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PERFORMANCE OF YEARLING HORSES ON PASTURE AND SUPPLEMENTAL FEED

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SUMMARY

Six Quarter horse yearlings, 3 colts and 3 fillies, which averaged about 650 lbs and 53" in height at the shoulder, were assigned to each of two pasture treatments: (1) pasture (PO), and (2) pasture + 8.3 lbs supplemental feed/hd/da (PF). Bermudagrass pastures were sod-seeded with Elbon rye, Gulf ryegrass, and Yuchi arrowleaf clover in mid-October and grazing was initiated in mid-March on the winter annual forages. From late May to October 2, all horses grazed bermudagrass exclusively. During the winter pasture phase (3-15 to 5-29), horses on PF had average daily gains (ADG) twice that of horses on PO (1.87 lbs vs .97 lbs). The ADG for the 201-day trial was 1.46 for PF and 1.12 for PO. Stocking rates of slightly more than 3 horses per acre resulted in seasonal gains of 706 lbs/ac for PO and 937 lbs/ac for the PF treatment. The horses grew less than 2" in height during the treatment period. Horses on the PF treatment had higher condition scores and more rib fat at termination of the trial. Rump fat thickness, however, was the same for horses on both treatments.

OBJECTIVE

The primary objective of this trial was to determine the influence of pasture and pasture plus supplemental feed on performance of yearling Quarter horses.

PROCEDURE

Six Quarter horse yearlings, 3 colts and 3 fillies, were allotted to each of two pasture treatment groups based on sex, weight, height and body condition. The two pasture treatments were as follows: (1) pasture plus 8.3 lbs/hd/da of a 14% protein supplemental feed; and (2) pasture only until August 28, and 8.3 lbs/hd/da of 14% supplement from August 28 to October 2. Horses were group-fed (50 lbs/group) once daily during the trial. Bermudagrass [*Cynodon dactylon* (L.) Pers.] was sod seeded with 'Elbon' rye (*Secale cereale* L.), 'Gulf' ryegrass (*Lolium multiflorum* Lam.) and 'Yuchi' arrowleaf clover (*Trifolium*

vesiculosum Savi.) in mid-October. Full-time, continuous grazing of the cool-season annual forages was initiated on March 15. By mid- to late May, the cool-season forages constituted less than 25% of the diet, and from June to October, all horses grazed bermudagrass exclusively. Although the stocking rates were held relatively uniform among pastures at approximately 3.0 horse-equivalents per ac (700 lbs = 1 horse equivalent), forage available to ground level (0 in ht) was measured at monthly intervals. Liveweight and height at withers measurements were taken at approximate 30-d intervals throughout the 201-d trial. At termination of the trial, all horses were condition scored and fat thickness estimates made over the rump and rib via an electronic scanner.

RESULTS AND DISCUSSION

Pastures used in this trial were stocked at 3.0 horse-equivalents/ac for the Pasture Only (PO) treatment and 3.2 horse-equivalents/ac for the Pasture-Feed (PF) treatment with each horse unit being equivalent to 700 lbs. As evidenced by the data, forage availability was adequate at all times, with the exception of July, so that ad libitum intake was not restricted (Table 1). Nutritive value of forage samples, as estimates of diet selection, was similar between groups (Table 2). Relative to stocking rate trials with beef cattle on adjacent pastures, grazing pressures which allowed for more than 100 lb dry matter forage per 100 lb body weight were designated as light stocking rates and resulted in maximum individual animal performance. The magnitude of the grazing pressures expressed as lb of forage dry matter per 100 lb of body weight, along with visual observations, suggested that sufficient forage was available to allow for selective grazing within each pasture. However, with the advance in chronological and physiological maturity of the bermudagrass, there was an increased incidence of selective or spot-grazing behavior in both the PO and PF pastures. Although not quantitatively measured in this trial, horses in the PO pastures grazed for longer periods of time than did horses in the PF pastures because the PF group tended to anticipate feeding.

Table 3 shows a summary of the growth data taken during the grazing period. There were no differences in height between the two treatments as both sets of horses gained nearly 2" during the 201-d trial. Respective height gains for colts and fillies were 2.0" and 1.8" for PO and 2.2" and 1.2" for PF. The relatively small average daily change in height at the withers may be due to the age of the horses when the trial was initiated. Certainly the most rapid stages of skeletal growth occurred prior to the yearling stage.

Horses assigned to the PF treatment gained more weight than did horses on the PO treatment ($P<.01$) (Table 3). However, a closer examination of the weight gain data showed that the weight gain advantage of horses on PF over horses on PO occurred during the winter pasture period. During this time (period 1) the average daily gain (ADG) of horses on PF was 1.87 lb; whereas, the ADG of horses on PO was .97 lb. Thus, the ADG from PF horses was twice that from PO horses ($P<.01$). Similar trends between fed vs non-fed animals grazing winter pasture have been observed with cattle during the first 60 to 75 days of the grazing period. However, it is not clear as to whether the gain advantage of PF over PO horses was a result of supplemental energy, dry matter or a combination of both these and other digestive factors.

There were no differences in ADG of horses on either PF or PO during the exclusive bermudagrass grazing period (June to October). The horse ADG from May 29 to August 28 was slightly less than 1.3 lb; whereas, the ADG of horses from August 28 to October 2 when both groups of horses were receiving supplemental feed was approximately 1.0 lb/hd/da. Although there were no differences in ADG between the two groups of horses, those horses on PF gained 1.16 lb/da; whereas, those on PO gained 1.01 lb/da. It was anticipated that the PO horses would make some compensatory gains during this 35-d period. However, the feed did not have an additive nor a compensating effect which may have been due partially to a change in grazing behavior. The horses on the PO treatment tended to behave more like the horses on the PF treatment in that they anticipated a feeding period rather than conducting their previous foraging habits. The overall ADG during the trial were different among treatments, 1.12 for PO vs 1.46 for PF,

(P<.01) and were similar in magnitude to gains of thoroughbred horses which received similar levels of supplemental feed during the growing phase.

Estimates of body condition were made via condition scoring and electronic scanning of subcutaneous rib and rump fat (Table 3). At the end of the trial, horses on the PF treatment had higher (P<.01) body condition scores, 5.9 vs 4.2, than horses on the PO treatment. There were no differences in rump fat of horses between treatments as the rump fat thickness was estimated at approximately .8 in. Differences in rib fat (P<.01) of horses did occur between treatment with those on PO with .89 in. and those on PF with 1.30 in. fat thickness.

In summary, yearling horses which started the 201-d trial receiving 8.3 lb/hd/da of a 14% protein supplement gained more and were fatter than horses which received pasture only. However, the weight gain advantage was attributable to the winter pasture period and not the bermudagrass period. Additionally, these kinds of improved pastures in the southeastern U.S. are capable of stocking rates in excess of 3.0 horses/ac (700-lb equivalent) and can produce more than 900 lb/ac gain during the development period. The use of exclusive forage rations for yearling horses was determined to be a biologically feasible method of development, however, the activity and training schedules of the yearlings should be considered.

TABLE 1. PERIODIC FORAGE AVAILABILITIES AND GRAZING PRESSURES

	Treatments			
	Pasture Only		Pasture + Feed	
Date	lb DM/ac[a]	lb DM/100 lb BW[b]	lb DM/ac	lb DM/100 lb BW
Mar. 15	2550	192	2300	181
Apr. 27	3996	275	5854	396
May 29	2719	184	2868	185
July 3	1142	58	742	40
Aug. 28	5227	270	6224	309
Oct. 2	3110	154	4675	222

[a]lb dry matter forage/ac

[b]lb dry matter forage/100 lb body weight

TABLE 2. PERCENT PROTEIN AND IN VITRO DRY MATTER DIGESTIBILITY (IVDMD) OF FORAGE IN PASTURE TREATMENTS

	Treatments			
	Pasture Only		Pasture + Feed	
Date	Protein	IVDMD	Protein	IVDMD
	----------%		----------%	
4-4	19.0	76.2	18.8	75.2
5-10	17.5	73.0	20.0	76.7
5-24	9.9	61.7	11.7	65.8
6-11	10.6	55.7	10.9	53.0
6-29	10.2	49.5	11.4	55.0
7-18	16.4	61.3	16.7	59.0
8-1	16.3	58.6	15.1	60.0
8-15	13.8	58.4	14.2	58.4
9-6	11.1	48.0	11.3	50.4
10-2	10.8	49.5	11.0	50.2

TABLE 3. SUMMARY OF GROWTH DATA DURING GRAZING PERIOD

Item	Treatments: Pasture Only	Treatments: Pasture + Feed
No. of animals	6	6
Height at withers, in		
Initial	54.1	52.8
Gain	1.9 c	1.7 c
Avg. Daily	.0095c	.0085c
Weight, lbs		
Initial	665	637
Gain[a]		
Period 1	72.5 c	140.5 d
Period 2	118 c	112 c
Period 3	35.5 c	40.5 c
Total	226 c	293 d
Avg. Daily		
Period 1	.97 c	1.87 d
Period 2	1.30 c	1.23 c
Period 3	1.01 c	1.16 c
Total	1.12 c	1.46 d
Stocking rate[b], Avg. horse-equiv./ac	3.1	3.2
Gain/ac[b], Total	706 c	937 d
Condition Score, Final	4.2 c	5.9 d
Rump Fat, Final	0.76 c	0.90 c
Rib Fat, Final	0.89 c	1.30 d

[a]Period 1, Mar. 15 to May 29 (75-d); Period 2, May 29 to Aug. 28 (91-d); Period 3, Aug. 28 to Oct. 2 (35-d); Total, Mar. 15 to Oct. 2 (201-d)

[b]Gain per animal x stocking rate = gain/ac (1 horse equivalent=700 lb)

[c,d]Means within rows with different superscripts differ (P<.01)