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# Fattening Good and Common Grade Steers in Southeastern Coastal Plains<sup>1</sup>

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## INTRODUCTION

Beef cattle production in the southeastern Coastal Plains has been stimulated in recent years through the development of improved pastures and through increased feed supplies made possible by replacing some of the cotton areas with feed crops, such as corn, cowpeas, peanuts, and velvetbeans. By improved forest-range management practices, cattle and crop production has been correlated with timber production, resulting in increased returns to the operators. As the environment has improved so has the general quality of the cattle. Although the bulk of beef produced in the area has been from grass alone, yet there has been an increasing trend toward the production of beef with more finish than that commonly found in strictly grass-fed beef in the southeastern area. In this part of the country, in normal times, there are available for cattle feeding a variety of legume hays, such as peanut, lespedeza, soybean, kudzu, cowpea, and others; silage crops, such as corn, soybean, and cane; and other products, such as cottonseed hulls and meal and peanut meal, which can be used advantageously in the production of beef.

Farmers on diversified farms are making use of the results obtained at experiment stations in the region in which cattle have been fattened on locally produced feeds and are finding a good market for their feed crops in the form of beef. Experiments at the Georgia Coastal Plain

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Experiment Station, 1934 to 1938, inclusive,<sup>3</sup> showed that velvetbeans fed in the pod, cottonseed meal, and peanut meal—all high-protein feeds produced in the area—can be used satisfactorily with snapped corn and peanut straw (commonly called peanut hay), which are also locally grown in the production of beef. Later experiments at this same station<sup>4</sup> showed that blackstrap molasses, which is usually available in the area in normal times, can be fed satisfactorily with a combination of snapped corn, velvetbeans, and peanut straw. A corn-molasses mixture in the ratio of 1:1 was about 80 percent as efficient in the production of steer gains as corn by itself, whereas a mixture of 3 parts of corn to 1 part of molasses was 90 percent as efficient.

Creep feeding of calves on farms where beef cattle herds having native cows as a base are being graded up by the use of purebred beef bulls, makes it possible to increase the net returns from calf production. Experiments conducted at the Georgia Coastal Plain Experiment Station in 1942 and 1943<sup>5</sup> showed that calves consuming daily about 4 pounds of concentrates consisting of 6 parts by weight of ground snapped corn and 1 part of peanut meal brought nearly \$7 higher average net return per calf for the 2-year period than calves not creep-fed.

In studies conducted from 1936 to 1939, inclusive, the Georgia Agricultural Experiment Station<sup>6</sup> at Experiment, Ga., found that peanut meal and cottonseed meal were of about equal value in steer-fattening rations when fed in conjunction with corn, peanut hay, and corn-sorghum silage. When a mixture of equal parts of cottonseed meal and peanut meal was fed in the same quantity as of either meal alone, and other feeds were kept constant, the steer gains were almost identical. Other experiments conducted at this station during a 4-year period, 1937-38 to 1940-41,<sup>6</sup> showed that corn-soybean silage, cottonseed hulls, and peanut hay, either ground or unground, were satisfactory roughages in corn and cottonseed-meal rations for fattening steers. The groups fed peanut hay made the greatest gains, followed by those fed silage and cottonseed hulls, respectively.

As native and native-grade cattle still predominate in many localities of the area and accordingly yield a considerable proportion of the beef produced, the experiments reported in this bulletin were designed to compare these low-grade cattle with high-grade beef-bred types in their ability to fatten under dry-lot feeding conditions. The experiments were conducted for a 3-year period at Tifton, Ga., in cooperation with the Georgia Coastal Plain Experiment Station.

### EXPERIMENTAL PROCEDURE

In November of each year, 30 Common grade steers representing the native and native-grade cattle and 30 Good grade beef-bred steers were selected. They were approximately 2 years old when placed on experiment. The Common steers were produced in southern Georgia and northern Florida. A large proportion of the Good steers were

<sup>3</sup> McCOMAS, E. W., DOUGLAS, J. R., and SOUTHWELL, B. L. VELVETBEANS, COTTONSEED MEAL, AND PEANUT MEAL AS PROTEIN FEEDS FOR FATTENING STEERS IN THE COASTAL PLAIN AREA. U. S. Dept. Agr. Tech. Bull. 831, 12 pp., illus. 1942.

<sup>4</sup> McCOMAS, E. W., DOUGLAS, J. R., and SOUTHWELL, B. L. CORN-MOLASSES MIXTURES COMPARED WITH CORN FOR FATTENING BEEF CATTLE IN THE COASTAL PLAIN AREA. U. S. Dept. Agr. Tech. Bul. 864, 10 pp., illus. 1943.

<sup>5</sup> GEORGIA COASTAL PLAIN EXPERIMENT STATION. TWENTY-FOURTH ANNUAL REPORT. Ga. Coastal Plain Expt. Sta. Bul. 40, 112 pp., illus. 1944. (See pp. 70-71.)

<sup>6</sup> MASSEY, Z. A. BEEF CATTLE FEEDING INVESTIGATIONS. Ga. Expt. Sta. Bul. 211, 19 pp., illus. 1941.

produced at the Georgia Coastal Plain Experiment Station; the remainder, in Texas. During the 3-year period the Common feeder steers averaged about 550 pounds in weight and the Good feeder steers about 620 pounds, at the beginning of the experiments.

The animals were fed ground snapped corn and 36-percent cottonseed meal in a ratio of 6 parts by weight of corn to 1 part of cottonseed meal. Peanut straw was fed unground in a separate trough. The steers were fed once a day during the first test and twice daily during the last 2 tests. In the first 2 experiments the 30 Good steers were fed as 1 group for the first 84 days, as were the 30 Common cattle, at the end of which time one-half of the steers of each group were selected at random and slaughtered. The remaining 30 head were carried 56 days longer, or a total of 140 days. In the last experiment the cattle were divided at the outset into 4 groups, 2 representing the Good grade and 2 the Common grade. One group of each grade was marketed at the end of 84 days' feeding, and the remaining 2 groups were carried for 140 days.

Experimental feeding was begun with a small quantity of the concentrate mixture and a full feed of hay, and the concentrates were gradually increased until full feeding was reached in about 20 days. The Good and Common steer groups were fed essentially the same amounts of concentrates per 100 pounds of live weight, based on the weights of the steers at the beginning of the test. For the two groups fed for 140 days, feed adjustments based on live weight at the end of the first 84 days were made at this time. Each group was fed in an open lot approximately  $1\frac{1}{2}$  acres in size. Water and a mineral mixture were always available. The latter was composed of equal parts of common salt, finely ground steamed bonemeal, and ground limestone. At the end of the fattening periods the cattle were slaughtered and the usual slaughter and marketing data were obtained. Carcass grades were obtained after the carcasses had chilled about 24 hours. The significance of differences between groups was determined by the method of Snedecor.<sup>7</sup>

## RESULTS OF EXPERIMENTS

### 1938-39. EXPERIMENT

The average gains, rations, feed consumption, and marketing data for the steers in the first experiment are given in table 1. The average weights of the steers at the end of each 28-day period are shown graphically in figure 1.

<sup>7</sup> SNEDECOR, G. W. STATISTICAL METHODS APPLIED TO EXPERIMENTS IN AGRICULTURE AND BIOLOGY. Ed. 3, 422 pp., illus. Ames, Iowa. 1940.

TABLE 1.—Summary of results of the first experiment 1938-39

Item	Cattle fed 84 days (Nov. 18, 1938, to Feb. 10, 1939)		Cattle fed 140 days (Nov. 18, 1938, to April 7, 1939)	
	Group 1 <sup>1</sup>	Group 2 <sup>2</sup>	Group 1a <sup>1</sup>	Group 2a <sup>2</sup>
Grade of cattle.....	Good	Common	Good	Common
Steers..... number.....	15	15	15	15
Average initial weight per steer..... pounds.....	583	530	615	515
Average final weight per steer..... do.....	798	706	968	797
Average gain per steer..... do.....	215	176	353	282
Average daily gain per steer..... do.....	2.56	2.10	2.52	2.01
Average daily feed per steer: <sup>3</sup>				
Ground snapped corn..... do.....	16.57	15.20	19.32	15.91
Cottonseed meal..... do.....	2.76	2.54	3.22	2.65
Peanut straw..... do.....	3.38	3.14	2.72	2.28
Average feed consumption per steer: <sup>3</sup>				
Ground snapped corn..... do.....	1,302	1,277	2,705	2,227
Cottonseed meal..... do.....	24	213	451	371
Peanut straw..... do.....	282	264	381	319
Feed consumed per 100 pounds' gain: <sup>3</sup>				
Ground snapped corn..... do.....	647.4	725.6	766.3	789.7
Cottonseed meal..... do.....	107.9	121.0	127.8	131.6
Peanut straw..... do.....	132.1	150.0	107.9	113.1
Cost of feed per 100 pounds' gain <sup>4</sup> ..... dollars.....	7.15	8.02	8.24	8.50
Value of feed per steer..... do.....	15.37	14.12	29.10	23.98
Feeder cost per 100 pounds..... do.....	8.10	6.05	8.10	6.05
Feeder cost per steer..... do.....	47.22	32.06	49.82	31.16
Total steer and feed cost..... do.....	62.59	46.18	78.92	55.14
Sales weight per steer..... pounds.....	776	693	958	777
Sales price per 100 pounds..... dollars.....	8.75	8.30	10.00	8.60
Gross return per steer..... do.....	67.90	57.52	95.80	66.82
Net return per steer <sup>5</sup> ..... do.....	5.31	11.34	14.88	11.68
Carcass grade <sup>6</sup> ..... score.....	20.80	21.73	15.07	19.47
Dressing percentage <sup>7</sup> ..... percent.....	55.67	56.54	59.03	58.70

<sup>1</sup> Groups 1 and 1a fed as one group for first 84 days.

<sup>2</sup> Groups 2 and 2a fed as one group for first 84 days.

<sup>3</sup> Feed adjusted at end of 84 days on basis of steer weights at that time.

<sup>4</sup> Ground snapped corn, \$0.65 per bushel (80 pounds); cottonseed meal, \$24 per ton; peanut straw, \$9 per ton.

<sup>5</sup> Gross return less steer and feed costs.

<sup>6</sup> Grade scores: Choice, 8-12, inclusive; Good, 14-18, inclusive; Commercial, 20-24, inclusive; Utility, 26-30, inclusive; Cutter, 32-36, inclusive; and Canner, 38-42, inclusive.

<sup>7</sup> Based on sales weight and cold-carcass weight.

Of the two groups fed 84 days, the Good steers (group 1) weighed 53 pounds more on the average than the Common steers (group 2) at the beginning of the test, and 92 pounds more at the end, which represented 39 pounds more gain for the fattening period. This difference in gain was significant ( $p < 0.05$ ). Figure 1 shows that the Common steers made more consistent gains than the Good steers throughout the 84 days, but after the first 28 days on feed the difference in gains became progressively more marked in favor of the higher grade steers. This result indicates that low-grade cattle of the age and weight used do not respond so well to long feeding periods as do higher grade cattle. As the two groups were fed approximately the same quantities of feed per unit of live weight, the better grade steers were accordingly more economical in their use of feed. This fact is reflected in their lower feed consumption per 100 pounds of gain; for instance, the Good steers required only about 89 percent as much of the concentrates as did the Common steers. Other feeds were in essentially the same relationship. There were indications that the Good steers would have consumed more feed, particularly during the first 84 days, but since the Common steers would consume no more than that fed, it was necessary to limit the amount given to the former group. Had the Good steers been full-fed, they probably would have made a higher and more economical gain.

The gains of the Common steers cost \$0.87 per 100 pounds more than those of the Good steers, but their total feed cost was \$1.25 less per head. The former group returned \$6.03 more per head above steer and feed costs than the latter. The greater return by the Common steers was due to their greater margin between slaughter and feeder prices. These cattle had a margin of \$2.25 per 100 pounds, whereas the Good steers had only \$0.65. There was no significant difference in carcass grade between these two groups, as both graded from average to high Commercial. The Common steers had a slight

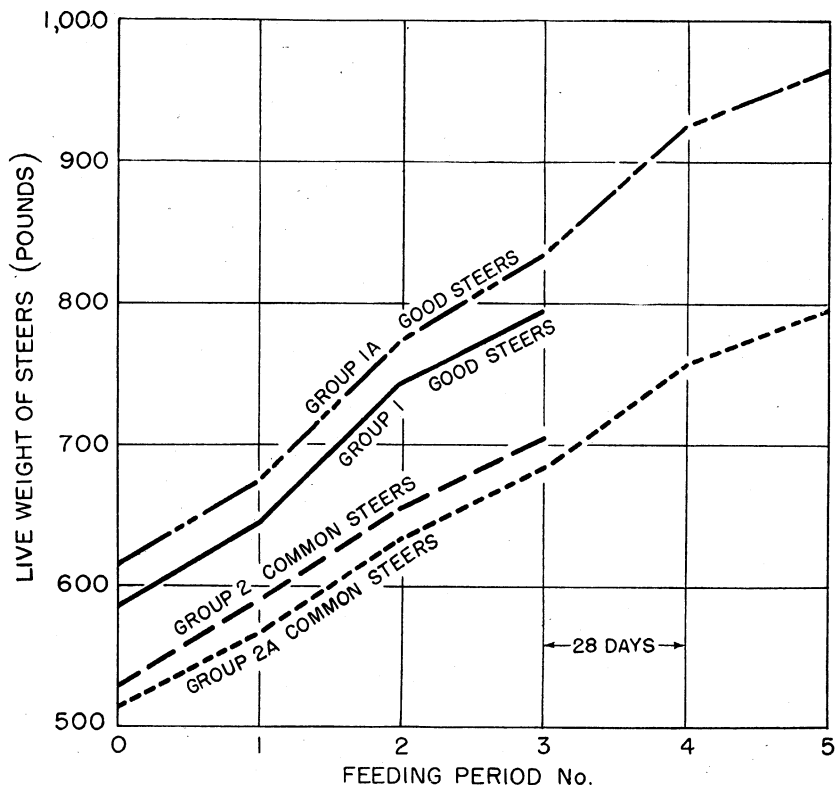


FIGURE 1.—Average live weights of steers by feeding periods during the 1938-39 experiment.

advantage in dressing percentage, but this difference was not statistically significant.

A comparison of the two grades of steers for the 140-day fattening period shows that the Good steers (group 1a) made 71 pounds more gain per head on the average than the Common steers (group 2a). This difference represents more than one-half pound greater daily gain per head, which is statistically highly significant ( $p < 0.01$ ). Figure 1 shows the gains of these groups to be rather constant through the experiment, with a slight trend toward greater differences in gains between the two groups as the fattening period progressed, the Good steers having the advantage. This group consumed only 97 percent

as much of the concentrates and 95 percent as much peanut straw, per 100 pounds of gain, as did the Common steers, but the consumption was essentially the same per 100 pounds of live weight. Like those fattened only 84 days, the higher grade steers made more economical gains than those of the lower grade. The former required about 3 percent less feed, and had a correspondingly lower feed cost, per 100 pounds of gain. The Good steers had a margin of \$1.90 per 100 pounds between slaughter and feeder prices, whereas the Common steers had a margin of \$2.55. The greater gains of the higher grade steers, together with higher sales value, were sufficient to result in a

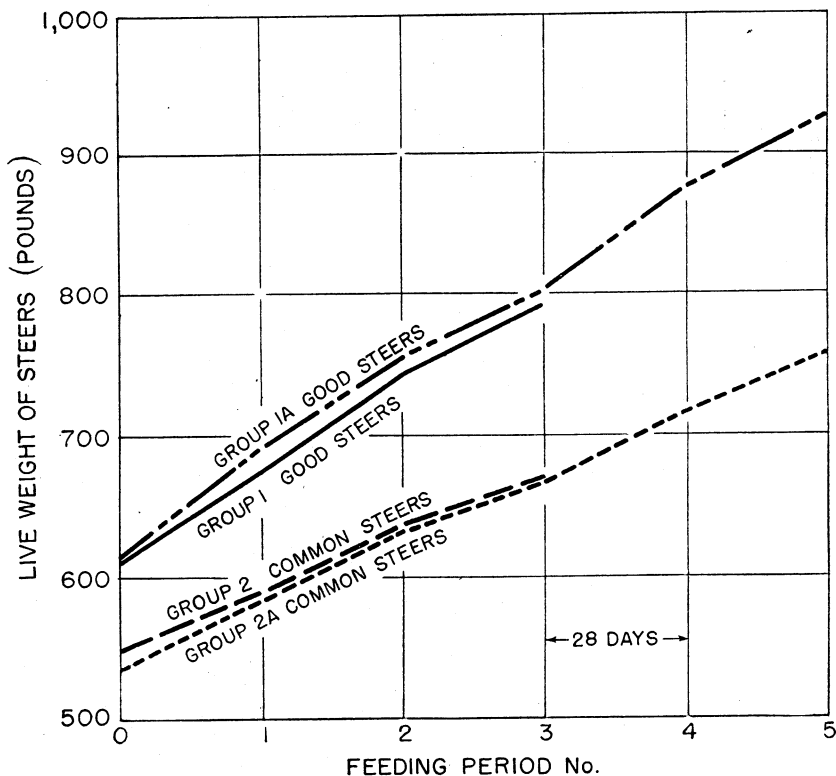


FIGURE 2.—Average live weights of steers by feeding periods during the 1939-40 experiment.

net return of \$3.20 more per steer than that of the Common steers. In carcass grade the Good steers approached high Good, whereas the Common steers were top Commercial, or nearly one full grade lower. This difference was highly significant. In dressing percentage there was only 0.33 percent difference in the average for the two groups, in favor of the Good steers. This difference was not significant.

A comparison of the cattle fed 140 days with the corresponding groups marketed at the end of 84 days' feeding shows only a slight decrease in rate of gain after 84 days' feeding. The Common steers made a slightly lower rate of gain for the last 56 days than did those of the higher grade. It was evident that the Good steers made a

greater improvement in finish than the Common steers during the last 56-day period, as their sales price increased \$1.25 per 100 pounds, as compared with only \$0.30 for the Common steers. Feeding 56 days beyond the 84-day period increased the net return of the Good steers by \$9.57 per head as compared with only \$0.34 for the Common steers. The carcasses of the Good steers were essentially one full grade higher at the end of 140 days than at the end of 84 days, whereas those of the Common steers advanced only about one-third of a grade.

In rate and economy of gains, carcass grade, and dressing percentage, the results of this year's test indicate that the higher grade steer will have an advantage over the lower grade for either an 84- or 140-day fattening period. However, since the prices of Common feeder steers usually are lower than those of the Good grade, the former make greater returns when fattened for a comparatively short period than for a longer period.

## 1939-40 EXPERIMENT

The average gains, rations, feed consumption, and marketing data for the steers in the second experiment are given in table 2. The average weights of the steers at the end of each 28-day period are shown graphically in figure 2.

TABLE 2.—*Summary of results of the second experiment 1939-40*

Item	Cattle fed 84 days (Nov. 1, 1939, to Jan. 24, 1940)		Cattle fed 140 days (Nov. 1, 1939, to (March 20, 1940)	
	Group 1 <sup>1</sup>	Group 2 <sup>2</sup>	Group 1a <sup>1</sup>	Group 2a <sup>2</sup>
Grade of cattle.....	Good	Common	Good	Common
Steers..... number.....	15	15	15	15
Average initial weight per steer..... pounds.....	610	550	612	538
Average final weight per steer..... do.....	792	671	926	759
Average gain per steer..... do.....	182	121	314	221
Average daily gain per steer..... do.....	2.17	1.44	2.24	1.58
Average daily feed per steer: <sup>3</sup>				
Ground snapped corn..... do.....	16.43	14.56	17.77	14.86
Cottonseed meal..... do.....	2.74	2.43	2.96	2.48
Peanut straw..... do.....	2.48	2.15	1.91	1.61
Average feed consumption per steer: <sup>3</sup>				
Ground snapped corn..... do.....	1,380	1,223	2,488	2,081
Cottonseed meal..... do.....	230	204	415	347
Peanut straw..... do.....	208	181	267	225
Feed consumed per 100 pounds' gain: <sup>3</sup>				
Ground snapped corn..... do.....	758.2	1,010.7	792.4	941.6
Cottonseed meal..... do.....	126.4	168.6	132.4	157.0
Peanut straw..... do.....	114.3	149.6	85.0	101.8
Cost of feed per 100 pounds' gain <sup>4</sup> ..... dollars.....	9.39	12.51	9.66	11.48
Value of feed per steer..... do.....	17.09	15.14	30.36	25.38
Feeder cost per 100 pounds..... do.....	8.50	6.00	8.50	6.00
Feeder cost per steer..... do.....	51.85	33.00	52.02	32.28
Total steer and feed cost..... do.....	68.94	48.14	82.34	57.66
Sales weight per steer..... pounds.....	771	657	894	730
Sales price per 100 pounds..... dollars.....	8.65	7.10	10.25	8.00
Gross return per steer..... do.....	66.69	46.65	91.64	58.40
Net return per steer <sup>5</sup> ..... do.....	-2.25	-1.49	9.28	0.74
Carcass grade <sup>6</sup> ..... score.....	16.93	27.47	14.40	22.40
Dressing percentage <sup>7</sup> ..... percent.....	56.96	55.03	59.95	57.84

<sup>1</sup> See footnote 1, table 1.<sup>2</sup> See footnote 2, table 1.<sup>3</sup> See footnote 3, table 1.<sup>4</sup> Ground snapped corn, \$0.75 per bushel (80 pounds); cottonseed meal, \$28 per ton; peanut straw, \$9 per ton.<sup>5</sup> See footnote 5, table 1.<sup>6</sup> See footnote 6, table 1.<sup>7</sup> See footnote 7, table 1.

Of the two groups fed for 84 days, the Good steers (group 1) weighed 60 pounds more per head than those of the Common grade (group 2) at the beginning of the test and 121 pounds more at the end. Their gain, therefore, was greater by 61 pounds, which was highly significant ( $p < 0.01$ ). The gain by each group was rather consistent throughout the entire period, but the difference between the two groups widened slightly as the fattening period progressed, the Good steers making the larger gain (fig. 2). As in the previous year, both groups were fed about the same quantities of feed per unit of weight. However, in the 1939-40 experiment, the Good steers were full-fed, whereas the Common steers would have consumed more feed if they had been given the opportunity. This condition was the reverse of that for the previous year. The Good steers were more efficient than those of the Common grade in their use of feed, as they produced 100 pounds of gain with approximately 76 percent as much of the concentrates and peanut straw. However, they made greater financial losses than the Common steers, owing to rather unfavorable market conditions. The Good steers sold for only \$0.15 per 100 pounds more than they cost as feeders, as compared with \$1.10 for the Common steers. The former graded average Good in carcass as compared with average Utility for the latter steers. This difference of two full grades was highly significant. The higher finish of the Good steers was also reflected in a higher dressing percentage. The difference was significant ( $p < 0.05$ ).

Of the two groups fed for 140 days, the higher grade steers (group 1a) gained 93 pounds more than those of the lower grade (group 2a), which difference was highly significant ( $p < 0.01$ ). The Good steers were again more efficient, as they consumed only 84 percent as much of the concentrates and 83 percent as much peanut straw per 100 pounds of gain as the Common steers and as a result had \$1.82 lower feed cost. The Good steers sold for \$1.75 more than their feeder cost, whereas the Common steers sold for \$2 more. The former, however, sold for \$2.25 per 100 pounds more than those of the lower grade. The higher selling price and lower cost of gains, together with the greater gains, of the higher grade steers were sufficient to offset the greater margin between selling price and feeder costs of the steers of lower grade. The Good steers returned \$8.54 more per head than the other group, after steer and feed costs were deducted. The carcasses of the former graded high Good as compared with average Commercial for the latter. This difference of  $1\frac{1}{2}$  grades was highly significant. The fact that the Good steers dressed more than 2 percent higher than the Common steers also reflected their higher condition or finish. This difference was statistically significant.

In comparing the performance of the steers of each grade for the 140-day and 84-day periods, table 2 and figure 2 show that the rate of gain was slightly greater for the longer fattening period in each instance. In this year both the Good and Common steers made greater net returns for the longer period of feeding, but the higher grade cattle had a considerable advantage over the lower grade. The sales price of the Good cattle at the end of 140 days was \$1.60 per 100 pounds more than at the end of 84 days' feeding, whereas for the Common steers the increase was only \$0.90 per 100 pounds. The Good steers improved about one-half a grade in carcass quality and dressed 3 percent higher by the additional 56 days of feeding, whereas



the Common steers advanced about one grade in carcass quality and 2.81 percent in dressing percentage. The lower grade cattle made slightly greater improvement by the additional 56 days' feeding than those of the preceding test.

1940-41 EXPERIMENT

The average gains, rations, feed consumption, and marketing data for the steers in the third experiment are given in table 3. For the

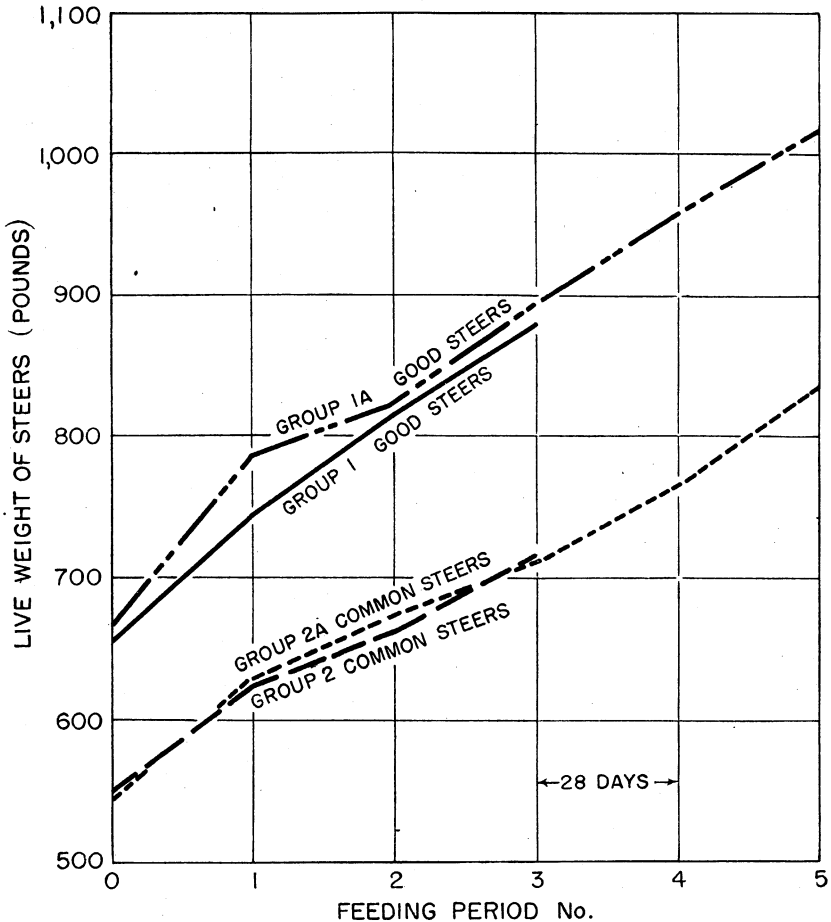


FIGURE 3.—Average live weights of steers by feeding periods during the 1940-41 experiment.

84 days' fattening test the Good steers (group 1) gained 56 pounds more per head than the Common steers (group 2). This difference in gains was similar to that during the second experiment and was highly significant ( $p < 0.01$ ).

The average weights of the steers at the end of each 28 days are shown graphically in figure 3. As in previous years, there was a slight tendency for the differences in gains between Good and Common

steers to become greater as the fattening period advanced. The gains were slightly more rapid for all groups during the first period, however. Although the steers in each group were fed the same quan-



FIGURE 4.—The better grade steers at the end of 140 days' feeding in the 1940-41 experiment.

titles of feed per 100 pounds' live weight, during the 84-day test the Good steers were somewhat more economical in their production of gains and produced them at lower costs than the steers of Common



FIGURE 5.—The lower grade steers at the end of 140 days' feeding in the 1940-41 experiment.

grade. The Good steers consumed only 94 percent as much of the concentrates and about 93 percent as much peanut straw per 100 pounds' gain as the other group. These results were in agreement with those of the previous 2 years. In the feeding period of 140 days,

the Common steers were superior in these respects, which result was contrary to those of the 2 preceding years. In the 140-day period of 1940-41, the Common steers required only 96 percent as much of the concentrates and 97 percent as much peanut straw as the higher grade steers. In this experiment, as well as in the preceding one, the Common steers would have consumed more feed if they had been given the opportunity. Differences in the quality and condition of the two groups of steers in this year's test at the end of 140 days' feeding are shown in figures 4 and 5.

TABLE 3.—Summary of results of the third experiment 1940-41

Item	Cattle fed 84 days (Nov. 13, 1940, to Feb. 5, 1941)		Cattle fed 140 days (Nov. 13, 1940, to Apr. 2, 1941)	
	Group 1	Group 2	Group 1a	Group 2a
Grade of cattle.....	Good	Common	Good	Common
Steers.....number.....	15	15	15	15
Average initial weight per steer.....pounds.....	654	548	665	546
Average final weight per steer.....do.....	880	718	1,016	837
Average gain per steer.....do.....	226	170	351	291
Average daily gain per steer.....do.....	2.69	2.02	2.51	2.08
Average daily feed per steer:				
Ground snapped corn.....do.....	16.70	13.38	18.60	14.89
Cottonseed meal.....do.....	2.78	2.23	3.09	2.48
Peanut straw.....do.....	4.63	3.75	3.84	3.11
Average feed consumption per steer:				
Ground snapped corn.....do.....	1,403	1,124	2,604	2,084
Cottonseed meal.....do.....	234	187	433	347
Peanut straw.....do.....	389	315	538	435
Feed consumed per 100 pounds' gain:				
Ground snapped corn.....do.....	620.8	661.2	741.9	716.2
Cottonseed meal.....do.....	103.5	110.0	123.4	119.2
Peanut straw.....do.....	172.1	185.3	153.3	149.5
Cost of feed per 100 pounds' gain <sup>1</sup> .....dollars.....	7.57	8.06	8.83	8.53
Value of feed per steer.....do.....	17.11	13.71	31.00	24.83
Feeder cost per 100 pounds.....do.....	9.00	6.25	9.00	6.25
Feeder cost per steer.....do.....	58.86	34.25	59.85	34.12
Total steer and feed cost.....do.....	75.97	47.96	90.85	58.95
Sales weight per steer.....pounds.....	861	705	973	798
Sales price per 100 pounds.....dollars.....	10.50	8.25	10.60	8.50
Gross return per steer.....do.....	90.40	58.16	103.14	67.83
Net return per steer <sup>2</sup> .....do.....	14.43	10.20	12.29	8.88
Carcass grade <sup>3</sup> .....score.....	15.60	24.13	14.53	19.73
Dressing percentage <sup>4</sup> .....percent.....	55.69	53.79	58.81	56.00

<sup>1</sup> Ground snapped corn, \$0.70 per bushel (80 pounds); cottonseed meal, \$28 per ton; peanut straw, \$8 per ton.

<sup>2</sup> See footnote 5, table 1.

<sup>3</sup> See footnote 6, table 1.

<sup>4</sup> See footnote 7, table 1.

In the 84-day test the higher grade steers had a sales price of \$1.50 per 100 pounds over their feeder price, whereas the Common steers had a margin of \$2. The much greater gain of the Good steers, however, was sufficient to offset their lower margin and enabled them to yield a net return of \$4.23 more per steer. In carcass grade the Good steers were average Good, whereas the Common steers were low Commercial, or 1½ grades lower. This difference was highly significant and similar to that between these groups in the second experiment. In dressing percentage the difference of 1.9 percent between groups 1 and 2 in favor of the Good steers was significant.

Of the two groups fed 140 days, the difference in gains of 60 pounds per head between the Good steers (group 1a) and the Common steers (group 2a) was highly significant ( $p < 0.01$ ). The former group had a margin of \$1.60 per 100 pounds between their sales price and feeder cost, as compared with \$2.25 for the latter group, but the greater

gains of the Good steers and a sales price \$2.10 per 100 pounds higher were sufficient to offset their somewhat higher cost of gains and their lower margin of profit. The Good steers returned \$3.41 more per head after feeder and feed costs were deducted. The superior finish of these steers over those of the Common grade was reflected in higher quality of carcass and dressing percentage. The carcasses of the higher grade steers were classified as high Good, whereas those of the Common steers averaged one full grade lower, or high Commercial. Differences in carcass grade and dressing percentage were statistically highly significant.

In this last year's test there was no advantage, so far as net returns were concerned, in feeding either grade of steers beyond 84 days, whereas in the 2 preceding years both grades of steers yielded greater net returns from an additional 56 days of feeding, the Good steers showing a considerable advantage over the Common steers. In the third year's test, at the end of 140 days' feeding, the sales price per 100 pounds was only \$0.10 higher for the Good steers and \$0.25 higher for the Common steers, than at the end of 84 days, in spite of the fact that the steers in both groups had considerably more finish as evidenced by higher scoring carcasses and significantly higher dressing percentages.

#### AVERAGE RESULTS OF THE THREE EXPERIMENTS

In all 3 years the Good steers made significantly greater gains than the Common steers during both the 84- and 140-day fattening periods. The average differences amounted to 52 pounds per head during the shorter feeding period and 74.6 pounds when the steers were fed 56 days longer. Higher grade steers, therefore, may be expected to gain more rapidly and to continue gaining at a higher rate during a longer feeding period than steers of the lower grades.

In the 84-day feeding period the Common steers required more feed per 100 pounds' gain than the Good steers in each of the 3 years. The difference ranged from 6.7 to 33 percent with an average of about 18 percent for the 3 years. The Good steers produced their gains at an average feed cost of \$1.49 less per 100 pounds and returned an average of \$1.42 more per 100 pounds than the Common steers during the 3-year period. In 2 years the Common steers made the greater returns after steer and feed costs were deducted. The average results for the 3 years showed a difference in return of \$0.85 per head in favor of the lower grade steers for the 84-day fattening period. The Good steers, even though less profitable, on the average, graded low Good in carcass, which was one full grade higher than the carcasses of the Common steers. The higher quality of the carcasses of the Good steers was also revealed in a slightly higher dressing percentage in 2 years.

In the 140-day feeding period, as in the 84-day period, the Common steers consumed, on the average, 6.3 percent more feed per 100 pounds' gain than the Good steers, even though in the third year they required 3.3 percent less. In cost of feed per 100 pounds' gain there was an average difference of \$0.59 in favor of the Good steers, and in average sales price the better grade steers had an advantage of \$1.91 per 100 pounds. The Good steers graded high Good in carcass, which was one full grade above the Common steers, and they also dressed 1.75 percent higher.

The difference between the average gains of Good and Common steers fed an additional 56 days, or 140 days in all, was 23 pounds. As the feeding period advanced beyond 84 days, the Good steers fattened more economically than the Common steers, but the difference in amount of gain tended to be less. There was a greater difference between the sales price of the Good and Common steers at 140 days than at the end of 84 days, indicating that as the feeding period advanced there was a greater tendency to fatten on the part of the Good steers. They also dressed 1.75 percent higher than the Common steers at the end of 140 days, as compared with about 1 percent after 84 days' feeding.

### SUMMARY AND CONCLUSIONS

In experiments conducted for 3 years (1938-39 to 1940-41) in cooperation with the Georgia Coastal Plain Experiment Station, Tifton, Ga., 4 groups of cattle were fed each year as follows: One group of 15 Common steers and another group of 15 Good steers were fed a mixture of 6 parts, by weight, of ground snapped corn and 1 part of cottonseed meal, together with peanut straw for 84 days, and two similar groups were fed an additional 56 days, or 140 days in all. The Good and Common steers were fed essentially the same quantities of feed per 100 pounds of live weight.

The results indicate that for a period of 84 days steers grading Good as feeders will make greater gains than Common steers and that the difference in gains becomes more pronounced as the feeding period is extended. Good steers may also be expected to make more efficient use of their feed for either a short or long period, but this may not result in greater net returns above feeder steer and feed costs. Under the conditions of these experiments, the Common steers made greater net returns for the 84-day fattening period, owing to their greater margin—nearly \$1—between feeder and slaughter steer prices. This increased margin was due to a low feeder value rather than to a high sales price for slaughter cattle. These tests therefore indicate that feeder steers of the Common grade may be expected to make fair returns for a fattening period of 84 days if they can be purchased at a relatively low cost. Under the conditions of these experiments the Common steers had a feeder value of \$2.43 less per 100 pounds than steers of the Good grade. Even though there is the possibility of Common steers making greater net returns in the feed lot for a short period, such as happened in these tests, yet Common cattle would not be so profitable to the producer of feeder cattle as would the better grades.

Under the conditions of these experiments, Good steers may be expected to use their feed more advantageously than Common steers in fattening periods of about 140 days, as measured not only by greater gains but also by more efficient gains, and accordingly make greater net returns. The increased gain made by Good steers results in higher quality carcasses and higher dressing percentages, factors which enhance the sales price.

These experiments indicate, therefore, that Common steers are suitable for fattening periods of about 3 months, but for periods of about 5 months they are not so satisfactory as cattle that grade Good as feeders.





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