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From Beef Calf to Fat Steer in Ten Months on Oat Grazing and Dry Lot Feeding[1]

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INCREASING NUMBERS of Alabama cattle producers are keeping calves after weaning age and growing them to heavier weights. As an indication of this trend, the Agricultural Market News Service (USDA) reported that calves constituted 55 per cent of the total cattle marketings in Alabama in 1950, but only 44 per cent in 1954. It is generally agreed that this represents a desirable change in the marketing process provided an adequate supply of farm-produced feed and grazing is available.

Small grain pasture is ideal feed for the weaned beef calf because it is high in protein, low in fiber, highly digestible, and very palatable. Oats are widely grown in all sections of Alabama. It is common for oats to be grazed until the end of February, when the animals are removed and the crop is nitrated and permitted to make grain. Production information on oats grown solely for grazing by young beef cattle is limited.

In the test reported herein, oat pasture was established and used solely for grazing by lightweight stocker steer calves. After grazing the oats, the yearling steers were finished in dry lot, and then sold for slaughter. In the experiment no comparisons were made of alternate usages of the oat crop.

EXPERIMENTAL PROCEDURE

The experimental area consisted of two fenced, 4-acre paddocks located on a Humphrey's silt loam soil. The land was fallowed during the summer of 1955 and 500 pounds per acre of 0-14-14 fertilizer was applied before seeding. The oats were seeded at the rate of 3 bushels per acre on a prepared seedbed in mid-September, 1955. The forage was topdressed with 40 pounds of nitrogen per acre from ammonium nitrate.

Sixteen good stocker Hereford steer calves (average weight 381 pounds) were assigned to the two, 4-acre paddocks on November 22, 1955. The stocking rate of 2 animals per acre was not changed during the grazing life of the forage. When it was necessary to take the animals off the grazing paddocks because of bad weather, they were removed to a paved and sheltered feed lot where they were fed 1.5 pounds of cottonseed meal and 2 pounds of ground snapped corn per head daily in addition to a full feed of sorghum silage. They were weighed at 28-day intervals and records were kept of all supplemental feed consumed. At the end of the grazing season, May 29, the animals were graded and their market value was established. Immediately following the grading, the animals were allotted at random to two groups for finishing in dry lot.

Two feeding treatments were compared in dry lot. Lot 1 was full fed silage with a limited grain ration for the first part of the trial. The other group (Lot 2) did not receive silage, but was full fed a mixed ration composed of ear corn, alfalfa hay, cottonseed meal, cane molasses, and salt. Full

[1] The data were obtained at the Tennessee Valley Substation (Belle Mina), Agricultural Experiment Station System of the Alabama Polytechnic Institute, Auburn, Alabama. The study is part of a project entitled "Improvements in Production and Utilization of Feed and Forage for Beef and Dairy Cattle in Alabama."

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details of the two dietary treatments may be more clearly stated by listing them as follows:

LOT 1:

First 61 days on feed
Sorghum silage, free choice
Ground snapped corn, 5 pounds per head daily
Cottonseed meal, 2 pounds per head daily
(no stilbestrol)

Last 54 days on feed
No silage was fed.
The cattle were hand-fed hay and a feed mixture.
Composition of ration and method of feeding was exactly the same as that accorded the cattle in Lot 2.

LOT 2:

Full fed the following mixture
Ground snapped corn, 64.5 per cent
Cottonseed meal, 10 per cent
Cane molasses, 15 per cent
Legume-grass hay, 10 per cent
Salt, 0.5 per cent
All ingredients except the hay were mixed together. The hay was fed loose without grinding but regulated to an amount equal to 10 per cent of the total daily ration. The cottonseed meal contained 5 mg. of stilbestrol per pound.

The two lots of cattle were sold for slaughter on the same day and carcass data were obtained.

RESULTS

Results of the oat grazing phase of the test are summarized in Table 1. All values shown in the table are averages for the two, 4-acre paddocks.

Because of muddy fields and cold weather, the cattle were intermittently off the grazing paddocks for a total of 46 days between November 22 and March 5. During this 104-day period, the animals gained 125 pounds per head (1.21 pounds per day). Supplemental feed consumed per head in addition to pasture was 1,055 pounds of sorghum silage, 74 pounds of ground snapped corn, and 73 pounds of cottonseed meal. From March 6 until May 29, the cattle were continuously on oat grazing and they received no supplemental feed. During this latter period, the cattle gained 170 pounds per head (2.02 pounds per day). The cattle gained 57.6 per cent of their total weight gain during the last 84 days of the 188-day grazing period. The total gain per head for the entire grazing period was 290 and 301 pounds, respectively, for Lots 1 and 2. The comparable daily gains were 1.54 pounds and 1.60 pounds. The average *total* gain per acre from oat grazing and supplemental feed was 591 pounds.

At the end of oat grazing, the cattle graded Standard. Their appraised market value at this time was $17 per hundredweight or $109.31 per head. The cash cost outlay for oat grazing, including land preparation, amounted to $13.75 per steer[5] and the supplemental feed $6. Delivered cost per head for the stocker calves was $69.50. The average increase in value per steer over the cost of grazing and supplemental feed was $20.06.

TABLE 1. RESULTS OF GRAZING STOCKER CALVES ON OAT FORAGE, NOVEMBER 22, 1955–MAY 29, 1956, TENNESSEE VALLEY SUBSTATION, BELLE MINA, ALABAMA

Item	Resultant[1]
Number of acres per paddock	4
Number of animals per paddock	8
Number of days in test period	188
Average per steer	
Initial weight, lb.	381
Weight on 188th day, lb.	677
Total gain per steer, lb.	296
Average daily gain, lb.	1.57
Total gain per acre of grazing, lb.	592
Supplemental feed required per animal[2]	
Sorghum silage, lb.	1,055
Ground snapped corn, lb.	74
Cottonseed meal (41%), lb.	73
Total cost of supplemental feed per steer, dollars	6.00
Summary of some costs and returns	
Charge per animal for oat grazing[3]	$ 13.75
Total feed cost per animal	19.75
Feed cost per cwt., gain	6.67
Initial value per cwt. for calves	19.20
Initial total value per steer	69.50[4]
Initial value plus feed cost per steer	89.25
Value per cwt. end of oat grazing	17.00
Total value per steer end of oat grazing	109.31[4]
Increase in value per steer over cost of grazing and supplemental feed[5]	20.06

[1] Each recorded value is the average of 2 replications.
[2] The cost of supplemental feed was: ground snapped corn, $1.78 per cwt.; cottonseed meal (41 per cent), $2.80 per cwt.; sorghum silage, $5 per ton (estimated).
[3] The per acre cost to produce oat grazing was arrived at in the following manner: 500 lb. of 0-14-14 fertilizer @ $1.90 per cwt.; 125 lb. ammonium nitrate @ $3.60 per cwt.; 3 bushels seed oats @ $1.50 per bushel; and land preparation, $9.
[4] Value per head is calculated on live weight less 5 per cent shrink.
[5] This return would be to cover such cash and non-cash costs as labor, repairs, depreciation on facilities, sprays, and returns to capital investment.

[5] See footnote 3, Table 1.

TABLE 2. RESULTS OF FEED LOT FINISHING AFTER OAT GRAZING, MAY 30–SEPTEMBER 22, 1956, TENNESSEE VALLEY SUBSTATION, BELLE MINA, ALABAMA

Item	Lot 1 delayed full grain	Lot 2 no silage full grain fed
Number of animals per lot	8	8
Length of feeding period, days	115	115
Average per steer		
Initial weight, lb.	677	677
Final feed lot weight, lb.	921	948
Total gain, lb.	244	271
Average daily gain, lb.	2.12	2.36
Carcass grades		
Choice	2	5
Good	6	3
Dressing percentages		
Market weight (weighed at Huntsville)	60.10	61.74
Feed lot weight	57.23	59.42
Total feed consumed per animal		
Sorghum silage, lb.	2,438	-------
Ground snapped corn, lb.	1,138 (15 bu.)	2,019 (27 bu.)
Cottonseed meal with stilbestrol[1], lb.	246	302
Cane molasses, lb.	255	437
Legume-grass hay, lb.	56	303
Salt, lb.	16	16
Feed per cwt. gain		
Sorghum silage, lb.	999	-------
Ground snapped corn, lb.	466	745
Cottonseed meal with stilbestrol, lb.	101	111
Cane molasses, lb.	105	161
Legume-grass hay, lb.	23	112
Salt, lb.	6	6
Average daily ration		
Sorghum silage (1st 65 days), lb.	37.50	-------
Ground snapped corn, lb.	9.90	17.56
Cottonseed meal, lb.	2.14	2.63
Cane molasses, (Lot 1 last 54 days, only), lb.	5.10	3.80
Legume-grass hay (Lot 1 last 54 days only), lb.	1.12	2.63
Feed cost per cwt. gain[2]	$ 16.01	$ 20.89
Initial value per cwt. for feeders	17.00	17.00
Initial total value per steer[3]	109.31	109.31
Feed cost per steer	39.06	56.61
Initial value plus feed cost per steer	148.37	165.92
Selling price per cwt.	23.43	23.66
Price received per steer[3]	205.04	213.15
Increase in value per steer over cost of feed	56.67	47.23

[1] The cattle fed silage in Lot 1 did not receive stilbestrol until they were placed on full grain for the last 61 days of the test. Each pound of cottonseed meal contained 5 mg. of stilbestrol. The stilbestrol premix (Stilbosol) was supplied by the Eli Lilly Company, Indianapolis.

[2] The cost of feed ingredients per cwt. was: ground ear corn, $1.78; cottonseed meal (41%), $2.80; cottonseed meal with stilbestrol, $3.30; cane molasses, $1.70; hay, $1; sorghum silage, $0.25; and salt, $1.75. Grinding and/or mixing feed cost 35¢ per hundred pounds.

[3] Based on live weight less 5 per cent for shrink.

Results of the feed lot phase of the test are summarized in Table 2. The cattle in Lot 2 (no silage) made slightly higher average daily gain than the animals in Lot 1 (2.36 pounds per day vs. 2.12). Also the carcass grades and dressing percentages were slightly higher for group 2. However, the cattle fed silage (Lot 1) consumed considerably less corn in the fattening process, the cost of gain was less, and the return for feeding was greater. As a consequence of feeding the cattle in dry lot for 115 days after oat grazing, the market value per animal, after deducting cost of the fattening feed, was increased an average of $51.95.

DISCUSSION

The cattle made good use of the oat forage as evidenced by the rapid daily gain and high total gain per animal. It is pointed out, however, that the forage was never overgrazed and provided plentiful grazing at all times. Although the value of the supplemental feed cannot be evaluated in this test, it was necessary when the animals were off oat forage during the early winter period. The feeding system chosen for this purpose proved to be an efficient one from the standpoint of low cost and good performance of the cattle while off grazing.

After oat grazing, the cattle were in the feed lot during the warmest season of the year. Nevertheless, no trouble was experienced in keeping the cattle on feed. They finished out rapidly and were ready for market at a normally favorable period for sale of well-finished cattle.

In terms of feed required to produce 100 pounds of gain, 999 pounds of sorghum silage replaced 279 pounds of ground snapped corn, 10 pounds of cottonseed meal, 56 pounds of cane molasses, and 89 pounds of hay. In spite of the fact that the silage-fed group of cattle at sale time was not quite as well finished as was the full grain-fed group, the feed replacement value of silage appears exceptionally good. Management systems for slaughter cattle that include use of silage need further investigation.

Finally, it should be noted that for oat grazing and feed lot finishing, the cattle were on the farm only approximately 10 months. The animals weighed 381 pounds when placed on oat grazing and the average market weight was 935 pounds. Therefore, for the 306 days they were on hand, the animals gained at an average rate of 1.81

pounds per head daily. At this rate of gain, the cattle fattened while they grew. This is a desirable situation that usually results in efficient utilization of feed. During the 306 days in the test, the net increase in value of the cattle per head above feed cost amounted to $72.01.

SUMMARY

Starting with a lightweight, beef-type stocker calf in November a 935-pound fat steer was produced for market in 10 months. Oat grazing furnished good feed for the young test cattle as evidenced by the fact that the average daily gain during the oat grazing period of 188 days was 1.57 pounds. The animals fattened some in addition to growing while consuming the oat forage diet and graded Standard off grazing. It was necessary for the cattle to be pulled off grazing for a total of 46 days during the early winter. When off grazing the cattle were fed sorghum silage and a limited amount of corn and cottonseed meal. The kind of supplemental feed provided proved to be very satisfactory because of its low cost and the good performance of the cattle when they were off grazing.

After oat grazing the animals were fed in dry lot for 115 days during the summer. Cattle fed sorghum silage and limited grain for a part of the dry lot feeding period consumed a total of 15 bushels of corn per head and gained 244 pounds. Cattle fed no silage but a full feed of a mixed corn - cottonseed meal - molasses - hay ration consumed a total of 27 bushels of corn per head and gained 271 pounds. To produce 100 pounds of gain, the feed replaced by silage had a market value of $7.14 or the feed replacement value of silage per ton was $14.29.

During the period of approximately 10 months that the cattle were owned on the farm, the net value per head above feed cost was increased $72.01. This represents a return to cover such cash and non-cash costs as labor, repairs, depreciation on facilities, sprays, and returns to capital and investment.