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E. R. Lloyd

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Mississippi Agricultural Experiment Station

BULLETIN No. 167.

Corn Silage Compared With Hulls For Fattening Steers

By E. R. LLOYD.

AGRICULTURAL COLLEGE, MISSISSIPPI

OCTOBER, 1914.

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*In co-operation with U. S. Department of Agriculture.

Corn Silage Compared With Hulls For Fattening Steers

INTRODUCTION.

The feeding trial reported in this bulletin was conducted during the winter of 1911-12. At that time there were few silos in Mississippi and the principal feed used to fatten cattle was cottonseed meal and hulls. As a rule, the steers raised in the State were of poor quality with Jersey blood predominating. Few steers were finished for market. The bulk of the cattle were grazed, during summer and fall and shipped to market off of grass in October and November. In the short period of three years there have been hundreds of silos built in the State, and silage has, to a great extent, taken the place of cottonseed hulls as a roughage for all kinds of cattle. The cattle tick has been eradicated in about half the State and in a few more years the entire State will be freed of this pest. Nearly every grade herd of beef cattle is now headed by good registered bulls of one of the beef breeds. The raising and feeding of beef cattle has in the past few years developed into a very important industry in the State.

OBJECT OF EXPERIMENT.

The purpose of this work was to obtain additional data on the comparative value of corn silage and cottonseed hulls as a roughage for finishing beef cattle; to compare the cost of gains of steers fed under close confinement with those allowed the run of a paddock; to determine the amount and value of the manure actually saved from steers fed under close confinement and those allowed the run of a paddock.

CATTLE USED AND METHOD OF FEEDING.

For this experiment 24 head of native Mississippi steers were purchased, ranging in age from 4 to 5 years. Most of the steers had one cross of Shorthorn, Hereford, or Angus blood. For convenience of feeding, all of the steers were dehorned in November just before going on feed. This is responsible, in a great measure, for the small gains made by all lots during the feeding period. All of the lots were put on feed December 1 and were fed 142 days. The 24 steers were divided into four lots of 6 each.

Lots 1 and 2 received the same feed throughout the experiment, and the only difference in the two lots was that lot 1 was confined under shelter in an enclosure, 20 x 20 feet, and lot 2 was fed under an open shelter with free access to a paddock containing one-fourth of an acre. The following ration was fed the two lots: cottonseed meal, Johnson-grass hay, corn silage.

Lots 3 and 4 received the same feed, with lot 3 confined under shelter and lot 4 fed under shelter with free access to paddock. The following ration was fed the two lots: cottonseed meal, Johnson-grass hay, cottonseed hulls.

All of the lots were fed twice each day, at 6 A. M. and 4 P. M., and had free access to water at all times.

HOW THE CATTLE WERE VALUED.

At the close of the experiment the steers were consigned to Stewart, Son and McCormack, National Stock Yards, Illinois. When the steers reached the stock yards, they were divided into lots just as they had been fed, and each lot was classed and valued by Mr. William Fletcher, head buyer for Armour and Company. The four lots were sold to Armour and Company and the Company very kindly furnished us with killing weights, etc.

The following financial statement should not be taken to represent the actual profits in feeding beef cattle from year to year, but rather the relative profit depending on kind and cost of cattle, feed, and local conditions. A study of the financial statement will reveal the fact that the profits made from feeding these steers were not the results of gains made on feed but of the increased selling price over the purchase price. It will be noted that the gains were small, but the selling price was about double the purchase price.

In the following statement, the manure from each lot was carefully weighed and credited to that lot. In the case of lots 2 and 4, which had the run of paddocks, only the manure dropped under shelter was taken into account, that dropped on the paddock not being considered. The value given the manure was determined by chemical analysis.

Lot 1.—Six steers confined under shelter.

Amount eaten	{	silage.....	25560 lbs. @ \$ 3.00 per ton.....	\$ 38.34
		hay.....	4260 lbs. @ 10.00 per ton.....	21.30
		c. s. meal.....	5046 lbs. @ 25.00 per ton.....	63.07

To cost of feed for 6 steers 142 days.....	\$122.71
To purchase of 6 steers, wt. 6180 lbs. @ 4½c.....	278.10
To labor to feed 6 steers.....	15.63
To interest at 6% on purchase price for 7½ months.....	10.43
To freight, yardage, and commission.....	21.36

Total.....\$448.23

By sale of 6 steers, wt. 6522 lbs. @ 8c.....	\$521.76
By 40784 lbs. manure @ \$4.32 per ton.....	88.10

Total.....\$609.86

Profit on lot 1 (six steers).....	\$161.63
Profit per steer (manure included).....	26.94
Profit per steer (manure not included).....	12.25

Gain of lot.....	660 lbs.
Daily gain per steer.....	.77 lb.
Shrink in shipping.....	4.65%
Cost per 100 lbs. gain.....	\$18.81
Per cent dressed beef.....	59.32

Lot 2.—Six steers allowed freedom of paddock.

Amount eaten	{	silage.....	25560 lbs. @ \$ 3.00 per ton.....	\$ 38.34
		hay.....	4260 lbs. @ 10.00 per ton.....	21.30
		c. s. meal.....	5046 lbs. @ 25.00 per ton.....	63.07
To cost of feed for 6 steers 142 days.....				\$122.71
To purchase of 6 steers, wt. 6190 lbs. @ 4½c.....				278.55
To labor to feed 6 steers.....				15.63
To interest at 6% on purchase price for 7½ months.....				10.45
To freight, yardage, and commission.....				21.36
Total.....				\$448.70
By sale of 6 steers, wt. 6799 lbs. @ 8c.....				\$543.92
By 21063 lbs. manure @ \$4.32 per ton.....				45.50
Total.....				\$589.42
Profit on lot 2 (six steers).....				\$140.72
Profit per steer (manure included).....				23.45
Profit per steer (manure not included).....				15.87
		Gain of lot.....	940 lbs.	
		Daily gain per steer.....	1.10 lbs.	
		Shrink in shipping.....	4.65%	
		Cost per 100 lbs. of gain.....	\$11.12	
		Per cent dressed beef.....	59.32	

Lot 3.—Six steers confined under shelter.

Amount eaten	{	hulls.....	17040 lbs. @ \$ 6.00 per ton.....	\$ 51.12
		hay.....	4260 lbs. @ 10.00 per ton.....	21.30
		c. s. meal.....	5046 lbs. @ 25.00 per ton.....	63.07
To cost of feed for 6 steers 142 days.....				\$135.49
To purchase of 6 steers, wt. 6185 lbs. @ 4½c.....				278.35
To labor to feed 6 steers.....				15.63
To interest @ 6% on purchase price for 7½ months.....				10.43
To freight, yardage and commission.....				21.36
Total.....				\$461.24
By sale of 6 steers, wt. 6762 lbs. @ 8½c.....				\$574.77
By 44353 lbs. manure @ \$3.41 per ton.....				75.40
Total.....				\$650.17
Profit on lot 3 (six steers).....				\$188.93
Profit per steer (manure included).....				31.49
Profit per steer (manure not included).....				18.92
		Gain of lot.....	965 lbs.	
		Daily gain per steer.....	1.13 lbs.	
		Shrink in shipping.....	5.42%	
		Cost per 100 lbs. gain.....	\$14.06	
		Per cent dressed beef.....	59.01	

Lot 4.—Six steers allowed freedom of paddock.

Amount eaten	{	hulls.....	17040 lbs. @ \$ 6.00 per ton.....	\$ 51.12
		hay.....	4260 lbs. @ 10.00 per ton.....	21.30
		c. s. meal.....	5046 lbs. @ 25.00 per ton.....	63.07

To cost of feed for 6 steers 142 days.....	\$135.49
To purchase of 6 steers, wt. 6230 lbs. @ 4½c.....	280.35
To labor to feed 6 steers.....	15.63
To interest @ 6% on purchase price for 7½ months.....	10.43
To freight, yardage, and commission.....	21.36

Total.....\$463.26

By sale of 6 steers, wt. 7008 lbs. @ 8½c.....	\$595.68
By 22281 lbs. manure @ \$3.41 per ton.....	37.88

Total.....\$633.56

Profit on lot 4 (six steers).....	\$170.30
Profit per steer (manure included).....	28.38
Profit per steer (manure not included):.....	22.07

Gain of lot.....	1180 lbs.
Daily gain per steer.....	1.38 lbs.
Shrink in shipping.....	5.42%
Cost per 100 lbs. of gain.....	\$14.06
Per cent of dressed beef.....	59.01

VALUE OF THE MANURE.

When the manure was being hauled out to spread on the land, samples were taken from the different lots for analysis. The manure from the silage and hull lots analyzed as follows:

	Manure from lots fed silage and meal.	Manure from lots fed hulls and meal.
Moisture.....	74.78%	78.50%
Nitrogen.....	0.69%	0.57%
Potash.....	0.76%	0.61%
Phosphoric Acid.....	0.63%	0.38%

The analyses show the manure from lots fed corn silage and cottonseed meal to be worth \$4.32 per ton, and that from lots fed hulls and cottonseed meal to be worth \$3.41 per ton. In the field tests with manure from the different lots, 10 tons per acre were applied broadcast, in every case. Where manure from the lots fed silage and cottonseed meal was applied to land on which corn was grown for silage, the increased yield from the manured plot over the check plot was 4.88 tons per acre. Where manure from lots fed hulls and cottonseed meal was applied, the increased yield from the manured plot over the check plot was 4.58 tons per acre. Where the corn was allowed to ripen and was harvested for grain, the increased yield from the manured plot over the check plot was 10.9 bushels per acre. Where cotton was the crop used, the increased yield from the manured plot over the check plot was 363 pounds of seed cotton per acre.

In addition to the four lots of steers containing one cross of beef blood, another lot of 24 grade Jersey steers, which contained apparently no blood of any of the strictly beef breeds, were selected and divided into two lots of 12 animals each. The steers were from 4 to 5 years old, and were dehorned just before going on feed. In this experiment, no account was taken of the manure produced. One lot received a ration of silage and cottonseed meal and the other lot, hulls and cottonseed meal. No hay was fed in either case.

FINANCIAL STATEMENT.

Lot 1.—Twelve steers.

Amount eaten	{	silage.....	65184 lbs. @ \$ 3.00 per ton.....	\$ 97.76
		c. s. meal.....	10092 lbs. @ 25.00 per ton.....	126.15

To cost of feed for 12 steers 142 days.....	\$223.91
To purchase of 12 steers, wt. 12530 lbs. @ 4c.....	501.20
To labor to feed steers.....	31.25
To interest @ 6% on purchase price for 7½ months.....	18.75
To freight, yardage, and commission.....	42.72
Total.....	\$817.83

By sale of 12 steers, wt. 13760 lbs. @ \$7.55.....	\$1038.88
Profit on lot 1 (12 steers).....	221.05
Profit per steer.....	18.42

Gain of lot.....	1710 lbs.
Daily gain per steer.....	1 lb.
Shrink in shipping.....	3.23 %
Cost per 100 lbs. of gain.....	\$13.14
Per cent of dressed beef.....	58.05

Lot 2.—Twelve steers.

Amount eaten	{	hulls.....	41688 lbs. @ \$ 6.00 per ton.....	\$125.00
		c. s. meal.....	10092 lbs. @ 25.00 per ton.....	126.15

To cost of feed for 12 steers for 142 days.....	\$251.21
To purchase of 12 steers, wt. 12260 lbs. @ 4c.....	490.40
To labor to feed steers.....	31.25
To interest @ 6% on purchase price for 7½ months.....	18.38
To freight, yardage, and commission.....	42.72

Total.....\$833.96

By sale of 12 steers, wt. 13780 lbs. @ \$7.75.....	\$1067.95
Profit on lot 2 (12 steers).....	233.99
Profit per steer.....	19.50

Gain of lot.....	2030 lbs.
Daily gain per steer.....	1.19 lbs.
Shrink in shipping.....	3.58%
Cost per 100 lbs. gain.....	\$12.38
Per cent of dressed beef.....	58.40