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Effect of Grazing Time of Winter Pastures on Performance, Forage Intake, and Digesta Flow in Heifers

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Summary

Simmental crossbred and Brahman heifers were grazed for different lengths of time on small grain-ryegrass pastures to monitor animal performance, forage consumption, and digesta flow. Total forage intake was increased on the hay and pasture combination diets, and this occurred in association with increases in fill and fecal output.

Both Simmental crossbred and Brahman heifers had high total forage intake and high weight gains on hay plus 6 hours winter pasture. Both breeds also had high total forage intake on hay plus 2 hours winter pasture but exhibited low weight gains. In addition, Simmental crossbred heifers gained more on full time winter pasture than Brahman heifers; whereas, Brahman heifers gained more on hay plus cottonseed meal than Simmental heifers.

Introduction

Grazing cattle on winter pastures is often used as a means to lessen the economic burden of feed purchases and to improve cattle performance during the winter months. This experiment was designed to evaluate the effect of grazing time on winter pasture on performance, forage intake, and flow of digesta in heifers of two beef breed types.

Procedure

Simmental crossbred ($\frac{1}{2}$ Simmental $\times$ $\frac{1}{4}$ Brahman $\times$ $\frac{1}{4}$ Hereford) and Brahman heifers received one of the following treatments: (1) free choice Coastal bermudagrass hay plus one pound of cottonseed meal/head daily, (2) full time Elbon rye and Gulf ryegrass winter pasture, (3) 6 hours/day of winter pasture plus free choice hay or, (4) 2 hours/day of winter pasture plus free choice hay. Two heifers of each breed were used per treatment in a two replicate design. Animal body weight was recorded at 28-day intervals. Hay intake was measured daily. At the beginning of each of two test periods (January 19 and February 25), heifers were pulse dosed with hay particles labeled with ytterbium (Yb), an indigestible marker. Fecal grab samples were then taken at serial intervals from 0 to 120 hours post dose. Fecal output, fill of indigestible dry matter and forage residence time in the gastrointestinal tract were calculated from Yb excretion. In addition, digestibility of the winter pasture and hay was estimated and used with fecal outputs to calculate intake of winter pasture.

Results and Discussion

Weight gain data of the heifers is shown in Table 1. This is expressed as total gain over the 56-day study and as

KEYWORDS: Simmental crossbred heifers/Brahman heifers/forage intake/winter pastures/body weight gain.

TABLE 1. THE EFFECT OF WINTER PASTURE (WP) GRAZING TIME ON BODY WEIGHT GAIN OVER A 56-DAY STUDY

Treatment	Gain/head (lb)		ADG (lb)	
	Simmental crossbred	Brahman	Simmental crossbred	Brahman
Full time winter pasture (WP)	116.2 a	50.5 ab	2.08 a	.90 ab
6 hours WP + hay	85.6 a	57.8 ab	1.53 a	1.03 ab
2 hours WP + hay	46.1 b	41.7 b	.82 b	.74 b
Hay + cottonseed meal	39.2 b	55.3 a	.70 b	.99 a

Means within a column with different superscripts are different ($P < .05$).

average daily gain (ADG). Within a breed, as hours of grazing time on winter pasture increased, body weight gains increased in Simmental crossbred heifers but not in Brahman heifers. Among the treatments studied, the Simmental crossbred heifers exhibited highest gains while on full time winter pasture and efficiently utilized hay plus 6 hours grazing time on winter pasture. Two hours of winter pasture plus hay depressed gains in the Brahman heifers to a greater degree than other diets evaluated. These performance data suggest a possible difference in the way the two breed types are able to utilize limited grazing of winter pasture. A more detailed study is needed, however, to make definitive statements concerning breed differences.

Forage intake, fill of indigestible dry matter, and fecal output of the heifers on a pounds per 100 lb of animal body

TABLE 2. THE EFFECT OF WINTER PASTURE (WP) GRAZING TIME ON POUNDS OF FORAGE DRY MATTER INTAKE, FILL AND FECAL OUTPUT PER 100 POUNDS ANIMAL BODY WEIGHT

Treatment	Forage Intake, lb/100 lb BW			Fill	Fecal Output
	Hay	WP	Hay + WP	lb/100	lb BW
Full time winter pasture (WP)	—	4.39 a	4.39	.59 a	.88 a
6 hours WP + hay	3.62 a	2.65 b	6.27	.85 b	1.37 b
2 hours WP + hay	3.87 a	1.39 c	5.26	.56 a	1.06 c
Hay + cottonseed meal	4.83 b	—	4.83	.80 b	1.19 bc

Means within a column with different superscripts are different ($P < .05$).

weight basis is summarized in Table 2. With increasing grazing time on winter pasture, hay intake decreased and pasture forage intake increased. When total forage intake was evaluated, more forage was consumed by heifers on the hay and pasture combination diets.

Forage residence time in the gastrointestinal tract was similar among treatments and averaged 25.8 hours. Fill was greater when heifers consumed hay plus cottonseed meal or hay plus 6 hours grazing time on winter pasture. The increased fill may be due to the bulk and lower digestibility on the exclusive hay diet and was probably a function of total forage consumed on the hay plus 6 hours winter pasture diet. Consequently, along with an increase

in forage consumption and fill, increased fecal output was observed on the hay plus 6 hours winter pasture treatment. Reduced dry matter intake, fill and fecal output was observed in heifers on full time winter pasture. Increases in forage dry matter intake occurred in association with increases in fill and fecal output rather than with changes in forage residence time when on the hay and pasture combination diets.