 100 POUNDS OF GAIN.

In work of this character the real value of a feed, or a combination of feeds, is measured by the number of pounds of feed required to make 100 pounds of gain in live weight. With this information the farmer can apply the knowledge to his own conditions and quickly determine what it would cost to make 100 pounds of gain on his own farm. The table following shows the quantity of feed required to make 100 pounds of increase in live weight and the cost of the gains under the conditions of this test. The price placed upon the feeds was their actual cost laid down on the farm. The silage, of course, was made on the farm, and on it was placed an estimated value of $2.50 a ton.

TABLE 3.—*Quantity And Cost Of Feed Required To Make 100 Pounds Of Gain.*
(Dec. 1, 1909—Feb. 23, 1910.)
(84 Days.)

Lot	RATION	Pounds of feed to make 100 pounds of gain	Cost of feed to make 100 pounds of gain
		Pounds	
1	Cottonseed meal	341 meal	
	Cottonseed hulls	1020 hulls	
	Corn silage	781 silage	$ 8.98
2	Cottonseed meal	399 meal	
	Cottonseed hulls	931 hulls	
	Johnson-grass hay	550 hay	$11.47
3	Cottonseed meal	357 meal	
	Cottonseed hulls	1554 hulls	$10.08
	Results for first 56 days—while silage was fed.		
1	Cottonseed meal	287 meal	
	Cottonseed hulls	812 hulls	
	Corn silage	1132 silage	$ 7.98
2	Cottonseed meal	372 meal	
	Cottonseed hulls	1004 hulls	
	Johnson-grass hay	641 hay	$11.88
3	Cottonseed meal	280 meal	
	Cottonseed hulls	1475 hulls	$ 8.80

When feeds are valued as previously stated it is seen that the silage-fed steers (Lot 1) made the cheapest gains in both cases. When the whole period of 84 days is taken into consideration each 100 pounds of increase in live weight cost $8.98 when the silage was used, $11.47 when Johnson-grass hay (Lot 2) supplemented the cottonseed meal and hulls, and $10.08 when nothing was fed except cottonseed meal and hulls (Lot 3). Johnson-grass hay proved to be the most expensive and unsatisfactory feed used. During the first 56 days, when silage was being fed, each 100 pounds of gain in Lot I cost $7.98; the same gain cost $11.88 in Lot 2 where Johnson-grass hay was used in place of silage, and $8.80 in Lot 3 where cottonseed meal and hulls were fed alone. As far as economical gains were concerned the silage proved to be a valuable addition to the cottonseed meal and hulls, but money was lost when Johnson-grass hay replaced part of the cottonseed hulls, each 100 pounds of increase in weight costing just $3.08 more when the hay was fed than when cottonseed meal and hulls were fed alone.

By studying the second part of Table 3, it is seen (Lot 1) that 287 pounds of cottonseed meal, 812 pounds of hulls and 1132 pounds of silage produced 100 pounds of increase in weight. When the meal and hulls were fed alone (Lot 3) it is further seen that 280 pounds of meal plus 1,475 pounds of hulls produced the same number of pounds of increase in weight; therefore 1132 pounds of silage saved 663 pounds of hulls, but, at the same time, caused the loss of 7 pounds of cottonseed meal. Or, 1 ton of the silage actually saved $3.94 worth of hulls and cottonseed meal when hulls and meal were valued at $7.00 and $26.00 a ton respectively. Corn silage in this test was therefore worth $3.94 a ton. In the same way it is found that 641 pounds of Johnson-grass hay took the place of 471 pounds of hulls, but caused the loss of 92 pounds of cottoseed meal; or, 1 ton of hay proved to have a feeding value of only $1.31 when the meal and the hulls were valued as above. Johnson-grass hay in this

test was therefore worth $1.31 a ton, whereas it cost $11.00 a ton. Ton for ton, silage was just three times as valuable as Johnson-grass hay when they were both used along with cottonseed meal and hulls for fattening cattle. Johnson-grass hay proved to be a poor feed for fattening purposes, while silage had an exceedingly high value when used for the same purpose. The cattle feeder cannot, therefore, afford to use Johnson-grass hay along with cottonseed meal and hulls for fattening purposes, and this experiment tends to show that the majority of southern feeders cannot use a more economical feed than silage for this purpose.

ADVANTAGES OF USING PURCHASED FEEDS.

The majority of our southern farmers object to buying cottonseed meal, hulls, and other feeds for beef cattle on the ground that the original prices of the feeds can not be realized after being fed to cattle. At the same time thousands of these same farmers buy cottonseed meal and use it as a commercial fertilizer, when experience and experiments all teach that the first use of the meal should be as a feed for some kind of live stock, and the second use as a fertilizer in the shape of barnyard manure. When the cottonseed meal is fed to live stock it is used twice, once as a feed and again as a fertilizer. Many of our best farmers feed cattle for no other reason than to obtain the barnyard manure and are satisfied if they come out even on the cattle; the manure is well worth the expense of feeding.

In these experiments the cottonseed meal cost $26.00 a ton and the hulls $7.00 a ton, and we are satisfied that in every case these feeds realized, as a result of feeding to the cattle, much more than they cost. That is, an actual profit was made on each ton of the feeds and at the same time the manure was left on the farm. The meal and hulls, therefore, were no expense at all to the soil or to the succeeding crops.

VALUE OF BARN YARD MANURE.

The farmer who has lands which should be built up should feel that he has fed cattle at a profit when manure is obtained free above all other expenses as this manure has an exceedingly high fertilizing value.

"Beef cattle should be more generally introduced because of the good they do in building up and maintaining soils. Under the present system of cotton farming the soils are becoming poorer and poorer. With the introduction of cattle the soil will begin to be built up. Director Thorne, of the Ohio Station, has been making tests with barnyard manure for several years, applying the manure upon a plot of ground upon which was running a three years' rotation of corn, wheat, and clover. Eight tons of manure an acre were applied. The average yearly increase an acre, following the one application, was as follows:

Corn, 14.7 bushels at 70 cents a bushel	$10.29
Corn stover, 744 pounds at $6.00 a ton	2.23
Wheat, 8.36 bushels at $1.00 a bushel	8.36
Wheat straw, 897 pounds at $4.00 a ton	1.79
Clover hay, 686 pounds at $12.00 a ton	4.12
Total value of 8 tons of manure	26.79
Total value of 1 ton of manure	3.35

He further states (Bulletin 183 Ohio Experiment Station) that the value of farm manure can be materially increased by balancing the manure with the addition of a carrier of phosphorus. The farm manures are too high in nitrogen as compared with the other elements. By balancing stable manure, the value of 8 tons was increased $12.20 after deducting the cost of the material used for the balancing of the manure. This is $1.53 a ton and when added to the $3.35 above, brings the total possible value of each ton of manure up to $4.88. During a feeding period of 100 days each steer will produce at least 1.5 tons of manure. This profit should be added to the feeding or direct profits.

The Arkansas Station (Bulletin 68) made a test to de-

termine the value, to each succeeding crop, of growing peas in the corn, gathering the corn and then grazing both the peas and the stalks by the steers. The steers were fed some cottonseed in addition to the grazing. As the result of this crop of peas and the grazing, the succeeding cotton crop was increased 626.5 pounds of seed cotton over the area where corn alone had been grown. A third lot was planted to corn and the increase in corn, due to the pea crop and the grazing, was 14 bushels per acre."*

FINANCIAL STATEMENT.

It should be remembered that the financial statements in this bulletin are based on the local conditions where the feeding was carried on. Should the conditions elsewhere be different, the financial results will also differ. The price of the cattle when put into the feed-lot is one very variable factor. The feeders in this particular experiment cost 3¼ cents a pound. In another part of the State they might have cost more, and in still a third part they might have cost considerably less than they did in Sumter County. The financial statement will not be misleading if the reader bears in mind that it does not apply to all conditions.

The cattle, as previously noted, were bought in Sumter and neighboring counties for 3¼ cents a pound during the fall of 1909. They were fed on cottonseed meal and cottonseed hulls for 24 days before the test began. The test continued for 84 days, when the cattle were ready for sale, and were shipped to the Louisville, Kentucky, market where all of the steers sold for $5.75 per hundredweight. It cost 65 cents per hundredweight to ship them to the market, so they are estimated in the financial statement at $5.10 per hundredweight. The $5.10 represents the price actually received on the farm.

*See Alabama Experiment Station Bulletin 150

Lot 1:—Cottonseed meal, cottonseed hulls, corn silage:

To 20 steers 16220 lbs. at 3¼ cents a pound	$527.15
To 10290 lbs. cottonseed meal at $26 a ton	133.77
To 30768 lbs. cottonseed hulls at $7 a ton	107.69
To 23554 lbs. corn silage at $2.50 a ton	29.44
	798.05
By sale of 20 steers, 18658 lbs. at $5.10 per cwt	951.66
Total profit	$153.61
Profit per steer	7.68

Lot 2:—Cottonseed meal, cottonseed hulls, Johnson-grass hay:

To 20 steers, 16400 pounds, at 3¼ cs. a pound	$533.00
To 10290 lbs. cottonseed meal at $26 a ton	133.77
To 24026 lbs. cottonseed hulls at $7 a ton	84.09
To 14185 lbs. Johnson-grass hay at $11 a ton	78.02
	828.88
By sale of 20 steers, 18411 lbs. at $5.10 per cwt.	938.96
Total profit	$110.08
Profit per steer	5.50

Lot 3:—Cottonseed meal, cottonseed hulls:

To 20 steers, 17020 lbs. at 3¼ cts. a pound	$552.15
To 10290 lbs. cottonseed meal at $26 a ton	133.77
To 44755 lbs. cotton seed hulls at $7.00 a ton	159.09
	845.01
By sale of 20 steers, 19303 lbs. at $5.10 per cwt	984.45
Total profit	$139.44
Profit per steer	6.97

The above financial statement shows that all of the lots of steers were fed at a profit. The outcome was satisfactory. The greatest profit was made in Lot 1, where silage was used. The smallest profit was made in Lot 2, where Johnson-grass hay was fed. The cattle in Lots 1 and 3 sold at the same price and made practically the

same total gains in live weight, but those in Lot 1 had the advantage in that they had a cheap fed, silage, added to the basal ration of cottonseed meal and hulls. Each steer in Lot 1 made a clear profit of $7.68, while each one in Lot 3 made a profit of only $6.97. The steers which received Johnson-grass hay along with the cottonseed meal and hulls (Lot 2) made a profit of only $5.50 each.

SLAUGHTER DATA.

Table 4 shows the total weight of each lot of cattle, the live weight at the Louisville market, the number of pounds each steer lost in shipment, the dressed weight at Louisville, and the per cent of dressed weight to live weight. The steers were driven 4 miles to a railroad, and, on account of delays, were in the cars 48 hours.

TABLE 4.—*Slaughter Records.*

Lot	Number o' steers	Total weight on farm	Total weight at Louisville	Average shrinkage en route per steer	Total dressed weight at Louisville	Average per cent. dressed out by farm weights	Average per cent. dressed out by market weights
		Pounds	Pounds	Pounds	Pounds	Per cent.	Per cent.
1	20	19235	17685	77.5	9926	57.6	56.1
2	20	18980	17615	68.3	9736	51.3	55.3
3	20	19900	18325	78.8	10164	51.1	55.5

The shrinkage on the road was rather great, but it should be remembered that there was a delay of several hours in shipment. Those cattle which were fed Johnson-grass hay (Lot 2) lost the fewest pounds in weight. Each steer lost 77.5, 68.3 and 78.8 pounds in Lots 1, 2, and 3 respectively; or, the silage-fed steers (Lot 1) lost in transit 8.1 per cent of their weight, those in Lot 2 (Johnson-grass lot) lost 7.1 per cent, while those in Lot 3 (cottonseed meal and hulls) shrunk 7.9 per cent.

The steers in Lot 1, (the silage-fed cattle) dressed out higher than the steers in Lots 2 and 3, dressing 56.1 per cent by the market weights. The steers in Lots 2 and 3 dressed 55.3 per cent and 55.5 per cent respectively.

TABLE 5.—*Summary of Results.*

	LOT 1 Feed:— Cottonseed meal Cottonseed hulls Corn silage	LOT 2 Feed:— Cottonseed meal Cottonseed hulls Johnson-grass hay	LOT 3 Feed:— Cottonseed meal Cottonseed hulls
	Pounds	Pounds	Pounds
Average weight of steers at beginning, Dec. 1, 1909	811	820	851
Average weight of steers at close Feb. 23; 1910	962	949	995
Average total gain of each steer for whole period of 84 days	151	129	144
Average daily gain of each steer whole period of 84 days	1.8	1.54	1.71
Average daily gain of each steer for first 56 days while silage was fed	1.86	1.43	1.89
Average cottonseed meal fed daily per steer	6.1	6.1	6.1
Average cottonseed hulls fed daily per steer	15.1	14.3	26.6
Average silage fed daily per steer	21.0		
Average Johnson-grass hay fed daily per steer		8.40	
Cottonseed meal to make 100 pounds of gain for whole period of 84 days	341	399	357
Cottonseed meal to make 100 pounds of gain for first 56 days	287	372	280
Roughage to make 100 pounds gain for whole period of 84 days	781 silage 1020 hulls	931 hulls 550 hay	1554 hulls
Roughage to make 100 pounds of gain for first 56 days while silage was fed	812 hulls 1132 silage	1004 hulls 641 hay	1475 hulls
Cost to make 100 pounds of gain for whole period of 84 days	$8.98	$11.47	$10.08
Cost to make 100 pounds of gain for first 56 days	7.98	11.88	8.80
Cost of steers per cwt. in fall	3.25	3.25	3.25
Selling price of steers in Louisville	5.75	5.75	5.75
Selling price of steers on farm	5.10	5.10	5.10
Profit per steer	7.68	5.50	6.97

SUMMARY STATEMENTS.

1—The steers which were used in this test were from 2 to 3 years old. They had all been graded up by the use of Aberdeen-Angus, Hereford, and Shorthorn sires.

2—At the beginning of the test they averaged 827 pounds each in weight. They were fed 84 days and at the close of the test each steer averaged 967.

3—The 60 head of steers were divided into three lots and fed as follows:—

Lot 1:—Cottonseed meal.
Cottonseed hulls.
Corn silage.

Lot 2:—Cottonseed meal.
Cottonseed hulls.
Johnson-grass hay.

Lot 3:—Cottonseed meal.
Cottonseed hulls.

4—For the whole period of 84 days an average daily gain of 1.8, 1.54, and 1.71 pounds were secured in Lots 1, 2, and 3, respectively.

5—During the first 56 days, when silage was fed in Lot 1, an average daily gain of 1.86, 1.43, and 1.89 pounds were secured in Lots 1, 2, and 3, respectively.

6—For the whole period of 84 days it cost $8.98, $11.47, and $10.08 to make 100 pounds of gain in Lots 1, 2, and 3, respectively.

7—For the first 56 days, when silage was fed in Lot 1, it cost $7.98, $11.88, and $8.80 to make 100 pounds of gain in Lots 1, 2, and 3, respectively.

8—The fall of 1909 the steers cost $3.25 per hundredweight. At the end of the test they were shipped to Louisville and sold for $5.75 per hundredweight.

9—Each steer in Lots 1, 2, and 3, netted a clear profit of $7.68, $5.50, and $6.97, respectively.

10—Corn silage proved to be an exceedingly satisfactory addition to a basal ration of cottonseed meal and hulls, but Johnson-grass hay was an exceedingly unsatisfactory supplement when used in the same way.

Part II.

Wintering Steers Preparatory to Summer Fattening on Pasture.

INTRODUCTION.

For several years this Station, cooperating with the Bureau of Animal Industry, has been studying the subject of wintering mature steers and subsequently fattening them in the summer on pasture. Some of the work has been published,* but the conditions surrounding the work herein published were altogether different from the circumstances surrounding the previous work. In the first place, these cattle were of different age and quality from the ones which were used in the former experimental work. In the second place, the grass upon which these cattle grazed grew on a sandy instead of a lime soil. In the previous work the cattle were grazed upon lime soils with sweet clover (Melilotus) as the basal pasture crop during the early part of the grazing season. In the work published in this bulletin no sweet clover pastures were available, as it does not occur upon the sandy soils of this region.

Two separate experiments are reported in this section owing to the fact that two distinct types of cattle were used. The animals were divided into four lots, two of them composed of high grade young cattle, and the other two of common or scrub cattle fully a year older. The work was done in cooperation with Mr. F. I. Derby, of Sumter County, Alabama, he furnishing the cattle and the feed and the Alabama Experiment Station and the Bureau of Animal Industry providing a trained man to carry on the experiment. Mr. J. W. Ridgway was lo-

*See Alabama Station bulletin No. 151, or Bureau of Animal Industry bulletin No. 131.

cated on the farm and had personal supervision of all the experimental work.

OBJECTS OF THE WORK.

This work was outlined with the following objects in view:

1. To study the problem of feeding steers during the winter months with a view to fattening them on pasture the following summer.
2. To determine the profits, if any, in supplementing sandy soil pastures with cottonseed cake during the summer fattening process.
3. To study a common southern method of managing and fattening common or scrub cattle.

Steers can be purchased cheaper during the fall of the year than at any other time, so many feeders prefer to buy in the fall. When cheap steers are so purchased, a common practice in the South is to "rough" them through the winter months as cheaply as possible, turn them on pasture the following summer and sell them to the butcher at the end of the pasture season.

THE CATTLE.

The cattle were all bought in Sumter and neighboring counties, but those selected for Lots 4 and 5 were an excellent grade of animals, all having Shorthorn or Aberdeen-Angus blood, while those placed in Lots X and Y represented no particular breeding; they were, in fact, scrubs, or the common cattle of the neighborhood. The steers in Lots 4 and 5 were from 20 to 24 months old when purchased in the fall of 1909, and had attained an average weight of 616 pounds. The steers of Lots X and Y were from 3 to 4 years old and weighed only 565 pounds each when the test began, December 6, 1909. The cattle, both young and old, were dehorned as soon as brought to the farm.

The reader's attention should be called to the fact that, while the results secured in Lots 4 and 5 are comparable

with each other, they are not in any way comparable with the results secured in Lots X and Y. These are two separate experiments and are not comparable in any way.

PASTURES.

The soil upon which these steers grazed was of a sandy and sandy loam character, such as is found in a cut-over pine district. A large proportion of the pastures was low so that in rainy weather they became exceedingly wet. There was some sandy ridge land, however, in each pasture.

Carpet grass, lespedeza, broom sedge and a small amount of bermuda and Paspalum Dilatatum constituted the plants that formed the pastures. They afforded an abundance of grass throughout the grazing season, but the growth was rank and very watery, as the frequent rains kept the pasture exceedingly wet during the whole test. Sweet clover (Melilotus) does not grow in this region. No expense or time had ever been expended on these pastures except to build a wire fence around them. The plants mentioned above had come voluntarily after the pine woods were cleared away.

WINTER RANGE.

The steers of Lots X and Y, after being dehorned and tagged, were turned out December 6, 1909, in a tract of cut-over pine lands. Approximately 20,000 acres of land were in this tract, but it was not fenced, so the steers had the privilege of going practically anywhere in the southern part of Sumter County. This land had grown up during the previous summer with broom sedge, lespedeza and other native grasses. When frost came the grasses were, of course, all killed, but still they afforded some grazing for the steers during the first part of the winter. During the latter part of the winter, when grazing is usually short, no little amount of Augusta vetch came up and furnished good grazing during the early spring months. This plant, more than anything

else, perhaps, kept the steers from losing weight while on the range, as it gave good grazing in March and April. The steers evidently gained in weight during these two months. The steers were not taken off this range until April 23, 1910.

The young steers of Lots 4 and 5 were not turned on the range.

PLAN OF THE FEEDING.

In order to give a clear idea of the nature of the work, the general plan of the feeding is outlined below:

TABLE 6.—*General Plan of The Feeding.*

The Young Steers.

Lot	Number of steers	Winter Feeding (Dec. 6, 1909-March 31, 1910)	Summer Fattening (April 2, 1910-Aug. 26, 1910)
4	18	Cottonseed meal, Cottonseed hulls ½ ration	Pasture, Cottonseed cake
5	17	Cottonseed meal, Cottonseed hulls, Johnson-grass hay ½ ration	Pasture, Cottonseed cake

The Common Steers.

		(Dec. 6, 1909—April 23, 1910)	(April 23, 1910-Sept. 2, 1910)
X and Y	43	Range only	Pasture, Cottonseed cake
		Range only	Pasture alone

The general plan was to feed the steers of Lot 4 and 5 sufficient feed to produce small gains throughout the winter months. They were a good class of cattle and young, so it was thought that it would pay to feed them liberally during the winter months. Accordingly a partial ration of cottonseed meal and cottonseed hulls was fed to the steers in Lot 4 while those in Lot 5 had some Johnson-grass hay added to the basal ration of cotton-

seed meal and hulls. No effort was made to fatten these young cattle during the winter; the object was to make only small gains and keep them in thriving condition. The fattening was to occur the subsequent summer, when they were on the pasture.

The steers of Lots X and Y were turned out as one lot on the range. Being of poor quality, it was not thought that it would be profitable to give them high-priced feeds during the winter months when they were to be fattened on pasture the following summer. As stated before, the range consisted of cut-over pine lands; they had the freedom of probably 20000 acres.

The authors realize that this latter method of handling and feeding cattle during the winter is one that will soon go out of vogue on account of the fact that these large ranges will eventually be settled and fenced, but at the present time and under present conditions many farmers are so situated that they can profitably make use of these large tracts. These cattle received no attention at all throughout the winter months. In fact, only a few of them were seen during the whole winter. The following spring, April 21, they were brought up, weighed again, and turned onto the summer pasture for the summer fattening work. They were now divided in two lots and fed upon different feeds. The steers of Lots X were grazed upon a pasture and received a small feed of cottonseed cake in addition to the pasture. The steers of Lot Y were in a similar pasture and received nothing in addition.

No shelter except the trees was provided for the cattle in either the winter or summer time. They did not seem to suffer from cold in the winter or from the heat in the summer. The summer pastures were abundantly provided with good shade trees and water.

While there were cattle ticks in the pasture, yet the cattle were not permitted to become badly infested. A dipping vat was used to keep down heavy infestation. No cases of Texas fever developed.

The weight of each steer was secured at the beginning

and end of each test, and with the exception of Lots X and Y during the winter of 1909-10, the total weight of each lot was noted every twenty-eight days. When the steers were sold they were driven 4 miles to the shipping point at Whitfield, Alabama.

CHARACTER AND PRICE OF FEEDS.

Local conditions determine to a large extent the farm prices of feeds. Any price that might be assumed would not meet all conditions, but the following prices have been taken as a basis upon which to make financial estimates:

Cottonseed meal	$26.00 a ton
Cottonseed cake	26.00 a ton
Cottonseed hulls	7.00 a ton
Johnson-grass hay	11.00 a ton
Pasture, per steer	50 cts. a month

All of the feeds were of good quality. The cottonseed cake, which was used in all of the summer feeding work, had been broken into nut size by the oil mill and sacked. As has been stated in a previous bulletin, this cake can be purchased in the large cake size, just as it comes from the press, for about $2.00 a ton cheaper than in the nut size. Some feeders find that it pays to break the cake on their own farms. The cake is the same thing as cottonseed meal, except that it is not ground into a meal. There are several advantages in feeding cake in place of cottonseed meal, especially in summer feeding. A rain does not render the cake unpalatable; but it will often put the meal in such a condition that the cattle will not eat it. Again, no loss is incurred with the cake during windy days, whereas the meal, when fed in the open pasture, is sometimes wasted on account of the winds. Furthermore, the cake requires chewing before being swallowed, and therefore must be eaten very much slower than the meal, so when a number of steers are being fed together the greedy one has little chance to get enough cake to produce scours. In feeding cottonseed meal the greedy steer often scours on account of the fact

that he can bolt the meal and get more than his share; this not only injures the steer but makes the bunch "feed out" unevenly.

DAILY RATIONS DURING WINTER MONTHS.

It should again be noted that the cattle were not being fattened during the winter months; they were simply being carried through so as to be in condition for fattening on grass the following summer. The steers of Lots 4 and 5 were confined on cotton fields where cotton had been grown the previous summer. Of course, they obtained some feed from these cotton fields, especially the first part of the winter, and in addition were given a half ration of cottonseed meal, hulls, and hay, as noted below. Lots X and Y were on the open range with no additional feed. The amount of feed given is shown in the following table:

TABLE 7.—*The Average Daily Amount of Feed Given Each Steer During the Winter Months.*

The Young Steers.
(Dec. 6, 1909—Mar. 31, 1910.)
(116 days.)

Lot	Number of steers	RATION	Average daily amount
			Pounds
4	18	Cottonseed meal	2.35
		Cottonseed hulls	13.29
5	17	Cottonseed meal	2.35
		Cottonseed hulls	6.82
		Johnsonrgrass hay	5.50
The Common Steers. (Dec. 6, 1909—Apr. 23, 1910) (139 days.)			
X	43	Open range only	None
and			
Y		Open range only	None

It is seen that none of the steers was fed more than a half ration of purchased feeds. Each steer in Lot 4 received an average daily feed of 2.35 pounds of cottonseed meal plus 13.29 pounds of hulls. Each steer in Lot 5 consumed an average of 2.35 pounds of cottonseed meal, 6.82 pounds of cottonseed hulls and 5.5 pounds of Johnson-grass hay daily. These were small amounts of feed but, as will be seen later, the animals made a fairly good daily gain. During the whole winter each animal in Lot 4 ate 273 pounds of cottonseed meal and 1542 pounds of hulls at a total cost of $8.95. During the same length of time each steer in Lot 5 ate 273 pounds of cottonseed meal, 791 pounds of hulls, and 638 pounds of hay, at a cost of $9.83.

The steers in Lots X and Y received no food at all in addition to the cut-over pine range.

WEIGHTS AND GAINS DURING THE WINTER MONTHS.

The following table shows that all of the cattle gained during the winter months even the ones which were turned out on the open range and received no feed or attention during the whole winter. In this connection it should be called to mind that these cattle which were turned out on the range were mature animals. They were better able than young animals to care for themselves, as they were strong enough to get about over large areas and hunt for a living. Mature steers can withstand careless treatment and yet come through to spring in fairly good condition, while young animals, like those in Lots 4 and 5, might starve with similar feed and treatment. No one would advise a farmer to turn young animals on an open range during the winter months and give them no feed or attention. A young beef animal, if he is to attain a respectable size, must be fed and cared for during the cold months.

TABLE 8.—*Weights and Gains During the Winter Months.*

The Young Steers
(Dec. 6, 1909—Mar. 31, 1910.)
(116 days.)

Lot	Number of steers	RATION	Average initial weight of each steer	Average spring weight of each steer	Average total gain of each steer	Average daily gain of each steer
			Pounds	Pounds	Pounds	Pounds
4	18	Cottonseed meal, Cottonseed hulls ½ ration	624	698	74	0.64
5	17	Cottonseed meal, Cottonseed hulls, Johnson-grass hay ½ ration	608	676	68	0.59

The Common Steers.
(Dec. 6, 1909—Apr. 23, 1910)
(139 days.)

X and Y	43	Range alone / Range alone	565	575	10	0.08

The steers in Lots 4 and 5 made as good gains as was desired. No effort was made to fatten them. During the whole feeding period of 116 days each steer gained 74 and 68 pounds in Lots 4 and 5 respectively. They were in an excellent condition when spring came.

Each steer in the range lots (Lots X and Y combined) gained 10 pounds during the whole winter. They too, were in good condition when grass came in the spring. When cattle are turned on the open range during the winter they, as a rule, lose instead of gain in weight. In some former work the cattle which had no feed during the cold months except what they secured from the open range, lost approximately 100 pounds each during the winter time.* It is a very unusual occurence for steers to make gain during the winter months when handled and fed as were those in Lots X and Y.

*See Alabama Station Bulletin 151, or Bureau of Animal Industry Bulletin 131.

QUANTITY AND COST OF FEED REQUIRED TO MAKE 100 POUNDS GAIN DURING THE WINTER.

The following table shows that the gains made during the winter months by the steers in Lots 4 and 5 were expensive ones. There is no way to determine the cost of gains made by the range cattle (Lots X and Y), as no value or rental price has ever been placed upon the open range.

TABLE 9.—*Quantity and Cost of Feed Required to Make 100 Pounds of Gain During the Winter Months.*

The Young Steers
(Dec. 6, 1909—Mar. 31, 1910.)
(116 days.)

Lot	RATION	Feed required to make 100 pounds of gain	Cost of feed to make 100 pounds of gain
		Pounds	
4	Cottonseed meal	368	
	Cottonseed hulls	2077	$12.05
5	Cottonseed meal	424	
	Cottonseed hulls	1160	
	Johnson-grass hay	935	14.71

The Common Steers.
(Dec. 6, 1909—Apr. 23, 1910)
(139 days.)

X and Y	Range alone	None	Nothing

Each 100 pounds of gain during the winter months cost $12.05 and $14.71 in Lots 4 and 5 respectively. These were very expensive gains and hard to overcome even when the steers wer continued on a very cheap ration—pasture and cottonseed cake—the following summer. In fact the expensive winter gains of Lots 4 and 5 were never counteracted by the cheap gains of the following

summer, as money was finally lost on these two lots of cattle. The gains secured during the winter months were expensive by reason of the fact that the ration was too near a mere maintenance ration. It is seen that in Lot 4, 368 pounds of cottonseed meal plus 2077 pounds of hulls were required to make 100 pounds of increase in live weight. In Lot 5, where Johnson-grass hay was introduced, 424 pounds of cottonseed meal, 1160 pounds of hulls and 935 pounds of hay were required to make 100 pounds of gain.

Johnson-grass hay did not improve the ration of cottonseed meal and hulls. Nothing was gained by its introduction. In comparing the results of Lots 4 and 5, it is learned that 935 pounds of Johnson-grass hay saved 917 pounds of hulls, but caused a loss of 56 pounds of cottonseed meal; or, one ton of the hay was worth $5.26 in this feeding test, when cottonseed meal and cottonseed hulls are valued at $26.00 and $7.00 a ton respectively. It will be remembered that in Part I of this bulletin the same hay was worth only $1.31 a ton as a fattening feed. The nearer a feed or a combination of feeds approaches a mere maintenance ration the more valuable such a hay as Johnson-grass becomes.

The small increase in live weight of the steers in Lots X and Y was made without cost as the range, their only feed, was free.

THE SPRING COST OF THE STEERS.

The steers in Lots 4 and 5 cost 3½ cents a pound the fall of 1909; those in Lot 4 averaged $21.84 each, and those in Lot 5 $21.28. They were well-bred animals; no scrubs were among them. The steers in Lots X and Y were of a very common grade and cost only 2¼ cents a pound. Although these cattle were not to be fattened for the market until the next summer, they were all bought during the fall of 1909, as it is practically impossible to get together a bunch of cattle in the spring. However,

it costs something to feed cattle through the winter months, and the farmer who buys them in the fall with the intention of carrying them until the following summer to fatten for the market, is interested in knowing what it will cost to get them through the winter months. In other words, he desires to know the spring cost, which is equal to the fall price plus the cost of getting the cattle through the winter months. If it were possible to get them through the winter months without cost, or gain, or loss in weight, the spring and fall prices would be identical, but this can seldom be accomplished. As a rule, the steers must be fed, and they commonly gain or lose in weight. These expenses and changes in live weight all have a bearing on the spring price.

The following table presents the fall price, the cost to get each steer through the winter, and the spring price after the winter expenses and changes in live weight have been taken into consideration.

TABLE 10.—*Average Fall and Spring Prices of the Cattle, and Cost of Winter Feeding.*

The Young Steers

(Dec. 6, 1909—Mar. 31, 1910.)

(116 days.)

Lot	RATION	Fall price per hundred-weight	Average cost to feed each steer through the winter	Spring price per hundred-weight
4	Cottonseed meal Cottonseed hulls	$3.50	$8.95	$4.41
5	Cottonseed meal Cottonseed hulls Johnson-grass hay	3.50	9.83	4.60

The Common Cattle

(Dec. 6, 1909-April 23, 1910—139 days).

X and Y	Range alone	$2.25	Nothing	$2.21

In Lot 4 it cost $8.95 to feed each steer through the winter months. In Lot 5, where Johnson-grass hay was used, the expense to feed each steer for the same length of time was raised to $9.83. The Johnson-grass hay increased the expense. When these winter expenses are added to the original cost and allowance made for the winter gains, the steers in the spring cost $4.41 and $4.60 per hundredweight in Lots 4 and 5 respectively, which brought their average price to $30.79 for Lot 4, and $31.11 for Lot 5.

The steers in Lots X and Y were cheaper at the end of the winter than they were the previous fall. This was due to the fact that they gained a few pounds during the winter months (10 pounds each), while no expense was attached to feeding them, as they were grazed on the open range. It is, of course, an unusual occurence for these two factors to be combined in this way. These catttle were bought in the fall of 1909 for $2.25 per hundredweight, but when spring arrived, April 23, 1910, their cost per hundredweight was reduced to $2.21.

FATTENING THE CATTLE ON PASTURE.

At the close of the winter tests the steers were redivided into lots, turned into the summer pastures and fattened for the late summer market.

The winter feeding of Lots 4 and 5 was discontinued March 31, 1910. On April 2, 1910, the pastures were ready for grazing, so the summer fattening tests were inaugurated on this date. The steers in Lots 4 and 5 were combined into one lot, and grazed upon the same pasture throughout the summer experiment.

The range or common cattle (Lots X and Y) were divided into two lots, as nearly equal as possible in quality, size, breeding, and placed upon separate pastures on April 23, 1910. One lot of cattle, Lot X, was fed cottonseed cake along with the pasture; Lot Y was fed nothing except pasture.

The feeding was done once a day in open fed troughs;

these troughs were conveniently located in the pastures. In order that all of the cattle would come out to the troughs the feeding was done in the cool of the evening, or about sundown.

An abundance of water and salt was kept before the animals all the time.

AMOUNT OF COTTONSEED CAKE FED EACH STEER DAILY.

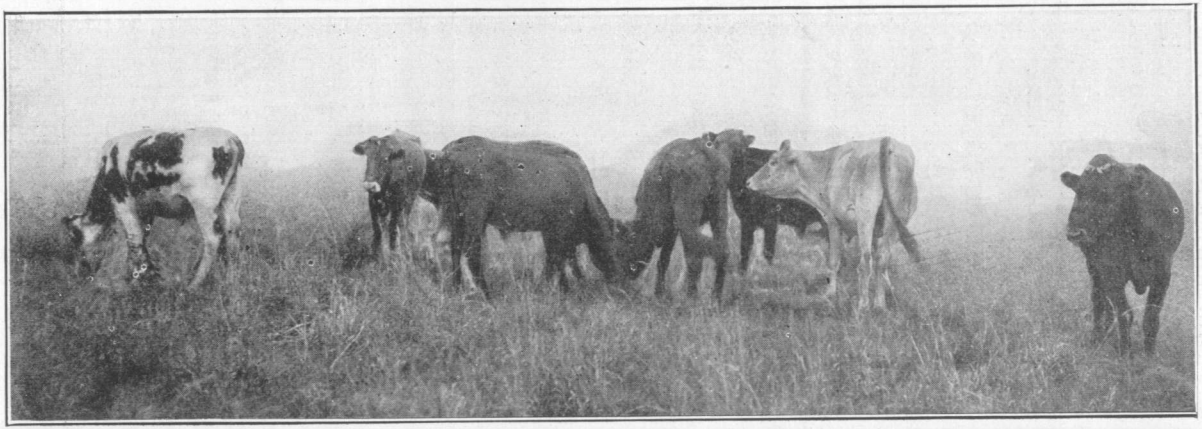
To avoid scouring and other ill results, steers which are being fattened must become accustomed gradually to cottonseed meal and cottonseed cake. Many feeders increase the feed too rapidly for best results. The temptation is to get the steers on full feed within a few days after the feeding begins, but this tendency should be curbed. The following table illustrates the amount of cottonseed cake given each steer daily by periods of 28 days:

TABLE 11.—*Daily Ration for Each Steer During Summer Fattening.*

	THE YOUNG STEERS (April 2, 1910-Aug. 26, 1910)	THE COMMON STEERS April 23, 1910-Sept. 2, 1910)	
Ration	Lots 4 and 5 combined (Cottonseed cake and pasture)	Lot X (Cottonseed cake and pasture)	Lot Y (Pasture alone)
	Pounds	Pounds	
First 28 days	2.19 cake	2.84 cake	Pasture alone
Second 28 days	4.36 cake	3.48 cake	Pasture alone
Third 28 days	5.50 cake	3.48 cake	Pasture alone
Fourth 28 days	6.00 cake	5.00 cake	Pasture alone
Fifth 23 days	6.00 cake	Last 21 days:— 4.91 cake	Pasture alone
Last 7 days	5.14 cake		

Attention is again called to the fact that the results secured in Lots 4 and 5 (now combined into one lot) cannot be compared with those secured in Lots X and Y. It

Lots 4 and 5. Picture taken after cattle had been on feed about 30 days.



should be noted that these lots were not started on feeds at the same date, sold at the same time, or fed and cared for similarly the preceeding winter. This is not a test in which common cattle are compared with good ones. Lots X and Y, however, are comparable with each other.

All of the cattle, except Lot Y which were on the pasture alone, were given a very small daily feed of cake during the first few weeks. Each of the young steers received an average of only 2.19 pounds of cake daily during the first 28 days. This amount was increased from time to time, as shown in the table. For a time each steer was eating 6 pounds of cake a day, but this amount was finally reduced somewhat on account of scouring and hot weather.

At first the common steers (Lot X) were also given a very small allowance of cottonseed cake, each steer receiving an average of 2.84 pounds of cake daily during the first 28 days. The steers in this lot were never given a daily feed of over 5 pounds of cake. The steers in Lot Y received no feed at all in addition to the pasture, the object being to learn whether it would pay to feed cottonseed cake to steers of this grade while grazing a fairly good pasture.

WEIGHTS AND GAINS ON PASTURE.

The following table shows the average initial weight, average final weight, and the total and average daily gains of each steer. All of the gains were unsatisfactory. To have been entirely satisfactory the average daily gains should have been not less than 2 pounds. The authors are unable to state postively why the gains were no greater, but it was probably due to the unusual amount of rain during the grazing season. The pastures were on low grounds which continued extremely wet throughout the greater part of the test. The grass made a good growth and the steers seemed to be well filled practically all of the time, but, of course, the grass that they obtained was very soft and full of water.

TABLE 12.—*Weights, Total Gains, and Average Daily Gains of the Steers During the Summer of 1910.*

The Young Steers.
(April 2, 1910—Aug. 26, 1910.)
(147 days.)

Lot	Number of steers	RATION	Average initial weight of each steer	Average final weight of each steer	Average total gain of each steer	Average daily gain of each steer
			Pounds	Pouuds	Pounds	Pounds
4 and 5	35	Pasture and Cottonseed cake	687	855	168	1.14

The Common Steers.
(April 23, 1910—Sept. 2, 1910.)
(113 days.)

X	28	Pasture Cottonseed cake	572	761	189	1.42
Y	15	Pasture alone	580	757	177	1.33

Each of the young steers made a total gain of 164 pounds during the 147 days that they were on feed. This was an average daily gain of 1.14 pounds. As stated before, these gains were exceedingly unsatisfactory. With the amount of cottonseed cake they received along with the pasture it was expected that they would make not less than an average daily gain of 2 pounds a day. In some former feeding work* the daily gains obtained averaged more than two pounds when the pastures were supplemented by cottonseed cake.

The common cattle of lot Y (pasture alone) made fairly satisfactory gains, although larger gains were expected. Each steer made an average daily gain of 1.33 pounds, or a total gain of 177 pounds for the whole summer of 133 days. The steers (Lot X) which received some cottonseed cake along with the pasture made a

*See Alabama Station Bulletin 151 or Bureau of Animal Industry Bulletin 131.

very little larger daily gain than the ones on pasture alone. Each cake-fed steer made an average daily gain of 1.43 pounds, or a total gain of 189 pounds for the whole summer, while the pasture steers each gained 177 pounds, or an average daily gain of 1.33 pounds.

QUANTITY AND COST OF FEED REQUIRED TO MAKE 100 POUNDS GAIN.

When cattle are being fattened and the gains are small, they are almost certain to be expensive; the results secured in this experiment were no exception to the general rule. The table following shows that the summer gains were extremely expensive when compared to former experiments that have been made in this State. At least two factors were involved in making these summer gains expensive. First, the cattle were fed a rather heavy ration of high-priced cottonseed cake along with the pasture, and, second, the cattle did not respond to the liberal feeding, due probably at least in part to the wet pastures.

TABLE 13.—*Quantity and Cost of Feed Required to Make 100 Pounds of Grain.*

The Young Steers.

(April 2, 1910—Aug. 16, 1910)

(147 days)

Lot	Number of steers	RATION	Total cost of feed and pasture for each steer	Pounds of feed to make 100 pounds of gain	Cost to make 100 pounds of gain (including pasture)
				Pounds	
4 and 5	35	Pasture Cottonseed cake	$11.54	423	$7.06

The Common Cattle.

(April 23, 1910—Sept. 2, 1910.)

(133 days.)

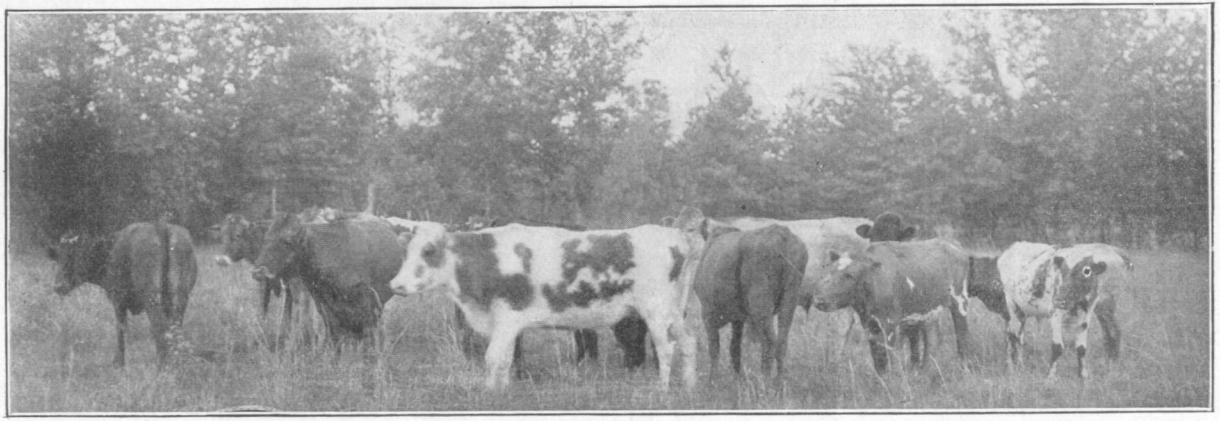
X	28	Pasture Cottonseed cake	$9.10	274	$4.82
Y	15	Pasture alone	2.38	None	1.55

It cost $11.54 to feed each steer in Lots 4 and 5 through the summer when cottonseed cake is valued at $26.00 a ton and the pasture at 50 cents a month for each animal. Or it required 423 pounds of cottonseed cake at a cost of $7.06, to make 100 pounds of increase in live weight. This was an unusually expensive gain for summer feeding.

The following extract is taken from Alabama Station bulletin No. 151, which is a report of some previous work done in fattening cattle in the summer time on pasture: "In every case above, the cost to make one hundred pounds increase in live weight was very low. (In one case $1.18 when pasture was used alone; in another case $1.03; when cottonseed cake was used it cost only $2.56 to make 100 pounds of gain in one experiment, and $3.21 in a second test). When steers are fattened during the winter time each pound of gain is put on at a loss, as each pound put on may be expected to cost from 8 to 12 cents; and the profit is dependent upon the enchancement of the value of the steer over and above the selling value of pounds of gain made. In these tests each pound put on during the fattening period was put on at a profit, a very unusual occurrence in fattening beef cattle. These cheap finishing gains made the feeding operations comparatively safe as far as profits were concerned. As stated before, these cheap gains were due to two factors; first, the cattle had a cheap and succulent roughage—pasture. Second, the amount of concentrated feeds used was kept down to a comparatively small figure; from 2.76 to 3.31 pounds of cottonseed cake and 4.48 pounds of cottonseed were fed each steer daily."

In Lot X, one of the lots of common cattle, 274 pounds of cake were required to make 100 pounds of gain, at an expense of $4.82 per hundredweight. To feed each steer in this lot all summer it cost $9.10, when the feeds are valued as above. The cattle in Lot Y received no cake in addition to the pasturage so it cost only $2.38 to feed each one from April 23 to September 2 when pasturage is valued at 50 cents a month per head.

Lot X. Picture shows a few individuals of the lot. They are eating cottonseed cake as a supplement to pasture. Each steer returned a clear profit of $6.97.



Lot Y. Picture shows a few individuals of lot. Picture taken soon after test was inaugurated. A clear profit of $11.00 was made on each animal.

FINANCIAL STATEMENT OF THE SUMMER FEEDING.

As stated before, the cattle in Lots 4 and 5 cost 3½ cents a pound in the fall of 1909. These cattle were fed through the winter of 1909-'10 on a light ration of feeds as heretofore outlined. When spring arrived, and the expense of the winter feeding had been added to the fall price, the steers had cost $4.41 and $4.60 per hundredweight respectively. These were the values placed upon them at the beginning of the summer feeding, April 2, 1910. On August 26, 1910, they were sold for $4.50 per hundredweight on the farm, after a 3 per cent shrink.

The common cattle in Lots X and Y were also purchased in the fall of 1909, costing, however, only 2¼ cents a pound. They ate no expensive feeds during the winter months as they were turned out on the open range. On April 23, 1910 they were taken off this winter range and weighed again, and it was learned that each steer had gained 10 pounds during the winter. Owing to the fact that they had been fed no feeds during the winter upon which a price was placed (open range has no value placed upon it) they were really cheaper in the spring of 1910 than they were the previous fall as they had gained in weight. This condition of affairs is, of course, very unusual. When this increase in weight was taken into consideration, the cattle cost $2.21 per hundredweight the spring of 1910; at the beginning of the summer work this value was placed upon them. On September 2, 1910 they were sold and shipped to the Atlanta market, realizing $3.87½ per hundredweight for Lot X and $3.60 per hundredweight for Lot Y.

FINANCIAL STATEMENT OF LOTS 4 AND 5.

Lot 4—Cottonseed cake and pasture:		
To 18 steers, 12,566 lbs. at $4.41 per cwt...	$554.16	
To 12,770 lbs. cottonseed cake at $26.00 per ton	166.01	
To pasture for 5¼ months at 50 cents a month	47.25	
	767.42	
By sale 18 steers, 15,064 lbs. at $4.50 per cwt.		$677.88
Total loss	89.54	
Loss per steer	4.97	
Lot 5—Cottonseed cake and pasture:		
To 17 steers, 11,494 lbs. at $4.60 per cwt.	$528.72	
To 12,061 lbs. cottonseed cake at $26.00 a ton	156.79	
To pasture for 5¼ months at 50 cents a month	44.62	
	730.13	
By sale 17 steers, 13,978 lbs. at $4.50 per cwt.		$629.01
Total loss	101.12	
Loss per steer	5.95	

It is seen that the steers in both of these lots were fed at a loss, each steer losing $4.97 and $5.95 in Lots 4 and 5 respectively. It should be noted that the expense of feeding these cattle through the previous winter is also charged against them in the above statements. The steers in Lot 4 were fed through the previous winter on cottonseed meal and hulls, while those of Lot 5 had some Johnson-grass hay added to the basal ration of cottonseed meal and hulls. More money was lost on the steers in Lot 5 because of the fact that Johnson-grass hay increased the expense of the winter ration.

(See page 87.)

This work shows clearly that profits cannot be made upon cattle when the conditions are as they were in this test. It is true that the beef cattle market was demoralized just at the time of sale, but even with a normal market it would have been impossible to have made money on these young steers. To have come out even on the operation the steers of Lots 4 and 5 would have had to sell for $5.09 and $5.24 per hundredweight respectively. This they would not have done even under normal market conditions. Too much high-priced feed had been fed. Furthermore, subsequent work seems to teach that, while they were fed too long a time in the summer, they were not fed liberally enough during the winter. If they had been sold earlier in the summer the financial outcome would not have been so discouraging, as the price would have been better and considerable high-priced feed would have been saved. In fact, a little profit would have been secured if they had been sold about July. Then again, the expense of feeding them during the winter was a heavy one, while only small gains were secured. It cost $8.95 and $9.83 to feed each steer in Lots 4 and 5 through the winter months. If profits are to be made in handling cattle in this manner, the winter feed bill must be carefully looked after.

Two or three methods of feeding can be adopted by which the winter feeding can be done more economically than was the case in this test. In the first place, these young steers were not fed a sufficient amount of feed during the winter months. Their ration was too near a mere maintenance ration. In the second place, the open range in some parts of the State, can be used to supplement the high-priced feeds. With young animals the range can never entirely take the place of high-priced feeds, as young animals must be fed during the winter months if satisfactory results are secured. This system of wintering cattle, however, will disappear as soon as the State becomes more densely populated and the large farms are divided into small ones. In the

third place, the old cotton and corn fields can be made to be exceedingly profitable when fenced; both the young and old animals can be turned on these fields and oftentimes secure one-half of their winter feed from them. This third method is a permanent one and will be introduced more and more as our farming conditions change.

FINANCIAL STATEMENT OF LOTS X AND Y.

Lot X—Cottonseed cake and pasture:		
To 28 steers, 16,011 lbs. at $2.19 per cwt.	$350.64	
To 14,493 lbs. cottonseed cake at $26.00 a ton	188.41	
To pasture, 4 ¾ months at 50 cents a month	66.50	
	605.55	
By sale 28 steers, 20,665 lbs. at $3.87½ per cwt.		$800.77
Total profit	195.22	
Profit per steer	6.97	
Lot Y—Pasture alone:		
To 15 steers, 8,697 lbs. at $2.25 per cwt.	195.68	
To pasture, 4¾ months at 50 cents a month	35.63	
	231.31	
By sale 15 steers, 11,008 lbs. at $3.60 per cwt.		$396.29
Total profit	164.98	
Profit per steer	11.00	

These steers were sold on the farm with a 3 per cent shrink. Those in Lot X sold for $3.87½ per hundredweight, and those in Lot Y for $3.60. Exceedingly satisfactory profits were made on these cattle, $6.97 clear profit being made on each steer in Lot X, while each animal in Lot Y returned a profit of $11.00

In this particular experiment it did not pay to supplement the pasture with the cottonseed cake; more money would have been made it the cake had not been used. These results, however, do not agree with others secured in former work*. The cattle in Lot X did not respond to the extra feed of cottonseed cake; this is shown to be true by the daily gains. The steers in Lot Y where no cake was fed made an average daily gain of 1.33 pounds, while the steers of Lot X, where the cake was fed along with pasture, made an average daily gain of only 1.42 pounds. This is unusual and the authors regard the results as abnormal.

SLAUGHTER RECORDS.

The steers of Lots 4 and 5 were shipped to Atlanta, where complete slaughter records were secured. Those of Lots X and Y were also shipped to Atlanta, but no slaughter data were obtained.

TABLE 14.—*Shipping Weights and Slaughter Data.*

Lot	Number of steers	Total weight on farm	Total weight at Atlanta	Shrinkage en route per steer	Total dressed weight at Atlanta	Per cent. dressed out by farm weight	Per cent. dressed out by Atlanta weight
		Pounds	Pounds	Pounds	Pounds	Per cent.	Per cent.
4	18	15530	14920	33.9	8252	53.1	55.3
5	17	14402	13740	38.9	7531	52.3	54.8

The cattle were driven 4 miles from the farm to the railroad. The shrinkage en route was not large, being 33.9 pounds and 38.9 pounds for each animal in Lots 4 and 5 respectively. By Atlanta weights, the steers in Lot 4 dressed 55.3 per cent, while those in Lot 5 dressed 54.8 per cent.

*See Alabama bulletin 151, or Bureau of Animal Industry bulletin 131.

SUMMARY.

1. Two separate tests are reported in Part II. The steers in Lots 4 and 5 were a high-grade bunch of young cattle; those in Lots X and Y were the common cattle of Sumter and neighboring counties. These tests are not comparable.

2. The steers in Lots 4 and 5 were carried through the winter of 1909-'10 on the following feeds:—

Lot 4—
Cottonseed meal,
Cottonseed hulls.

Lot 5—
Cottonseed meal,
Cottonseed hulls,
Johnson-grass hay.

The general plan was to give sufficient feed to produce small gains throughout the winter months. No effort was made to fatten the steers as they were to be fattened the following summer on pasture.

3. The steers in Lots X and Y were carried through the winter of 1909-'10 on the range alone; no purchased feeds were used. The object was to fatten these cattle the following summer on pasture.

4. The steers in Lots 4 and 5 ate the following amounts of feed each day during the winter:

Lot 4—
Cottonseed meal .....2.35 pounds
Cottonseed hulls .....13.29 pounds

Lot 5—
Cottonseed meal .....2.35 pounds
Cottonseed hulls .....6.82 pounds
Johnson-grass hay .....5.50 pounds

5. The test was inaugurated December 6, 1909. On this date the steers in Lots 4 and 5 averaged 624 and 608 pounds in weight. At the close of the winter period, April 1, 1910, the steers had attained an average weight of 698 and 676 pounds in the respective lots.

6. The steers in Lots X and Y (combined during the winter months) averaged 565 pounds in weight at the beginning of the winter test, December 6, 1909. At the close of the winter, April 23, 1910, they had attained an average weight of 575 pounds.

7. To feed each steer through the winter cost $8.95 and $9.83 in Lots 4 and 5 respectively. Johnson-grass hay increased the expense; it did not pay to use the hay along with the cottonseed meal and hulls.

8. The steers in Lots 4 and 5 cost 3½ cents a pound when they were purchased the fall of 1909. At the end of the winter feeding they had cost $4.41 and 4.60 per hundredweight respectively, after the gains were taken into consideration.

9. Owing to the fact that the common cattle in Lots X and Y were fed nothing except range during the cold months, but at the same time gained a little in weight, they were cheaper when spring opened than they were the previous fall. They were bought in the fall of 1909 for $2.25 per hundredweight, and at the end of the winter period, April 23, 1910, their cost per hundredweight was reduced to $2.21.

10. When the spring of 1910 arrived all the cattle were turned on pasture and fattened for the late summer market. Lots 4 and 5 were combined into one lot, while Lots X and Y were separated into two lots. The steers in Lot 4 and 5 were fed cottonseed cake along with pasture from April 2, 1910 to August 26, 1910. The steers in Lots X and Y were given the following feeds from April 23, 1910 to September 2, 1910:

Lot X—
Pasture,
Cottonseed cake.

Lot Y—
Pasture alone.

11. The steers in Lots 4 and 5 (now combined) made an average daily gain of only 1.14 pounds during the pasture season. This was unsatisfactory.

12. The steers in Lots X and Y made an average daily gain of 1.42 and 1.33 pounds respectively during the pasture season. This was also unsatisfactory.

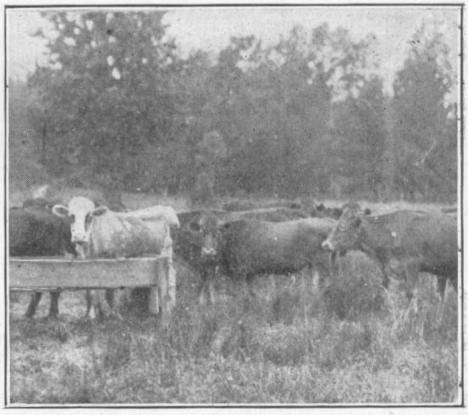
13. Including the cost of pasture, it cost $7.06 to make 100 pounds of gain in Lots 4 and 5 during the pasture period. These were unusually expensive gains for the summer season.

14. Including the cost of pasture, it cost $4.82 and $1.55 to make 100 pounds of gain in Lots X and Y respectively.

15. The reader's attention should be called to the fact that the results secured in Lots 4 and 5 are not comparable with those secured in Lots X and Y.

16. Money was lost on the cattle in Lots 4 and 5, $4.97 on each steer in Lot 4, and $5.95 on each one in Lot 5.

17. Excellent profits were realized on the cattle in Lots X and Y, $6.97 on each steer in Lot X, and $11.00 on each one in Lot Y. In this experiment it did not pay to supplement the pasture with the cottonseed cake. This result, however, does not agree with other results secured in former experiments. For reasons stated in the text of this bulletin the authors regard this result as abnormal.



Part III.

The Value of Shelter for Fattening Cattle in Alabama.

INTRODUCTION.

During the winters of 1904-'05, 1905-'06, and 1906-'07 this Station, working in cooperation with the Bureau of Animal Industry, carried through some tests to determine the value, if any, of shelter in fattening southern steers. These results were published in Bulletin 103 of the Bureau of Animal Industry. In comparing the daily gains, the authors stated, "The animals in Pen 2 were fed under an open shed, and Pen 6 had no shelter. The average daily gains for the three years was 1.55 pounds for the pen under shelter and 1.47 pounds for the lot without shelter. In the two wet winters (1904-'05 and 1905-'06) the largest daily gains were made by the lot under shelter; but in the mild and rather dry weather of 1906-'07 the lot without shelter made more rapid gains."

With regard to feed requirements, the authors further stated, "In two experiments out of three and in the average for three years, shelter resulted in a slight economy in use of concentrated feeds and a slight loss in the use of roughage. In other words, shelter on the whole saved 0.2 of a pound of cottonseed meal per pound of gain and lost 0.49 of a pound of roughage. The steers out of doors consumed a larger ration roughage."

Or, in other words, when the cottonseed meal is valued at $26.00 a ton and hulls at $7.00 a ton the shelter saved practically 9 cents on every 100 pounds of gain made; sheds cannot be built and maintained with this small saving.

However, the above steers were not managed with refence to bedding and available space for exercise as they

are usually fed on the farms of Alabama. "The feed lots were 16 by 90 feet, the ground sloping away from the shed. These lots had a good slope, but still became very muddy in wet weather. The lot without shelter was at times several inches deep in mud, so that the steers had no dry place to lie down. None of the lots were bedded, though the sheds were. The feed troughs were under the sheds. The water troughs were near the feed troughs and under the shed, the water being supplied from a well. The troughs had float valves, so that a fresh supply of water was kept in them at all times."

The average feeder of the State does not confine the fattening steers in small lots 16 by 90 feet; the Station and Bureau authorities, however, on account of the lack of ground, had to do so, and of course the steers in the lot without shelter were at a disadvantage on account of deep mud. When the farmer feeds without shelter the steers can usually find a dry piece of ground on which to lie, as they are not confined in small lots.

In connection with another line of work during the winter of 1910-11 an opportunity presented itself to carry through another experiment along this line upon an extensive scale, and the conditions surrounding the present test were more nearly in keeping with average farm conditions than were those of the former experiments.

The present work was done in cooperation with Mr. E. F. Allison of Sumter County, Alabama. Mr. Allison furnished the cattle and the feed and the Alabama Experiment Station and the Bureau of Animal Industry provided a trained man to look after the details of feeding. Mr. L. W. Shook was stationed on the farm and had personal supervision of the experiment.

PLAN OF THE EXPERIMENT.

This work was planned with two objects in view:

1. To study various methods of making and saving manure when beef cattle are fattened during the winter months. One lot of steers was fed on a 5-acre tract of level sandy land, so that all the manure they made was deposited upon the land without the expense of hauling. A second bunch of cattle was fed in a small lot, across one side of which was a good shed. Both the lot and the shed were bedded when necessary. The steers could always find dry places upon which to lie. An accurate account was kept of the amount of bedding hauled, the labor required to haul it, and the expense of hauling the manure from the barn to a second 5-acre tract of land adjoining the first tract. The comparative value of the two methods of making and saving manures is to finally measure in terms of subsequent yields of corn and cotton.

2. To study the value, if any, of shelter in fattening southern beef animals.

The results of the second object are reported in the following pages. Sufficient information relative to the first object has not been collected to warrant a report.

THE CATTLE.

The cattle used in this test were a mixed lot of steers, heifers, and cows, averaging from two to four years of age. As the main object of the test was to study methods of making and saving manure, the quality of the animals was somewhat neglected. They were the common cattle of Sumter and neighboring counties; only a very few showed signs of improved beef blood. They cost $2.30 per hundredweight during the late fall of 1910. The price paid shows that the quality was poor, as the best feeders of the county were selling for $3.00 to $3.50 per hundredweight.

PRELIMINARY MANAGEMENT AND FEEDING.

A few of the cattle were raised upon the farm where the experiment was conducted; the majority, however, were purchased from neighbors. Some of the cattle were purchased early in the fall; these, together with the few that were raised on the farm, were grazed upon a large pasture with no additional feed from October 10, to October 21, 1910. On October 21, thirty head were taken from this pasture and turned into a peanut pasture where hogs and sheep were grazing. While they were on peanuts each animal was given a daily feed of one pound of cottonseed cake. On October 31 they were returned to the first mentioned pasture and the daily allowance of cake was raised to 2 pounds for each animal. As cold weather approached the value of the pasture gradually decreased, and the amount of cake was therefore gradually increased. By December 16, 1910 each animal was eating practically 4 pounds of cake each day. On this date they were taken off the pasture as it was of no further value, and the test inaugurated.

The cattle were all dehorned before the experiment began. During the test proper, the individual weights of the cattle were secured at the beginning and end of the test. Lot weights were secured every 28 days. Fedding was done twice each day, once about 7 o'clock in the morning and again at 4 o'clock in the afternoon. The cottonseed meal was mixed with the hulls by hand. Water was kept before the cattle all the time. Salt was fed once a week.

LOTS AND SHELTER.

The cattle were divided into two lots. Lot 1 was fed in a small inclosure, across the east side of which extended a shed and the feed troughs; the animals, therefore had the privilege of standing either under the shed or in the open lot. From time to time sufficient bedding was hauled to cover the entire lot. The object was to

keep the whole lot well bedded, but several times during the test that part of the lot not under shelter became exceedingly muddy. However, the cattle could always find dry places. The steers in Lot 2 were fed on a five-acre tract of sandy land with no shelter at all. This tract of land had been under cultivation for several years so the trees had been removed. The feed troughs, which were also in the open, were made in such a way that they could be pulled from place to place; in this way the manure was evenly distributed over the field. The soil was a sandy one, so the ground never became exceedingly muddy although the winter of 1910-11 was an unusually wet one.

CHARACTER AND PRICE OF FEEDS.

Cottonseed meal and coottonseed hulls were fed to both lots. No other feeds were used. Both the meal and the hulls were of good quality. The following prices were taken as a basis upon which to make the financial estimates:

Cottonseed meal	$26.00 a ton
Cottonseed hulls	7.00 a ton

DAILY FEED FOR EACH STEER.

There seems to be no doubt that the majority of our southern farmers feed too much cottonseed meal to cattle which are being fattened. The average feeder is tempted to increase the amount of cottonseed meal too rapidly at the beginning of the feeding period and continue to increase the amount until the total feed of meal is entirely too great. When this is done the cattle are oftentimes "burnt out" by the time they have been fed from 70 to 80 days and must then be sold, often under unfavorable market conditions. "Burnt out" cattle cannot be held for better market conditions.

The table below shows the average daily ration of cottonseed meal and hulls in this experiment by periods of 28 days each:

TABLE 15.—*Average Quantity of Feed Eaten by Each Animal Daily.*

(Dec. 16, 1910—March 8, 1911.)

(103 days.)

Period	LOT 1 (Shelter)	LOT 2 (No shelter)
	Pounds	Pounds
First 28 days	4.15 cottonseed meal 18.11 cottonseed hulls	4.19 cottonseed meal 16.63 cottonseed hulls
Second 28 days	5.04 cottonseed meal 20.17 cottonseed hulls	5.05 cottonseed meal 20.12 cottonseed hulls
Third 28 days	5.33 cottonseed meal 19.39 cottonseed hulls	5.20 cottonseed meal 19.51 cottonseed hulls
Last 19 days	5.19 cottonseed meal 18.61 cottonseed hulls	5.18 cottonseed meal 18.69 cottonseed hulls

At the beginning of the test the cattle averaged 578 and 585 pounds in weight in Lots 1 and 2 respectively.

These cattle were, in a way, accustomed to cottonseed meal, as they had received a small feed of cottonseed cake for several weeks previous to the beginning of the experiment, yet their daily allowance of meal was below 3 pounds an animal for several days after the test began. This amount was gradually raised and each steer ate an average of 4.15 pounds of cottonseed meal daily during the first 28 days; along with this amount of meal an average of 18.11 pounds of hulls were consumed daily by each animal. They were given all of the hulls they would clean up. The cattle in Lot 2 ate practically the same as those in Lot 1. The heaviest feeding of cottonseed meal occurred in Lot 1 during the third period, when an average of 5.33 pounds of cottonseed meal was given each animal daily.

Feeding continued for 103 days, yet no ill results, as dizziness, staggering or blindness, followed the use of the cottonseed meal. As stated before, many feeders, on account of the excessive use of cottonseed meal, are not able to feed for more than 80 days.

WEIGHTS AND GAINS.

Although the daily allowance of cottonseed meal was maintained at a rather small amount, the cattle made satisfactory gains. At the same time no loses were sustained as a result of feeding meal too liberally.

TABLE 16.—*Weights and Gains.*
(Dec. 16, 1910—March 28, 1911.)

Lot	Number of cattle	RATION	Initial weight Dec. 16, 1910	Final weight March 26, 1911	Total gain of each animal	Average daily gain of each animal
			Pounds	Pounds	Pounds	Pounds
1 (Shelter)	33	Cottonseed meal Cottonseed hulls	578	754	176	1.71
2 (No shelter)	34	Cottonseed meal Cottonseed hulls	585	757	172	1.67

Each animal in Lot 1, fed under shelter, weighed 578 pounds at the beginning and 754 pounds at the close of the test, making a total gain of 176 pounds, or an average daily gain of 1.71 pounds. It is seen that the cattle which had no shelter (Lot 2) also made good gains, as each one made a total gain of 172 pounds during the test, or an average daily gain of 1.67 pounds. As far as gains were concerned, the shelter was of no practical value as the cattle with shelter made an average total gain of only 4 pounds more than the ones without shelter.

QUANTITY AND COST OF FEED REQUIRED TO MAKE 100 POUNDS OF INCREASE IN LIVE WEIGHT.

Many feeders believe that a fattening animal will increase in weight during the winter months very much more economically when he is sheltered than when he is forced to remain out in the open weather. The following table shows that there were, at least, no striking results to be secured from the employment of shelter for fattening animals under the conditions of this test.

TABLE 17.—*Quantity and Cost of Feed Required to Make 100 Pounds of Gain.*
(Dec. 16, 1910—March 28, 1911)

Lot	RATION	Pounds of feed to make 100 pounds of gain	Cost to make 100 pounds of gain
		Pounds	
1 (Shelter)	Cottonseed meal Cottonseed hulls	288 1120	$7.66
2 (No shelter)	Cottonseed meal Cottonseed hulls	292 1122	7.72

When shelter was employed (Lot 1) it required 288 pounds of cottonseed meal and 1,120 pounds of hulls, at a cost of $7.66, to make 100 pounds of gain. When no shelter was provided (Lot 2) the same gains were made with 292 pounds of meal and 1,122 pounds of hulls, at a cost of $7.72. In other words, the shelter saved 6 cents on each 100 pounds of gain made.

Sheds or barns cannot be built and maintained with this small saving. Other considerations, however, may make it profitable to employ a good shelter for fattening cattle. For instance, when it is impossible to save the manure in any other way, it is, without doubt, a wise thing to build barns or sheds for conserving it.

PROFIT ON COTTONSEED MEAL AND HULLS AS A RESULT OF FEEDING THEM TO THE CATTLE.

In this test the cottonseed meal and hulls sold by means of the cattle at a handsome profit. Furthermore, the fact must not be overlooked that the greater part of the fertilizer value of these feeds was left on the farm after they had passed through the cattle. The financial statement shows that with Lot 1 the total cost of the meal and hulls was $444.17, and there remained a clear profit of $227.15 after paying all expenses. With Lot 2 the result was even better, the feed in this case costing $451.81, and the net profit being $254.34.

FINANCIAL STATEMENT.

This mixed bunch of cattle was bought during the fall of 1910 for an average price of $2.30 per hundredweight. When they were ready to be shipped they were driven three miles to the railroad at Bellamy, Alabama, and sent to New Orleans where slaughter data and sale prices were secured. It cost 40 cents a hundredweight to ship them to New Orleans when freight, commission, yardage, weighing, labor, and feed en route were all taken into consideration. At New Orleans the cattle in Lot 1 sold for an average price of $5.00 per hundredweight, while those in Lot 2 sold for an average price of $5.06 per hundredweight.

FINANCIAL STATEMENT.

Lot 1.—Shelter:		
To 33 cattle, 19,080 lbs. at $2.30 per cwt	$438.84	
To 16,677 lbs. cottonseed meal at $26 per ton	216.80	
To 64,962 lbs. cottonseed hulls at $7 per ton	227.37	
To shipping expenses at 40 cents per cwt.	96.54	
	979.55	
By sale of 33 cattle, 24,134 lbs, at $5.00 per cwt.		$1,206.70
Total profit	$ 227.15	
Profit per animal	6.88	
Lot 2.—No Shelter:		
To 34 cattle, 19,875 lbs. at $2.30 per cwt.	$ 457.13	
To 17,084 lbs. cottonseed meal at $26 per ton	222.09	
To 65,634 lbs. cottonseed hulls at $7 per ton	229.72	
To shipping expenses at 40 cts. per cwt.	99.85	
	1008.79	

By sale of 34 cattle, 24,963 lbs. at $5.06 per cwt. $1263.13

Total Profit .....$ 254.34

Profit per animal 7.48

Each animal in Lot 1 returned a clear profit of $6.88 above all expenses, while each animal in Lot 2 returned a profit of $7.48. Therefore, the animals which had no shelter were finally more profitable than those which were provided with a good barn; this was due to the fact that the cattle without shelter sold for a little higher price at New Orleans than the others.

TABLE 18.—*Summary Table*

	LOT 1 (Shelter)	LOT 2 (No shelter)
Average cost of cattle in fall 1910	$2.30	$2.30
Ration for each lot	Cottonseed meal Cottonseed hulls	Cottoneeed meal Cottonseed hulls
Average initial weight of each animal	578 lbs.	585 lbs.
Average final weight of each animal	754 lbs.	757 lbs.
Average total gain of each animal	176 lbs.	172 lbs.
Mumber of days on feed	Dec. 16, 1910- Mch. 28, 1911	Dec. 16, 1910- Mch. 28, 1911
Average daily gain	1.71 lbs.	1.67 lbs.
Feed to make 100 pounds of gain	288 lbs. meal 1120 lbs. Hulls	292 lbs. meal 1122 lbs. hulls
Cost to make 100 pounds of gain	$7.66	$7.72
Selling price of cattle per cwt. in New Orleans	5.00	5.06
Entire cost per cwt. to ship them to New Orleans	0.40	0.40
Total profit on each animal	6.88	7.48

SUMMARY STATEMENTS.

1. The cattle (67 in number) used in the test were a mixed lot of steers, heifers, and cows, averaging from 2 to 4 years of age. As the chief object of the work (not reported, however, in this publication) was to study methods of making and saving manures, the quality of the animals was somewhat neglected.

2. The object of the experiment herein reported was to study the value, if any, of shelter in fattening southern beef animals.

3. The cattle cost on the average, $2.30 per hundredweight.

4. The test was inaugurated December 16, 1910 and closed March 28, 1911, a period of 103 days.

5. The cattle were divided into 2 lots, one without shelter and one with shelter. Both lots were fed similar rations of cottonseed meal and cottonseed hulls.

6. At the beginning of the test the average weight of each animal in Lots 1 and 2 was 578 and 585 pounds respectively.

7. Each animal in Lots 1 and 2 made an average total gain of 176 and 172 pounds respectively.

8. In Lot 1, where shelter was employed, it required 288 pounds of cottonseed meal and 1120 pounds of hulls to make 100 pounds of gain in live weight, while in Lot 2, where no shelter was used, 292 pounds of meal and 1,122 pounds of hulls were required to make the same gains.

9. It cost $7.66 and $7.72 to make 100 pounds of increase in live weight in Lots 1 and 2 respectively.

10. Shelter saved only 6 cents on each 100 pounds of gain made.

11. A clear profit of $6.88 and $7.48 was made on each animal in Lots 1 and 2 respectively.

Part IV.

Early Compared with Late Fattening of Steers on Pasture.

INTRODUCTION.

The farmer who fattens cattle on pasture is often undecided as to the proper time to sell. The cattle may be sold during the early summer months, after being fed for 90 days, or they may be carried throughout the whole pasture period and sold late in the fall just before the pastures are exhausted. The feeder, however, is familiar with the fact that fat cattle bring better prices in the early than in the late summer months. Few cattle of any kind are offered for sale during May, June and the early part of July, so if fat steers are held and not marketed until August and September they come in competition with thousands of grass-fed cattle. This large supply of grass cattle naturally depresses the prices of all classes. However, gains are made cheaply during the pasture season, and notwithstanding the fact that cheaper prices obtain late in the summer, the feeder often cannot decide whether it would pay better to rush his animals for the early summer market, or feed a small supplementary feed, thus making the gains cheaply and slowly, and sell late in the summer.

In order to assist the farmer in dealing with this feeding problem, the experimental work hereinafter described was undertaken. When steers are bought right, fed correctly, and sold intelligently, it has been previously demonstrated that satisfactory profits can be realized when they are fattened on pasture. The present test was carried out with the object of studying the problem as to whether it is more profitable to begin feeding early in the spring and feed a rather heavy ration

of cottonseed cake along with the pasture for a short time, or delay the inauguration of the feeding until the pasture grasses are well started in the spring and feed a light ration of cake along with the pasture for a longer period of time.

PLAN OF THE WORK.

The test, extending over three years, was carried on during the pasture seasons of 1909, 1910, and 1911. The cattle in each case were bought the previous fall, because they could be bought much cheaper in the fall than in the spring. In fact, steers in this section can hardly be purchased at all during the spring months. As they were not to be fattened until the following summer, it was necessary to make a study of the cheapest and best methods of getting them through the winter months. However, this part of the test is not presented here. Some results of wintering steers preparatory to summer fattening may be seen in Part II of this bulletin, and in Alabama Station Bulletin 151.

When the grass appeared in the spring the winter feeding was discontinued, and the pasture fattening work inaugurated. The feeding was done on the farm of Cobb and McMillian, of Sumter County, Alabama. They purchased the cattle and the feed, and provided the pastures, which were divided into various fields in order to facilitate the work. The Alabama Experiment Station and the Bureau of Animal Industry provided a trained man to live on the farm and have personal supervision of the tests. Mr. W. F. Ward, one of the authors of this publication, was stationed on the farm.

The weight of each steer was secured at the beginning and end of each test, and the total weight of each lot was noted every 28 days. When the steers were sold some of them had to be driven 9 miles to the shipping point at Scooba, Mississippi, while other were driven 12 miles to Epes, Alabama, for loading.

THE CATTLE AND THE PASTURE.

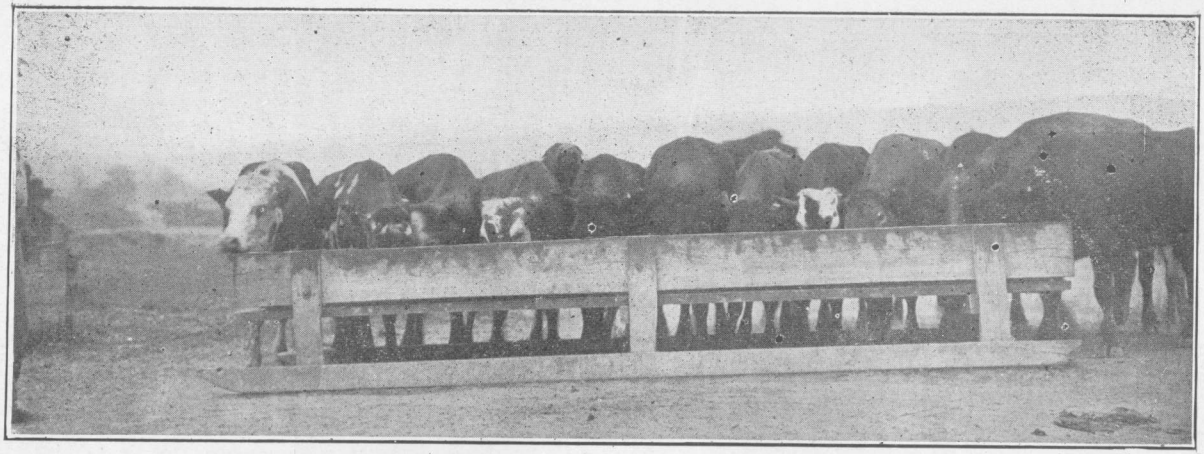
As far as possible grade Aberdeen-Angus, Shorthorn, Hereford, and Red Polled steers were employed; a few animals had a predominence of Jersey and scrub breeding. They were all bought of farmers in Sumter, Wilcox, Marengo, and neighboring counties, so they represented fairly accurately the average cattle of the western part of Alabama. In age they varied from 2 to 4 years. As will be seen later, the average weight at the beginning of the test was about 640 pounds. When compared with northern cattle it is seen that they were small, but they were as large as the average of the State.

The summer pastures used in these experiments consisted of a mixture of sweet clover (Melilotus), Japan clover (Lespedeza), Johnson-grass, crab grass, and some Bermuda grass. The sweet clover became available for grazing about April 1, while the Japan clover afforded practically no grazing until June 15. In some sections of the country sweet clover is considered a pest, as stock will not eat it, but in the South, or at least in Alabama, all kinds of stock eat it with great relish; they take to it as readily as to alfalfa.

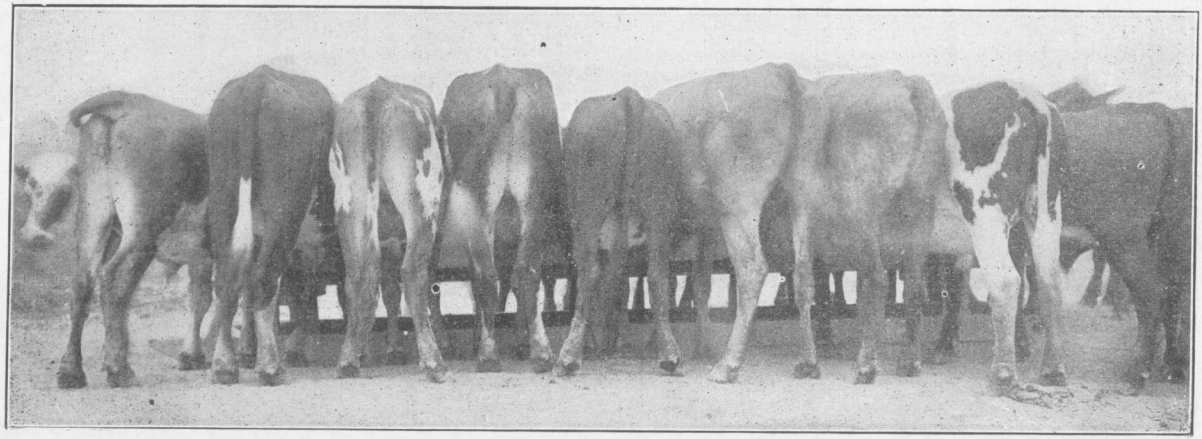
The pasture was divided into fields, the size of each one depending upon the number of cattle grazed upon it, and also upon whether the steers were to be fed a light or a heavy supplementary feed. The object was to have an abundance of pasture for each lot of cattle. The early fattening lots of cattle (Lots F) were turned onto the pasture at a very early date, in fact before the grasses had become thoroughly established. The exact dates will be given later on.

The cattle were fed but once a day. This was done about sundown so that they would all come out to the troughs, which were placed at convenient places in the pastures. No feed was thrown upon the ground.

No shelter, except trees, was provided; but the cattle did not suffer from the heat, as the pastures contained plenty of good shade trees. When a summer shade is



Lot F. Early-fed cattle, summer 1910. These steers were fed cottonseed cake along with pasture and each one returned a clear profit of $9.90.



Lot F. A close view of some of the individuals of the lot while eating cottonseed cake.

provided, cattle will suffer no more from heat in Alabama than they will in Illinois or Iowa.

While there were ticks in the pastures, the cattle were not permitted to become badly infested with them; a dipping vat was used to keep down heavy infestation. In the three year's work, during which time 224 head of cattle were fattened, only one or two cases of Texas fever developed and none of these cases was lost. In future work it is expected that the tick will be entirely eliminated.

QUALITY AND PRICE OF FEEDS.

The cottonseed cake was purchased upon the market so an average market price was taken in making up the financial statements. It must borne in mind, however, that prices vary from time to time, and from place to place. For instance, cottonseed cake is valued at $26.00 a ton in this publication; but at the present writing (December 20, 1911) cake can be purchased for $21.00 a ton. The price mentioned above, $26.00 a ton, very closely approximates the average price for the years 1909, 1910, and 1911. The pasture is valued at 50 cents per month per steer.

The cottonseed cake had been broken into nut size and sacked. This was done by the mill. The cake can be purchased in the large cake size, just as it comes from the press, for about $2.00 a ton cheaper than the nut size. Some feeders find that it pays to break the cake on their own farms. As a whole, the cake was of excellent quality; poor and damaged cake was fed a few times, when the good material could not be secured.

DAILY RATIONS.

The steers in Lot B were fed longer each year than those in Lot F, the object being to start Lot F on feed a few weeks before Lot B, and also to give the animals in Lot F the heavier supplementary ration of cottonseed cake. This plan was followed out except in 1911; the spring of 1911 was an unusually dry one and, as a re-

sult, the pastures were not ready for grazing as early as usual, consquently the lots were started on feed the same date but sold at different times. The steers in Lot B were started on feed April 9 in 1909, April 7 in 1910, and April 21 in 1911. Those in Lot F were started on feed March 19 in 1909, March 25 in 1910, and April 21 in 1911. The cattle in the B lots were sold August 26 in 1909, August 2 in 1910, and September 8 in 1911. Those in the F lots were sold August 5 in 1909, June 23 in 1910, and August 27 in 1911. Thus the steers in the B lots were fed an average of 137-2/3 days, while those in the F lots were fed an average of 119-2/3 days.

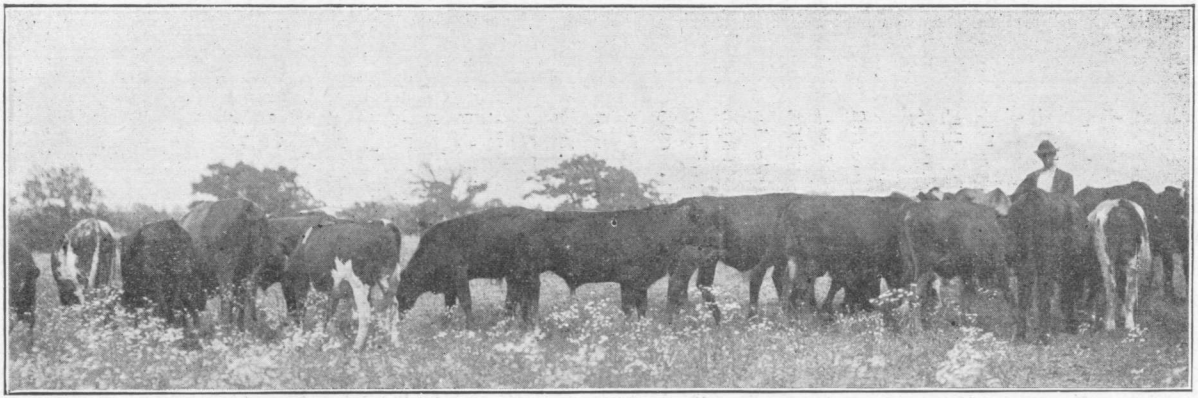
The pastures upon which the two lots of cattle grazed were not exactly similar throughout the whole test, as those in the F lots were started at an earlier date (except in 1911) than those in the B lots. As a matter of fact, the pastures in the F lots were of very small value during the first two or three weeks of the tests; however, the experiment was outlined to learn whether it is profitable to start steers on feed during the very early spring months. On account of the fact that the pastures were short at this early date the cattle of the F lots were started on a rather heavy feed of cottonseed cake.

TABLE 19.—*Daily Feed of Cottonseed Cake by Periods of 28 Days.*

Period	LOT B (Long Feeding)			LOT F (Short Feeding)		
	1909 April 9, to Aug. 26	1910 April 7 to Aug. 2	1911 April 21 to Sept. 8	1909 March 19 to Aug. 5	1910 March 25 to June 23	1911 April 21 to Aug. 27
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
First 28 days	2.35	2.21	2.88	3.24	3.27	3.40
Second 28 days	3.33	4.41	3 76	3.91	4.57	4.87
Third 28 days	3.54	3.80	3.72	4.82	5.00 For 7 days	4.97
Fourth 28 days	3.67	3.65 For 26 days	3.76 For 29 days	5.00	5 00	5.00 For 17 days
Fifth 28 days	3.83 For 14 days	3 50	3.76	5.00	----------	5.00
Sixth 28 days	4.00					

It is seen that the steers in the B lots were given from 2.21 to 2.88 pounds of cottonseed cake at the inauguration of the tests, while those in the F lots ate from 3.24 to 3.40 pounds each daily. At the close of the tests each steer in the B lots was consuming from 3.5 pounds to 4.0 pounds of cake, while those in the F lots were eating, on the average, 5 pounds daily. As a matter of fact, there was practically no difference in the total quantity of cake fed to each steer in Lots B and F, the main difference being that the steers in the F lots ate their amounts of feed in the fewer number of days.

While, to many feeders, the daily feed of cottonseed cake seems small, still reasonably good gains were secured when the size of the cattle is considered. The steers in the B lots averaged practically 600 pounds in weight at the inauguration of the tests, and an average daily gain of 1.87 pounds was secured. Those in the F lots were somewhat larger, averaging practically 690 pounds in weight, and an average daily gain of 2.04 pounds was obtained. Large amounts of cake are not required to obtain good gains when the cattle are grazing a reasonably good pasture. It is, in any event, impracticable to feed a heavy ration of cake along with pasture, as scours develop quickly when cottonseed cake is fed too freely. Scours occurred in fact in a few cases when no more than 5 pounds of cake were fed each steer daily. In the North and Northwest, where corn is cheap, it is practicable and usually profitable to supplement the pasture with a daily ration of from 15 to 18 pounds of corn daily for each steer, but there is no feed in the South cheap enough to be used in such large amounts.



Lot B, 1910. This bunch of cattle was fed from April 7 to August 2 on cottonseed cake and pasture. They made good gains and each steer realized aclear profit of $11.00.

Lot B, 1911. These steers were fed from April 21 to September 8 on cottonseed cake and pasture. They also made good gains and each steer returned a clear profit of $6.48.

TOTAL AND DAILY GAINS.

Table 20 outlines the initial and final weights and the gains of each lot, also the average total and daily gains of each steer.

TABLE 20.—*Weights and Gains.*
(Summary of 3 Years)

Lot	No. steers	No. days on feed	Year	RATION	Initial weight of lot	Final weight of lot	Total gain of lot	Average total gain of each steer	Average daily gain
		Days			Pounds	Pounds	Pounds	Pounds	Pounds
F (Short Peroid)	35	140	1909	Pasture and cake	25321	34919	9598	274.2	1.96
	30	91	1910	Pasture and cake	20042	26062	6020	200.7	2.21
	25	128	1911	Pasture and cake	16522	22808	6286	257.4	1.96
							3-year average		2.04
B (Long Period)	75	154	1909	Pasture and cake	47916	69664	21748	289.9	1.88
	34	119	1910	Pasture and cake	19586	27514	7928	233.2	1.96
	25	140	1911	Pasture and cake	14123	20128	6005	240.2	1.72
							3-year average		1.87

These cattle were from 2 to 4 years old, and small for their age. It should be remembered, however, that the initial weight were all taken at the close of the winter months, when the animals were in their lightest form. The steers in the F lots averaged 723, 668, and 661 pounds, in weight at the inauguration of the pasture work in 1909, 1910, and 1911, respectively; while those in the B lots averaged 639, 576, and 565 pounds, respectively. The steers in the F lots, the short-fed ones, made an average daily gain of 1.96, 2.21, and 1.96 pounds in 1909, 1910, and 1911, respectively, or, an average daily gain of 2.04 pounds for the three years. The steers in the B lots, the long-fed cattle, made an average gain of 1.88, 1.96, and 1.72 pounds in 1909, 1910, and 1911, respectively, or an average of 1.87 pounds for the three years. The steers in the F lots were fed a heavier ration

of cottonseed cake than those in the B lots and as a result gained more rapidly. When the size of the cattle is taken into account, it is seen that the gains were satisfactory.

At the end of the feeding periods the steers in the F lots had attained an average weight of 998, 869, and 885 pounds in 1909, 1910, and 1911, respectively, while those in the B lots were somewhat smaller. For Southern cattle they were of good size—larger than the average—but the southern markets prefer larger carcasses than these cattle produced, and will pay a premium for the large steers.

QUANTITY AND COST OF FEED REQUIRED TO MAKE 100 POUNDS OF GAIN.

Table 21 shows the number of pounds of feed required to make 100 pounds of gain in each case, the cost of the cottonseed cake to make the gains, and also the cost to make the increase in live weight when both the cake and the pasture are charged against the gains. It is seen that the increase in live weight during the fattening period was put on at a profit. That is, each pound added to the weight of the steers during the fattening period did not cost as much as it sold for on the market. This is an unusual state of affairs in fattening cattle, as under average winter conditions, and summer conditions also where a heavy supplementary grain feed is given, each pound of increase during the fattening period is made at a loss.

The economical gains in these tests were mainly due to two factors: first, the daily gains were satisfactory, notwithtsanding the fact that a small amount of high-priced feeds was consumed by each steer, and second, the animals were grazing a pasture—the cheapest feed that can possibly be obtained in Alabama. When large amount of concentrated feed is used to supplement the pasture the cost of the increase in weight will be much more expensive than was the case in these experiments.

TABLE 21.—*Quantity and Cost of Feed Required to Make 100 Pounds of Gain.*

Lot	No. steers	Year	RATION	Pounds of cotton-seed cake to make 100 pounds of gain	Cost to make 100 pounds of gain	
					Cake	Cake and pasture
				Pounds		
F (Short Period)	35	1909	Pasture and cake	224	$2.91	$3.76
	30	1910	Pasture and cake	197	2.56	3.32
	25	1911	Pasture and cake	244	3.17	4.02
			3-year average..	220	$2.86	$3.69
B (Long Period)	75	1909	Pasture and cake	181	$2.35	$3.24
	34	1910	Pasture and cake	176	2.29	3.24
	25	1911	Pasture and cake	210	2.73	3.70
			3-year average..	185	$2.41	$3.33

In the F lots is seen that 224, 197, and 244 pounds of cottonseed cake were required to make 100 pounds of increase in live weight in the years 1909, 1910, and 1911, respectively; or, averaging the three years, 220 pounds of cake were eaten for every 100 pounds of gain. In the B lots, 181, 176, and 210 pounds of cake were fed to every 100 pounds of gain in live weight in 1909, 1910, and 1911 respectively; or an average for the three years of 185 pounds. The saving of cottonseed cake in favor of the B lots was due to the fact that the steers in these lots were given a smaller daily allowance than those in the F lots.

The total expense in the F lots to make 100 pounds increase in live weight when the pasture and cake are both charged against the gains was $3.76, $3.32, and $4.02 in 1909, 1910, and 1911, respectively; or an average of $3.69 for the three years. The total cost to make the same gains in the B lots was $3.24, $3.24 and $3.70 in 1909, 1910, and 1911 respectively; or an average for the three years of $3.33.

PRICES REALIZED ON THE COTTONSEED CAKE, AND THE PASTURE AS A RESULT OF FEEDING THE STEERS.

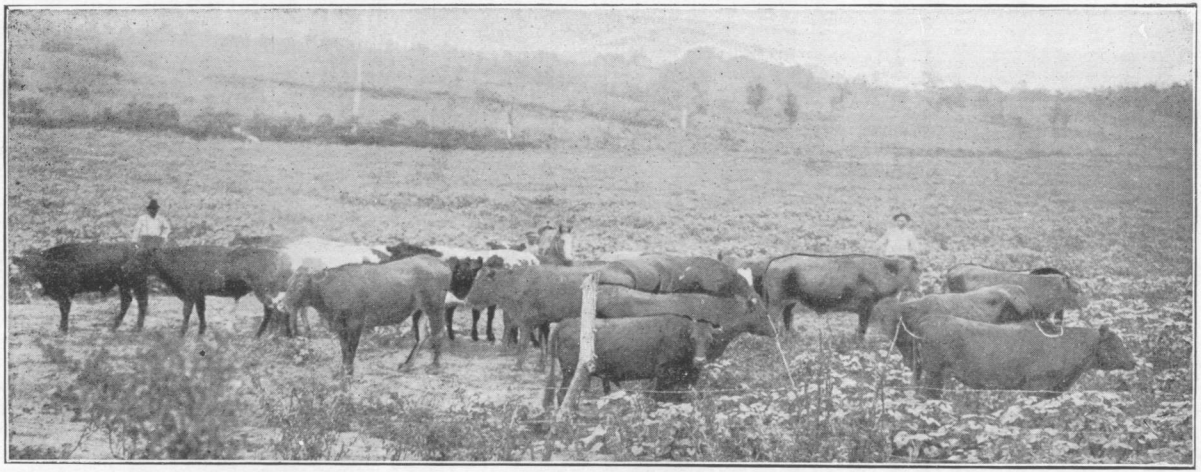
The table below again reinforces the point, which has previously been made several times in this publication, that the farmer can well afford to buy certain feeds not raised on the farm and feed them to beef cattle. The table further shows how valuable pastures can be when properly grazed by beef cattle. The average farmer of the State secures no returns or profits at all from the pasture portion of his farm; the pastures are usually idle. But the following table shows that the pasture can be made to return excellent profits.

TABLE 22.—*Prices Realized on the Cottonseed Cake and the Pasture as a Result of Feeding the Steers.*

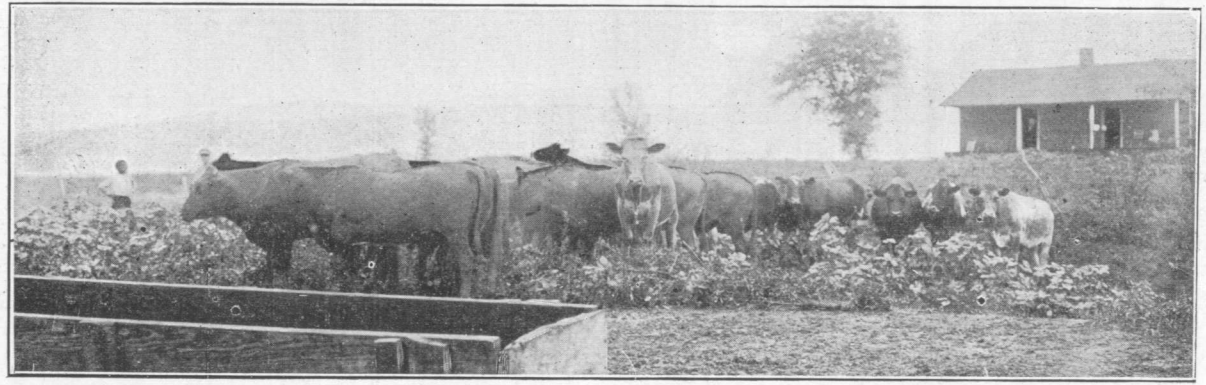
	LOT B (Long Feeding)			LOT F (Short feeding)		
	1909	1910	1911	1909	1910	1911
Price realized on each ton of cottonseed cake when value of pasture is fixed at 50 cents a month per steer	$52.35	$79.68	$51.67	$52.83	$76.17	$48.84
Value of pasture per steer for whole pasture season when the price of cake is fixed at $26.00 a ton	9.48	13.28	8.81	10.59	11.41	8.94
Value of pasture per steer per month	1.85	3.35	1.89	2.27	3.76	2.10

The cottonseed cake cost $26.00 a ton, but it was resold by means of the steers, for $51.67 to $79.68. With the exception of one year (Lot B, 1911), the value of the cake was more than doubled each time, and one year (Lot B, 1910), it was sold through the steers for more than three times what it originally cost.

The pasture proved to be exceedingly valuable in every case. Pastures can be rented anywhere in the State for 50 cnts a month for each steer, but, when measured in terms of profits made on the cattle, the pastures grazed in these tests proved to be worth very much more than



Lot F, 1911. This lot of steers was fed on cottonseed cake and pasture from April 21 to August 27. A profit of $6.81 was made on each animal.



50 cents a month. The last line in the table shows the pasture to be worth from $1.85 to $3.35 a month for each steer when the cake is valued at $26.00 a ton. These results indicate that our farmers could well afford to devote no little attention to making pasture lands with a view to grazing them off with beef cattle.

FINANCIAL STATEMENT.

As will be seen in the table below, the steers were purchased at various prices at the beginning of the tests. They cost from $2.95 to $3.50 per hundredweight, depending upon the size and quality of the steers, and the year purchased. When ready for sale buyers came to the farm and purchased them on the farm after a 3 per cent shrink. In one case (Lot B, 1909), they were sold as low as $3.90 per hundredweight on the farm; in no instance did they sell for more than $4.50 per hundredweight. After being sold they were shipped to various southern markets. Two or three loads were sent to Meridian, Mississippi; some were sent to Atlanta, Georgia, while several corloads were shipped to New Orleans. The table below shows, among other things, the initial cost of the cattle each year, the selling price each year, and the total profit on each naimal:

TABLE 23.—*Financial Statement.*

Lot	No. steers	Year	RATION	Initial price per hundred-weight	Initial cost of each steer	Cost of feed eaten by each steer	Total cost of each steer	Selling price per hundred-weight	Total selling price of each steer
F (Short Period)	35	1909	Pasture and cake	$3.20	$23.15	$10.33	$33.48	$4.375	$41.73
	30	1910	Pasture and cake	3.20	21.38	6.64	28.02	4.50	37.92
	25	1911	Pasture and cake	3.50	23.13	9.98	33.01	4.50	39.82
			3-year average	$3.28+	$22.55	$9.08	$31.63	$4.45+	$39.82
B (Long Period)	75	1909	Pasture and cake	$2.95	$18.85	$9.38	$28.23	$3 90	$35.14
	34	1910	Pasture and cake	2.95	16.99	7.33	24.32	4.50	35.32
	25	1911	Pasture and cake	3.50	19.77	8.89	28.66	4.50	35.14
			3-year average	$3.05+	$17.80	$8.91	$27.46	$4.16+	$35.19

It is seen that excellent profits were made in all the tests. In the F lots clear profits of $8.25, $9.90, and $6.81 were made on each steer in 1909, 1910, and 1911, respectively. An average profit of $8.30 was made on each animal. In the B lots clear profit of $6.91, $11.00, and $6.48 were made in 1909, 1910, and 1911, respectively. In these lots an average profit of $7.73 was secured on each steer. Or, those cattle which were started on feed early, fed a heavy ration of cake along with the pasture, and marketed early in the summer months returned slightly greater total profit,—$0.57 each—than the ones which were started on feed later and finished for the market at a late date. This is not a marked difference, however, in favor of the early method of feeding. The greatest advantage in favor of the early method of fattening cattle during the summer months is one that does not appear in a test of this kind. When the steers are disposed of at an early date the pastures can be grazed by a second bunch of cattle, or the grass has an opportunity to make an extra growth, thus affording extra feed for the winter months, before cold weather sets in. With many farmers late pastures are of great value in saving winter feeds.

TABLE 24.—*Summary of Averages.*

	Lot B (Long Period)	Lot F (Short Period)
Average pounds of cottonseed cake eaten by each steer daily in 1909	3.40 pounds	4.39 pounds
Average pounds of cottonseed cake eaten by each steer daily in 1910	3.45 pounds	4.33 pounds
Average pounds of cottonseed cake eaten by each steer daily in 1911	3.60 pounds	4.66 pounds
Average daily gains for three years	1.87 pounds	2.04 pounds
Average number of pounds of cottonseed cake to make 100 pounds of gain	185 pounds	220 pounds
Average cost of cottonseed cake to make 100 pounds of gain	$2.41	$2.86
Average total cost to make 100 pounds of gain (both pasture and cake included)	$3.33	$3.69
Average initial cost of steers per hundredweight	$3.05+	$3.28+
Average selling price of steers per hundredweight	$4.16+	$4.45+
Average profit on each steer	$7.73	$8.30

SUMMARY STATEMENTS.

1. The object of this part of the work was to determine whether it is more profitable to feed steers a short or a long period of time when they are being fattened on pasture.

2. Grade Aberdeen-Angus, Shorthorn, Hereford, and Red Polled steers, with a few common ones, were used. They were bought in Sumter and neighboring counties and represented fairly accurately the average cattle of the western part of Alabama.

3. The steers were fed on pasture and cottonseed cake during the following periods of time:—

B Lots—(Long feeding periods):—
1909—April 9-August 26.
1910—April 7-August 2.
1911—April 21-September 8.

F Lots—(Short feeding periods):—
1909—March 19-August 5.
1910—March 25-June 23.
1911—April 21-August 27.

4. The following average daily feeds of cake were given:—

B Lots— (Long feeding periods):	F Lots— (Short feeding period):
1909—3.40 pounds	4.39 pounds
1910—3.45 pounds	4.33 pounds
1911—3.60 pounds	4.66 pounds

5. The steers in the B lots made a daily average gain of 1.87 pounds, while those in the F lots gained at the rate of 2.04 pounds each day.

6. There were required 185 pounds of cottonseed cake to make 100 pounds of gain in the B lots, while 220 pounds of cake were eaten in the F lots to make the same gain.

7. When the pasture and cake are both charged against the gains, it cost $3.33 and $3.69 to make 100 pounds of gain in the B and F lots, respectively.

8. The steers in the B lots cost on the average $3.05 per hundredweight at the beginning of the tests; they sold for $4.16 per hundredweight at the close. The steers in the F lots cost $3.28 per hundredweight, and sold for $4.45 per hundredweight.

9. Clear average profits of $7.73 in the B lots and $8.30 per steer in the F lots were made.

10. An additional advantage in selling the cattle early is that the pastures have an opportunity to make an extra growth after the cattle are taken off, thus providing feed for the early winter months. In fact, this is probably the chief advantage to be secured in selling cattle at an early date.