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Costs and returns from drylot feeding of cattle in Mississippi

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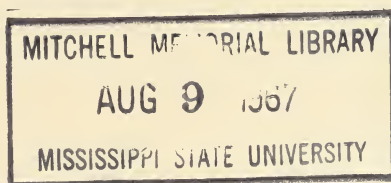
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COSTS AND RETURNS FROM
DRYLOT FEEDING OF
CATTLE IN MISSISSIPPI



MISSISSIPPI STATE UNIVERSITY
AGRICULTURAL EXPERIMENT STATION
HENRY H. LEVECK, Director

PREFACE

This bulletin contains estimates of costs and returns from drylot feeding of cattle under several systems. These estimates are based on average prices and upon average rates of production. It should be realized that a very small change in prices or in the average daily gain has a considerable effect upon the profitability of the system.

The facilities described in this bulletin represent somewhat of an ideal situation in that only new, durable structures are considered and the systems are completely automated. Cattle can and are being fed in Mississippi with considerably less investment. The systems described represent the more prevalent types and sizes at the time of the study. An individual interested in constructing a feedlot will find the bulletin a useful guide for explaining some of the more popular systems. However, he would be well advised to visit several lots before making a final decision as to type.

ACKNOWLEDGEMENTS

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TABLE OF CONTENTS

	Page
PREFACE	2
ACKNOWLEDGEMENTS	2
SUMMARY	4
COSTS AND RETURNS FROM DRY-LOT FEEDING OF CATTLE IN MISSISSIPPI	5
INTRODUCTION	5
Data Sources	5
COSTS OF CONDITIONING CALVES	6
Rations, Rates of Gain and Facilities	6
Investment	7
Costs	7
Transportation Rates	10
COSTS OF FINISHING STEERS	11
Rations, Rates of Gain and Facilities	11
Investment	12
Costs	12
Transportation Rates	14
RETURNS	16
From Conditioning	16
From Finishing	17
APPENDIX	19

SUMMARY

The purpose of this study was to estimate costs and returns from drylot feeding of cattle in Mississippi. Capacities of lots considered were for 100, 300, and 500 head at one time. Both conditioning 400-pound steer calves to 715-pound feeders and finishing them to 1040-pound slaughter weights were considered.

In the conditioning process a conventional silage-corn combination ration and a high-energy corn silage ration were considered. For finishing, the conventional silage-corn ration was modified so that the silage was discontinued during the last 60 days. The high-energy silage ration was the same as that for conditioning; a third ration consisted predominantly of corn.

The investment per head for the conditioning phase ranged from \$213 for the silage-corn system for the 100-head lot feeding a single batch per year down to \$78 for the same feeding system where two batches per year are conditioned in a 500-head lot. Based upon 1960-64 average prices for feeder calves, conditioning costs per head, exclusive of labor, ranged from \$135 for the large two-batch high-energy system to \$160 for feeding a single batch of 100 on the silage-corn ration.

In the finishing process, investment per head varied from \$210 per head feeding silage-corn to a single batch of 100 down to only \$47 per head using the corn ration for two batches of 500. Costs of finishing, exclusive of labor, based on 1960-64 prices for feeders varied from \$234 per head for the smallest corn enterprise for a single batch to \$195 for two batches of 500 in the high-energy silage system.

Based upon the data used in the study, the finishing phase is indicated to be more profitable than is conditioning calves in Mississippi. For a single

batch, feeding through the winter seemed to be most profitable for both phases. Even then, the silage-corn ration did not show positive returns for conditioning while the most profitable 500-head lot feeding high-energy silage made only \$11 per head exclusive of labor costs. Two consecutively fed batches per year in the conditioning phase did not appear profitable even with the savings from greater use of facilities because of the adverse effect of higher calf prices and lower feeder prices.

Finishing cattle through the winter would have yielded returns per head varying from \$12 in the 100-head corn system to \$46 in the 500-head high-energy system. Beginning with a second batch in May, returns on the second group would have averaged only \$6 per head below those fed in the winter.

All of the estimates presented in this report could be altered considerably if the feeder produced his own corn and charged it to the feeding enterprise at the cost of production, as was done for silage. The absolute dollar returns from a particular ration system should not be the only criterion used to select such a system.

Those individuals who do not have sufficient land or good land for either corn or grain sorghum silage might do better with the corn system. Also, those individuals with limited capital must take capital requirements into consideration. The 715-pound feeder animal may have been grazed to this weight at a cheaper cost than was estimated. However, in each situation the alternative rate of returns, which could have been realized by the producer had he followed a cow-calf system or had row crops must be considered.

Costs and Returns from Drylot Feeding of Cattle in Mississippi

By

WILLIAM G. WALKER and TRAVIS D. PHILLIPS

INTRODUCTION

Mississippi cattlemen, long among the nation's leading producers of feeder calves, are awakening to the possibilities that may lie in finishing these animals for slaughter. Already, many producers are placing their calves on feed at weaning, in lots of 50 to 100 head or so, and conditioning them to "two-way" calves, to be sold either for light-weight slaughter or for further finishing. An even more recent development in the state has been the finishing of these conditioned or "warmed up" animals to slaughter weights of around 1,000 pounds.

Since dry-lot feeding is an enterprise relatively new to the state, many cattlemen will want to take a close look at expected costs and returns associated with various systems of feeding before deviating from their established cow-calf operations. Estimates of per-head costs and returns for several types and sizes of feed-lot operations have recently been developed through research at Mississippi State University. In this report these estimates are presented for:

- (a) conditioning 400 - pound steer calves to 715-pound feeders; and
- (b) finishing 715 - pound steers to 1040-pound slaughter weights.

For the calf-conditioning enterprises, both a conventional corn-silage-shelled corn ration and a high-energy silage rations are considered.¹ In the steer-finishing models estimates are develop-

ed for three rations: (1) a conventional silage-corn ration to be fed for 100 days and followed by a ration high in corn content for 60 days; (2) a high-energy silage ration identical in composition to that used in calf-conditioning; and (3) a ration consisting mostly of shelled corn and cottonseed hulls.

For each of the five feeding systems above, per-head costs and returns are estimated for enterprises of 100, 300, and 500 head. In addition, the effects of feeding both one and two batches of animals per year are considered. In all, then, estimates for a total of 30 slightly different feed-lot operations are presented.

Data Sources

Information on inputs and practices currently being used was obtained in an extensive survey of cattle-feeders in Mississippi. Costs for the 30 model operations were synthesized from survey data and from information supplied by personnel in various technical departments of the Mississippi Agricultural Experiment Station. Considerable help, particularly on facility requirements, was obtained from research underway in Illinois.²

To reduce the effect of short-term price changes, 1960-64 average prices for cattle, and for most feed ingredients except silage, were used in these estimates. For silage, cost-of-production figures based on work previously reported by McReynolds and Hamill³

¹ High-energy silage is corn cut immediately below the ear or grain sorghum cut just under the seed head when the moisture content has become lower than for conventional silage. Research on high-energy silage has been underway for several years at the Mississippi Delta Agricultural Experiment Branch Station at Stoneville.

² VanArsdall, Roy N., **Guides for Use in Planning Beef Systems**, Mimeograph release AE-3971, University of Illinois, College of Agriculture, Urbana, Illinois, December 1963. Also, VanArsdall supplied other helpful suggestions through correspondence.

³ McReynolds, John T., and James G. Hamill, **Budgets for Forage Crops in the Brown Loam Area of Mississippi**, Miss. Agri. Exp. Sta. AEC. M.R. No. 46, August 1965.

were used. Prices of all other input items are representative of those prevailing in the state in 1964. (See Appendix for input price data).

Depreciation rates on equipment and facilities were obtained from technical

personnel and from the trade. In instances where identical items of equipment are to be used in enterprises of different sizes, these rates are adjusted for changes in amounts of annual use.

COSTS OF CONDITIONING CALVES

The survey of cattle-feeders indicated that most feeders of lighter-weight animals were using rations high in roughage rather than high in corn content. Preliminary analyses show rations of the former type to be the less expensive. For these reasons, only roughage-type rations were considered in developing estimates of costs of conditioning calves.

Rations, Rates of Gain and Facilities

Facilities required were estimated on the assumption that no existing facilities are available for feeding cattle, except possibly lots for working new cattle before they go into the feedlot. Facility requirements for 100-, 300-, and 500-head calf-conditioning enterprises are itemized in Appendix Tables 1 and 2.

Either of the two rations considered for calves was assumed to yield an average daily gain of 1.75 pounds, Tables 1 and 2. With such gain it would take 180 days to bring 400-pound calves to 715-pound weights. Thus, silo capacities are based on an 180-day feed-

ing program. If two batches per year are to be fed, these capacities must be doubled, but no changes need to be made in other facilities.

The feed-lot, paved with 4-inch concrete, allows 70 square-feet of space per animal. A concrete feed bunk, with a 10-foot wide roof, runs down the center. Fences are of creosote post-steel cable construction. An automatic feeding system augers out all feed.

Silos, of the concrete stave type, are equipped with unloaders. Storage facilities for shelled corn, where needed, are sufficiently large to hold a truck-load or more. Where dry grain rations are to be used, a hammer mill and feed mixer are included.

The lists of facilities shown in the appendix tables include a deep well and pump. In many instances, however, the farm's existing water system may be adequate to supply the additional water needed. In fact, all facility requirements are based on general recommendations and may be adjusted for particular farm situations.

Table 1. Silage-corn ration: Average daily feed requirements and costs for a 400 lb. calf to gain 315 lbs. at an average rate of 1.75 lb. per day.

Kind of feed	Quantity of feed	Cost per day
	pounds	cents
Corn silage		
As silage	(27.00)	(7.83) ¹
Hay equiv.	9.00	7.83
Shelled corn	6.00	14.25
Ground limestone	.22	.22
Urea	.22	1.10
Deflourinated phosphate	0.14	0.43
Mineralized salt	0.08	0.22
Vitamin A premix	+	0.20
Antibiotic	+	0.63
Total	15.66	24.88
Feed cost per lb. of gain		14.22

Source: Adapted from Subcommittee on Beef Cattle Nutrition, **Nutrient Requirements of Domestic Animals, No. IV**, Nutrient Requirements of Beef Cattle, Revised Edition, Publication 1137, National Academy of Science — National Research Council, Washington, 1963.

¹ Due to an 8% loss in storage, 2174 pounds of silage should be produced for each ton fed. Therefore, one pound of silage at feeding time cost 0.29 cents (Appendix Table 7).

Table 2. High-energy corn silage ration: Average daily feed requirements and costs for a 400 lb. calf to gain 315 lbs. at an average rate of 1.75 lb. per day.¹

Kind of feed	Amount	Cost per day
	pounds	cents
High-energy corn silage	43.00	15.91 ²
Urea	0.22	1.10
Ground limestone	0.22	0.22
Mineralized salt	0.08	0.22
Antibiotic	+	0.63
Total		18.08
Feed cost per lb. of gain		10.33

Source: Adapted from Subcommittee on Beef Cattle Nutrition, **Nutrient Requirements of Domestic Animals, No. IV**, Nutrient Requirements of Beef Cattle, Revised Edition, Publication 1137, National Academy of Science — National Research Council, Washington, 1963.

¹ Usually cut just below the ear with a conventional silage harvester of which the cutter bar with some modification can be raised 24 to 30 inches above the ground.

² Due to an 8% loss in storage, 2174 pounds of silage should be produced for each ton fed. Therefore, one pound of silage at feeding time costs 0.37 cents (Appendix Table 7).

For example, it may be practical in some instances to eliminate the concrete slab, or to concrete only an area around the feed bunk. Generally, however, the less concrete, the more land is required for the feed-lot. Again, in place of an automatic feeding system, a fence-line feed bunk is often used for feeding from either upright or trench silos.

Investment

A 100-calf capacity system designed for use of a conventional silage-dry corn ration would require a larger investment in facilities than would one of the same size planned for use of high-energy silage. This difference occurs mainly because of the extra facilities needed for storing and handling dry feeds. With only minor additions, however, these dry-feed facilities would be sufficient to handle feed for up to 500 head. For that reason the larger enterprises, where conventional silage is to be fed, require less investment than do those of the high-energy silage type.

At the 1964 level of prices, facility investments in conventional silage feed-lot systems designed for one batch of animals a year would range from \$21,256 for a 100-head system to \$62,493 for a 500-head capacity lot, Table 3. Thus, investment per head would average \$213 for the smaller enterprise and \$125 for the largest considered. Feeding two batches of calves per year would drop these averages to \$134 and \$78, respectively.

For the high-energy silage system, investment requirements range from \$19,041 for 100 head to \$69,547 for 500 head, if only one batch a year is fed, Table 4. Feeding two batches a year would drop the per-head average investment from \$190 to \$128 in a 100-head operation, and from \$139 to \$96 in a 500-head one.

Costs

In estimating costs of feeding cattle two kinds of costs must be considered: annual investment costs—or depreciation and interest on investment—and out-of-pocket operational costs.

In developing estimates of operational costs, calves going into the feed-lot were priced at \$21.68 per hundred-weight, the 1960-64 average price for 400-pound steer calves at Memphis. Price quotations for comparable animals sold in Mississippi during the period were not available, since the Market News Service does not report sales from Mississippi markets.

Daily feed costs per animal for the conventional silage-corn ration were estimated at about 25 cents, Table 1. Corresponding costs for the high-energy silage ration was considerably lower, Table 2. In developing these costs, an acre of silage was considered to cost \$81.17 to produce and to yield 15 tons of conventional or 12 tons of high-energy silage, Appendix Table 7. All costs of production are included so that the \$5.41 per ton for conventional and \$6.76 for high-energy silage rep-

Table 3. Investment in facilities and equipment for feeding 400 lb. calves to 715 lb. yearlings, 180 days on a silage-corn ration, by size of enterprise and number of batches fed per year, Mississippi, 1964.

Item	No. fed per batch					
	100		300		500	
	(1 batch)	(2 batches)	(1 batch)	(2 batches)	(1 batch)	(2 batches)
	dollars					
Land	100	100	100	100	200	200
Lot, shelter and buildings						
Concrete lot, feed bunk and fence	2,943	2,943	8,148	8,148	13,611	13,611
Cattle shed	4,200	4,200	12,600	12,600	21,000	21,000
Feed room	384	384	384	384	384	384
Feed storage						
Shelled corn	394	394	394	394	394	394
Corn silage	5,450	10,900	11,000	22,000	15,500	31,000
Mixed ration	226	226	226	226	226	226
Feed handling and processing equipment						
Hammer mill, feed mixer and feed meters	1,891	1,891	1,891	1,891	1,891	1,891
Auger feeder	558	558	1,458	1,458	3,096	3,096
Screw augers	854	854	854	854	935	935
Silage blower	900	900	900	900	900	900
Water system						
Deep well, pump and 120-gal. tank ¹	1,062	1,062	1,062	1,062	1,062	1,062
3/4" pipe and waterers	326	326	658	658	1,326	1,326
Manure handling equipment						
Front-end loader	468	468	468	468	468	468
Manure spreader	700	700	700	700	700	700
Miscellaneous equipment						
Scales and shelter	600	600	600	600	600	600
Headgate and chute	200	200	200	200	200	200
Total investment	21,256	26,706	41,643	52,643	62,493	77,993
Investment/head	213	134	139	88	125	78

¹ Adapted from Jacks, Barney H. and Phillips, Travis D., **Costs of Producing Hogs in Confinement**, Bulletin 628, Mississippi Agricultural Experiment Station, State College, Mississippi, October, 1961. Includes 300 feet of drilling and casing.

Table 4. Investment in facilities and equipment for feeding 400 lb. calves to 715 lb. yearlings, 180 days on a silage-corn ration, by size of enterprise and number of batches fed per year, Mississippi, 1964.

Item	No. fed per batch					
	100		300		500	
	(1 batch)	(2 batches)	(1 batch)	(2 batches)	(1 batch)	(2 batches)
	dollars					
Land	100	100	100	100	200	200
Lot, shelter and buildings						
Concrete lot, feed bunk and fence	2,943	2,943	8,148	8,148	13,611	13,611
Cattle shed	4,200	4,200	12,600	12,600	21,000	21,000
Feed room	384	384	384	384	384	384
Feed storage						
Corn silage	6,600	13,200	15,500	31,000	26,000	52,000
Feed handling equipment						
Auger feeder	558	558	1,458	1,458	3,096	3,096
Silage blower	900	900	900	900	900	900
Water system						
Deep well, pump and 120-gal. tank ¹	1,062	1,062	1,062	1,062	1,062	1,062
3/4" pipe and waterers	326	326	658	658	1,326	1,326
Manure handling equipment						
Front-end loader	468	468	468	468	468	468
Manure spreader	700	700	700	700	700	700
Miscellaneous equipment						
Scales and shelter	600	600	600	600	600	600
Headgate and chute	200	200	200	200	200	200
Total investment	19,041	25,641	42,778	58,278	69,547	95,547
Investment/head	190	128	143	97	139	96

¹ Adapted from Jacks, Barney H. and Phillips, Travis D., **Costs of Producing Hogs in Confinement**, Bulletin 628, Mississippi Agricultural Experiment Station, State College, Mississippi, October, 1961. Includes 300 feet of drilling and casing.

resent the cost of silage ready to be blown into the silo. Actually, some economies are associated with size, depending upon the usage of specialized harvesting equipment.

Veterinary and medical costs include veterinary services, medicines and parasite control, and stilbestrol at the rate of two implants per animal. Electricity cost was computed by applying Tennessee Valley Authority's residential rates to the estimated number of kilowatt-hours consumed by the enterprise.

Estimates of labor costs include charges for time spent in buying and selling cattle, receiving them, care of sick animals, checking cattle, cleaning pens, grinding and mixing feed, feeding with mechanical feeders, and loading out cattle. Grinding and mixing feed, feeding, and cleaning pens require approximately 80 percent of the labor in both feeding systems. Feed handling and processing is semi-automated.

One man should be able to handle any of the enterprises considered, with additional labor needed only for receiving and loading out cattle. Should the operator do the work himself, or if labor is available at no additional cost, returns from the sale of cattle would include a return for his labor. If labor must be hired, however, it then becomes an operating cost. For these reasons, charges for labor are separated from other specified operating cost shown below, but are included in the estimates of total and per-head costs. In all cost comparisons below, the per-head costs used are those that exclude labor, as shown in the bottom row of the cost tables for the respective systems.

Estimated costs per head of conditioning calves with the conventional silage-corn ration range from \$160 in a 100-head enterprise to \$151 in a 500-head operation, when only one batch a year

Table 5. Costs of feeding 400 lb. calves to 715 lb. yearlings, 180 days on a silage-corn ration, by size of enterprise and number of batches fed per year, Mississippi, 1964.

Item	No. fed per batch					
	100		300		500	
	(1 batch)	(2 batches)	(1 batch)	(2 batches)	(1 batch)	(2 batches)
	dollars					
Investment Costs:						
Depreciation:						
Lot, shelter and buildings	301	301	845	845	1,399	1,399
Feed storage	248	466	470	910	651	1,271
Feed handling and processing equipment	273	370	403	664	667	1,001
Water system	138	138	170	170	235	235
Manure handling eqt.	58	70	76	140	117	175
Miscellaneous equipment	50	50	50	50	50	50
Interest ¹	534	670	1,044	1,319	1,567	1,955
Total	1,602	2,065	3,058	4,098	4,686	6,086
Operating Costs:						
Cattle	8,672	17,344	26,016	52,032	43,360	86,720
Feed	4,479	8,958	13,437	20,874	22,395	44,790
Vet. and medicine	125	250	375	750	625	1,250
Repairs	767	1,029	1,606	2,180	2,496	3,276
Electricity	11	22	26	52	58	116
Interest on operating capital ²	386	773	1,137	2,244	1,889	3,731
Total	14,440	28,376	42,597	84,132	70,823	139,883
Total specified costs	16,042	30,441	45,655	88,230	75,509	145,969
Labor ³	275	550	820	1,640	1,369	2,738
Total cost	16,317	80,911	46,475	89,870	76,878	148,707
Per head:						
With labor	163	155	155	150	154	149
Without labor	160	152	152	147	151	146

¹ 5% on average investment including land.

² 5% for one year on silage, limestone, and urea; 5% for ½ year on all other items making up operating costs.

³ Adapted from Johnson, R. G. Nodland, T. R., **Labor Used in Cattle Feeding**, Bulletin 451, Minnesota Agricultural Experiment Station, St. Paul, Minnesota, March, 1960; Williams, Willard F. and McDowell, James I., **Costs and Efficiency in Commercial Dry-Lot Cattle Feeding**, processed series, P-509, Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma, June, 1965.

is fed, Table 5. Thus, on a hundred-weight basis the respective feed-lot operators would have \$22.37 and \$21.12 invested in the conditioned calves. Feeding two batches per year would reduce costs in the 100-head operation by \$8 per head, and in the 500-head system by \$5 per head.

In the high-energy silage system, per-head cost estimates for one-batch operations vary from \$140 to \$145, Table 6. Per hundredweight, these costs are \$19.58 and \$20.28. Feeding a second batch would reduce per-head costs by \$7 in the smallest operation and by \$4 to \$5 in the larger ones.

In summary, it appears that costs of conditioning calves on high-energy silage average about 8 to 9 percent below those in similar enterprises using a conventional silage-corn ration.

Transportation Rates

Costs of transporting cattle are not included in the estimates shown above since these costs vary with the method of transportation and the distance cattle are hauled. The feed-lot operator must, however, consider any costs he must bear for transporting cattle to and from the feed-lot. To aid him in doing so the following estimates of prevailing truck rates are given:

A two and one-half ton truck with a capacity of 17 to 20 400-pound calves or 11 to 14 715-pound steers would cost an estimated 30 cents per loaded mile. A large single-deck trailer with a capacity of 50 400-pound calves or 40 715-pound steers would cost 45 cents per loaded mile. A large double-deck trailer hauling 85 to 95 400-pound calves or 60 to 70 steers weighing 715 pounds would cost 60 cents per loaded mile.

Table 6. Costs of feeding 400 lb. calves to 715 lb. yearlings, 180 days on a high-energy corn silage ration, by size of enterprise and number of batches fed per year, Mississippi, 1964.

Item	No. fed per batch					
	100		300		500	
	(1 batch)	(2 batches)	(1 batch)	(2 batches)	(1 batch)	(2 batches)
	dollars					
Investment Costs:						
Depreciation:						
Lot, shelter and buildings	301	301	845	845	1,399	1,399
Feed storage	264	528	620	1,240	1,040	2,080
Feed handling equipment	93	129	194	309	385	577
Water system	138	138	170	170	235	235
Manure handling equipt.	58	70	76	140	117	175
Miscellaneous equipment	50	50	50	50	50	50
Interest ¹	479	644	1,172	1,560	1,744	2,394
Total	1,383	1,860	3,127	4,314	4,970	6,910
Operating Costs:						
Cattle	8,672	17,344	26,016	52,032	43,360	86,720
Feed	3,254	6,508	9,762	19,524	16,270	32,540
Vet. and medicine	125	250	375	750	625	1,250
Repairs	716	1,000	1,678	2,373	2,778	3,921
Electricity	11	22	26	52	58	116
Interest on operating capital ²	351	686	1,040	2,053	1,733	3,422
Total	13,129	25,810	38,897	76,784	64,824	127,969
Total specified costs	14,512	27,670	42,024	81,098	69,794	134,879
Labor ³	250	500	715	1,430	1,195	2,390
Total costs	14,762	28,170	42,739	82,528	70,989	137,269
Per head:						
With labor	148	141	142	138	142	137
Without labor	145	138	140	135	140	135

¹ 5% on average investment including land.

² 5% for one year on feed; 5% for 1/2 year on all other items making up operating costs.

³ Adopted from Johnson, R. G. and Nodland, T. R., **Labor Used in Cattle Feeding**, Bulletin 451, Minnesota Agricultural Experiment Station, St. Paul, Minnesota, March, 1960; Williams, Willard F. and McDowell, James I., **Costs and Efficiency in Commercial Dry-Lot Cattle Feeding**, processed series P-509, Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma, June, 1965.

COSTS OF FINISHING STEERS

Finishing operations considered here consist of feeding either one or two batches of heavy feeder steers to slaughter weights of 1040 pounds. A variation not considered was the finishing of one batch of steers and the conditioning of a batch of calves. Such operation would necessitate some modification in feed storage capacity.

Rations, Rates of Gain and Facilities

In the model designed for use of conventional silage the ration is similar to that used for conditioning younger animals, except that for the last 60 days of feeding silage is discontinued and the amount of corn fed per day is more than doubled, Tables 1, 7. This ration is expected to produce average daily gains of 1.75 during the 100 days of silage-corn feeding and 2.50 pounds during the period of heavy corn feeding. With such gains, and at 1964 prices, costs of the ration would run about 35 to 36 cents per animal day, or an estimated

17.49 cents per pound of gain. Facility requirements for such system are itemized in Appendix Table 3. If two lots of steers a year are to be finished, the silo capacities shown in that table must be doubled.

The high-energy silage ration for steers is the same as for calves, except that larger quantities of silage are fed daily, Tables 2, 8. At an average daily gain of 2.0 pounds, steers would need 162 days on this ration to gain 325 pounds. Feed costs per pound of gain would run slightly more than 11 cents. Facilities required for this system would be the same as for conditioning with high-energy silage, except for more silage capacity, Appendix Tables 2, 4.

On a predominantly corn ration, Table 9, steers could be expected to gain 325 pounds in 141 days, or at a rate of 2.3 pounds per day. Facilities for this ration are described in Appendix Table 5.

Table 7. Silage-corn and corn ration; Average daily requirements and costs for a 715 lb. yearling to gain 1.75 lb. per day for 100 days on silage-corn and 2.5 lbs. per day for the next 60 days on corn.

Kind of feed	(Quantity of feed Cost per day	
	pounds	cents
Silage-corn (100 days)		
Corn silage		
As silage	(39.00)	(11.31) ¹
Hay equivalent	13.00	11.31
Shelled corn	6.00	14.25
Ground limestone	0.22	0.22
Urea	0.22	1.10
Deflourinated phosphate	0.14	0.43
Mineralized salt	0.08	0.22
Vitamin A premix	+	0.20
Antibiotic	+	0.63
Total	19.66	28.36
Feed cost per lb. of gain		16.21
Corn (60 days)		
Shelled corn	16.50	39.19
Cottonseed hulls	3.74	3.74
Cottonseed meal	.51	1.78
Urea	.25	1.25
Salt	.10	.28
Deflourinated phosphate	.13	.40
Vitamin A premix	+	.20
Antibiotic	+	.63
Total	21.23	47.47
Feed cost per lb. of gain		18.99
Average feed cost per lb. of gain		17.49

Source: Adapted from Subcommittee on Beef Cattle Nutrition, **Nutrient Requirements of Domestic Animals, No. IV**, Nutrient Requirements of Beef Cattle, Revised Edition, Publication 1137, National Academy of Science, National Research Council, Washington, 1963.

¹ Due to an 8% loss in storage, 2174 pounds of silage should be produced for each ton fed. Therefore, one pound of silage at feeding time costs 0.29 cents (Appendix Table 7).

Table 8. High-energy corn silage ration: Average daily feed requirements and costs for a 715 lb. yearling to gain 325 lbs. at an average rate of 2.0 lbs. per day.¹

Kind of feed	(Quantity of feed Cost per day	
	pounds	cents
High-energy corn silage	54.00	19.98 ²
Urea	0.22	1.10
Ground limestone	0.22	0.22
Mineralized salt	0.08	0.22
Antibiotic	+	0.63
Total	54.52	22.15
Feed cost per lb. of gain		11.08

Source: Adapted from Subcommittee on Beef Cattle Nutrition, **Nutrient Requirements of Domestic Animals, No. IV**, Nutrient Requirements of Beef Cattle, Revised Edition, Publication 1137, National Academy of Science - National Research Council, Washington, 1963.

¹ Usually cut just below the ear with a conventional silage harvester of which the cutter bar with some modification can be raised 24 to 30 inches above the ground.

² Due to an 8% loss in storage, 2174 pounds of silage should be produced for each ton fed. Therefore, one pound of silage at feeding time costs 0.37 cents (Appendix Table 7).

Investment

Since the major differences in facilities for the various silage-using models are in silo capacities, cattle-finishing facilities for systems of that type would cost about the same to construct as would calf-conditioning facilities of comparable sizes. Per-head investments are estimated at \$75 to \$210, depending upon the kind of silage to be used and the number of steers to be finished annually, Tables 10, 11.

Systems designed for use of shell corn rations require no silos, and thus can be constructed at considerably less cost than can comparable silage-using systems, Table 12. Year-round operations would lower average investment to about 80 percent of the amounts shown in the table for two-batch operations, since, on the corn ration, two and one-half batches could be finished in a year.

Costs

Feeder steers going into the feed-lots were priced at \$19.82 per hundred-weight, the 5-year (1960-64) average of price quotations for standard and good feeder steers at Memphis, Appendix Table 10. That price is considerably lower than either the \$20.00 to \$23.08 costs reported earlier for conditioning feeders or the over-all average of \$20.04 that Mississippi farmers received for steers and heifers during the 1960-64 period. Yet there is ample justification for pricing the steers at average market value.

Costs of other inputs were estimated in the same manner as were costs for the conditioning phase.

In the single-batch, conventional silage system estimated costs per steer finished range from \$229 in a 100-head operation to \$219 in a 500-head enter-

Table 9. Corn ration: Average daily feed requirements and costs for a 715 lb. yearling to gain 325 lbs. at an average rate of 2.3 lbs. per day.

Kind of feed	(Quantity of feed Cost per day	
	pounds	cents
Shelled corn	16.50	39.19
Cottonseed hulls	3.74	3.74
Cottonseed meal51	1.78
Urea25	1.25
Mineralized salt10	.28
Deflourinated phosphate13	.40
Vitamin A premix	+	.20
Antibiotic	+	.63
Total	21.23	47.47
Feed cost per lb. of gain		20.64

Source: Adapted from Subcommittee on Beef Cattle Nutrition, **Nutrient Requirements of Domestic Animals, No. IV**, Nutrient Requirements of Beef Cattle, Revised Edition, Publication 1137, National Academy of Science - National Research Council, Washington, 1963.

Table 10. Investment in facilities and equipment for feeding 715 lb. yearlings to 1040 lb. slaughter cattle, 100 days on a silage-corn ration followed by 60 days on a corn ration, by size of enterprise and number of batches fed per year, Mississippi, 1964.

Item	No. fed per batch					
	100		300		500	
	(1 batch)	(2 batches)	(1 batch)	(2 batches)	(1 batch)	(2 batches)
	dollars					
Land	100	100	100	100	200	200
Lot, shelter and buildings						
Concrete lot, feed bunk and fence	2,943	2,943	8,148	8,148	13,611	13,611
Cattle shed	4,200	4,200	12,600	12,600	21,000	21,000
Feed room	384	384	384	384	384	384
Feed storage						
Shelled corn	394	394	394	394	394	394
Corn silage	4,850	9,700	9,500	19,000	13,500	27,000
Cottonseed hulls	394	394	536	536	536	536
Mixed ration	226	226	226	226	226	226
Feed handling and processing equipment						
Hammer mill, feed mixer and feed meters	1,891	1,891	1,891	1,891	1,891	1,891
Auger feeder	558	558	1,458	1,458	3,096	3,096
Screw augers	854	854	854	854	935	935
Silage blower	900	900	900	900	900	900
Water system						
Deep well, pump and 120-gal. tank ¹	1,062	1,062	1,062	1,062	1,062	1,062
3/4" pipe and waterers	326	326	658	658	1,326	1,326
Manure handling equipment						
Front-end loader	468	468	468	468	468	468
Manure spreader	700	700	700	700	700	700
Miscellaneous equipment						
Scales and shelter	600	600	600	600	600	600
Headgate and chute	200	200	200	200	200	200
Total investment	21,050	25,900	40,679	50,179	61,029	74,529
Investment/head	210	130	136	84	122	75

¹ adapted from Jacks, Barney H., and Phillips, Travis D., *Costs of Producing Hogs in Confinement*, Bulletin 628, Mississippi Agricultural Experiment Station, State College, Mississippi, October, 1961. Includes 300 feet of drilling and casing.

Table 11. Investment in facilities and equipment for feeding 715 lb. yearlings to 1040 lb. slaughter cattle, 162 days on a high-energy corn silage ration, by size of enterprise and number of batches fed per year, Mississippi, 1964.

Item	No. fed per batch					
	100		300		500	
	(1 batch)	(2 batches)	(1 batch)	(2 batches)	(1 batch)	(2 batches)
	dollars					
Land	100	100	100	100	200	200
Lot, shelter and buildings						
Concrete lot, feed bunk and fence	2,943	2,943	8,148	8,148	13,611	13,611
Cattle shed	4,200	4,200	12,600	12,600	21,000	21,000
Feed room	384	384	384	384	384	384
Feed storage						
Corn silage	7,300	14,600	19,720	39,440	28,500	57,000
Feed handling equipment						
Auger feeder	558	558	1,458	1,458	3,096	3,096
Silage blower	900	900	900	900	900	900
Water system						
Deep well, pump and 120-gal. tank ¹	1,062	1,062	1,062	1,062	1,062	1,062
3/4" pipe and waterers	326	326	658	658	1,326	1,326
Manure handling equipment						
Front-end loader	468	468	468	468	468	468
Manure spreader	700	700	700	700	700	700
Miscellaneous equipment						
Scales and shelter	600	600	600	600	600	600
Headgate and chute	200	200	200	200	200	200
Total investment	19,741	27,041	46,998	66,718	72,047	100,547
Investment/head	197	135	157	111	144	101

¹ adapted from Jacks, Barney H., and Phillips, Travis D., *Costs of Producing Hogs in Confinement*, Bulletin 628, Mississippi Agricultural Experiment Station, State College, Mississippi, October, 1961. Includes 300 feet of drilling and casing.

Table 12. Investment in facilities and equipment for feeding 715 lb. yearlings to 1040 lb. slaughter cattle, 141 days on a corn ration, by sizes of enterprise and number of batches fed per year, Mississippi, 1964.

Item	No. fed per batch					
	100		300		500	
	(1 batch)	(2 batches)	(1 batch)	(2 batches)	(1 batch)	(2 batches)
	dollars					
Land	100	100	100	100	200	200
Lot, shelter and buildings						
Concrete lot, feed bunk and fence	2,943	2,943	8,148	8,148	13,611	13,611
Cattle shed	4,200	4,200	12,600	12,600	21,000	21,000
Feed room	384	384	384	384	384	384
Feed storage						
Shelled corn	394	394	394	394	394	394
Cottonseed hulls	536	536	536	536	536	536
Mixed ration	226	226	394	394	394	394
Cottonseed meal	226	226	226	226	226	226
Feed handling and processing equipment						
Hammer mill, feed mixer and feed meters	1,891	1,891	1,891	1,891	1,891	1,891
Auger feeder	558	558	1,458	1,458	3,096	3,096
Screw augers	854	854	854	854	935	935
Water system						
Deep well, pump and 120-gal. tank ¹	1,062	1,062	1,062	1,062	1,062	1,062
3/4" pipe and waterers	326	326	658	658	1,326	1,326
Manure handling equipment						
Front-end loader	468	468	468	468	468	468
Manure spreader	700	700	700	700	700	700
Miscellaneous equipment						
Scales and shelter	600	600	600	600	600	600
Headgate and chute	200	200	200	200	200	200
Total investment	15,668	15,668	30,673	30,673	47,023	47,023
Investment/head	157	78	103	52	95	47

¹ adapted from Jacks, Barney H., and Phillips, Travis D., *Costs of Producing Hogs in Confinement*, Bulletin 628, Mississippi Agricultural Experiment Station, State College, Mississippi, October, 1961. Includes 300 feet of drilling and casing.

prise. Per hundredweight, these costs become \$22.02 and \$21.06. Feeding two batches per year would lower costs by \$9 per head in the smallest lot and by \$5 per head in the largest, Table 13.

High-energy silage systems gave the lowest average costs of the three, with costs per head in those systems running \$19 to \$23 below those in corresponding conventional silage systems, Table 14.

With corn priced at \$1.33, costs in systems using the shelled corn ration average \$26 to \$28 per head higher than those in the high-energy silage systems, Table 15. If the feeder can produce corn for less than \$1.33 per bushel, and if corn were charged to the feeding enterprise at cost of production, per-head costs in these systems might be

lowered considerably. To a lesser extent, using home-produced corn could also reduce costs in the systems using a conventional silage-corn ration.

Transportation Rates

As is the case in calf-conditioning operations, transportation costs borne by the feeder must be added to costs of finishing. Estimates of rates for feeder steers were given earlier. From the same sources, the following estimates are given: Rates on a two and one-half ton truck, hauling 8 to 10 1040 pound steers, are 30 cents per loaded mile; on a single deck trailer, with a capacity of 25 to 30 steers, 40 cents per loaded mile; and on a double-deck trailer hauling 40 to 45 steers, 60 cents per loaded mile.

Table 13. Costs of feeding 715 lb. yearlings to 1040 lb. slaughter cattle, 100 days on a silage-corn ration followed by 60 days on a corn ration, by size of enterprise and number of batches fed per year, Mississippi, 1964.

Item	No. fed per batch					
	100		300		500	
	(1 batch)	(2 batches)	(1 batch)	(2 batches)	(1 batch)	(2 batches)
Investment Costs: dollars						
Depreciation:						
Lot, shelter & buildings	301	301	845	845	1,399	1,399
Feed storage	245	439	438	818	593	1,133
Feed handling and processing equipment	273	370	403	664	659	1,001
Water system	138	138	170	170	234	234
Manure handling equip.	58	70	76	140	117	175
Miscellaneous equipment	50	50	50	50	50	50
Interest ¹	529	650	1,019	1,257	1,531	1,869
Total	1,594	2,018	3,001	3,944	4,583	5,861
Operating Costs:						
Cattle	14,171	28,342	42,513	85,026	70,855	141,710
Feed	5,684	11,368	17,052	34,104	28,420	56,840
Vet. and medicine	125	250	375	750	625	1,250
Repairs	759	997	1,568	2,081	2,437	3,143
Electricity	10	20	23	46	52	104
Interest on operating capital ²	546	1,076	1,617	3,203	2,688	5,329
Total	21,295	42,053	63,148	125,210	105,077	208,376
Total specified costs	22,889	44,071	66,149	129,154	109,660	214,237
Labor ³	268	536	820	1,640	1,340	2,680
Total costs	23,157	44,607	66,969	130,794	111,000	216,917
Per head:						
With labor	231	223	223	218	222	217
Without labor	229	220	220	215	219	214

¹ 5% on average investment including land.

² 5% for one year on silage, limestone, and urea for 100 days; 5% for ½ year on all other items making up operating costs.

³ Adapted from Johnson, R. G. and Nodland, T. R., *Labor Used In Cattle Feeding*, Bulletin 451, Minnesota Agricultural Experiment Station, St. Paul, Minnesota, March, 1960; Williams, Willard F., and McDowell, James I., *Costs and Efficiency in Commercial Dry-Lot Cattle Feeding*, processed series P-509, Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma, June, 1965.

Table 14. Costs of feeding 715 lb. yearlings to 1040 lb. slaughter cattle, 162 days on a high-energy corn silage ration, by size of enterprise and number of batches fed per year, Mississippi, 1964.

Item	No. fed per batch					
	100		300		500	
	(1 batch)	(2 batches)	(1 batch)	(2 batches)	(1 batch)	(2 batches)
Investment Costs: dollars						
Depreciation:						
Lot, shelter & buildings	301	301	845	845	1,399	1,399
Feed storage	292	584	789	1,578	1,140	2,280
Feed handling equipment	93	129	194	309	385	577
Water system	138	138	170	170	234	234
Manure handling equip.	58	70	76	140	117	175
Miscellaneous equipment	50	50	50	50	50	50
Interest ¹	496	678	1,108	1,670	1,806	2,518
Total	1,428	1,950	3,232	4,762	5,131	7,233
Operating Costs:						
Cattle	14,171	28,342	42,513	85,026	70,855	141,710
Feed	3,601	7,202	10,803	21,606	18,005	36,010
Vet. and medicine	125	250	375	750	625	1,250
Repairs	744	1,056	1,847	2,710	2,878	4,127
Electricity	10	20	23	46	52	104
Interest on operating capital ²	500	988	1,486	2,947	2,474	4,905
Total	19,151	37,858	57,047	113,085	94,889	188,106
Total specified costs	20,579	39,806	60,279	117,847	100,020	195,339
Labor ³	232	464	656	1,312	1,088	2,176
Total costs	20,811	40,272	60,935	119,159	101,108	197,515
Per head:						
With labor	208	201	203	199	202	198
Without labor	206	199	201	196	200	195

¹ 5% on average investment including land.

² 5% for one year on feed; 5% for ½ year on all other items making up operating costs.

³ Adapted from Johnson, R. G. and Nodland, T. R., *Labor Used In Cattle Feeding*, Bulletin 451, Minnesota Agricultural Experiment Station, St. Paul, Minnesota, March, 1960; Williams, Willard F., and McDowell, James I., *Costs and Efficiency in Commercial Dry-Lot Cattle Feeding*, processed series P-509, Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma, June, 1965.

Table 15. Costs of feeding 715 lb. yearlings to 1040 lb. slaughter cattle, 141 days on a corn ration, by size of enterprise and number of batches fed per year, Mississippi, 1964.

Item	No. fed per batch					
	100		300		500	
	(1 batch)	(2 batches)	(1 batch)	(2 batches)	(1 batch)	(2 batches)
	dollars					
Investment Costs:						
Depreciation						
Lot, shelter & buildings	301	301	845	845	1,399	1,399
Feed storage	69	69	78	78	78	78
Feed handling and processing equipment	236	325	354	573	592	888
Water system	138	138	170	170	234	234
Manure handling equip.	53	50	76	140	117	175
Miscellaneous equip.	50	50	50	50	50	50
Interest ¹	394	394	769	769	1,181	1,181
Total	1,246	1,347	2,342	2,625	3,651	4,005
Operating Costs:						
Cattle	14,171	28,342	42,513	85,026	70,855	141,710
Feed	6,708	13,416	20,124	40,248	33,540	67,080
Vet. and medicine	125	250	375	750	625	1,250
Repairs	562	602	1,180	1,294	1,881	2,025
Electricity	9	18	27	54	45	90
Interest on operating capital ²	540	1,065	1,600	3,174	2,663	5,286
Total	22,115	43,693	65,819	130,546	109,609	217,441
Total specified costs	23,361	45,040	68,161	133,171	113,260	221,446
Labor ³	282	564	846	1,692	1,410	2,820
Total costs	23,643	45,604	69,007	134,863	114,670	224,266
Per head:						
With labor	236	228	230	225	229	224
Without labor	234	225	227	222	227	221

¹ 5% on average investment including land.

² 5% for 1/2 year on all items making up operating costs.

³ Adapted from Johnson, R. G. and Nodland, T. R., **Labor Used In Cattle Feeding**, Bulletin 451, Minnesota Agricultural Experiment Station, St. Paul, Minnesota, March, 1960; Williams, Willard F., and McDowell, James I., **Costs and Efficiency in Commercial Dry-Lot Cattle Feeding**, processed series P-509, Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma, June, 1965.

RETURNS

A considerable degree of seasonality is associated with cattle prices. Returns, then, depend rather heavily upon the time of year feeding is begun and when cattle are sold. To show the effect of seasonality, returns at the 5-year average level of prices are compared with those computed for a period when price relationships of animals to be put on feed and animals coming out of feed-lots are normally the most favorable.

In computing these returns it is assumed that, on the average, one-half of each lot of calves conditioned would grade Good, the other half Standard, and that finished steers would be equally divided between Good and Choice grades. A death loss of 1 percent is also assumed. Since revenues are to be calculated on a per-head basis, death loss will, for simplicity, be accounted for by deducting 1 percent from the market value of the average animal conditioned or finished. Marketing

charges of \$3.75 per head are also deducted from the market value of animals sold. Neither labor nor transportation cost is deducted from returns computed below.

From Conditioning

Prices for 715-pound feeder steers averaged \$19.82 per hundredweight during 1960-64 (Appendix Table 10). At that price, revenue from conditioned calves would have averaged \$137 per head (\$19.82 x 7.15 less 1 percent and less \$3.75). Thus, at 1960-64 average cost-price relationships, conditioning calves would not, on the average, be profitable. Even without a charge for labor, losses could run as high as \$23 per head, Table 16. Were all the labor hired, losses would be as much as \$2.75 per head greater.

Were all, instead of only half, of the animals to grade Good, receipts would be \$1.26 per hundredweight, or \$9 per

head, greater. Such receipts would give a small positive return to management and labor in the high-energy silage operations. But from that return transportation costs incurred would have to be deducted.

Timing operations to catch the more favorable seasonal prices would change the picture somewhat. In Mississippi, most feeding is begun in the fall, especially if silage is to be fed. Over the 1960-64 period calf prices were lowest in November, and heavy feeder prices were highest in April (Appendix Tables 9-10). But October calf prices averaged only 17 cents higher than those of November. Thus starting calves on feed in October and marketing them in April would make the enterprise somewhat more attractive, at least for the high-energy silage feeder, Table 17. Feeding a second batch following the group sold in the Spring would be highly unprofitable, because calves would be bought at peak prices and sold at the seasonal low.

Feeders who can add approximately 300 pounds on calves by grazing may find this a more profitable way to con-

dition them. However, it should be remembered that the same resources required to condition the animal this way might be more profitably applied to producing another calf.

From Finishing

Based upon the 5-year average of prices of feeder steers and slaughter cattle, finishing appears considerably more attractive than does conditioning. Positive returns (exclusive of costs for labor and transportation) range from \$6 per head on a single batch of 100 head fed the corn ration to \$45 per head in the largest high-energy silage model (Table 18). Were all finished animals to grade Choice, receipts would run about \$8.50 per head higher. Also, feeder-produced corn could alter these returns considerably.

The average feeding period for the three systems is approximately five months. Feeder steer prices for the 1960-64 period were lowest in December but monthly averages varied only \$.09 per hundredweight during October-December (Appendix Table 10). Peak slaughter prices occurred in September;

Table 16. Net returns to labor and management per-head from conditioning 400-pound steer calves to 715-pound good and standard feeders, 1960-64 average steer calf and feeder prices.

Item	Number fed per batch					
	100		300		500	
	1 batch	2 batches	1 batch	2 batches	1 batch	2 batches
Net receipts ¹	137	137	137	137	137	137
Silage-Corn						
Costs	160	152	152	147	151	146
Loss	-23	-15	-15	-10	-14	-11
High-energy						
Costs	145	138	140	135	140	135
Loss	-8	-1	-3	2	-3	2

¹ At 19.82 percent less 1% death loss and \$3.75 marketing charge.

Table 17. Net returns to labor and management per-head from conditioning 400-pound steer calves to 715-pound good and standard feeders, 1960-64 average October prices for steer calves and April prices for feeders.

Item	Number fed in single batch		
	100	300	500
	(dollars per head)		
Net receipts ¹	145	145	145
Silage-corn			
Costs	155	147	146
Net returns	-10	-2	-1
High-energy			
Costs	140	135	134
Net returns	5	10	11

¹ At \$21.06 per hundredweight less 1% and less \$3.75 marketing charges.

however, the range from September to December was only \$.34 per hundredweight (Appendix Table 11). April slaughter prices were only \$.74 per hundredweight below the peak prices of September.

Thus, on the average, it appears that placing steers on feed in November to hit the April slaughter market would be the best timing of a finishing enterprise. Returns would average about \$6 per head higher than those based on the 5-year average of prices, Table 19.

Beginning a second batch in April to catch the peak prices of September would have the net effect of lowering returns \$9 per head below those pre-

sented in Table 19—the price of the slaughter animal would rise \$7 per head but April feeder prices are \$16 per head higher than November ones. However, by waiting until May to begin the second batch, return for the group feed through the summer would decline only \$6 below returns for the winter feeding—costs of the feeder cattle would be \$12 higher but net receipts would increase \$6.

A continuation of the conditioning cattle for finishing would not appear to be as attractive as finishing a second batch. The calf-feeder-slaughter animal price relationship would seem to favor selling calves and purchasing heavier animals for finishing.

Table 18. Net returns to labor and management per-head from finishing 715-pound feeder steers to 1040-pound choice and good slaughter steers, 1960-64 average feeder and slaughter prices.

Item	Number fed per batch					
	100		300		500	
	1 batch	2 batches	1 batch	2 batches	1 batch	2 batches
Net receipts ¹	240	240	240	240	240	240
Silage-corn						
Costs	229	220	220	215	219	214
Net returns	11	20	20	25	21	26
High-energy						
Costs	206	199	201	196	200	195
Net returns	34	41	39	44	40	45
Corn						
Costs	234	225	227	222	227	221
Net returns	6	15	13	18	13	19

¹ At \$23.72 per hundredweight less 1% and less \$3.75 marketing charges.

Table 19. Net returns to labor and management per-head from finishing 715-pound feeder steers to 1040-pound choice and good slaughter steers, 1960-64 average November feeder steer and April slaughter steer prices.

Item	Number fed in single batch		
	100	300	500
	(dollars per head)		
Net receipts ¹	239	239	239
Silage-corn			
Costs	222	213	212
Net returns	17	26	27
High-energy			
Costs	199	194	193
Net returns	40	45	46
Corn			
Costs	227	220	219
Net returns	12	19	20

¹ At \$23.62 per hundredweight less 1% and less \$3.75 marketing charges.

APPENDIX

Appendix Table 1. Feeding facilities and equipment for feeding 400 lb. calves to 715 lb. yearlings, 180 days on a silage-corn ration, by size of enterprise, Mississippi, 1964.

Item	Unit	Number fed		
		100	300	500
Land				
Feedlot and accompanying facilities	acre	1	1	2
Buildings and lots				
Cattle shed	sq. ft.	2,800	8,400	14,000
Feed room	sq. ft.	192	192	192
Concrete lot	sq. ft.	7,000	21,000	35,000
Lot fence	ft.	262	332	574
Concrete feed bunk, 5 ft. wide with 10 ft. roof	ft.	50	150	250
Feed storage facilities				
6.5 ton metal tank	no.	1	1	1
1,000 bu. metal bin	no.	1	1	1
20' x 40' silo ¹	no.	1		
26' x 60' silo ¹	no.		1	
36' x 68' silo ¹	no.			1
Feed handling and processing equipment				
Hammer mill and feed mixer	no.	1	1	1
Feed meter	no.	4	4	4
3" grain auger 20' long	no.	1	1	2
5" grain auger 21' long	no.	1	1	1
8" portable auger 30' long	no.	1	1	1
9" auger mechanical feeder	ft.	62	162	344
Silage blower	no.	1	1	1
Water system				
Deep well, pump and 120-gallon tank	no.	1	1	1
3/4" pipe	ft.	125	276	600
Automatic waterers	no.	2	4	8
Manure handling equipment				
Front-end loader	no.	1	1	1
Manure spreader	no.	1	1	1
Miscellaneous equipment				
Scales and shelter	no.	1	1	1
Headgate and chute	no.	1	1	1

¹ Silo capacity must be doubled if 2 batches are fed per year.**Appendix Table 2. Feeding facilities and equipment for feeding 400 lb. calves to 715 lb. yearlings, 180 days on a high-energy corn silage ration, by size of enterprise, Mississippi, 1964.**

Item	Unit	Number fed		
		100	300	500
Land				
Feedlot and accompanying facilities	acre	1	1	2
Buildings and lots				
Cattle shed	sq. ft.	2,800	8,400	14,000
Feed room	sq. ft.	192	192	192
Concrete lot	sq. ft.	7,000	21,000	35,000
Lot fence	ft.	262	332	574
Concrete feed bunk, 5 ft. wide with 10 ft. roof	ft.	50	150	250
Feed storage facilities				
22' x 50' silo ¹	no.	1		
36' x 63' silo ¹	no.		1	
30' x 60' silo ¹	no.			2
Feed handling equipment				
9" auger mechanical feeder	ft.	62	162	344
Silage blower	no.	1	1	1
Water system				
Deep well, pump and 120-gal. tank	no.	1	1	1
3/4" pipe	ft.	125	276	600
Automatic waterers	no.	2	4	8
Manure handling equipment				
Front-end loader	no.	1	1	1
Manure spreader	no.	1	1	1
Miscellaneous equipment				
Scales and shelter	no.	1	1	1
Headgate and chute	no.	1	1	1

¹ Silo capacity must be doubled if 2 batches are fed per year.

Appendix Table 3. Feeding facilities and equipment for feeding 715 lb. yearlings to 1040 lb. slaughter cattle, 100 days on a silage-corn ration followed by 60 days on a corn ration, by size of enterprise, Mississippi, 1964.

Item	Unit	Number fed		
		100	300	500
Land				
Feedlot and accompanying facilities	acre	1	1	2
Buildings and lots				
Cattle shed	sq. ft.	2,800	8,400	14,000
Feed room	sq. ft.	192	192	192
Concrete lot	sq. ft.	7,000	21,000	35,000
Lot fence	ft.	262	332	574
Concrete feed bunk, 5 ft. wide with 10 ft. roof	ft.	50	150	250
Feed storage facilities				
6.5 ton metal tank	no.	1	1	1
1,000 bu. metal bin	no.	2	1	1
1,560 bu. metal bin	no.		1	1
18' x 40' silo ¹	no.	1		
26' x 50' silo ¹	no.		1	
28' x 70' silo ¹	no.			1
Feed handling and processing equipment				
Hammer mill and feed mixer	no.	1	1	1
Feed meter	no.	4	4	4
3" grain auger 20' long	no.	1	1	2
5" grain auger 21' long	no.	1	1	1
8" portable auger 30' long	no.	1	1	1
9" auger mechanical feeder	ft.	62	162	344
Silager blower	no.	1	1	1
Water system				
Deep well, pump and 120-gal. tank	no.	1	1	1
3/4" pipe	ft.	125	276	600
Automatic waterers	no.	2	4	8
Manure handling equipment				
Front-end loader	no.	1	1	1
Manure spreader	no.	1	1	1
Miscellaneous equipment				
Scales and shelter	no.	1	1	1
Headgate and chute	no.	1	1	1

¹ Silo capacity must be doubled if 2 batches are fed per year.

Appendix Table 4. Feeding facilities and equipment for feeding 715 lb. yearlings to 1040 lb. slaughter cattle, 162 days on a high-energy corn-silage ration, by size of enterprise, Mississippi, 1964.

Item	Unit	Number fed		
		100	300	500
Land				
Feedlot and accompanying facilities	acre	1	1	2
Buildings and lots				
Cattle shed	sq. ft.	2,800	8,400	14,000
Feed room	sq. ft.	192	192	192
Concrete lot	sq. ft.	7,000	21,000	35,000
Lot fence	ft.	262	332	574
Concrete feed bunk, 5 ft. wide with 10 ft. roof	ft.	50	150	250
Feed storage facilities				
26' x 40' silo ¹	no.	1		
36' x 68' silo ¹	no.		1	
16' x 40' silo ¹	no.		1	
36' x 68' silo ¹	no.			1
30' x 60' silo ¹	no.			1
Feed handling equipment				
9" auger mechanical feeder	ft.	62	162	344
Silage blower	no.	1	1	1
Water system				
Deep well, pump and 120-gal. tank	no.	1	1	1
3/4" pipe	ft.	125	276	600
Automatic waterers	no.	2	4	8
Manure handling equipment				
Front-end loader	no.	1	1	1
Manure spreader	no.	1	1	1
Miscellaneous equipment				
Scales and shelter	no.	1	1	1
Headgate and chute	no.	1	1	1

¹ Silo capacity must be doubled if 2 batches are fed per year.

Appendix Table 5. Feeding facilities and equipment for feeding 715 lb. yearlings to 1040 lb. slaughter cattle, 141 days on a corn ration, by size of enterprise, Mississippi, 1964.

Item	Unit	Number fed		
		100	300	500
Land				
Feedlot and accompanying facilities	acre	1	1	2
Buildings and lots				
Cattle shed	sq. ft.	2,800	8,400	14,000
Feed room	sq. ft.	192	192	192
Concrete lot	sq. ft.	7,000	21,000	35,000
Lot fence	ft.	262	332	574
Concrete feed bunk, 5 ft. wide with 10 ft. roof	ft.	50	150	250
Feed storage facilities				
6.5 ton metal tank	no.	2	1	1
1,000 bu metal bin	no.	1	2	2
1,560 bu. metal bin	no.	1	1	1
Feed handling and processing equipment				
Hammer mill and feed mixer	no.	1	1	1
Feed meter	no.	4	4	4
3" grain auger 20' long	no.	1	1	2
5" grain auger 21' long	no.	1	1	1
8" portable auger 30' long	no.	1	1	1
9" auger mechanical feeder	ft.	62	162	344
Water system				
Deep well, pump and 120-gal. tank	no.	1	1	1
3/4" pipe	ft.	125	276	600
Automatic waterers	no.	2	4	8
Manure handling equipment				
Front-end loader	no.	1	1	1
Manure spreader	no.	1	1	1
Miscellaneous equipment				
Scales and shelter	no.	1	1	1
Headgate and chute	no.	1	1	1

Appendix Table 6. Prices of input items, Mississippi.¹

Item	Unit	Cost per unit
Feed ingredients		
Yellow corn (No. 2 grade)	bu.	\$ 1.33
Cottonseed meal (41% protein)	ton	70.00
Cottonseed hulls	ton	20.00
Deflourinated rock phosphate	cwt.	62.00
Mineralized salt	cwt.	2.75
Vitamin A premix	lb.	1.50
Corn silage²		
Conventional	ton	5.41
High-energy	ton	6.76
Urea	ton	100.00
Pure antibiotic	lb.	23.00
Ground limestone	cwt.	1.00
Stilbestrol	implant	.125
Land	acre	100.00
Lot		
Concrete in lot	sq. ft.	.30
Lot fence	ft.	1.50
Concrete feed bunk, 5 ft. wide for mechanical feeder	ft.	5.50
Roof for feed bunk, 10 ft. wide	ft.	3.50
Buildings		
Cattle shed	sq. ft.	1.50
Feed room	sq. ft.	2.00
Feed storage facilities		
6.5 ton metal tank	each	226.00
1,000 bushel metal bin	each	394.00
1,560 bushel metal bin	each	536.00
16' x 40' silo	each	4,220.00
18' x 40' silo	each	4,850.00
20' x 40' silo	each	5,450.00
22' x 50' silo	each	6,600.00
26' x 40' silo	each	7,300.00
26' x 50' silo	each	9,500.00
26' x 60' silo	each	11,000.00
28' x 70' silo	each	13,500.00
30' x 60' silo	each	13,000.00
36' x 68' silo	each	15,500.00
Feed conveying and distributing equipment		
3" grain auger, 20 ft. long	each	81.20
5" grain auger, 21 ft. long	each	172.52
8" portable auger, 30 ft. long	each	600.00
9" auger feeder	ft.	9.00
Silage blower	each	900.00
Feed processing equipment		
10" hammer mill	each	1,096.69
Feed mixer	each	593.55
Feed meter	each	50.00
Waterers, automatic	each	150.00
Deep-well water system		
Drilling and 4" casing	ft.	1.99
3/4" pipe	ft.	.21
1 H. P. pump equipped with 120-gallon tank	each	465.23
Each	each	600.00
Scales and shelter	each	200.00
Loading chute and headgate	each	468.00
Front-end loader	each	700.00
Manure spreader	each	700.00
Labor	hr.	1.25

¹ Corn and cottonseed meal prices are simple monthly averages of Market News Service prices at Jackson, 1960-64. Other feed ingredients prices obtained from feed mill operators represent prices during the same period. Other prices obtained from farm catalogs, equipment dealers, and other studies are representative of 1964.

² See Appendix Table 7 for costs.

Appendix Table 7. Corn for silage: Estimate of production and harvesting costs per acre, Mississippi, 1964.¹

Item	Unit	Quantity	Price	Amount
			(dol.)	(dol.)
Seed	bu.	0.3	12.00	3.60
Fertilizer				
20% Superphosphate	cwt.	2.5	1.75	4.38
60% Muriate of Potash	cwt.	1.5	2.75	4.12
Ammonium Nitrate	cwt.	4.0	3.80	15.20
Lime (custom spread) ²	ton	0.2	8.00	1.60
Herbicide	lb.	1.2	2.90	3.48
Tractor operation	acre	1.0	14.95	14.95
Equipment operation	acre	1.0	10.49	10.49
Labor	hr.	8.35	1.00	8.35
Interest on land ³				15.00
Total cost per acre				81.17
Total cost per ton				
Conventional				5.41
High-energy				6.76

Source: Adapted from McReynolds, John T. and Hamill, James G., **Budgets for Forage Crops in the Brown Loam Area of Mississippi**, Mississippi Agricultural Experiment Station AEc. M. R. No. 46, August, 1965.

¹ This budget is based upon using good, deep, well-drained soils with an expected yield of 15 tons per acre of conventional silage. This same land and cultural practices were expected to yield the equivalent of at least 80 bushels of corn or 12 tons of high-energy silage. The latter is reduced 20 percent to allow for less stalk and a lower moisture content.

² One ton pro-rated over 5 years.

³ Interest charged at 5 percent on land valued at \$300 per acre.

Appendix Table 8. Years of expected life and depreciation rates of facilities.¹

Item	Years of expected life	Annual depreciation rate
	number	percent
Lot and buildings	25	4
Silos	25	4
Metal bins	20	5
Augers	10	10
Feed processing equipment and waterers	10	10
Deep well, pump and tank	10	10
Water pipe	15	6.67
Scales and shelter	20	5
Headgate and chute	10	10
Front-end loader	10	10
Manure spreader	10	10
Silage blower	12	8.33

¹ Where the same item of feed processing and handling equipment and manure handling equipment was used for all sizes of enterprises, the depreciation rates were based upon the amount of use.

Appendix Table 9. Steer calf prices: Monthly prices for 400 lb. calves, Memphis, 1960-64.¹

Month	1964	1963	1962	1961	1960	5-year average
	(dollars per hundredweight)					
January	21.61	23.96	22.65	20.66	22.10	22.20
February	21.93	23.90	23.71	21.26	23.08	22.78
March	22.71	24.30	24.54	23.12	24.08	23.75
April	20.66	25.13	25.22	22.88	23.96	23.57
May	18.89	23.87	23.61	22.67	24.56	22.72
June	17.95	23.36	23.37	20.64	22.52	21.57
July	16.83	23.78	23.22	19.90	21.52	21.05
August	16.56	23.34	23.19	21.64	19.71	20.89
September	17.00	22.52	23.77	21.10	19.64	20.81
October	16.79	21.41	24.02	20.18	19.25	20.33
November	16.79	20.63	23.64	21.60	18.16	20.16
December	15.71	20.16	24.56	21.72	19.58	20.35
Annual Average	18.62	23.03	23.79	21.45	21.51	21.68

Source: **Market News Service**, Memphis.

¹ Prices for 1962-64 are an average for choice, good, and standard grades. Quoted prices for 1960 and 1961 were for choice and good combined and for common and medium combined; therefore, the above 1960 and 1961 prices are an average of these two sets of prices. These prices were used because they are near the level of prices received for calves in Mississippi.

Appendix Table 10. Feeder steer prices: Monthly prices for 715 lb. good and standard grades of steers, Memphis, 1960-64.¹

Month	1964	1963	1962	1961	1960	5-year average
(dollars per hundredweight)						
January	18.41	21.92	19.74	20.03	20.85	20.19
February	18.82	20.85	20.24	19.64	22.10	20.33
March	19.10	21.18	20.88	20.92	23.05	21.03
April	18.06	21.76	21.58	20.65	23.25	21.06
May	16.56	20.96	21.02	20.94	23.28	20.55
June	16.24	20.63	20.50	19.58	22.20	19.83
July	15.70	21.34	20.74	19.52	21.14	19.69
August	15.84	20.13	20.88	20.72	18.71	19.26
September	15.94	20.19	21.76	20.04	18.55	19.22
October	15.68	19.23	21.98	19.74	17.75	18.89
November	15.44	18.50	22.00	20.34	17.89	18.83
December	14.82	17.50	22.38	20.70	18.92	18.80
Annual average	16.72	20.42	21.10	20.22	20.64	19.82

Source: Market News Service, Memphis.

¹These prices were used because they are near the level of prices received for steers and heifers in Mississippi. Marketing charges were estimated to average \$.53 per hundredweight.

Appendix Table 11. Slaughter steer prices: Monthly prices for 1040 lb. choice and good grade steers, Memphis, 1960-64.¹

Month	1964	1963	1962	1961	1960	5-year average
(dollars per hundredweight)						
January	21.78	25.66	24.54	25.07	24.04	22.02
February	21.23	23.82	24.08	24.41	24.71	23.60
March	21.14	22.44	24.83	23.71	25.53	23.53
April	20.59	22.74	25.14	23.58	26.06	23.62
May	19.68	22.12	24.68	22.58	25.65	22.94
June	19.86	22.18	24.46	21.88	24.95	22.67
July	21.52	23.82	24.48	22.09	24.79	23.34
August	23.08	23.83	25.18	23.32	24.07	23.90
September	23.68	23.62	27.39	23.42	23.70	24.36
October	23.26	23.47	26.90	23.44	24.16	24.25
November	22.69	23.09	27.03	24.03	23.90	24.15
December	22.12	21.70	26.70	25.01	24.58	24.02
Annual average	21.72	23.21	25.45	23.54	24.68	23.72

Source: Market News Service, Memphis.

¹Marketing charges were estimated to average \$.36 per hundredweight.