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Abstract

A digestion trial was conducted to determine the effect of method of processing supplemental alfalfa on the intake and utilization of dormant, bluestem-range forage. Supplement treatments were 1) control: no supplement; 2) ground and pelleted, suncured alfalfa; 3) ground and pelleted dehydrated alfalfa; and 4) longstem alfalfa hay. Bluestem forage intake (% BW), diet digestibility, and ruminal dry matter fill 4 hours after feeding were increased (P<.10) when supplemental alfalfa was fed, compared with no supplementation. Little difference was evident among different forms of supplemental alfalfa for most of the forage utilization characteristics measured. However, a weak trend (P=.18) was observed for increased intake of bluestem forage by the steers supplemented with dehydrated alfalfa pellets compared with suncured alfalfa pellets.

Keywords

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INFLUENCE OF METHOD OF PROCESSING SUPPLEMENTAL ALFALFA ON INTAKE AND UTILIZATION OF DORMANT, BLUESTEM-RANGE FORAGE BY BEEF STEERS[1]

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Summary

A digestion trial was conducted to determine the effect of method of processing supplemental alfalfa on the intake and utilization of dormant, bluestem-range forage. Supplement treatments were 1) control: no supplement; 2) ground and pelleted, suncured alfalfa; 3) ground and pelleted dehydrated alfalfa; and 4) longstem alfalfa hay. Bluestem forage intake (% BW), diet digestibility, and ruminal dry matter fill 4 hours after feeding were increased ($P < .10$) when supplemental alfalfa was fed, compared with no supplementation. Little difference was evident among different forms of supplemental alfalfa for most of the forage utilization characteristics measured. However, a weak trend ($P = .18$) was observed for increased intake of bluestem forage by the steers supplemented with dehydrated alfalfa pellets compared with suncured alfalfa pellets.

(Key Words: Supplements, Intake, Crude Protein Flow, Dormant Range, Alfalfa.)

Introduction

Previous research has demonstrated that protein supplements enhance intake and utilization of poor-quality forages. It has also been shown that alfalfa can be successfully used as a protein supplement. A 1990 study showed some improvement in forage intake and performance in beef cattle fed dehydrated alfalfa pellets as a supplement, compared with longstem alfalfa hay. However, it was unclear whether the improved response was from reduced particle size, alteration of protein degradability, or a combination of both. Our objective was to measure intake and forage utilization by beef steers fed bluestem-range forage supplemented with different forms of alfalfa.

Experimental Procedures

Four ruminally and duodenally fistulated crossbred steers (average BW = 845 lb) were rotated (Latin square experiment) through the following supplementation treatments: 1) control, no supplement; 2) ground and pelleted, suncured, alfalfa supplement; 3) ground and pelleted, dehydrated, alfalfa supplement; and 4) longstem, alfalfa hay supplement. The alfalfa was from a single cutting (July 14, 1990), and harvested material from alternate windrows was either dehydrated and pelleted or conserved in small square bales. Half of the bales subsequently were ground and pelleted to form the suncured pellets. All alfalfa supplements contained an average of 20% crude protein (CP). The supplements were fed at .5% of BW, and the dormant bluestem-range forage (2.6% CP, 75% NDF) was fed ad libitum at 130% of the previous 5 days' average intake. The steers were fed twice daily, 12 hours apart. To determine intake and digestibility, the steers were fitted with fecal bags for a 7-day intake and total fecal collection period following a 14-d adaptation. Ruminal dry matter and liquid fill were

[1]The authors would like to thank Gary Ritter, Wayne Adolph, Tye Engel, Jason Lewis, and the student workers from the Range/Cow-calf Unit for their invaluable assistance in conducting this trial.

determined by manually emptying each steer's rumen just before and 4 hr after the a.m. feeding.

Results and Discussion

Bluestem forage intake (% BW), diet dry matter (DM) digestibility, ruminal DM fill 4 hours after feeding, and ruminal liquid fill increased ($P < .10$) when supplemental alfalfa was fed as compared with no supplementation (Table 1). Because of the enhanced intake elicited by alfalfa supplementation and the concomitant improvement in digestibility, digestible DM intake also increased ($P < .10$) when supplemental alfalfa was fed as compared with no supplementation. Little difference was evident among the different forms of alfalfa with respect to the forage utilization characteristics measured, except a trend ($P = .18$) for increased total intake and forage intake by steers supplemented with dehydrated alfalfa pellets compared with suncured alfalfa pellets. This trend appears to be corroborated by the differences observed in DM fill measured 4 hours after feeding. The limited differences among the different forms of supplemental alfalfa may be due to the fact that the quality of supplements was very similar (hay was kept in a covered shed until processing) and relatively high. Under field conditions, suncured pellets are often made from lower quality hay that has been subjected to some degree of weathering. Under such conditions, dehydrated alfalfa pellets would be expected to be higher in quality and, therefore, might elicit improved performance.

Table 1. Influence of the Form of Supplemental Alfalfa on Intake, Digestibility, Protein Flow, and Rumen Fill[a]

	Treatment				
Item	Control	Dehy	Sun	Long	SE
DM Intake, % BW					
Total	.83[b]	2.09[c]	1.86[c]	1.90[c]	.11
Forage	.83[b]	1.59[c]	1.36[c]	1.42[c]	.11
Supplement	.00	.50	.48	.50	
Total Tract Digestibility, %					
DM	34.41[b]	49.68[c]	47.28[c]	49.39[c]	2.64
NDF	44.97	48.53	49.85	52.82	3.65
Digestible DM Intake, lb/d	2.13[b]	8.48[c]	7.22[c]	7.69[c]	.58
Rumen Fill					
DM, lb 0 hour	16.25	18.92	17.01	18.56	1.07
4 hour	17.17[b]	22.57[c]	19.73[cd]	19.31[bd]	.83
Liquid, liter[e]	46.16[b]	70.29[c]	54.83[c]	57.04[c]	2.37

[a]SE = Standard error; % BW = percent of body weight; DM = dry matter; NDF = neutral detergent fiber.
[b,c,d] Row means with different superscripts differ ($P < .10$).
[e]No treatment × time interaction ($P > .10$). Values are an average of 0 and 4 h evaluations.