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AUBURN

RAISING BEEF CATTLE IN ALABAMA

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*In co-operative beef work with Bureau of Animal Industry.



*Some Alabama grass steers. In Experimental work
in summer 1909.*

RAISING BEEF CATTLE IN ALABAMA

By DAN T. GRAY AND W. F. WARD.

INTRODUCTION.

The work of eradicating the "Texas-fever" tick is progressing satisfactorily in the South; every year new areas are freed from the tick, and with the progress of the work there comes an added interest in all kinds of cattle production. When the ticks in a county are exterminated, renewed interest begins to be immediately manifested in the beef cattle business, as the Southern farmers now realize that the "Texas-fever" tick has been practically the only drawback to the cattle business in the past. When the tick is finally exterminated no section of the United States will be as well suited to beef production as the South, because of its mild climate, long grazing season, and cheap lands.

At the present time the South produces but a small proportion of the meat that her people consume. In Alabama there are but 544,000 head of cattle other than milk animals; or, in other words, there are about 1.2 head of cattle in the State to each family. If no outside meats were

shipped into the State, the people would consume all of this beef in less than a year's time. There is a wide field open to the Southern farmer who wishes to produce beef.

There are many reasons why the Southern States should raise more beef cattle than are being raised at the present time. First, the South, under the present system of farming, has thousands of acres—and good ones, too—which are not being used at all. Statistics tell us that only about 40 per cent of the tillable or arable land of the South is being used. Sixty per cent of the land is lying idle and returns to the owner not a cent in wealth. All of the lands cannot be used as cotton lands, because, first, there are not enough people to work the lands in any such way, and second, many of these pauper acres are not suitable for cultivation. In fact, many acres that are now under cotton cultivation should be turned into permanent pastures and grazed with live stock. No state can become wealthy when only 40 per cent of the land capital is being used. The grocer, or the banker, or the hardware merchant, could not possibly make a profit on his business if he used only 40 per cent of his capital. And the farmer cannot hope to be successful in his operations until he begins to make use of at least a reasonable proportion of his capital. No farming business can be made successful when only \$4,000 out of a possible \$10,000 is being used.

Then again 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 plat 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 a bushel	8.36
Wheat straw, 897 pounds at \$4 a ton	1.79
Clover hay, 686 pounds at \$12 a ton	4.12
<hr/>	
Total value 8 tons of manure	\$26.79
Total value 1 ton of manure	3.35

He further states (Bul. 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 phosphorous. 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, or 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 (Bul. 68) made a test to determine 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 being 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.

A third reason why beef should be more generally produced in the South, is that there is a demand for it, and the demand should be met in order that the money may be kept at home. "During the year of 1907 there were about 15,151 home raised animals slaughtered in the city of Birmingham (this includes cattle, veal, hogs, sheep and kids), while there were 36,097 live Western animals brought into the city and slaughtered. In addition to all this, thousands

of pounds of cured meats were also retailed over the city." (Farmers' Bulletin No. ...) This money should be kept at home and added to the Southern wealth. Packing houses are now being built throughout the South, and good markets are assured for the beef animals which the farmer produces.

The fourth reason offered in favor of beef production is, that as our farmers learn the value of diversification in farming operations, there will be an increased amount of roughage, as corn, fodder, cowpea and clover hays, soy beans, etc., which, many times can be marketed more profitably through the beef animals than in any other way. The beef cattle serve as important machines for converting the surplus fodders into valuable barnyard manure, which gives to the growing crops not only the benefits of its fertilizing elements, but increases the mechanical condition of the soil by the addition of that important compound—humus. No animal can take the place of the beef steer in making use of the winter corn and cotton fields.

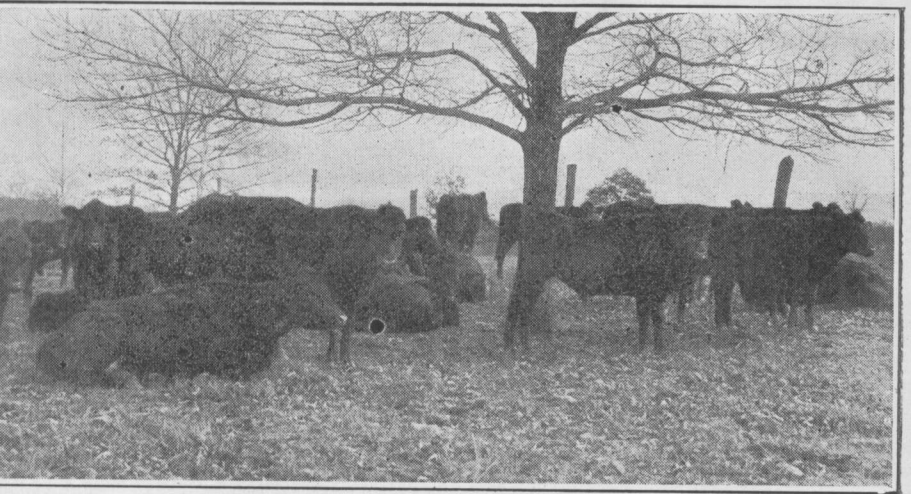
Beef cattle are peculiarly suited to fit into the farming operations of the South. The farms are large, and many acres are not being used because of the lack of sufficient labor. At present there is no better way to put the whole farm to work than by introducing beef cattle into the system of farming. They require but a small amount of labor in addition to that used upon the average cotton farm. The hog, while he deserves a prominent place upon almost every farm, cannot be made to use all of the large uncultivated areas on the farms, for he is not strictly a grazing animal. Many farmers who have the large uncultivated areas are not now sufficiently skilled in the handling of live stock to introduce sheep or dairy cattle, as the sheep and dairy business require more skill than the beef business. Then, too, the dairy business requires an increase in the amount of labor used upon the farm; and the labor item is one that many farmers are trying to reduce.

DETAILS OF THE TEST.

OBJECT OF THE WORK.

The primary object of this work was to learn what it would cost to raise a grade steer to the feed-lot period, under average Southern conditions. After this was determined, it was expected that suggestions could be made and plans offered by which beef animals could, in the future, be produced more cheaply than were the ones in this test.

In order to obtain definite information regarding beef



General view of cattle used in experiment.

production in the South, which would enable them to logically outline work for the future, the Alabama Experiment Station, and the Bureau of Animal Industry of the United States Department of Agriculture, jointly undertook a co-operative experiment with a large stock farmer in the Tennessee valley.

CATTLE USED.

The animals used in the work were a herd of grade Aberdeen-Angus cows, headed by two pure-bred Aberdeen-Angus

bulls. Mr. J. S. Kernachan, of Florence, Alabama, the farmer with whom the work was conducted, began in 1900 the work of grading up some Holstein and scrub cows by the use of pure-bred Aberdeen-Angus bulls. The Holstein cows had been used for dairy purposes. The scrub cows were bought from some of the neighboring farmers. The scrub and Holstein mothers were not included in the experimental work. Their grade offspring were used. The experimental herd, at the beginning of the test in 1906, consisted of the following animals:

Cows (that had dropped calves)	15
Two year old heifers (18 to 30 months) ...	13
Yearling heifers (12 to 18 months)	12
Heifer calves (recently born)	14

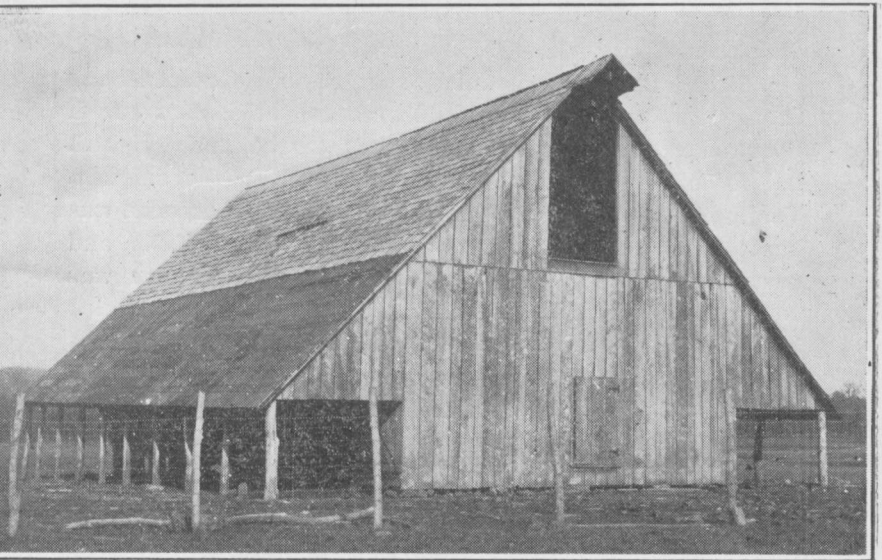
Three of the above cows were five years old; the others were less than five years of age. All of them were grade Angus. Some of the young ones were three-fourths pure, but the majority were but one-half pure. While Mr. Kernachan had some pure-bred Aberdeen-Angus cows upon his farm, they were not included in the test. No pure-bred animals except the bulls were used.

MANAGEMENT OF THE HERD.

During the summer months the herd grazed upon a good pasture; no feed was given in addition to the pasture. This pasture was made up principally of white clover, bermuda and lespedeza. This afforded the animals abundant pasture for about seven months of the year. During the winter months all of the cattle, young and old, had the run of the range. This range, which was inclosed, consisted of the old corn and cotton fields, with some cane along the river and creek banks. In addition to the winter range, hay and cottonseed were fed. (See statement later for the winter feeds). The cattle were not made to go through the winter on range alone, so when spring came they were in reasonably good flesh. It might have been profitable to

have kept all the animals gaining throughout the winter months; as to this the authors cannot say since this test does not cover that point. The young stuff did make gains during each winter, but the cows and older animals usually lost in weight during the latter part of the winter.

The shelter was of such a nature that none of the animals suffered from the cold. During the mild winter weather the canebrake afforded ample protection from the cold. During severe storms or continued wet spells the cattle barn was used.



The barn used to store hay and shelter cattle. Note the open sheds on each side. 50 x 70 feet.

During the first year of the test the bulls were not allowed to run with the cows. The males were kept in a pasture separate from the cows and the cows brought there to be bred. It was learned, however, that many of the cows went through the year without bringing calves, as the other farm work prevented the owner from keeping in close touch with the cows. During the second year's work the bulls were allowed to run with the cows; thereupon the per cent

of calves born during the first quarter of the year increased very materially over what it was when the bulls were kept in a pasture to themselves.

No effort was made to completely eradicate the ticks. When the cattle became badly infested with ticks they were greased on the parts of the body where the ticks were most numerous.

HOW DATA WAS COLLECTED.

The farm was visited at least every three months by a representative from either the Bureau or the Station, and data secured about the births, deaths, weights, feeds used, etc. Each animal was numbered by means of a metal tag in the ear so that individual records could be secured. Soon after a calf was born it was tagged and weighed. All feeds were weighed or measured out to the animals. Vast amounts of manure were produced, but no account was kept of it, as most of it was dropped out in the fields and pastures. During the winter months some manure was collected around the barns and lots; this was all hauled onto the cultivated fields.

PRICE OF FEEDS.

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

Mixed hay	\$ 6.00 a ton
Cottonseed	14.00 a ton
Green sorghum	1.50 a ton
Pasture	2.50 an acre for season

The hay, which consisted of a mixture of sorghum, crab grass, Johnson grass and cowpeas, was not of good quality, so a rather low farm price was placed upon it. Six dollars a ton was all it was worth. The green sorghum was used one fall (1906) for several days to supplement a short pas-

ture which was rendered short on account of an extreme drouth, and an early frost. The sorghum was cut and immediately thrown to the cattle. No price was placed upon the winter range. One hundred sheep, and about thirty horses and mules used the winter range in common with the cattle.

WEIGHTS AND GAINS.

TABLE I. *Average Weights and Gains of Cattle for Two Years*

CLASS	No. of animals	Average final weight	Summer gains		Winter gains		Summer and winter gains	
			Average total gain per head for summer	Average daily gain	Average total gain per head for winter	Average daily gains	Total gain	Daily gain
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1-12 months	44	402	224	1.24	52	.29	276	.77
12-24 "	42	645	219	1.22	-16	-.089	203	.564
24-30 "	30	773	196	1.09	-25	-.14	170	.472
24-33 "	18	832	170	.95	-35	-.19	136	.40
Cows*			116	.65	-104	-.58	12	.034

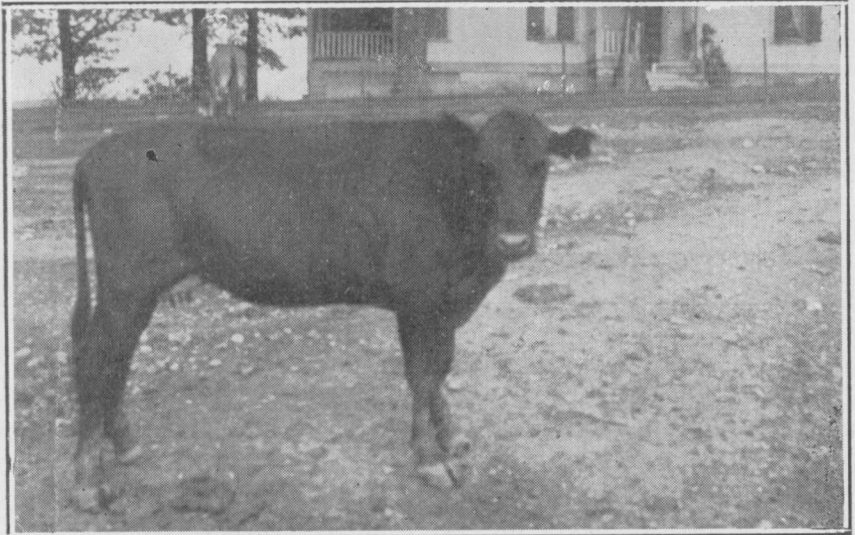
*Number of cows varied from time to time.

From the above table (Table 1) we see that at twelve months of age the calves averaged 402 pounds in weight, while the 24 months old steer averaged 645 pounds, the 30 months old steers averaged 773 pounds, and the animals which were 33 months old weighed 832 pounds. These were light weights, which were due, in part at least, to the fact that the animals had ticks on them during the summer months.

During the summer the gains were heaviest with the calves, each one making a gain of 224 pounds from April 15th to October 15th, or a daily gain of 1.24 pounds. Each yearling made a gain of 219 pounds, or a daily gain of 1.22 pounds during the six months of summer. During the third period (24-30 months) a daily gain of 1.08 pounds was made, while in the fourth period (24-33 months) a daily gain of only .95 pounds per head was made. The cows

gained .65 of a pound per head per day, or a total gain of 116 pounds each during the summer.

During the winter months (October 15th-April 15th) each calf made a total gain of 52 pounds or a daily gain of .29 of a pound. The yearlings lost 16 pounds each in weight for the winter, the animals ranging from 24 to 30 months old lost 25 pounds each, and those which came in the fourth class (24-33 months) lost 35 pounds each for the same period. The cows lost 104 pounds each; this was largely due to the fact that many of them dropped calves during the winter time.



An average cow of the herd. Does not show compactness and sufficient depth of body for an ideal beef cow.

An average of the whole year shows that the calves made a daily gain of .77 pounds or a total gain of 276 pounds per head. The yearlings made a daily gain of .564 pounds per head, or a total of 203 pounds for the 12 months. A gain of 170 pounds per head, or a daily gain of .47 of a pound, was made by the cattle while they were increasing from 24 months to 30 months in age, while 136 pounds or .4 of a pound per head per day, was made by the ani-

mals while they were increasing in age from 24 to 33 months. The cows gained only 12 pounds for the year, showing that they were practically mature when they first dropped calves.

In short, the above table shows that, under the conditions of this experiment the daily gains were smaller as the animals increased in age. This was true in both the summer and winter work.

The gains were not as large as they should have been, due partly to the extremely dry weather from June to July 20, 1906, when the grass in the pastures became perfectly dry, and partly to the fact that one of the pastures used in 1907, was so wet in the early spring, that the grass did not grow satisfactorily during the whole summer. The fact has already been mentioned that the animals were also infested with the Texas tick.

COST OF GAINS.

The cost of gains during the summer was based upon a rental of \$2.50 per acre for all land used for pasture; calves under one year of age were charged one-half price. When the cost of keeping the dam was not charged against the calves, they made 100 pounds at a cost of 63 cents, but when the expense of the dam, as well as the pasture of the calf were charged against the calf, the cost of 100 pounds of gain was raised to \$1.88. The cost of keeping the dam is the expense of keeping 1.39 cows, as only one calf was produced to every 1.39 cows. (See table 4). The yearlings made 100 pounds of gain during the summer at a cost of \$1.28, the two and a half year old steers (24-30 months) at a cost of \$1.43, and the gains of the steers in the fourth class (24-33 months) were made at a cost of \$1.65 per 100 pounds.

TABLE 2. *Average Cost of Summer and Winter Gains.*

CLASS	Summer			Winter			Whole Year		
	Pounds gain	Cost of pasture	Cost of 100 pounds gain	Pounds gain	Cost of feed	Cost of 100 pounds gain	Pounds gain	Cost of pasture and feed	Cost of 100 pounds gain
Calves* 1-12 months	224	\$1 40	\$0.625	52	.....	.....	276	\$1 40	\$ 0 51
Calves** 1-12 months	224	4 20	1 88	52	\$4 90	\$9 42	276	9 10	3 30
Yearlings 12-24 months	219	2 80	1 28	-16	4 90	.....	203	7 70	3 79
2-yr. olds 24-30 months	195	2 80	1 43	-25	4 90	.....	170	7 70	4 53
2-yr. olds 24-33 months	170	2 80	1 65	-35	4 90	.....	136	7 70	5 66
Cows all ages	116	2 80	2 41	-104	4 90	.....	12	7 70	64 18

*Keep of dam not charged. **Keep of dam charged.

Feeds charged as follows: Cottonseed at \$14.00 per ton; green sorghum at \$1.50 per ton; mixed hay at \$6.00 per ton; pasture charged at \$2.50 per acre for season.

In the winter all cattle had access to the corn, cotton and pea-stubble fields of the plantation, and were fed some hay and a small amount of cottonseed to keep them in a reasonable condition of flesh. The average cost of wintering those animals that were more than twelve months of age was \$4.90 per head (See table 3).

When the cost of wintering the dam was charged against the calf, the cost of 100 pounds of gain was \$9.42. As all the other animals lost some in weight during this period, the cost of gain could not be determined.

The last column of Table 2 shows that when the cost of keeping the dam was not charged against the calf, 100 pounds of gain for the whole year cost 51 cents, but when the dam's yearly expense, as well as the pasture of the calf, were charged against the calf, the total cost to make 100 pounds of gain was \$3.30. The cost of keeping an animal

from the time he was 12 months until he was 24 months old was \$7.70; the amount of gain was 203 pounds, thus making 100 pounds of gain cost \$3.79.

The two year old animals (24-30 months) gained 170 pounds at a cost of \$7.70, or at a rate of \$4.53 per 100 pounds for the year. The cost of gain on the long two year old cattle (24-33 months) was \$5.66 per 100 pounds.

The last column of the table points out the fact that, as the animal advanced from the calf period to maturity, the cost of 100 pounds of gain increased, and all other conditions being equal, the younger the animal the cheaper were the gains.

WINTERING CATTLE.

Table 3, shows the total amount of feed consumed, the total cost to winter the whole herd, and the average cost to winter each animal for three consecutive winters.

TABLE 3. *Cost of Wintering Cattle**

YEAR	No. of cattle	Pounds of cotton seed consumed	Cost of cotton seed	Pounds of green sorghum consumed	Cost of sorghum	Pounds of hay consumed	Cost of hay	Total cost	Average cost per head
1905-'6..	45	27000	\$189 00	.....	.....	35600	\$106 80	\$295 80	\$6 57
1906-'7..	65	12000	84 00	22000	\$16 50	39600	118 80	219 30	3 37
1907-'8..	59	3132	21 92	.....	.....	86443	259 32	281 24	4 77
Average	....	14044	98 31	7333	5 50	53881	161 64	265 45	4 90

*Only animals above one year old were counted. The feed that the calves ate was charged against those animals which were more than one year old.

During the winter of 1905-'6 the herd consumed 27,000 pounds of cottonseed and 35,600 pounds of hay. That is, each animal that was more than 12 months old, consumed 600 pounds of cottonseed and 791 pounds of hay for the whole winter. The winter of 1905-'6 was a hard one on the cattle, as it was very wet and rainy. The winter range was not as good as usual, hence the large amount of feed consumed.

With cottonseed charged at \$14.00 a ton, and hay at \$6.00 a ton, each animal that was over twelve months old, con-

sumed \$6.57 worth of feed. The cattle, as a herd, came through the winter in good condition.

The winter of 1906-'7 was very mild and the cattle did not eat as much feed per head as they ate the previous winter.

There were two very heavy frosts on the nights of October 13th and 14th, however, which killed all the lespedeza, so the cattle had to be fed some green sorghum from the middle of October until the fields became available as winter range.

Each animal consumed, during the whole winter, 338 pounds of green sorghum, 185 pounds of cottonseed, and 610 pounds of hay. The cost of wintering each animal above twelve months old was \$3.37.

From October 15th to December 1st, of the winter 1907-'8, the cattle were fed hay and a small amount of cottonseed, as there was no green sorghum to be used. During this time they consumed 11 pounds of hay and 1.2 pounds of cottonseed per head per day. From December 1st to January 1st they were in the fields and canebrake and did not come up for feed. From January 1st to March 20th, 1908, the cattle came up to the barn each evening and were fed hay, but no grain.

For the whole winter each animal consumed 53 pounds of cottonseed and 1,465 pounds of hay. The cost of wintering the cattle was \$4.77 per head.

The average for the three winters shows that it cost \$4.90 to winter each animal over twelve months of age.

AREA OF PASTURE REQUIRED PER ANIMAL.

A number of cattle, not in the experiment, were grazed in the pasture with the experimental cattle. Assuming that two calves would eat as much grass as an animal over twelve months old (and this assumption is followed out in rental charges), there would be the equivalent of 92 animals on 103 acres of land during the summer of 1906, or an average of 1.12 acres of pasture to each animal.

During the year of 1907 there were 90 animals on the 103 acres, giving an average of 1.14 acres to each animal.

An average for the two years shows that 1.13 acres of land furnished pasture for one animal. This area, when charged at \$2.50 per acre, gives a cost of \$2.80 per season for the pasture of each animal over twelve months old.

This pasture was far better than the average Alabama pasture, as is shown by the fact that 1.13 acres supplied sufficient pasture for one animal. On an average, from 3 1-2 to 5 1-2 acres are required for each animal. When this piece of land was first put down to pasture it would not to keep as many animals as it does now; in fact, it was no better than the average pasture but by grazing, it has been raised to its present state of fertility.

BREEDING RECORD.

TABLE 4. *The Per Cent of Calves Born.*

YEAR	No. of cows	No. of calves dropped	Per cent. of calves dropped	Record by quarters; number of calves dropped			
				Jan. 15 to April 15	April 15 to July 15	July 15 to Oct. 15	Oct. 15 to Jan. 15
1906..	24	17	70.8	5	4	5	3
1907.....	25	18	72	9	1	5	3
1908.....	25	14	56	14	..*	..	..

*The experiment closed on April 15th, so no record was obtained later than this date.

An animal that had dropped a calf was classified as a cow; the heifers were put in this class as soon as they calved. The number of calves born was very small, when compared to the number of cows that should have brought calves, especially during the year 1906. This low number was partly due, no doubt, to the fact that the bulls were kept away from the cows and the owner, owing to the pressure of other business, not being able to breed the cows when they should have been bred. The owner soon realized

the fact that too many of the cows went through the year without bringing calves, so in the spring of 1907 he turned the bulls with the cows and permitted them to run together the year round.

A complete record of the number of calves dropped was not secured for the year 1908—the year after the bulls were turned with the cows—as the test closed in April; but during the first quarter of the year 1908, fourteen calves were born, while during the same quarter of the years 1906 and 1907 only 5 and 9 calves, respectively, were born. No record was kept of the number of calves dropped after April, 1908, but when the last notes and weights were made it was seen that practically all of the cows were pregnant. Of course, it is a disputed point whether it is better to allow the bull to be with the cows or to keep him away from them all of the time. The farmer who has large pastures and has other business to look after, in addition to the cattle, cannot possibly obtain a high per cent of calves unless the bull is permitted to be with the cows. The busy farmer will not see the cows at the right time.

The breeder of registered animals should not allow the bull to run with the cows, for it is desirable that a record of the date of service be kept.

It is important that as many of the cows as possible produce calves each year; the idle cow is not only idle capital but she is a constant consumer of farm products. The idle cow has a very important part to play in the total expense of raising a calf, as the expense of keeping her must be charged against the calves which other cows produce (See financial statement, table 5-A). When there were 25 cows the owner had \$750 invested in cattle (estimating each cow to be worth \$30); of this amount only \$540 was returning a profit when 72 per cent of the cows brought calves. In this case there were \$210 invested in idle capital; this amount represents the equivalent of seven cows, and those seven cows consumed \$51.80 worth of feed in a year.

FINANCIAL STATEMENTS.

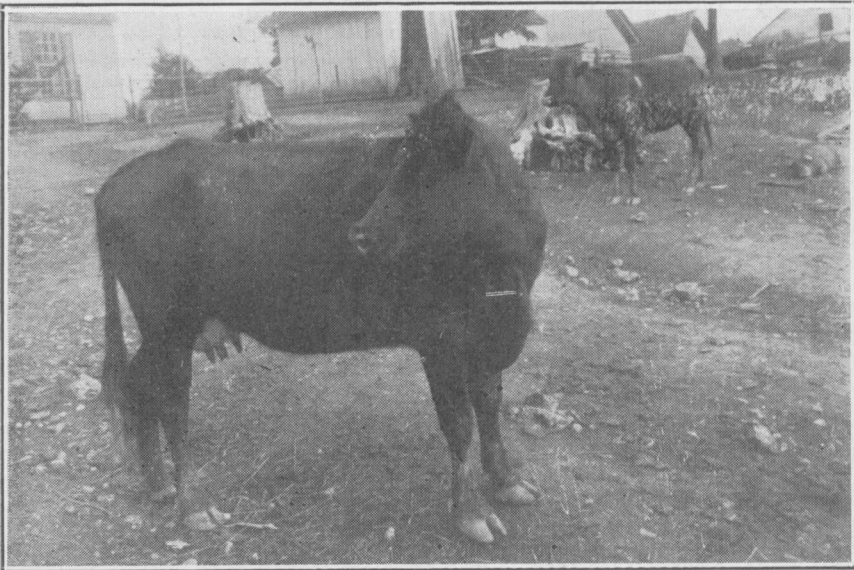
FEED EXPENSE TO RAISE A BEEF ANIMAL TO VARIOUS AGES.

As a rule the farmer charges nothing against the cost of raising a calf but the feeds consumed. Looking at it from this standpoint the cost of raising a calf in this experiment, to various ages was as follows:

A. To 12 months:	
To winter feed of 1.39 cows the first winter	\$ 6.81
To summer pasture of 1.39 cows	3.89
To summer pasture of 1 calf	1.40
	\$12.10
Total cost	\$12.10
Cost per hundred weight	3.01
B. To 24 months:	
To cost of 12 months old calf	\$12.10
To winter feed of animal (12-24 months)*	4.90
To summer pasture (12-24 months)	2.80
	\$19.80
Total cost	\$19.80
Cost per hundred weight	3.07
C. To 30 months:	
To cost of 24 months old steer	\$19.80
To winter feed of animal (24-30 months)*	4.90
	\$24.70
Total cost	\$24.70
Cost per hundred weight	3.20
D. To 33 months:	
To cost of 30 months old steer	\$24.70
To summer pasture for one-half summer	1.40
	\$26.10
Total cost	\$26.10
Cost per hundred weight	3.14

*Here again it is assumed that all animals over twelve months of age ate the same amount of feed, which assumption is, of course, not absolutely accurate. In rental practice, though, this assumption is carried out.

It should be remembered that the different classes of animals were not kept separate and fed in different lots; they all ran together, so the above statement is only a close approximation of the cost of raising the animals to the various ages. In the above statement it has been assumed that all animals which were over twelve months of age ate the same amount of feed and pasture; it was further assumed that the animal under twelve months of age used only one-half as much pasture as the animal which was over one year old. The last assumption is in keeping



A good cow of the herd. She dropped a calf every year.

with actual farm charges for pasture. It should be remembered that the cost to winter an animal was secured by dividing the total number of animals over one year old into the total cost of feed consumed during the winter months.

When placing the value upon the feeds, as shown on page 2, it cost \$12.10 to raise a twelve months old calf, \$19.80 if he was kept until he was twenty-four months of age, \$24.70 to raise him to two and one-half years old, and

\$26.10 to keep him until he was thirty-three months old. Or, it cost about three cents a pound to grow the animal to various ages, when nothing but the feed and pasture was charged against him.

This feed bill could be materially reduced by extending the pasture grazing season. The pasture season could be extended three months, almost anywhere in the South, by the use of "spotted" burr clover (*Medicago maculata*). Burr clover is a winter growing crop and occupies the ground in common with bermuda, which makes its growth during the summer months.

FEED EXPENSE, INTEREST, INSURANCE, ETC., TO PRODUCE A BEEF CALF.

In estimating the cost of producing a beef animal, it is usual to charge nothing against the animal but the winter feed and the pasture used. But there are other items that should be charged against this animal, as interest on the money invested in the cattle, mortality, depreciation in value of the cows, etc. He should be credited with the manure produced. The following estimates charge the calf not only with the feeds used, but the other items mentioned above, and gives him credit for the approximate amount of manure produced:

A. To 12 months old:	
To winter feed of 1.39 cows	\$ 6.81
To summer pasture of 1.39 cows	3.89
To summer pasture of calf	1.40
To 7 per cent interest on 1.39 cows at \$30 per head..	2.92
To 7 per cent interest on 1-25 of a bull worth \$150..	.42
To annual depreciation in value of 1.39 cows at \$1.50..	2.09
To pro rata depreciation of herd bull .....	.80
To taxes, insurance, fencing and repairs .....	.86
To 4 per cent mortality	1.20
	\$20.39

	*By 3,600 pounds of calf manure at \$1.25 a ton ..	\$ 2.25
	By 10,800 pounds of mother's manure at \$1.25 a ton	<u>6.75</u>
	Total expense of calf	\$11.39
	Cost per hundred weight	2.85
B.	To 24 months old:	
	To cost at 12 months of age (manure not included)	\$20.39
	To winter feed	4.90
	To summer pasture	2.80
	To 7 per cent interest on yearling	1.45
	To taxes, insurance, repairs, etc. ....	.86
	To 4 per cent mortality .....	.83
		<u>\$31.23</u>
	By 23,400 pounds of manure for 24 mos. at \$1.25 a ton,	<u>14.63</u>
	Total expense of steer	\$16.60
	Cost per hundred weight	2.57
C.	To 30 months old:	
	To cost at 24 months of age (manure not included)	\$31.23
	To winter feed	4.90
	To 7 per cent interest on 2 year old animal for 6 mos.	1.10
	To taxes, insurance, repairs, etc., for 6 months ....	.43
	To 4 per cent mortality of 2 yr. old animals for 6 mos.	.63
		<u>\$38.29</u>
	By 28,800 pounds of manure for 30 mos. at \$1.25 a ton,	<u>18.00</u>
	Total expense of steer	\$20.29
	Cost per hundred weight	2.62
D.	To 33 months old:	
	To cost at 24 months old (manure not included)	\$31.23
	To winter feed	4.90
	To 3 months pasture	1.40
	To 7 per cent interest on 2 yr. old animal for 9 mos.	1.65
	To taxes, insurance, repairs, etc., for 9 months ....	.64
	To 4 per cent mortality for 9 months .....	.94
		<u>\$40.76</u>
	By 31,500 pounds of manure for 33 mos. at \$1.25 a ton,	<u>19.69</u>
	Total cost per steer	\$21.07
	Cost per hundred weight	2.53

*In estimating the amount of manure produced it was assumed that the animal under one year of age produced 20 pounds per day for 180 days; that the yearling produced 25 pounds per day for a year; and that the two year old steer and the cow each produced 30 pounds per day. The price of manure, \$1.25 a ton, is an assumed one, as there was no way to determine its exact value. But, judging from the many tests that have been made at Stations, the above value is a very conservative one. For instance, as quoted in the introduction, the Ohio experiments show raw manure to be worth \$3.35 a ton when placed under the crops mentioned; when the manure was treated with a phosphorous carrier, its value was raised to \$4.88 a ton. There was a difference, though, between the Ohio manure and the manure secured in the above tests; the Ohio manure was collected in the winter time when grains and hays were fed. It was a richer manure than that made during the summer months in this test, but probably no richer than the Alabama manures made during the winter months.

It is seen that when a calf is charged with everything that could be charged against him, and then credited with the manure produced, the cost of making 100 pounds of gain was somewhat smaller than the figures obtained when nothing but the feed and pasture were taken into consideration.

The labor employed to feed and look after the animals was not included in the above estimates, as it was a very small item. One winter the labor to feed and care for the cattle was \$10.00 for the whole herd. Another winter the total labor item was only \$7.50. The method used in the feeding and handling involved the use of but little labor; there was no feeding to be done but once a day, when the cottonseed and the hay were measured out to the cattle in a very few minutes.

When all of the expenses were charged against the animals and no credit was made for the manure, the expense of producing a steer varied from \$4.84 to \$5.07 per hundred pounds. The cost per hundred weight of raising a steer, when the manure produced received no credit, was as follows:

To 12 months of age	\$5.07 per hundred weight
To 24 months of age	4.84 per hundred weight
To 30 months of age	4.95 per hundred weight
To 33 months of age	4.90 per hundred weight

These figures mean that if the above animals were sold for the above prices (The above prices can be realized for good cattle, as is shown by the fact that 60 steers, of about the same quality as those in this test, were fed by the Alabama Experiment Station and the Bureau of Animal Industry and sold February 28th, 1910, on the Louisville market for \$5.75 per hundred weight) the feeds used were marketed at a good farm price; all deaths were deducted; seven per cent interest was received on the money invested in the animals; \$2.50 an acre were secured for the summer pasture; and finally the manure was secured free.

Of course, in order that all these profits be realized, good cattle must be raised; it cannot be done with scrubs; the

scrub will not sell to advantage when he is offered to the butcher or packer, as his meat is of a poor quality and he dresses out a low per cent of salable meat.

The cattle upon this farm were not produced as cheaply as it is possible to raise them in the South. At least two farm practices can be introduced upon the average farm which will make it possible for steers to be raised much cheaper than were these animals. In this test no winter pastures were used, except the winter range. Through the use of a combination of burr clover and bermuda the pasture season can be extended at least two months in the year. The farmer who lives as far south as Greenville, Alabama, can have a grazing pasture the year through by the use of bermuda, burr clover and velvet beans. In the second place, the cattle were infested with the Texas tick, which reduced their average size no small amount. It is impossible to state just how much the tick retards the growth of a steer, but there were several severe cases of tick fever reported. Some of these cases died, and some of them lived, but when they did live they never attained anything near their normal size. Through the efforts of both the Southern States and the Federal Government the tick is now being exterminated; when the tick is eliminated, the farmer can expect to raise larger cattle than formerly, and, too, the death rate will be materially decreased.