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H. K. Gayle

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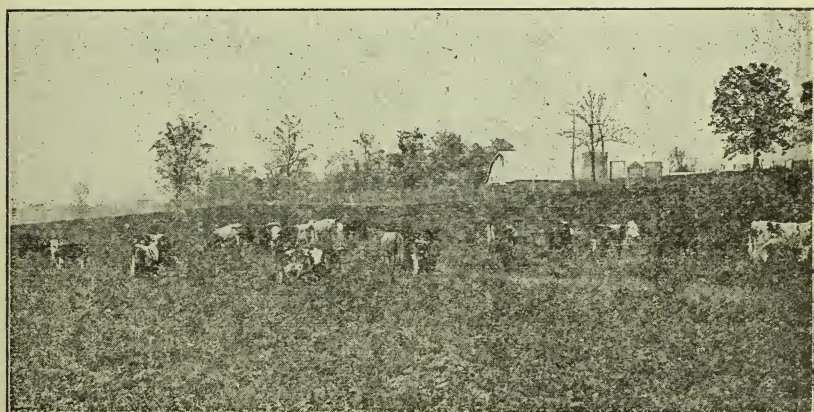
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Baby Beef and Calf Feeding

By H. K. GAYLE



ON WINTER PASTURE

Crimson clover furnishes an ideal late winter pasture for growing calves.

Mississippi Agricultural Experiment Station
Agricultural College, Mississippi

There is at present a world shortage of meat animals, and the producers of beef cattle are thereby enjoying unprecedented prosperity.

The only section of the United States that can practically and profitably increase to any considerable extent its production of beef cattle is the South East. In this section the mild climate, cheap lands and good grass offers rare opportunities to those engaged in beef cattle production.

The practice of fat calf and baby beef production affords a method of placing good beef on the market in a short time, and is profitable under a system of intensive farming when high grade cattle are used.

E. R. LLOYD, Director.

Baby Beef and Calf Feeding

By H. K. GAYLE

This bulletin describes two experiments conducted by the Mississippi Experiment Station at the Agricultural and Mechanical College, and two experiments conducted by the Division of Animal Husbandry, Bureau of Animal Industry of the United States Department of Agriculture, co-operating with the Mississippi Experiment Station. The co-operative experiments, by the Bureau, were conducted on the farm of Mr. Ben Walker, near West Point, Mississippi, on land typical of the black prairie section of Mississippi. All experiments are concerned with the fattening of calves for market under Mississippi conditions.

CONCLUSIONS

The practice of feeding out calves to be sold as fat calves or as baby beef has been increasing in the past few years. Calves not only make more economical use of their feed than the mature steers, but when sent to market in prime condition usually return, after an investment of but two years standing, a profit practically equal to that which is returned by steers after an investment of from three to five years, when the animals are raised by the feeder. Furthermore, the consumer is now demanding a comparatively small cut of meat of high quality.

When the surplus cattle are marketed as calves every year, it is possible to maintain a larger breeding herd on the same acreage than when the increase is grown out to mature steers. It is also possible to market heifers to the same advantage as steers, if they are sold as fat calves or baby beef.

The production of baby beefs or fat calves is best suited to a system of intensive farming. The proportion of concentrate to roughage required is greater in fattening calves for the market than in growing them into mature steers. The growing calf, admirably adapted to the utilization of roughage, can be carried through the first and second winters on cheap hays, silage, and stovers, with a very little high priced concentrate feed being fed. The fattening calf must, however, have an abundance of concentrated feeds, otherwise it will grow rather than fatten.

The farm that is made up largely of broken and semi-waste pasture lands is probably better adapted to the production of stocker and feeder cattle, with the minimum number being finished in the feed lot, than to the production of prime baby beef or fat calves.

For the production of calves that will give a good account of themselves in the feed lot, a herd of cows carrying several crosses of good beef blood is necessary. They must be mated to a heavily fleshed, blocky, beef bull of early maturing propensities. The rangy bull, rough in conformation, cannot be expected to sire a calf that will take on fat and finish smoothly as a yearling.

Prime baby beef can be produced profitably under Mississippi conditions. Late summer and fall calves can be carried through the winter at teat, pastured the following summer and fed the next winter at a tidy profit. Even those calves which are of fair to good quality, although unsuited for the production of prime beef, can be fattened at a good profit.

Summary

PART 1

Experiments by Mississippi Experiment Station.

EXPERIMENT 1—PRIME BABY BEEF, 1915-16

1. The objects of this experiment were: first, to determine if strictly prime baby beef could be produced profitably under Mississippi conditions; and second, to make a comparison of concentrate rations containing different proportions of chopped corn, corn and cob meal, oats, and cottonseed meal, for finishing calves in the dry lot, when fed with corn silage and Johnson grass hay and roughage.

2. The calves used were good grades, sired by registered beef bulls and out of good grade shorthorn cows. They were about 7 months old when first put on feed and 8½ months old when weaned and put on full feed. When sold they averaged fourteen months. When first started on feed the calves averaged 437.43 pounds in weight and were worth \$6 a hundred weight.

3. The average daily ration per calf while weaning was:

Bran	1	pound
Corn and Cob Meal	1.62	pound
Oats	1.62	pound
Cottonseed Meal .....	.13	pound

In addition they were given pasture and were allowed to suck their dams. During the 41-day weaning period the calves made an average daily gain of 1.5 pound per calf at a cost of \$6.22 per 100 pounds of gain.

4. The average daily ration per calf while on full feed was:

Lot I—

Corn Chops	3.14	lbs.
Oats	3.14	lbs.
Cottonseed Meal	1.57	lbs.
Corn Silage	18.	lbs.
Johnson grass hay.....	2.56	lbs.

Lot II—

Corn chops	3.59	lbs.
Cottonseed meal	3.59	lbs.
Corn silage	22.7	lbs.
Johnson grass hay.....	2.5	lbs.

Lot III—

Corn and Cob meal	1.89	lbs.
Cottonseed meal	3.79	lbs.
Corn silage	24.2	lbs.
Johnson grass hay.....	2.5	lbs.

Lot IV—

Corn and Cob meal.....	1.75	lbs.
Oats	1.75	lbs.
Cottonseed meal	3.51	lbs.
Corn silage	18.65	lbs.
Johnson grass hay	2.5	lbs.

Lot V—

Cottonseed meal	4.07	lbs.
Corn silage	22.1	lbs.
Johnson grass hay	2.54	lbs.

5. During the test period of 167 days the calves made a daily gain of 1.33, 1.41, 1.27, 1.4, and 1.32 pounds per calf for Lots I, II, III, IV, and V respectively.

6. The cost of making 100 pounds of gain was \$12.14, \$10.93, \$10.04, \$10.29, and \$8.08 for each of the five lots during the test

period. The profit per calf was \$.35, \$7.16, \$12.08, \$3.95, and \$8.64 for Lots I, II, III, IV, and V respectively.

7. The calves dressed out 58.30, 58.01, 57.49, 57.21, and 56.70 per cent. of their market weights, indicating that the rations containing the larger proportion of corn produced fatter carcasses than those containing chiefly cottonseed meal.

EXPERIMENT 2—FATTENING LATE CALVES, 1914-15

1. The objects of this experiment were, first, to determine if late summer and early fall calves and calves of such breeding as would make them unfit for the production of prime baby beef could be fattened profitably as yearlings; second, to make a comparison of cottonseed meal and cold pressed cake as a concentrate for fattening calves; and third, to make a comparison of corn silage and cottonseed hulls as a roughage for fattening calves.

2. The calves used were a fairly well bred lot of mixed Angus, Hereford, and Shorthorn, steer and heifer calves, averaging 505.56 pounds when put on feed at from 10 to 14 months of age, and valued at \$6 a hundredweight.

3. The calves were fed from December 1, 1914, to April 16, 1915, a period of 137 days. They were divided into five lots and received per calf the following average daily rations:

Lot I—	Lot II—
Cottonseed meal 2.71 lbs.	Cold pressed cake..... 4.05 lbs.
Corn and cob meal 4. lbs.	Corn and cob meal 4. lbs.
Corn silage .....22.55 lbs.	Corn silage .....22.55 lbs.
Lot III—	Lot IV—
Cottonseed meal 2.97 lbs.	Cold pressed cake 4.45 lbs.
Corn and cob meal..... 4. lbs.	Corn and cob meal..... 4. lbs.
Corn silage .....17.6 lbs.	Corn silage .....17.6 lbs.
Johnson grass hay 5. lbs.	Johnson grass hay 5. lbs.
Lot V—	
Cottonseed meal 2.7 lbs.	
Corn and cob meal..... 4. lbs.	
Cottonseed hulls .....13.76 lbs.	

4. During the test period of 137 days the calves made an average daily gain of 1.39, 1.58, 1.55, 1.67, and 1.32 pounds per calf for Lots I, II, III, IV, and V respectively.

5. Comparison between Lots I and II showed 1 pound of cottonseed meal to have the same feeding value as 1.29 pounds of cold pressed cake. Comparison between Lots III and IV showed 1 pound of cottonseed meal to have the same feeding value as 1.45 pounds of cold pressed cake. Comparison between Lots I and V showed 1 pound of cottonseed hulls to be equal in feeding value to 1.56 pounds of corn silage.

6. The cost of producing 100 pounds of gain was \$7.68, \$7.13, \$8.23, \$8.29, and \$8.63 for each of the five lots respectively.

7. The profit per calf from each respective lot was \$7.82, \$9.18, \$6.84, \$6.67, and \$6.00, showing that fair to good yearlings can be fed profitably although strictly prime beef is not produced.

PART II
EXPERIMENTS BY THE BUREAU OF ANIMAL
INDUSTRY

The work recorded in the following section was done by the Division of Animal Husbandry of the Bureau of Animal Industry, U. S. Department of Agriculture, co-operating with the Mississippi Experiment Station; the experiments were made on the farm of Mr. Ben Walker near West Point, Mississippi.

EXPERIMENT 1—FATTENING CALVES, 1914-15

1. The object of this test was to get further information concerning the use of cottonseed meal and mixtures of cottonseed meal and corn for finishing calves for the market.

2. The average initial weights of the calves used in the tests were: Lot I, 437; Lot II, 427; and Lot III, 436 pounds. The final weights were: Lot I, 682; Lot II, 695; and Lot III, 663 pounds. The average daily gains per calf were: Lot I, 1.71 pounds; Lot II, 1.87 pounds; and Lot III, 1.59 pounds.

3. All lots received corn silage, alfalfa hay, and cottonseed hulls as roughage. Lot I consumed 214 pounds of cottonseed meal for each 100 pounds of gain; Lot II consumed 172 pounds of cottonseed meal and 86 pounds of corn and cob meal per 100 pounds of gain; Lot III consumed 112 pounds of cottonseed meal and 225 pounds of corn and cob meal for each 100 pounds of gain.

4. The costs per 100 pounds of gain were as follows: Lot I, \$6.34; Lot II, \$6.34; and Lot III, \$7.40. The calves of all lots made gains very cheaply.

5. The amount of roughage required to make 100 pounds of gain was greatest with Lot I and smallest with Lot II.

6. The average profit per head for each of the lots was as follows: Lot I, \$5.67; Lot II, \$2.98; and Lot III, \$3.56.

7. The shrinkage of Lots I, II, and III was 36, 57, and 29 pounds per calf respectively. The heavy shrinkage of Lot II cannot be explained.

8. By market weights the calves dressed out as follows: Lot I, 54.85 per cent; Lot II, 54.05 per cent; Lot III, 53.87 per cent.

9. Since no pigs followed the calves of Lots II and III, it did not pay so well to feed a mixture of cottonseed meal and corn and cob meal, as to feed cottonseed meal as the sole concentrate.

*EXPERIMENT 2—HEAVY GRAIN RATION FOR
FATTENING CALVES, 1915-16*

1. The objects of this test were, first, to see if the feeding of heavy grain rations to calves until they were well finished would be profitable; second, to make a comparative study of the value of cottonseed meal alone, a combination of cottonseed meal and shelled corn, and shelled corn alone, to be fed with a ration of silage with a

small allowance of alfalfa hay; and, third, to determine approximately how much manure can be saved by feeding calves on a concrete floor.

2. The calves were good grades, having from two to three crosses of beef blood on original scrub stock. They were from 6 to 8 months of age and weighed 271, 265, and 280 pounds per calf for Lots I, II, and III respectively at weaning time, when the experiment began.

3. When on full feed the calves were eating the following ration per head per day:

Lot I—

Cottonseed meal	5. lbs.
Corn silage	26.7 lbs.
Alfalfa hay	4.0 lbs.

Lot II—

Cottonseed meal	2.0 lbs.
Shelled corn	8.0 lbs.
Corn silage	18.6 lbs.
Alfalfa hay	4.0 lbs.

Lot III—

Shelled corn	12.0 lbs.
Corn silage	13.3 lbs.
Alfalfa hay	4.0 lbs.

The calves that consumed a heavy grain ration consumed a smaller silage ration and those that ate a heavy silage ration ate a small grain ration.

4. The calves were fed for 156 days. They made a daily gain of 1.74, 1.7, and 1.8 pounds per calf for Lots I, II, and III respectively. This is a good gain for calves for a long feeding period.

5. The cost of making 100 pounds of gain for each of the three lots was \$8.17, \$8.58, and \$8.66 respectively.

6. When no pork credit is allowed the calves of Lots II and III, the average profit per head was: Lot I, \$10.48; Lot II, \$8.57; and Lot III, \$8.68. It is estimated that the pork produced was worth about \$3.00 per calf, which would make the feeding of corn slightly more profitable than feeding cottonseed meal alone.

7. The calves of Lots I, II, and III produced 29.2, 26.2, and 21.3 pounds of manure per head per day. No bedding was used and the manure was scraped up and weighed daily. Some of the liquid was lost.

8. In shipping, the calves of Lots I, II, and III shrank 48, 29, and 36 pounds respectively, or 6.8 per cent, 4.2 per cent, and 5.0 per cent of their live weight.

9. The calves dressed out 54.4, 56 and 55.9 per cent. of marketable meat. These percentages indicate that there was practically no difference in the fatness of the calves of Lots II and III, but both lots were much fatter than the calves of Lot I.

Detailed Description of Experiments

PART I

OBJECTS OF THE EXPERIMENTS

The objects of the experiments recorded are:

- 1 To determine if strictly prime baby beef could be produced profitably under Mississippi conditions.
- 2 To determine if the class of calves unfit for the production of prime baby beef could be fattened profitably and marketed as yearlings.
- 3 To get information on the most economical available feeds for finishing calves.
- 4 To find out to what particular system of farming in the South fat calf and baby beef production economically belongs.

Experiments by the Mississippi Experiment Station

EXPERIMENT 1—PRIME BABY BEEF, Winter 1915-16

Cottonseed Meal, Corn and Cob Meal, Corn Chops, Oats, Corn Silage, and Johnson Grass Hay for the feeding of prime baby beef.

CALVES USED

The calves used in this experiment were grade Angus, Hereford, and Shorthorn. They were out of good grade Shorthorn cows representing three to four crosses of beef blood on native stock and were all sired by registered bulls. In quality these calves were unusually good and would have sold as choice stockers.

FEED LOTS AND WATER SUPPLY

All calves were fed in a shed open on the East and South. They did not have the run of open lots but were confined to pens allowing about 60 square feet of floor space to each calf. The pens were kept well bedded at all times. Water was supplied from a deep well, to each pen. Feeding was done at 6:30 o'clock in the morning and at 3:30 o'clock in the afternoon.

CHARACTER AND PRICE OF THE FEEDS

The feeds used were all raised on the Station farm, except the small amount of bran used while weaning the calves, and the cottonseed meal, both of which were bought on the open market.

The cottonseed meal, which was of good quality, tested 7½ per cent nitrogen. The corn, also of good quality, shelled out 85 per cent. The oats were clean and sound. The silage made from

Goliad corn which cut at the rate of about 10 tons green silage an acre, was of good quality and free from mold. The Johnson grass hay was hardly average, as it was a little coarse and stemmy.

The feeds used were valued as follows:

Cottonseed meal	\$30.00 a ton
Bran	28.00 a ton
Corn and cob meal.....	.80 a bu.
Corn chops .....	.80 a bu.
Oats .....	.55 a bu.
Corn silage	3.00 a ton
Johnson grass hay	10.00 a ton

AVERAGE DAILY RATION

One of the first essentials to the successful finishing of calves in the feed lot is that the calf must never be allowed to lose its calf fat. The weaning, therefore, must be done gradually, so that the calf may receive no set back. Once a calf loses its bloom or calf fat it is practically impossible to finish it as prime beef before it is two years old, as the tendency is then to grow rather than to fatten.

To avoid this the calves of all lots in this experiment were brought up from pasture with their dams on October 10, when pastures were getting short and dry. Between October 10 and November 16 they were given a preliminary feeding period. During the first part of the preliminary period they were allowed to suck their dams twice daily; during the latter part of the period only once a day. On November 1 they were divided into their test lots: then for the next two weeks they were allowed to suck their dams only once every other day: and after that they were gradually put exclusively on the rations used for the respective tests. The calves were not started on full feed until November 16.

During the first part of the preliminary feeding period all calves were given all they would clean up of grain mixture of equal parts corn and cob meal, bran, and oats. A little cottonseed meal was added later on. They were run with their dams on pasture and given no additional roughage.

Table I shows the average daily ration per calf during the preliminary period of 41 days.

TABLE I
AVERAGE DAILY RATION—PRELIMINARY PERIOD
OCTOBER 10 TO NOVEMBER 16—41 DAYS

FEED	Lot I 5 calves	Lot II 5 calves	Lot III 5 calves	Lot IV 5 calves	Lot V 5 calves
Pasture and milk					
Bran	1.	1.	1.	1.	1.
Corn and cob meal.....	1.62	1.62	1.64	1.64	1.62
Oats	1.66	1.62	1.62	1.64	1.62
Cottonseed meal .....	.11	.13	.13	.13	.13
Corn Chops .....	.04	.04			

WEIGHTS AND GAINS, PRELIMINARY PERIOD

As stated previously, the object of feeding the calves for the 41 days before starting the test was, to get the calves accustomed to eating grain and to keep them gaining during the weaning process. For this reason they were given rather the most palatable ration than the cheapest.

Table II shows the average initial weight per calf in each lot at the time they were first put on feed, the average weight per calf in each lot at the conclusion of the preliminary period, and the gains made during the weaning process.

TABLE II
WEIGHTS AND GAINS—PRELIMINARY PERIOD
OCTOBER 10 TO NOVEMBER 16—41 DAYS

LOT	Average initial weight per calf	Average final weight per calf	Average total gain per calf	Average daily gain per calf
I	391.23 lbs.	449 66 lbs.	58.43 lbs.	1.42 lbs.
II	458.06 lbs.	521.83 lbs.	62.77 lbs.	1.5 lbs.
III	503.14 lbs.	565.33 lbs.	62.19 lbs.	1.51 lbs.
IV	404.52 lbs.	464.2 lbs.	59.68 lbs.	1.46 lbs.
V	430.2 lbs.	500 3 lbs.	70.1 lbs.	1.71 lbs.

As the table shows, the calves kept gaining at a good rate while being weaned. When weaned, they were in condition to go on to their test rations uniformly. The gains made during the preliminary period were fairly uniform for all lots, as would be expected, as they were all under the same conditions and on the same rations until the latter part of the period. Lot V made a slightly larger gain than either of the other lots. The reason for the difference is not known.

QUANTITY AND COST OF FEEDS REQUIRED TO MAKE
100 POUNDS OF GAIN. PRELIMINARY PERIOD

Table III shows the quantity and cost of feeds required to make 100 pounds of gain during the 41 day weaning period. Aside from the grain rations consumed the calves and their dams were charged for pasturage at the rate of 50 cents a head per month, the pasture for the cow being charged against the calf in payment of the milk consumed.

TABLE III
QUANTITY AND COST OF FEED REQUIRED TO MAKE 100 POUNDS OF
GAIN—PRELIMINARY PERIOD
OCTOBER 10 TO NOVEMBER 16—41 DAYS

FEED	Lot I.	Lot II	Lot III	Lot IV	Lot V
Bran	68.22 lbs.	64.96 lbs.	64.58 lbs.	67.12 lbs.	57.18 lbs.
Corn and cob meal	110.73 lbs.	104.89 lbs.	105.68 lbs.	110 07 lbs.	92 35 lbs.
Corn chops	2 73 lbs.	2 59 lbs.			
Oats	113.54 lbs.	104.97 lbs.	104 24 lbs.	110.14 lbs.	92.41 lbs.
Cottonseed meal.	7.43 lbs.	8 34 lbs.	8.7 lbs.	9.29 lbs.	7.91 lbs.
Cost of pas- ture	\$2.54	\$2.10	\$2.19	\$2.28	\$1.97
Total cost per 100 lbs. gain..	\$6.64	\$6.25	\$6.22	\$6.48	\$5.49

The foregoing table shows that surprisingly cheap gains were made by all calves, much cheaper, in fact, than would be expected of calves in the feedlot for a long period. The gains were also cheaper than could be expected of calves weaned without pasture, and milk from their dams.

AVERAGE DAILY RATION. EXPERIMENTAL PERIOD

During the experimental period of 167 days no sub-periods were used. It was thought best to make increases in the rations fed whenever the appetites of the calves would permit, rather than to use arbitrary periods. In this way it was possible to keep the calves on the maximum ration at all times.

The grain and the silage were fed separately. The calves were given all the grain they could clean up within one hour after feeding and all the silage they could clean up within three hours after feeding.

Table IV shows the average daily ration per calf when started on the experimental period, November 16: the average daily ration being consumed per calf at the end of the period, April 30, and the average daily ration per calf for the entire period:

TABLE IV
AVERAGE DAILY RATION
NOVEMBER 16 TO APRIL 30—167 DAYS

Lot	FEED	At Beginning of Test	At End of Test	Av. for Test period, 167 days
I	Corn chops.....2 parts	1.6 lbs.	4.8 lbs.	3.14 lbs.
	Oats .....2 parts	1.6 lbs.	4.8 lbs.	3.14 lbs.
	Cottonseed meal.....1 part	.8 lbs.	2.4 lbs.	1.57 lbs.
	Corn Silage	10. lbs.	18. lbs.	18. lbs.
	Johnson Grass Hay.....	5. lbs.	2. lbs.	2.56 lbs.
II	Corn chops .....1 part	1.7 lbs.	5. lbs.	3.59 lbs.
	Cottonseed meal.....1 part	1.7 lbs.	5. lbs.	3.59 lbs.
	Corn Silage	10. lbs.	20. lbs.	22.7 lbs.
	Johnson Grass Hay.....	5. lbs.	2. lbs.	2.5 lbs.
III	Corn and cob meal.....1 part	.93 lbs.	2.5 lbs.	1.89 lbs.
	Cottonseed meal .....2 parts	1.87 lbs.	5. lbs.	3.79 lbs.
	Corn Silage	10. lbs.	24. lbs.	24.2 lbs.
	Johnson Grass Hay.....	5. lbs.	2. lbs.	2.5 lbs.
IV	Corn and cob meal.....1 part	1. lbs.	2.5 lbs.	1.75 lbs.
	Oats .....1 part	1. lbs.	2.5 lbs.	1.75 lbs.
	Cottonseed meal .....2 parts	2. lbs.	5. lbs.	3.51 lbs.
	Corn Silage	10. lbs.	18. lbs.	18.65 lbs.
	Johnson Grass Hay.....	5. lbs.	2. lbs.	2.5 lbs.
V	Cottonseed meal	2. lbs.	5. lbs.	4.07 lbs.
	Corn Silage	10. lbs.	24. lbs.	22.1 lbs.
	Johnson Grass Hay.....	5. lbs.	2. lbs.	2.54 lbs.

The calves were started on a rather light grain ration, then the silage was increased as rapidly as they would take it, and the grain was increased a little. Toward the latter part of the period, the grain was increased and the silage and hay were decreased.

WEIGHTS AND GAINS

The calves were weighed individually for three consecutive days both at the beginning of the preliminary period and at the beginning of the test period. The average of three weighings was taken as their weight on the second day. Throughout the experiment they were weighed as lots every two weeks. At the conclusion of the experiment they were weighed individually again. All weighings were done at about 10 o'clock in the morning, after the calves had been fed, but had been given no water since the night before.

Table V shows the average weight per calf of each lot at the beginning of the test period, the final weight per calf, and the gains made.

TABLE V
WEIGHTS AND GAINS
NOVEMBER 16 TO APRIL 30—167 DAYS

LOT	RATION	Average Initial Wt. per Calf	Average Final Wt. per Calf	Average Total Gain per Calf	Average Daily Gain per Calf
I	Corn chops.....2 parts Oats .....2 parts Cottonseed meal.....1 part Corn silage Johnson grass hay.....	449.66 lbs.	671. lbs.	221.34 lbs.	1.33 lbs.
II	Corn chops.....1 part Cottonseed meal.....1 part Corn silage Johnson grass hay.....	521.83 lbs.	751. lbs.	239.17 lbs.	1.41 lbs.
III	Corn & cob meal.....1 part Cottonseed meal.....2 parts Corn silage Johnson grass hay.....	565.33 lbs.	776.8 lbs.	211.47 lbs.	1.27 lbs.
IV	Corn & cob meal.....1 part Cottonseed meal.....2 parts Oats .....1 part Corn silage Johnson grass hay.....	464.2 lbs.	697. lbs.	232.8 lbs.	1.4 lbs.
V	Cottonseed meal Corn silage Johnson grass hay.....	500.3 lbs.	721.4 lbs.	221.1 lbs.	1.32 lbs.

The preceding table shows that very satisfactory gains were made by all calves. It is interesting to note, however, that Lot II, which received a grain ration of equal parts chopped corn and cottonseed meal made larger gains than any of the other lots. The next largest gains were made by Lot IV which received a grain ration made up of one-half cottonseed meal, one-quarter corn and cob meal and one-quarter oats. There was very little difference between the gains made by lots I and V. Lot I received a grain ration made up of one-fifth cottonseed meal, two-fifths corn chops and two-fifths oats, and Lot V a grain ration of cottonseed meal alone. The smallest gains were made by Lot III, which received a grain ration of two-thirds cottonseed meal and one-third corn and cob meal. The gains make it apparent that a grain ration of one part cottonseed meal to one part chopped corn, corn and cob meal, or oats, produces larger gains than a ration containing either a larger or smaller pro-

portion of cottonseed meal when corn silage and Johnson grass hay are used for roughage.

QUANTITY AND COST OF FEEDS REQUIRED TO MAKE 100 POUNDS OF GAIN

Table V, showing weights and gains, reveals quite a latitude of choice in the feed stuffs that can be used to secure good gains on fattening calves. When the data are compared with those shown in Table VI it becomes easy to make the choice of feeds depend largely on their relative costs and availability.

Table VI shows the quantity of the different feeds required to produce 100 pounds of gain with each lot of calves and the cost per 100 pounds gain when the feeds were valued at the prices prevailing in the fall of 1915.

TABLE VI
QUANTITY AND COST OF FEEDS REQUIRED TO MAKE 100 POUNDS GAIN
TEST PERIOD, NOVEMBER 16 TO APRIL 30—167 DAYS

Lot	RATION	Pounds of Feed to Make 100 Pounds Gain	Cost of 100 Pounds Gain
I	Corn chops— $\frac{2}{3}$	237.43	\$12.14
	Oats— $\frac{2}{3}$	237.43	
	Cottonseed meal— $\frac{1}{2}$	118.76	
	Corn silage	1359.9	
	Johnson grass hay	188.85	
II	Corn chops— $\frac{1}{2}$	260.38	\$10.93
	Cottonseed meal— $\frac{1}{2}$	260.38	
	Corn silage	1648.92	
	Johnson grass hay	181.76	
III	Corn and cob meal— $\frac{1}{4}$	300.14	\$10.04
	Cottonseed meal— $\frac{3}{8}$	150.07	
	Corn silage	1913.12	
	Johnson grass hay	188.19	
IV	Corn and cob meal— $\frac{1}{4}$	125.9	\$10.29
	Oats— $\frac{1}{4}$	125.9	
	Cottonseed meal— $\frac{1}{2}$	251.8	
	Corn silage	1337.06	
	Johnson grass hay	179.59	
V	Cottonseed meal	307.89	\$ 8.08
	Corn silage	1669.08	
	Johnson grass hay	191.78	

According to the preceding table, the cost of producing 100 pounds of gain varied inversely with the proportion of cottonseed meal in the ration. It is also seen that 1 pound of cottonseed meal had approximately the same feeding value of 2 pounds of corn chops or oats, and slightly over 2 pounds of corn and cob meal. It is apparent that when cottonseed meal can be bought for \$30.00 a ton and corn at 75 cents a bushel—about the same price pound for pound—the cheapest gains can be made from a ration containing large proportions of cottonseed meal.

The financial result shown in Table VII is of value when the same relative costs of feeds used is constant. Variation in feed prices, however, might show an entirely different financial result. Any financial statement is at best an unsatisfactory summary of the results. Not only will variation in feed prices make a wide va-

riation in results, but fluctuating market conditions will also cause one ration to show superior to another which under normal conditions is the more profitable ration. The five lots of calves were sold rather on weight than on finish, as will be seen when the financial statement is compared with the slaughter data.

TABLE VII
FINANCIAL STATEMENT
Preliminary and Test Periods, 208 Days

LOT I

To 5 calves, 1956.16 lbs. at \$6.00 a cwt.....	\$117.37	
To 200.49 lbs. bran at \$28.00 a ton.....	2.80	
To 2959 lbs. oats at \$.55 a bushel.....	50.61	
To 323.78 lbs. corn and cob meal at \$.80 a bushel.....	3.69	
To 2635.6 lbs. corn chops at \$.80 a bushel.....	36.89	
To 1335.54 lbs. cottonseed meal at \$30.00 a ton.....	20.02	
To 15050 lbs. corn silage at \$3.00 a ton.....	22.52	
To 2090 lbs. Johnson grass hay at \$10.00 a ton.....	10.45	
To pasturage at \$1.00 a calf per month.....	6.82	
To freight, yardage, commission, etc.....	17.41	
Total expenditures	\$288.53	
By sale of 5 calves, 3280 lbs. at \$8.85 a cwt.....	\$290.23	
Net Profit		1.70
Profit per calf .....		.34

LOT II

To 5 calves, 2290.5 lbs. at \$6.00 a cwt.....	\$137.43	
To 200.49 lbs. bran at \$28.00 a ton.....	2.80	
To 323.78 lbs. corn and cob meal at \$.80 a bushel.....	3.69	
To 324 lbs. oats at \$.55 a bushel.....	5.54	
To 3002 lbs. corn chops at \$.80 a bushel.....	42.02	
To 3009.74 lbs. cottonseed meal at \$30.00 a ton.....	45.29	
To 18960 lbs. corn silage at \$3.00 a ton.....	28.42	
To 2090 lbs. Johnson grass hay at \$10.00 a ton.....	10.45	
To pasturage at \$1.00 a calf per month.....	6.82	
To freight, yardage, commission, etc.....	17.41	
Total expenditures	\$299.07	
By sale of 5 calves, 3660 lbs. at \$9.15 a cwt.....	\$334.85	
Net profit on lot.....		35.88
Profit per calf		7.18

LOT III

To 5 calves, 2515.8 lbs. at \$6.00 a cwt.....	\$150.94	
To 200.49 lbs. bran at \$28.00 a ton.....	2.80	
To 1908.65 lbs. corn and cob meal at \$.80 a bushel.....	21.77	
To 324 lbs. oats at \$.55 a bushel.....	5.54	
To 3187.34 lbs. cottonseed meal at \$30.00 a ton.....	47.81	
To 20230 lbs. corn silage at \$3.00 a ton.....	30.34	
To 2090 lbs. Johnson grass hay at \$10.00 a ton.....	10.45	
To pasturage at \$1.00 a calf per month.....	6.82	
To freight, yardage, commission, etc.....	17.41	
Total expenditures	\$293.88	
By sale of 5 calves, 3830 lbs. at \$9.25 a cwt.....	\$354.27	
Net profit on lot.....		60.39
Profit per calf.....		12.08

LOT IV

To 5 calves, 2022.6 lbs. at \$6.00 a cwt.....	\$121.30
To 200.49 lbs. bran at \$28.00 a ton.....	2.80
To 1793.78 lbs. corn and cob meal at \$.80 a bushel.....	20.48
To 1794 lbs. oats at \$.55 a bushel.....	30.59
To 2957.74 lbs. cottonseed meal at \$30.00 a ton.....	44.37
To 15560 lbs. corn silage at \$3.00 a ton.....	23.35
To 2090 lbs. Johnson grass hay at \$10.00 a ton.....	10.45
To pasturage at \$1.00 a calf per month.....	6.82
To freight, yardage, commission, etc.....	17.41
Total expenditures	\$277.63
By sale of 5 calves, 3410 lbs. at \$8.75 a cwt.....	\$297.38
Net profit on lot	19.75
Profit per calf	3.95

LOT V

To 5 calves, 2151 lbs. at \$6.00 a cwt.....	\$129.06
To 200.49 lbs. bran at \$28.00 a ton.....	2.80
To 323.78 lbs. corn and cob meal at \$.80 a bushel.....	3.69
To 324 lbs. oats at \$.55 a bushel.....	5.54
To 3431.24 lbs. cottonseed meal at \$30.00 a ton.....	51.47
To 18460 lbs. corn silage at \$3.00 a ton.....	27.67
To 2120 lbs. Johnson grass hay at \$10.00 a ton.....	10.60
To pasturage at \$1.00 a calf per month.....	6.82
To freight, yardage, commission, etc.	17.41
Total expenditures	\$255.08
By sale of 5 calves, 3570 lbs. at \$8.35 a cwt.....	\$298.29
Net profit on lot	43.21
Profit per calf	8.64

This table shows that the largest profit, \$12.08 per calf, was made on Lot III, which received one-third corn and cob meal and two-thirds cottonseed meal as the concentrate ration. The next largest profit was made on Lot V, which received cottonseed meal alone for a concentrate and returned a profit of \$8.64 per calf. Lot II, which received equal parts chopped corn and cottonseed meal, made the third largest profit of \$7.16 per calf. Though lots IV and II were fed advantageously, in that all feeds were marketed through the calves at good prices on the farm, the net profit derived from each lot indicates that oats are not fed to fattening calves profitably if they cost 55 cents a bushel and corn costs 75 cents a bushel. The net profit of Lot IV was \$3.95 per calf; of Lot I, \$.35 per calf.

Table VIII shows the result of the different rations fed as reflected in the dressing percentages when slaughtered. As a rule, when cattle are of the same quality as to breeding and size any difference in market price is in favor of those carrying the greatest degree of finish. This difference is made on the basis that a finished steer will dress out a larger percentage of salable meat than one not so fat. The quality of the meat of the fatter steer is also superior to that of the poorer one.

TABLE VIII
SLAUGHTER DATA

LOT	RATION	Average final weight per calf	Average market weight per calf	Average shrink in transit	Percentage dressed by market weight	Selling price per cwt.
I	Corn Chops— $\frac{2}{3}$	671. lbs.	656. lbs.	2.24%	58.30 lbs.	\$8.85
	Oats— $\frac{1}{3}$					
	Cottonseed meal— $\frac{1}{2}$					
	Corn silage					
	Johnson grass hay					
II	Corn chops— $\frac{1}{2}$	751. lbs.	732. lbs.	2.64%	58.01 lbs.	\$9.15
	Cottonseed meal— $\frac{1}{2}$					
	Corn silage					
	Johnson grass hay					
III	Corn and cob meal— $\frac{1}{3}$	776. lbs.	766. lbs.	1.39%	57.49 lbs.	\$9.25
	Cottonseed meal— $\frac{2}{3}$					
	Corn silage					
	Johnson grass hay					
IV	Corn and cob meal— $\frac{1}{4}$	697. lbs.	682. lbs.	2.16%	57.21 lbs.	\$8.75
	Oats— $\frac{1}{4}$					
	Cottonseed meal— $\frac{1}{2}$					
	Johnson grass hay					
V	Cottonseed meal	721.4 lbs.	714. lbs.	1.03%	56.70 lbs.	\$8.35
	Corn silage					
	Johnson grass hay					

The dressing percentages of the calves in the various lots show that the rations containing the larger proportions of corn produced fatter carcasses than the rations containing chiefly cottonseed meal. This is in keeping with previous experiments, which show that although cottonseed meal produces very cheap and economical gains the tendency of calves on a cottonseed meal ration is rather to grow than to fatten.

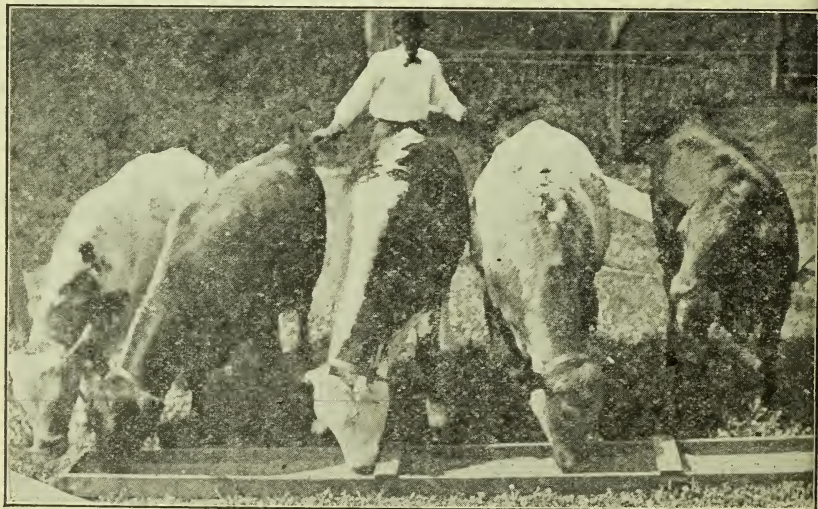


FIG. 1—PRIME BABY BEEF—EXPT. 1, LOT III

These calves were fed on a ration of one-third corn and cob meal and two-thirds cottonseed meal, and were sold at fourteen months old on the St. Louis Market for \$9.25 a hundred-weight.

EXPERIMENT 2—FATTENING LATE CALVES, Winter 1914-15

Cottonseed Meal, Cold Pressed Cake, Corn and Cob Meal, Corn Silage, Johnson grass Hay, and Cottonseed Hulls for fattening calves.

CALVES USED

The calves used in this experiment were a mixed lot of grade Angus, Hereford, and Shorthorn steers and heifer calves. When put on feed they averaged in age from 10 to 14 months and were of such class as would ordinarily be carried over winter as stockers. Having lost their calf fat they were not in good fattening but in vigorous growing condition.

FEED LOTS

All calves were fed in the same feed lots as described under Experiment 1.

CHARACTER AND PRICE OF THE FEEDS

The cottonseed meal, cold pressed cake, and cottonseed hulls, were bought in the open market at the prices shown in Table I. The corn, corn silage, and Johnson grass hay were raised on the station farm, and were of good quality.

TABLE I
MARKET PRICE OF FEEDS USED

Cottonseed meal	\$22.50 a ton
Cold pressed cake	17.50 a ton
*Corn and cob meal.....	21.43 a ton
Corn silage	3.00 a ton
Johnson grass hay	10.00 a ton
Cottonseed hulls	6.00 a ton

*On the basis of 80 cent corn costing 2 cents a bushel to grind into corn and cob meal.

AVERAGE DAILY RATION

The calves were taken off pasture and put in the feed lot December 1, 1914, and were fed for a period of 137 days, that is until April 16, 1915. They were started on the following daily rations per calf for each lot:

Lot I

Cottonseed Meal	2 lbs.
Corn and cob meal.....	4 lbs.
Corn silage	20 lbs.

Lot II

Cold pressed cake	3 lbs.
Corn and cob meal.....	4 lbs.
Corn silage	20 lbs.

Lot III

Cottonseed meal	2.5 lbs.
Corn and cob meal.....	2.5 lbs.
Johnson grass hay	5. lbs.
Corn silage	11.7 lbs.

Lot IV

Cold pressed cake	3.75 lbs.
Corn and cob meal.....	2.5 lbs.
Johnson grass hay	5. lbs.
Corn silage	11.7 lbs.

Lot V

Cottonseed meal	2 lbs.
Corn and cob meal.....	4 lbs.
Cottonseed hulls	10 lbs.

During the first part of the feeding period the silage for Lots I, II, III, and IV, and the hulls for Lot V were increased as rapidly as the calves would take care of it. During the latter part of the period, however, the cottonseed meal and cold pressed cake were increased in the various lots to all that the calves could clean up.

The average daily rations per calf of each lot for the entire feeding period of 137 days is shown in Table II.

TABLE II
AVERAGE DAILY RATION
137 DAYS

FEED	Lot I	Lot II	Lot III	Lot IV	Lot V
	Pounds	Pounds	Pounds	Pounds	Pounds
Cottonseed meal	2.71	4.05	2.97	4.45	2.7
Cold pressed cake		4.	4.	4.	4.
Corn and cob meal	4.	4.	4.	4.	4.
Corn silage	22.55	22.55	17.6	17.6	
Johnson grass hay			5.	5.	
Cottonseed hulls					13.76

WEIGHTS AND GAINS

The calves were weighed individually at each weighing and were weighed frequently throughout the feeding period.

Table III shows the average weight per calf in each lot at the beginning of the feeding period and at the conclusion of the feed period; the average total gain per calf, and the average daily gain per calf for each lot.

TABLE III

Lot	Average initial weight per calf	Average final weight per calf	Average total gain per calf	Average daily gain per calf
I	505. lbs.	696. lbs.	191. lbs.	1.39 lbs.
II	508.8 lbs.	724.5 lbs.	215.7 lbs.	1.58 lbs.
III	510.2 lbs.	722.8 lbs.	212.6 lbs.	1.55 lbs.
IV	501.8 lbs.	730.8 lbs.	229. lbs.	1.67 lbs.
V	502. lbs.	683.7 lbs.	181.7 lbs.	1.32 lbs.

As the preceding table shows, satisfactory gains were made by all lots. Comparison of Lot I with Lot II and of Lot III with Lot IV shows the relative value of cottonseed meal and cold pressed cake. Likewise comparison of the gains made by Lot I and Lot V shows the feeding value of cottonseed hulls and corn silage. These comparisons are shown impressively in Table IV, which gives the pounds of feed required to produce 100 pounds of gain.

TABLE IV
QUANTITY AND COST OF FEED REQUIRED TO MAKE 100 POUNDS GAIN

FEED	Lot I	Lot II	Lot III	Lot IV	Lot V
	Pounds	Pounds	Pounds	Pounds	Pounds
Cottonseed meal	192.24	258.	191.4	277.5	204.
Cold pressed cake		254.1	257.7	249.1	301.4
Corn and cob meal	286.91	1432.3	1134.	1096.2	
Corn silage	1617.8		322.1	311.3	
Johnson grass hay					1036.7
Cottonseed hulls					
Cost per 100 lbs. gain.....	\$7.68	\$7.13	\$8.23	\$8.29	\$8.63

The rations used were based on the assumption that 1 pound of cottonseed meal is in feeding value equivalent to approximately 1.5 pounds of cold pressed cake. From Tables III and IV it would seem that 1 pound of cottonseed meal as fed to Lot I has the same feeding value as 1.29 pounds of cold pressed cake which was fed to Lot II. When Lots III and IV are compared, however, 1 pound of cottonseed meal as fed to Lot III has the feeding value of 1.45 pounds of cold pressed cake as fed to Lot IV.

Comparison of corn silage with cottonseed hulls as a roughage for calves shows that 1 pound of cottonseed hulls as fed in Lot V has the feeding value of 1.56 pounds of corn silage as fed in Lot I.

The cost of producing 100 pounds gain is shown to be \$7.68, \$7.13, \$8.23, \$8.29, and \$8.63 for Lots I, II, III, IV, and V respectively. The cost of producing 100 pounds of gain was 55 cents less when 4.05 pounds of cold pressed cake were fed as the daily ration than when 2.71 pounds of cottonseed meal were fed. In each case 4 pounds of corn and cob meal and corn silage as a roughage, were given as supplementary feeds.

When 5 pounds of Johnson grass hay were added to the daily ration per calf and the cottonseed meal and cold pressed cake fed at the rate of 2.97 pounds and 4.45 pounds respectively, the cost of producing 100 pounds gain is \$.06 cheaper in favor of cottonseed meal.

With cottonseed hulls at \$6.00 a ton and corn silage at \$3.00 a ton, 100 pounds of gain were produced \$.95 cheaper from corn silage than from hulls.

Table V is the financial statement of the experiment. The feeds are given values prevalent in the fall of 1914.

TABLE V
FINANCIAL STATEMENT
LOT I

To 6 calves, 3029 lbs. at \$6.00 a cwt.....	\$181.74
To 2226 lbs. cottonseed meal at \$22.50 a ton.....	25.04
To 3288 lbs. corn and cob meal at \$21.43 a ton.....	35.23
To 18540 lbs. corn silage at \$3.00 a ton.....	27.81
To freight, yardage, commission, etc.	17.41
Total expenditures	\$287.23
By sale of 6 calves, 4050 lbs. at \$8.25 a cwt.....	\$334.13
Total net profit	46.90
Average profit per calf.....	7.82

LOT II

To 6 calves, 3053 lbs. at \$6.00 a cwt.....	\$183.18
To 3339 lbs. cold pressed cake at \$17.50 a ton.....	29.22
To 3288 lbs. corn and cob meal at \$21.43 a ton.....	35.23
To 18540 lbs. corn silage at \$3.00 a ton.....	27.81
To freight, yardage, commission, etc.	17.41
Total expenditures	\$292.85
By sale of 6 calves, 4217 lbs. at \$8.25 a cwt.....	\$347.90
Total net profit	55.05
Average net profit per calf	9.18

LOT III

To 6 calves, 3061 lbs. at \$6.00 a cwt.....	\$183.66
To 2442 lbs. cottonseed meal at \$22.50 a ton.....	27.47
To 3288 lbs. corn and cob meal at \$21.43 a ton.....	35.23
To 14470 lbs. corn silage at \$3.00 a ton.....	21.71
To 4110 lbs. hay at \$10.00 a ton.....	20.55
To freight, yardage, commission, etc.	17.41
Total expenditures	\$306.03
By sale of 6 calves, 4207 lbs. at \$8.25 a cwt.....	\$347.08
Total net profit	41.05
Average net profit per calf.....	6.84

LOT IV

To 6 calves, 3065 lbs. at \$6.00 a cwt.....	\$183.90
To 3663 lbs. cold pressed cake at \$17.50 a ton.....	32.05
To 3288 lbs. corn and cob meal at \$21.43 a ton.....	35.23
To 14470 lbs. corn silage at \$3.00 a ton.....	21.71
To 4110 lbs. hay at \$10.00 a ton.....	20.55
To freight, yardage, commission, etc.	17.41
Total expenditures	\$310.85
By sale of 6 calves, 4253 lbs. at \$8.25 a cwt.....	\$350.87
Total net profit	40.02
Average net profit per calf.....	6.67

LOT V

To 6 calves, 3011 lbs. at \$6.00 a cwt.....	\$180.66
To 2226 lbs. cottonseed meal at \$22.50 a ton.....	25.04
To 3288 lbs. corn and cob meal at \$21.43 a ton.....	35.23
To 11310 lbs. cottonseed hulls at \$6.00 a ton	33.93
To freight, yardage, commission, etc.	17.41
Total expenditures	\$292.27
By sale of 6 calves, 3979 lbs. at \$8.25 a cwt.....	\$328.27
Total net profit	36.00
Average net profit per calf.....	6.00

This table easily shows that yearling calves of fair breeding can be fed out profitably even though they be in rather poor condition when started on feed and not strictly prime beef when they are finished.

The financial statement shows furthermore that late summer and fall calves can be carried over winter at teat, pastured the fol-

lowing summer, and fed out profitably as yearlings even though strictly prime beef is not produced.

TABLE VI
SLAUGHTER DATA

Lot	Average farm weight per calf	Average market weight per calf	Average loss in transit per calf	Percentage loss in transit	Dressing percentage
I	696. lbs.	675. lbs.	21. lbs.	3.02%	56.13%
II	724.5 lbs.	702.8 lbs.	21.7 lbs.	2.99%	56.13%
III	722.8 lbs.	701.2 lbs.	21.6 lbs.	2.99%	56.13%
IV	730.8 lbs.	708.8 lbs.	22. lbs.	3.01%	56.13%
V	683.7 lbs.	662.2 lbs.	21.5 lbs.	3.15%	56.13%

The slaughter data, Table VI, show all calves to have finished with unusual uniformity. The shrinkage, in transit, was approximately 3 per cent of their barn weights. The calves were so uniformly finished throughout that they were killed as a whole. The dressing percentage of their market weight was 56.13 per cent.

PART II

Experiments by the Bureau of Animal Industry Co-operating With the Mississippi Experiment Station

EXPERIMENT 1—FATTENING CALVES, 1914-15

Cottonseed Meal, Corn and Cob Meal, Cottonseed Hulls, Corn Silage, and Alfalfa Hay for Fattening Calves.

OBJECT OF THE EXPERIMENT

The object of this test was to get further information concerning the use of cottonseed meal and mixtures of cottonseed meal and corn and cob meal for finishing calves for the market.

CALVES USED

The calves used in the experiment were grade Shorthorn, Angus, and Red Polled, the Shorthorns predominating in numbers. They were out of grade beef cows, were sired by registered bulls, and were representative of the second to third cross of good beef bulls on the native Mississippi cows. The quality of these calves would not let them make strictly first class baby beef. They were good stockers, for the making of good feeder steers.

FEED LOTS AND WATER SUPPLY

All calves were fed in a large barn which was open enough on the sides to permit thorough ventilation. About 50 square feet of space was allowed each calf for lying down and exercising. The plan of the barn was such that the calves could not have the run of open lots. For the first six weeks the pens were kept well bedded but after that, because of scarcity of bedding, were quite muddy and sloppy.

A water trough was in each pen, and water was furnished from a deep well. Feed troughs were used for feeding the silage and grain, and alfalfa was fed in racks over the troughs. The shattered leaves from the racks fell into the feed trough, so there was no waste of feed.

The feeding was done at 7 o'clock in the morning and at 3 o'clock in the afternoon.

CHARACTER AND PRICE OF THE FEEDS

Since this experiment was for the comparison of grain rations, the roughage for all lots was the same. The calves of all lots were fed about 5½ pounds of cottonseed hulls and 3½ pounds of alfalfa hay per head, daily, and were given all the silage they would eat.

The cottonseed meal was in quality about the average. An-

alysis showed an ammonia content equal to about 7.2 per cent of nitrogen. The corn was not quite so good as the average Mississippi corn.

The cottonseed hulls were of average quality. During the greater part of the experiment the hulls were good; but for a very short period some hulls of inferior grade were used, until good hulls could be obtained. The alfalfa hay which was bright and of good

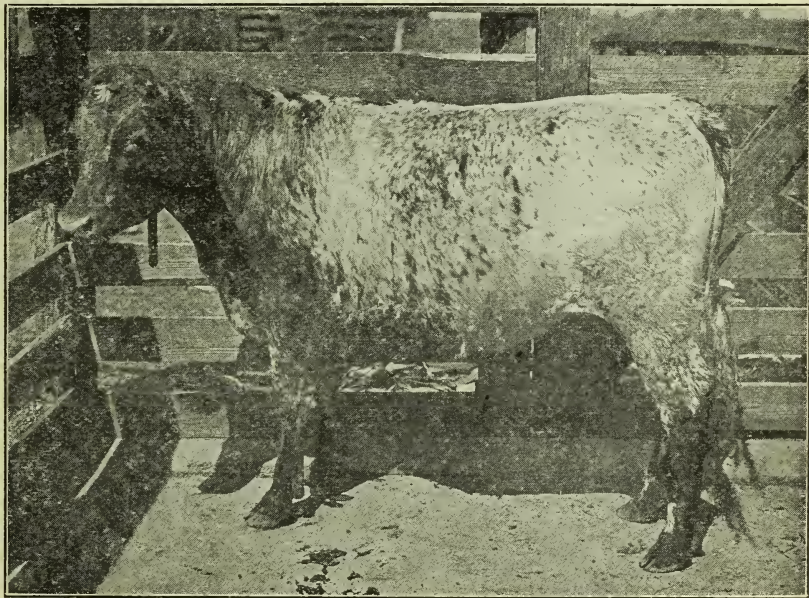


FIG. 2—A MARKET TOPPER

Grade Shorthorn steer 15 months old, weighing 820 pounds, and selling at St. Louis as baby beef at \$9.25 a hundredweight. Bred and finished by the Mississippi Experiment Station

quality, contained a little Johnson grass. The corn silage contained very little grain this year, and was not so good as is usually made on Southern farms. Taken as a whole, the feeds, with the exception of the silage, were just about the average used on the stock farms of the South.

The following prices were used for the feeds:

Cottonseed meal	\$23.50 a ton
Cottonseed hulls	6.50 a ton
Corn and cob meal.....	.70 a bu.
Corn silage	3.00 a ton
Alfalfa hay	15.00 a ton

The prices used for cottonseed hulls and meal were the actual

costs; those used for other feeds represented a good price for the farm grown feeds—a profit to the farm in the production of them.

AVERAGE DAILY RATIONS BY PERIODS

The calves of all lots had a preliminary feeding period from October 25 to November 13. During this time they got accustomed to the feed lots and to their feeds; and recovered from dehorning. They were therefore in condition to take readily to their feeds when started in the regular feeding period. During the preliminary period the feeds for all calves were gradually increased until the end of the second 28 day period. After that, the amount of concentrate was unvaried.

The following table shows the average daily ration per calf by 28-day periods.

TABLE I
AVERAGE DAILY RATIONS BY 28-DAY PERIODS

Lot	No. of Calves	FEED	1st. Period	2nd. Period	3rd. Period	4th. Period	5th. Period 31 days
I	14	Cottonseed meal	Pounds 2.8	Pounds 3.4	Pounds 4.0	Pounds 4.0	Pounds 4.0
		Cottonseed hulls	5.0	5.0	6.1	6.4	6.8
		Corn silage	11.3	11.4	13.8	14.2	14.8
		Alfalfa hay	3.6	3.9	3.4	2.7	3.9
II	12	Cottonseed meal	2.6	3.3	3.3	3.3	3.6
		Corn and cob meal.....	1.3	1.6	1.6	1.6	1.8
		Cottonseed hulls	4.9	4.7	5.7	6.4	7.1
		Corn silage	11.1	11.2	12.9	14.2	15.1
		Alfalfa Hay	3.3	3.6	3.1	3.3	4.4
III	14	Cottonseed meal	1.4	1.8	1.9	1.9	2.0
		Corn and cob meal.....	2.9	3.6	3.7	3.7	3.9
		Cottonseed hulls	5.0	4.7	4.8	5.3	6.3
		Corn silage	11.2	11.1	11.5	11.8	13.9
		Alfalfa hay	3.5	3.6	3.2	2.7	4.1

As the calves were never fed a heavy grain ration, the amount of roughage consumed did not decrease as the feeding progressed: in fact, it increased gradually as the calves increased in weight. The amount of alfalfa hay consumed by each lot was very uniform for each lot and for all periods of the experiment.

WEIGHTS AND GAINS

The regular feeding period began November 13, 1914. All calves were weighed individually on November 12, 13, and 14, and the average of the three weighings for each calf taken as the initial weight. Each lot of calves was weighed every 28 days during the test, and all calves were weighed individually at the close of the test. The calves were weighed about ten o'clock in the morning of each weigh day.

Table II shows the average weights per calf and the gains.

TABLE II
WEIGHTS AND GAINS
NOVEMBER 13 1914, TO APRIL 5, 1915—143 DAYS*

Lot	RATION	Average initial weight per calf	Average final weight per calf	Average total gains per calf	Average daily gains per calf
		Pounds	Pounds	Pounds	Pounds
I	Cottonseed meal	437	683	245	1.71
	Cottonseed hulls				
	Corn silage				
	Alfalfa hay				
II	Cottonseed meal— $\frac{2}{3}$	427	695	268	1.87
	Corn and cob meal— $\frac{1}{3}$				
	Cottonseed hulls				
	Alfalfa hay				
III	Cottonseed meal— $\frac{1}{3}$	436	663	227	1.59
	Corn and cob meal— $\frac{2}{3}$				
	Cottonseed hulls				
	Alfalfa hay				

*Preliminary feeding October 25 to November 12, inclusive.

The gains for the first two lots were very satisfactory for calves of their size and quality. The gain for Lot III was not so satisfactory; but when the daily ration of the calves are considered, it is seen that the calves of Lot III did not get as valuable grain ration as those of Lots I and II, if the theory is true that one pound of cottonseed meal is equal in feeding value to two pounds of corn for fattening calves.

QUANTITY AND COST OF FEEDS REQUIRED TO MAKE 100 POUNDS OF GAIN

Figures showing the amount of different kinds or of different combinations of feeds to make 100 pounds of gain in weight are of most importance to prospective feeders. When a feeder knows the value of his cattle and the available feeds, he can determine easily which feeds will be most profitable to use, if he is given the data showing the amount of feed required to make 100 pounds of gain, the effects of such feeds on the quality of the carcass, and the selling price of the animal.

Table III shows the quantity of feeds required to make 100 pounds of gain and the cost of making 100 pounds of gain when feeds were valued at the prices given herein.

TABLE III
 QUANTITY AND COST OF FEED REQUIRED TO MAKE 100 POUNDS OF GAIN
 NOVEMBER 13, 1914 TO APRIL 5, 1915—143 DAYS

Lot	RATION	Pounds of feed to make 100 lbs. of gain	Cost of 100 lbs. gain
I	Cottonseed meal	214	\$6.34
	Cottonseed hulls	346	
	Corn silage	774	
	Alfalfa hay	207	
II	Cottonseed meal— $\frac{2}{3}$	172	\$6.34
	Corn and cob meal— $\frac{1}{3}$	86	
	Cottonseed hulls	309	
	Corn silage	690	
	Alfalfa hay	191	
III	Cottonseed meal— $\frac{1}{3}$	112	\$7.40
	Corn and cob meal— $\frac{2}{3}$	225	
	Cottonseed hulls	331	
	Corn silage	753	
	Alfalfa hay	217	

There is not a great variation in the amount of roughage required to make 100 pounds of gain on the calves of the various lots, therefore, a direct comparison of the concentrates can be made.

When cottonseed meal was the sole concentrate, the calves of Lot I required 214 pounds to make 100 pounds of gain. The calves of Lot II required 172 pounds of cottonseed meal and 86 pounds of corn and cob meal to make the same amount of gain. The calves of Lot III required 112 pounds of cottonseed meal and 225 pounds of corn and cob meal to make 100 pounds of gain.

In this test when one-third of the cottonseed meal was replaced by an equal amount of corn and cob meal each pound of cottonseed meal proved to be equal in feeding value to 2.05 pounds of corn and cob meal, and when two-thirds of the ration was made up of corn and cob meal, each pound of cottonseed meal proved the equivalent of 2.21 pounds of corn and cob meal. This result has been in keeping with other experiments made with corn and cottonseed meal in the South.

At the prices which prevailed for feeds in 1914-15, the cost per 100 pounds gain for Lots I, II, and III, was \$6.34, \$6.34, and \$7.40 respectively. This is exceedingly satisfactory as the average for all calves is less than 7 cents per pound of gain. For mature animals fed on similar feeds the cost for each pound of gain would have been from 1½ to 4 cents more, showing the superior manner in which the calves utilize their feed. In fact, good calves are the only class of cattle that will put on gains in the feed lot at a price equal or less than the selling price of the animal per pound.

FINANCIAL STATEMENT

Table IV shows the financial results of the feeding experiments for all calves. The calves of Lot I were finished somewhat better than those of either of the other lots. The calves of Lots II

and III showed lack of finish, because of the small grain ration they were fed. Their selling price was consequently decreased.

TABLE IV
FINANCIAL STATEMENT

November 13, 1914—April 5, 1915—143 days.

LOT I—Cottonseed meal, cottonseed hulls, corn silage, alfalfa hay.

To 14 calves, 6118 lbs. at \$5.00 a cwt.....	\$305.90
To 7342 lbs. cottonseed meal at \$23.50 a ton.....	86.27
To 11853 lbs. cottonseed hulls at \$6.50 a ton.....	38.52
To 26533 lbs. corn silage at \$3.00 a ton.....	39.80
To 7110 lbs. alfalfa hay at \$15.00 a ton.....	53.32
To freightage, yardage, commission, insurance, etc., 14 head at \$2.175 a head.....	30.45
Total expenditures	\$554.26
By sale of 14 calves, 8740 lbs. at \$7.25 a cwt.....	\$633.65
Total profit on Lot I.....	79.39
Average profit per calf.....	5.67

LOT II—Cottonseed meal, two-thirds; cottonseed hulls, corn and cob meal, one-third; corn silage; alfalfa hay.

To 12 calves, 5124 lbs. at \$5.00 a cwt.....	\$256.20
To 5529 lbs. cottonseed meal at \$23.50 a ton.....	64.96
To 2764 lbs. corn and cob meal at \$.79 a bushel.....	27.64
To 9940 lbs. cottonseed hulls at \$6.50 a ton.....	32.30
To 22185 lbs. corn silage at \$3.00 a ton.....	33.28
To 6155 lbs. alfalfa hay at \$15.00 a ton.....	46.16
To freight, yardage, commission, insurance, etc., 12 calves at \$2.175 a head	26.10
Total expenditures	\$486.64
By sale of 10 calves, 6130 lbs. at \$7.25 a cwt.....	\$444.42
By sale of 2 calves, 1200 lbs. at \$6.50 a cwt.....	78.00
Total by sale of 12 calves.....	\$522.42
Total profit on Lot II.....	35.78
Average profit per calf	2.98

LOT III—Cottonseed meal, one-third; corn and cob meal, two-thirds; cottonseed hulls, corn silage, alfalfa hay.

To 14 calves, 6111 lbs. at \$5.00 a cwt.....	\$305.55
To 3756 lbs. cottonseed meal at \$23.50 a ton.....	44.13
To 7141 lbs. corn and cob meal at \$.70 a bushel.....	71.41
To 10512 lbs. cottonseed hulls at \$6.50 a ton.....	34.16
To 23922 lbs. corn silage at \$3.00 a ton.....	35.88
To 6897 lbs. alfalfa hay at \$15.00 a ton.....	51.73
To freight, yardage, commission, insurance, etc., 14 calves, at \$2.175 a head	30.45
Total expenditures	\$573.31
By sale of 12 calves, 7600 lbs. at \$7.25 a cwt.....	\$551.00
By sale of 2 calves, 1110 lbs. at \$6.50 a cwt.....	72.15
Total by sale of 14 calves.....	\$623.15
Total profit on Lot III.....	49.84
Average profit per calf.....	3.56

No charge was made for the labor of feeding the calves, which was small; on the other hand, no credit is given to the calves for the manure produced, and no credit given for pork produced in Lots II and III. By this method it is seen that the calves of Lot I were more profitable than those of the other lots. This is due partly to the very cheap price of cottonseed meal at that time (due to the outbreak of the war) and to the comparatively high price of corn on the farm where it was grown.

When it is considered that, the corn, corn silage, and hay were sold through the calves at excellent prices, and that a net cash profit was made, we regard the results as very satisfactory.

Table V shows the shrinkage due to shipping and the dressing percentages of the calves when slaughtered.

TABLE V
SLAUGHTER DATA

Lot	RATION	Average farm wt.	Average market wt.	Average shrink in transit	Average weight of carcass	Percentage dressed by farm weights	Percentage dressed by market weights
		of each calf 4-12-15	of each calf 4-14-15				
		Pounds	Pounds	Pounds	Pounds		
I	Cottonseed meal	660	624	36.0	342	51.88	54.85
	Cottonseed hulls						
	Corn silage						
	Alfalfa hay						
II	Cottonseed meal— $\frac{2}{3}$	668	611	57.0	330	49.40	54.05
	Corn and cob meal— $\frac{1}{3}$						
	Cottonseed Hulls						
	Alfalfa hay						
III	Cottonseed meal— $\frac{1}{3}$	651	622	29.0	335	51.44	53.87
	Corn and cob meal— $\frac{2}{3}$						
	Cottonseed hulls						
	Alfalfa hay						

The average shrinkage for all calves was 41 pounds per calf. The cause of heavier shrinkage of the calves of Lot II is unaccounted for. Though the calves of Lot II made the largest daily gains, they did not fatten so well as the calves of the other lots, which is reflected in the manner in which they dressed out. The calves of Lot I sold for a little more per hundred weight and dressed out slightly higher, than the calves of either of the other lots. The calves as a whole dressed out slightly over 54 per cent.

EXPERIMENT 2—HEAVY GRAIN RATION FOR FATTENING
CALVES, 1915-16

FATTENING BEEF CALVES ON CORN, COTTONSEED
MEAL, CORN SILAGE, AND ALFALFA

OBJECT OF THE EXPERIMENT

The objects of this test were:

1. To see if good grade calves such as can be easily raised in Mississippi can be finished for the market economically and profitably.
2. To make a comparative study of cottonseed meal alone, of a combination of cottonseed meal, and shelled corn, and of shelled

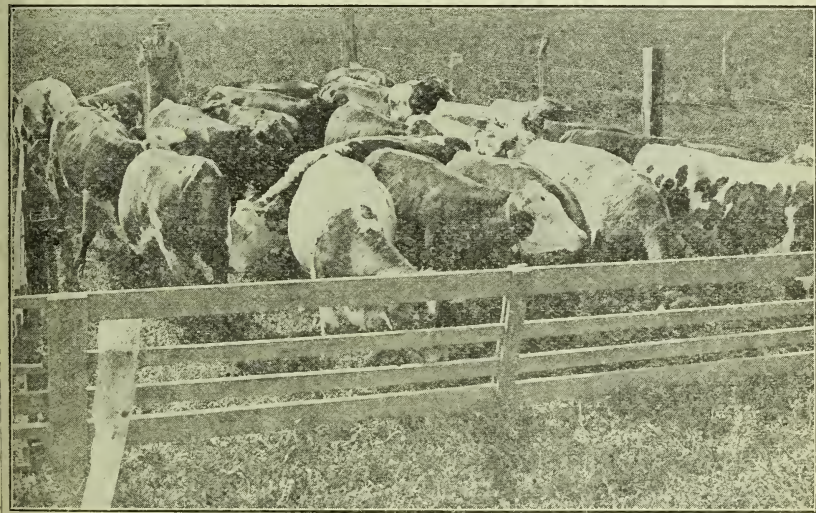


FIG. 3.—CALVES SHOWING QUALITY AND FINISH

These calves, fed during the winter 1915-16 by the Mississippi Experiment Station and sold for an average of \$60 a head, were produced from grade cows worth about \$50 apiece.

corn alone, as concentrated feeds to be used in finishing calves which are fed silage as the principal roughage and a small amount of alfalfa hay.

3. To determine approximately how much manure can be saved by feeding calves on a concrete floor under shelter.

CALVES USED

The calves used were from seven to eight months old, were a mixed lot of Shorthorns, Herefords, and Angus, and were of about the same quality as the calves used the previous year in Experiment 1.

CHARACTER AND PRICES OF FEEDS

The cottonseed meal was of good quality, analyzing from 7½ to 8 per cent ammonia. The corn was of good quality, being well matured and sound. The silage was of good quality, having been cut at the proper stage and carrying considerable grain. The corn would probably have yielded 45 bushels to the acre. The alfalfa was of rather low grade, as it had been damaged by heavy dew.

The feeds were charged at the following prices:

Cottonseed meal.....	\$27.00 a ton
Corn .....	.70 a bu.
Corn silage	3.00 a ton
Alfalfa hay	15.00 a ton

Cattle that are to be fed a long period will—as is well known—make almost as large gains and much more economical gains if they are fed a medium grain ration and all the good roughage they will eat for the first part of the feeding period, and are given a heavy grain ration during the latter part of the period. This method was followed in the experiment.

The following table shows the average amount of feed consumed daily per calf in each lot for each 28-day period they were fed.

TABLE VI
AVERAGE DAILY RATIONS BY 28-DAY PERIODS, 1915-1916

LOT	FEED	1st Period	2nd period	3rd Period	4th Period	5th Period	6th Period (Sixteen days)	Average for entire period of 156 days
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
I	Cottonseed meal	2.2	2.7	3.5	4.3	5 0	5.0	3.69
	Corn silage	16.8	22.7	23.8	25.3	23 7	26.7	22.87
	Alfalfa hay	5.9	5.8	4.0	4.0	4 0	4.0	4.65
II	Cottonseed meal	1.0	1.2	1.3	1.6	2.0	2.0	1.49
	Shelled corn	4.1	4.8	5.4	6.6	8 0	8.0	6.01
	Corn silage	14.7	18.3	18.3	18 9	16.2	18.6	17.43
	Alfalfa hay	5.8	5.4	4.0	4.0	3 9	4.0	4.57
III	Shelled corn	6.0	7.1	8.1	9 7	11.1	12.0	8.78
	Corn silage	13.6	13.7	15.6	14.3	12.1	13.3	13.80
	Alfalfa hay	5.5	5.6	4.0	4 0	3.6	4.0	4.49

The amount of silage consumed daily by the calves of Lot II was about 5½ pounds per calf less than that consumed by the calves of Lot I. The calves of Lot III, which were fed on shelled corn alone as the concentrate, consumed about half as much silage each day during the last two periods, as the calves which were fed cottonseed meal.

Table VII shows the average initial weight, the average final weight, the average gain per calf, and the average daily gain per calf for the entire period.

TABLE VII
TOTAL AND DAILY GAINS
NOVEMBER 12, 1915, TO APRIL 16, 1916—156 DAYS

Lot	RATION	Average initial weight per calf	Average final weight per calf	Average total gains per calf	Average daily gains per calf
		Pounds	Pounds	Pounds	Pounds
I	Cottonseed meal				
	Corn silage	430	701	271	1.74
	Alfalfa hay				
II	Cottonseed meal				
	Shelled corn	430	695	265	1.7
	Corn silage				
	Alfalfa hay				
III	Shelled corn				
	Corn silage	434	714	280	1.8
	Alfalfa hay				

The calves of Lot I were inclined to grow; so they fattened less rapidly than the calves of either of the other lots. The calves of Lot III were the fattest of the three lots, although there was not a great deal of difference, between the calves of Lots II and III.

QUANTITY AND COST OF FEED TO MAKE 100 POUNDS OF GAIN

The most important data in any feeding experiment are those relating to the daily ration, the rate of gain made by the animals, the amount of feed which is required to make 100 pounds of gain in weight, and the difference in selling price which results from the different methods of feeding. In the past, farmers and stockmen have paid too little attention to these figures and have laid too much stress upon the financial outcome of the special test, to get the most good out of the experimental work.

Table VIII shows the amount of feed required to produce 100 pounds of gain in weight on the calves and also the (comparative) cost of 100 pounds of gain.

TABLE VIII
QUANTITY AND COST OF FEED REQUIRED TO MAKE 100 POUNDS OF GAIN,
AND SELLING PRICE OF CALVES
NOVEMBER 12, 1915, to APRIL 16, 1916—156 DAYS

Lot	RATION	Pounds of feed to make 100 lbs. of gain	Cost of 100 lbs. of gain	Selling price of Calves per 100 Lbs.
I	Cottonseed meal	213	\$6.86	\$8.17
	Corn silage	1318		
	Alfalfa hay	268		
II	Cottonseed meal	88	\$9.05	\$8.58
	Shelled corn	353		
	Corn silage	1025		
	Alfalfa hay	269		
III	Shelled corn	489	\$9.14	\$8.66
	Corn silage	769		
	Alfalfa hay	250		

The calves in all lots received the same kind of roughage, but ate amounts varying with their appetites after consuming their grain. Though the daily gain of the calves in all lots was fairly uniform, the amount of roughage varied considerably. This variation is reflected in the amount of roughage required to make 100 pounds of gain.

The calves of Lot I required a very small amount of cottonseed meal and a comparatively large amount of cheap roughage to make 100 pounds of gain; the opposite is true of the calves of Lot III which received shelled corn as a concentrate. The calves of Lot III required more than twice as much grain to make 100 pounds of gain, somewhat less alfalfa, and only a little more than half as much silage. This resulted in more expensive gains for the calves receiving corn.

The exclusive use of cottonseed meal as a concentrate for calves has invariably resulted in good daily gains, and very economical gains. At the same time the calves have tended to grow more and fatten less than is desirable. The calves have consequently sold for somewhat less than corn fed calves, as shown in the table. The difference in selling price is often great enough to almost overcome the difference in the cost of production.

Strictly prime calves cannot be made by feeding them on cottonseed meal as the sole concentrate, though it is not always most profitable to put the maximum finish on calves, it is usually more profitable to have them well finished than half fat. It is more frequently the case that extra finish on calves pays better than it does on steers of two years or older.

FINANCIAL STATEMENT

Any financial statement is more or less unsatisfactory, because there are so many variations from year to year in the prices of feeds, selling prices of animals, and margin of profit, that the financial outcome may be completely reversed if any very radical change is made in any one of these factors. However, a financial statement, usually desired by the reader, is of some value for comparative purposes.

The calves were sold on the St. Louis market.

TABLE IX
FINANCIAL STATEMENT

November 12, 1915, to April 16, 1916—156 Days.

LOT I—Cottonseed meal, corn silage, alfalfa hay.

To 15 calves, 6450 lbs. at \$5.00 a cwt.....	\$322.50
To 8636½ lbs. cottonseed meal at \$27.00 a ton.....	\$116.59
To 53522 lbs. corn silage at \$3.00 a ton.....	80.28
To 10890 lbs. alfalfa hay at \$15.00 a ton.....	81.68
Total cost of feed	278.55

To freight charges	29.52
To commission	7.03
To yardage, hay, etc.	4.83
Total miscellaneous expenditures	41.38
Total expenditures	\$642.43
By sale of 15 calves, 9790 lbs. at \$8.168 a cwt.....	\$799.65
Total net profit on Lot I.....	\$157.22
Average net profit per calf.....	10.48

LOT II—Cottonseed meal, shelled corn, corn silage, alfalfa hay.

To 14 calves, 6017½ lbs. at \$5.00 a cwt.....	\$300.88
To 3256 lbs. cottonseed meal at \$27.00 a ton.....	\$ 43.96
To 13116 lbs. shelled corn at \$.70 a bushel.....	163.95
To 38076 lbs. corn silage at \$3.00 a ton.....	57.11
To 9986 lbs. alfalfa hay at \$15.00 a ton.....	74.90
Total cost of feed	339.92
To freight charges	27.55
To commission	6.56
To yardage, hay, etc.	4.51
Total miscellaneous expenditures	38.62
Total expenditures	\$679.42
By sale of 14 calves, 9320 lbs. at \$8.578 a cwt.....	\$799.35
Total net profit on Lot II.....	\$119.93
Average net profit per calf.....	8.57

LOT III—Shelled corn, corn silage, alfalfa hay.

To 15 calves, 6505 lbs. at \$5.00 a cwt.....	\$325.25
To 20547 lbs. shelled corn (366.9 bu.) at \$.70 a bu.....	\$256.84
To 32289 lbs. corn silage at \$3.00 a ton.....	48.43
To 10515 lbs. alfalfa hay at \$15.00 a ton.....	78.86
Total cost of feed	384.13
To freight charges	29.52
To commission	7.03
To yardage, hay, etc.	4.83
Total miscellaneous expenditures	41.38
Total expenditures	\$750.76
By sale of 15 calves, 10170 lbs. at \$8.662 a cwt.....	\$880.93
Total net profit on Lot III.....	\$130.17
Average net profit per calf.....	8.68

In this table no credit is given for the pork made by hogs following the calves of Lots II and III. Without considering this, exceedingly satisfactory profits were made on all the lots even after paying the farmer an unusually good price for his corn, corn silage, and alfalfa hay.

Hogs were put in Lots II and III to follow the calves. When cholera broke out on one part of the farm some of the fattest shotes were sold. Later some pigs and sows were permitted to follow the calves; but under the conditions, accurate records could not be kept of gains made by them. It is estimated that there should be a pork credit of at least \$3.00 a calf for each of the calves of Lot III.

If the pork credit were only \$2.00 a calf in Lot III, the calves which were fed a ration of shelled corn alone, paid the farmer 70c a bushel for the corn produced on the farm, and market prices for all roughage consumed; in addition they made as much profit as the calves which had been fed exclusively on cottonseed meal costing only \$27.00 a ton. This is especially significant and encouraging to the diversified farmer of the South; for when profits are as great from the feeding of corn at 70c a bushel as from the feeding of cottonseed meal at only \$27.00 a ton. The farmer may advantageously feed the corn he grows. It is quite probable that in the future, he will profit even more by feeding corn than by feeding cottonseed meal, for cottonseed meal will sell undoubtedly for more than \$27.00 a ton in the future. It is possible, however, that he may not enjoy this relative profit, for corn also may advance in price. Furthermore, the diversified farmer of the South with plenty of nutritious feeds,—such as silage, alfalfa, clover or cowpea hay, and corn—can finish out good calves without spending cash for feeds. The farmer who has no corn to feed, but has good roughage such as silage and hay, can feel sure that he can make good and economical gains by feeding cottonseed meal as the sole concentrate, though he cannot get the calves quite so well finished because of their tendency to grow when fed a heavy protein ration.

RECORDS OF MANURE PRODUCED

The calves were kept in pens with concrete floors under shelter, and the pens were scraped out daily and the manure was weighed. No bedding was used so there was some waste of liquid manure. The following table shows the amount of manure saved from the calves of each pen or lot.

TABLE X
MANURE YIELDS

November 12, 1915, to April 16, 1916—156 Days

Lot I.	Total yield	68,235.	lbs.
	Average per calf	4,549.	lbs.
	Average per calf daily.....	29.16	lbs.
Lot II.	Total yield	60,090.	lbs.
	Average per calf	4,083.	lbs.
	Average per calf daily	26.17	lbs.
Lot III.	Total yield	49,830.	lbs.
	Average per calf	3,322.	lbs.
	Average per calf daily	21.29	lbs.

No definite reason can be given for the calves of Lot I producing more manure than those of the other lots. The question arises; can it be possible that the high protein ration caused the calves to drink more water, thereby causing more liquid manure to be voided? The fact remains that the average amounts of manure produced per day by such calves was about 29 pounds per head.

SLAUGHTER DATA

Table XI shows the shrinkage from shipping to market and the dressing percentages of the calves.

TABLE XI
SLAUGHTER DATA

LOT	RATION	Average farm wt. per calf—4-16-16	Average market wt. per calf—4-19-16	Average shrinkage in transit	Percentage of shrinkage	Average weight of carcass	Percentage dressed by farm weight	Percentage dressed by market weight
		Pounds	Pounds	Pounds	Per cent	Pounds	Per cent	Per cent
I	Cottonseed meal	701	653	48	6.8	363	49.3	54.4
	Corn silage							
	Alfalfa hay							
II	Cottonseed meal	695	666	29	4.2	380	53.7	56.0
	Shelled corn							
	Alfalfa hay							
III	Shelled corn	714	678	36	5.0	387	53.1	55.9
	Corn silage							
	Alfalfa hay							

The difference in shrinkage between the calves of the three lots cannot be accounted for as they were handled exactly alike. It is to be expected that the calves of Lot I would shrink somewhat more than the other calves because they were not so fat and had been consuming a greater amount of roughage per day,—but the difference was quite large.

The carcasses of the calves of Lot I showed less fat and less finish than those of Lots II and III. No difference could be seen between the carcasses of Lots II and III, as they all were well finished.