Performance of Steers Grazed on Bermudagrass: A Cooperative Field Trial[1]

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Story in Brief

A cooperative field trial was conducted near McAlester, Oklahoma. Yearling steers (mean initial weight of 603 lb, and of moderate condition) were grazed on two common bermudagrass pastures during the 136-day trial (May 5 to September 18, 1979). Stocking rate varied from 2 to 2.5 steers per acre or 1500 to 1840 total lb of steer per acre during the trial. Daily gains of the steers were good (1.82 lb) during the first period of the trial, but decreased to .62 lb during the last period. Mean daily gain of the steers for the total trial was 1.28 lb. Failure to maintain an immature, high-quality forage throughout the trial, due to abnormally high rainfall, accounted for some of the reduction in steer gains.

Introduction

Last year we reported results of steer grazing trials, conducted during 1977 and 1978, on four improved varieties of bermudagrass near Perkins, Oklahoma (Horn and McMurphy, 1979). The objective of the cooperative field trial reported herein was to obtain data at a location that receives greater rainfall. The bermudagrass present in the pastures used in the trial is, however, believed to be common bermudagrass which is characteristic of much of the bermudagrass acreage in Eastern Oklahoma.

Experimental Procedure

Pastures and pasture management

Two bermudagrass pastures of 26 and 23 acres each, located about 10 miles northwest of McAlester, Oklahoma, were used in the trial. Both pastures had been overseeded the preceding fall with small grains for winter grazing. Winter steer groups had access to the pastures until April 30 before the trial began on May 5. On May 5, the pastures had good growths of forage that had been spot grazed; however, there was little bermudagrass growth due to an abnormally cold spring. Cool season annuals were abundant. The pasture also contained spotted areas of fescue (heading) and very spotted areas of ladino, little hop, arrowleaf clover and vetch. After the pastures were mowed about the first of June, bermudagrass was the predominant forage available to the steers and continued to thicken as the trial progressed.

[1]Appreciation is expressed to Mr. W.E. Allford for providing the facilities, cattle and labor used in this trial.

For good stocker gains, growth of bermudagrass forage must be removed about as fast as it grows if immature, high-quality forage is kept available for grazing. Stocking rates were adjusted by adding steers to, or pulling steers from, the pastures on two dates (July 6 and August 15) during the trial, and the pastures were mowed with a brush hog on the dates shown in Table 1 in an attempt to maintain immature, high-quality forage. The pastures were continuously grazed, whereas those in the trials reported by Horn and McMurphy (1979) were rotationally grazed. Pasture fertilization was as shown in Table 1.

Hand-plucked samples of available forage were taken from each pasture, around the fifth of each month, for crude protein and *in vitro* dry matter digestibility (IVDMD) analyses.

Steers

Steers used in the trial were out of a group of choice yearling crossbred steers purchased on April 19, 1979, at the Oklahoma City Stockyards. The steers were branded, vaccinated for blackleg, malignant edema, infectious bovine rhinotracheitis (IBR), parainfluenza 3 (PI-3), bovine virus diarrhea (BVD), leptospirosis pomona, wormed with TRAMISOL injectable and treated with Worbex within 3 days of receiving. The steers were initially implanted with 30 mg diethystilbestrol and reimplanted (August 15) with 36 mg RALGRO. The steers grazed the lush spring growth of bermudagrass and cool-season annuals prior to the beginning of the trial on May 5, and were in moderate condition (flesh).

The steers were sprayed with toxaphene-lindane for fly control on May 5 and July 6. In addition, back rubbers charged with diesel and toxaphene-lindane were located around mineral feeders of each pasture.

Table 1. Pasture fertilization and mowing dates[a].

		Pasture	
		West	East
Fertilization			
4/28	150 lb 33-0-0/acre	X	X
5/17[b]	150 lb 17-17-17/acre	X	
5/17[b]	250 lb 17-17-17/acre		X
6/23	150 lb 33-0-0/acre	X	X
8/18	150 lb 33-0-0/acre	X	X
Mowing			
6/5[d]		½[c]	
6/18[d]		½[c]	
6/25			X
8/17		X	X

[a]"X" indicates that pasture was fertilized or clipped on indicated date.
[b]100 lb/acre additional 17-17-17 was applied to east pasture because results of soil tests showed need for additional P and K.
[c]Only one-half of pasture was mowed on indicated date. About two-thrids of east pasture was mowed on May 25. However little forage was removed because the mower was set too high and pulled too fast.
[d]1250 lb of hay/acre removed from west pasture from combined mowings of June 5 and 18.

A mineral mixture that consisted of two-thirds dicalcium phosphate and one-third salt was fed free-choice to the steers throughout the trial.

Results and Discussion

The crude protein content and IVDMD of the hand-plucked forage samples decreased from initial values of about 23 and 72 percent, respectively, to 15.4 and 55 percent on July 5 and decreased further during the remainder of the trial (Table 2). The reduction in forage quality is attributable to: 1) some normal reduction in bermudagrass quality, which occurs with time into the bermudagrass growing season, and 2) failure, as a result of abnormally high rainfall, to maintain an immature bermudagrass forage in the pastures. In spite of adjusting stocking rates and mowing, the forage frequently got out ahead of the steers and was more mature than desired for maximum stocker gains.

Stocking rate (steers/acre and total lb of steer/acre) for the individual and total grazing interval(s) is shown in Table 3. Stocking rate ranged from about 2 to 2.5 steers/acre or 1500 to 1840 total lb of steer per acre during the trial.

Gains of the steers are shown in Table 4. During the first grazing interval of the trial, daily gains of the steers were good (i.e., 1.82 lb) even though the steers were fairly heavy (about 600 lb) and fleshy at the start of the trial. Daily gains of the steers

Table 2. Crude protein (CP) content and *in vitro* dry matter digestibility (IVDMD) of hand-plucked forage samples[a].

	Pasture					
	West		East		Average	
Date	CP	IVDMD	CP	IVDMD	CP	IVDMD
5-5	23.6	75.2	21.9	69.2	22.8	72.2
6-5	19.6	55.1	18.0	58.6	18.8	56.8
7-5	14.8	53.8	16.1	56.1	15.4	55.0
8-7	12.8	47.5	13.4	46.5	13.1	47.0
9-11	14.8	44.2	12.8	41.5	13.8	42.8

[a]Both CP and IVDMD are expressed as a percentage of forage dry matter.

Table 3. Stocking rate on bermudagrass pastures.

		Steers/acre			Total lb of steer/acre		
Grazing	Number	Pasture			Pasture		
interval	of days	West	East	Avg	West	East	Avg
5-5 to 7-6	62	2.31	2.24	2.27	1499	1508	1503
7-6 to 8-15	40	2.13	2.05	2.10	1551	1525	1538
8-15 to 9-18	34	2.47	2.35	2.41	1880	1800	1840
Total	136	2.29	2.21	2.26	1562	1536	1549

Table 4. Gains of steers on bermudagrass.

Grazing interval	Number of days	Mean wt (lb) of steers at start of grazing interval			ADG,[a] lb			Total gain/acre, lb		
					Pasture			Pasture		
		West	East	Avg	West	East	Avg	West	East	Avg
5-5 to 7-6	62	586	620	603	1.90	1.73	1.82	272	241	257
7-6 to 8-15	40	711	726	718	.89	1.16	1.01	76	95	85
8-15 to 9-18	34	745	762	754	.94	.24	.62	79	19	51
Total	136	—	—	—	1.37	1.18	1.28	427	355	393

[a]Average daily gain.

decreased throughout the remainder of the trial. An explanation for the marked difference in daily gains of steers in the two pastures during the August 15 to September 18 grazing interval is not apparent. Total gain per acre during the 136-day trial was 393 lb.

Literature Cited

Horn, G.W. and W.E. McMurphy. 1979. Animal Science Research Report. MP-104, p. 104.

Feeding Value of Ammoniated Wheat Straw for Yearling Steers

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Story in Brief

Yearling steers were fed either untreated wheat straw with a crude protein content of 3.0 percent or wheat straw which had been ammoniated during baling with a 6.0 percent crude protein content. The straw was fed in large round bales *ad lib* with 4.0 lb/day of dry matter per head from a ground shelled corn based supplement. Urea was added to the untreated straw supplement so as to provide as much nitrogen as was added to the ammoniated straw.

The daily dry matter intake of the ammoniated straw (7.2 lb/hd) was greater ($P<.10$) than that of the untreated straw (6.3 lb/hd). The average daily gain of steers consuming ammoniated straw (1.00 lb) and untreated straw (1.02 lb) was similar ($P>.10$). The lack of animal response was attributed to a relatively small increase in straw consumption and/or digestibility. The latter was attributed to incomplete ammoniation resulting from large ammonia losses during application.

Introduction

Approximately 1 ton of wheat straw is available as a potential feedstuff for each acre of wheat that yields 25 bushels of grain. The digestibility and crude protein content of wheat straw are low. Chemical treatment of straw with alkaline sodium hydroxide has generally increased digestibility, voluntary intake and animal performance. Ammoniation of wheat straw (Sundstol *et al.*, 1978): 1) costs less than treating with sodium hydroxide, 2) increases the crude protein content of the straw as well as increases digestibility and 3) is not a source of chemical pollution.

In previous experiments conducted in our laboratory, chopped wheat straw was sprayed with ammonium hydroxide at a level of 3.3 percent of the dry matter (Solaiman *et al.*, 1979). Reaction of the ammonia with the straw appeared to be complete in about