



*Supplementation of Steers
Grazing Sorghum-Sudan Pasture*

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FIG. 1. Steers on sorghum-sudan pasture had ample grazing when this photo was made July 8, 1968.



FIG. 2. Most of the forage had been grazed off by August 9, 1968, when this photo was made.

SUMMARY OF FINDINGS

Feeding steers being pastured on sorghum-sudan is of doubtful value, despite some increased beef gain per animal and per acre in Tennessee Valley Substation experiments. In fact, results indicate that this fast growing summer annual may not be suited as a pasture for growing out steers. Its high cost of planting and pasture management difficulties overbalance its advantage of high potential carrying capacity.

During the 3-year experiment, yearling steers were rotationally grazed on sorghum-sudan pastures. The grazing season was 77, 65, and 89 days for the 3 years. One group of steers was fed a blended feed mixture at the daily rate of 1 per cent of live weight while on pasture. The others got only pasture.

Feeding the blended mixture increased daily gain 50 per cent (from 1.1 pounds without supplement to 1.6 pounds daily with supplemental feeding), but steers consumed an average of 14.4 pounds of supplement per pound of induced gain. There was also a slight increase in carcass grade and dressing percentage. However, animal performance was not increased enough to make supplemental feeding an economical practice.

Total beef gain per acre by non-supplemented steers ranged from 159 to 300 pounds annually. With supplemental feeding, the range was from 282 to 462 pounds gain per acre.

Supplementation of Steers Grazing Sorghum-Sudan Pasture

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SORGHUM-SUDAN HYBRIDS are widely grown for temporary summer grazing. These crops make large forage yields and their potential stocking rates are high (3). Digestible dry matter (DDM) of sorghum-sudan hybrids is higher than warm-season perennial grasses, such as bermuda, and compares favorably with cool-season perennial grasses and legumes (3,4,5). However, DDM declines somewhat as the summer progresses, regardless of growth stage (4). Nitrogen fertilization has no effect on DDM or per cent leafiness of the forage (4,5). The high DDM suggests that animals should perform well on these grasses. In feeding trials, however, cattle gain has been low because of low intake of the forage (3,4).

Satisfactory results have been obtained with dairy cattle grazed on sorghum-sudan hybrids and supplemented with grain (3,7). Grazing results with beef cattle on these grasses are more limited. In previous Alabama experiments, beef steers grazing pearl millet made daily gains of only 1 pound per steer. This rate of gain is similar to that on warm-season perennial grasses (2,6). A 3-year grazing experiment on sorghum-sudan hybrids in west Florida resulted in daily gains of less than 1 pound per steer and 150 to 220 pounds of seasonal gain per acre (1). Daily gains per steer were lower on late-planted than on early-planted sorghum-sudan.

The relatively poor performance of steers on highly digestible summer annual grasses is a problem. Research reported in this publication was conducted to determine if supplemental grain feeding would improve gains of steers grazing sorghum-sudan.

EXPERIMENTAL PROCEDURE

Sorghum-sudan was planted on a prepared seedbed on Humphries silt loam in early May at the Tennessee Valley Substation during each of 3 years. Funks 77F was planted at a seeding rate of 30 pounds per acre the first 2 years and Funks 78F the third year. Mineral fertilizer was applied according to soil test. Nitro-

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gen at the rate of 50 pounds per acre was applied at planting and again in July.

Yearling Hereford steers were used for grazing the pastures. The animals put on the pastures initially and remaining for the entire grazing season were designated "tester" cattle from which rate of gain data were collected. Other cattle of comparable size and kind were used to graze surplus forage. Beef gain per acre was calculated from gains made by all cattle. One group of steers on pasture was fed the following blended mixture at the rate of 1 per cent of live weight daily:

Ground shelled corn.....	69 per cent
Cottonseed meal (41 per cent).....	10 per cent
Ground Coastal bermuda hay.....	20 per cent
Salt.....	1 per cent

The amount of feed was adjusted at each weigh day, usually every 14 days.

Two, 2-acre pastures were used the first year with non-supplemented steers on one area and supplemented steers on the other. Cattle in each treatment group were rotated between paddocks at 14-day intervals to minimize pasture differences. Steers were sold as feeders at the end of the grazing season the first 2 years, but went directly to slaughter after the third grazing season. Slaughter data were collected to determine changes in carcass composition as a result of supplemental feeding.

During the second and third years, four 2-acre pastures were used to permit rotational grazing. Supplement-fed steers grazed two areas and non-supplemented steers grazed the other two pastures. The first planting was made in early May and the second about 3 weeks later. Cattle were rotated between pastures at 14-day intervals and ungrazed, stemmy material was mowed in late June or early July. Dry matter content was determined from hand-harvested samples of forage collected every 2 weeks in each grazed pasture during the first and second year.

RESULTS

First Year

Steers grazed the pastures from June 17 to September 2, 1968 (77 days), Table 1. Initial stocking rate was 3 steers per acre, with additional animals added July 5 and July 9 for a peak stocking rate of 5 per acre. Steers gained well the first month (2.5 pounds per day for non-supplemented steers and 2.8 pounds for supplemented steers), after which gains were unsatisfactory. The initial high gain was probably not compensatory gain since all

TABLE 1. PERFORMANCE OF STEERS ON SORGHUM-SUDAN PASTURE, 1968

Performance measure	Grazing only	Grazing + supplement
Days on test, June 17 to September 2.....	77	77
Animal performance		
Av. stocking rate, animals/acre/day.....	4.2	4.2
Initial live weight of tester steers, lb. ¹	656	655
Final live weight of tester steers, lb.....	748	778
Total beef gain per acre, lb. ²	300	462
Av. daily gain of tester steers, lb.....	1.2	1.6
Supplemental feed		
Av. daily feed per steer, lb.....	-----	6.7
Feed per lb. induced gain, lb.....	-----	13.4

¹ Tester steers were animals that remained on pasture throughout the season.

² Per acre gain is total for tester steers and additional steers.

cattle were moved directly from orchardgrass or tall fescue pastures where they had gained 1.5 pounds daily for the previous 85-day period. Beef gain per acre was good, reflecting the high stocking rate.

Steer gains did not appear to be influenced by forage dry matter content. Dry matter content of forage ranged from 19 to 23 per cent and crude protein content averaged 20 per cent. Rainfall was only 21 per cent of normal during the first month of grazing. Somewhat more rain was received during July and August, but steer gains were poor during this period.

Supplemental feed improved the seasonal average daily gain from 1.2 to 1.6 pounds, but feed per pound of induced gain (13.4 pounds) was high. Steers receiving supplemental feed did not graze as closely as the unsupplemented group. Adequate amounts of forage were available when cattle were on the pastures, Figures 1 and 2 (page 2).

Second Year

Pastures were stocked June 3, 1969, and grazed until August 6 (65 days), Table 2. Low rainfall resulted in a short grazing season. The initial stocking rate of both pastures was 3 steers per acre, declining to 1.5 in August. Seasonal average daily gains were similar to those of the previous year. Daily gains during the first month were 2.3 pounds for supplemented steers, as compared with 1.5 pounds for those not supplemented. Gains declined sharply during the season, averaging only 1.0 pound and 1.6 pounds for the non-supplemented and supplemented steers, respectively. In comparison, steers on adjacent Coastal bermuda pastures stocked at 3 steers per acre had daily gains of 1.0 pound

TABLE 2. PERFORMANCE OF STEERS ON SORGHUM-SUDAN PASTURE, 1969

Performance measure	Grazing only	Grazing + supplement
Days on test, June 3 to August 6.....	65	65
Animal performance		
Av. stocking rate, animals/acre/day.....	2.5	2.6
Initial live weight of tester steers, lb. ¹	682	662
Final live weight of tester steers, lb.....	744	768
Total beef gain per acre, lb. ²	159	282
Av. daily gain of tester steers, lb.....	1.0	1.6
Supplemental feed		
Av. daily feed per steer, lb.....	6.9
Feed per lb. induced gain, lb.....	10.2

¹ Tester steers were animals that remained on pasture throughout the season.

² Per acre gain is total for tester steers and additional steers.

from May 15 to August 18. Supplemental feed conversion was low. Steers required 10.2 pounds of supplement per pound of induced gain. Beef gain per acre was much lower than the preceding year because of lower carrying capacity.

Extremely rapid growth resulted in surplus grazing at several times. It is likely that the stocking rate could have been increased to utilize this surplus forage.

Dry matter content of the grass varied somewhat over the season, as shown here: June 3, 11 per cent; June 16, 22 per cent; June 30, 27 per cent; July 14, 21 per cent; July 22, 24 per cent, and July 30, 17 per cent.

Daily gains of grazed steers were highest during June and lowest in late July. It is doubtful if dry matter content of this forage is associated with animal performance. Air temperatures were high during the summer and might be a factor in low daily gain. Temperatures during late June and the first half of July were in the upper nineties nearly every day.

Third Year

In 1970 the grazing period (May 29 to August 25) was somewhat longer than in previous years, 89 versus 77 or 65 days, but stocking rate was lower than in the two previous years, Table 3. Daily gains of non-supplemented steers averaged 1.5 pounds from May 29 to July 20, followed by a decline as in previous years. Forage quality appeared good, particularly on regrowth after mowing and fertilizing in July. Nevertheless, both groups of steers made poor gains from July 21 to August 25. Supplemental feeding improved the season daily gain from 1.1 to 1.5 pounds per steer, but the feed required per pound of induced gain (19.6 pounds) was high. Total beef gain per acre was low for both

TABLE 3. PERFORMANCE OF STEERS ON SORGHUM-SUDAN PASTURE, 1970

Performance measure	Grazing only	Grazing + supplement
Days on test, May 29 to August 25.....	89	89
Animal performance		
Av. stocking rate, animals/acre/day.....	1.7	2.0
Initial live weight of tester steers, lb. ¹	680	691
Final live weight of tester steers, lb.....	777	822
Total beef gain per acre, lb. ²	170	262
Av. daily gain of tester steers, lb.....	1.1	1.5
Supplemental feed		
Av. daily feed per steer, lb.....	-----	7.5
Feed per lb. induced gain, lb.....	-----	19.6
Carcass data		
USDA grades.....	high Std.	low Good
Dressing percentage.....	53.6	56.3

¹ Tester steers were animals that remained on pasture throughout the season.

² Per acre gain is total for tester steers and additional steers.

treatments. For the non-supplemented steers, it was only slightly higher than the previous year.

Both groups of steers were light weight at slaughter. The feed increased the dressing percentage slightly but it was low for both groups. Carcass grades were high Standard and low Good for non-supplemented and supplemented groups, respectively.

DISCUSSION

Sorghum-sudan pasture was generally unsatisfactory for growing steers, but it had high potential carrying capacity for short periods. The large fluctuation in forage growth caused by variable soil moisture made it difficult to maintain a proper stocking rate, even with rotational grazing. Unless surplus growth can be cut for silage, it is likely that considerable forage will be wasted, as was the case in this experiment.

Daily gains of steers grazing sorghum-sudan for the summer period averaged about 1 pound and were similar to that previously reported on sorghum-sudan (1) and pearl millet (2,6). Similar rate of gain can be expected on warm-season perennial grasses that are normally cheaper sources of grazing.

Supplemental feeding of the blended mixture at 1 per cent of live weight improved daily gain about 50 per cent, but large amounts of feed were required per pound of induced gain. The combination of annually-seeded sorghum-sudan pasture and supplemental feeding was not an attractive program. In contrast, rate of gain and beef per acre on cool-season annual pastures have been considerably higher.

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