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EFFECTS OF COOKED MOLASSES BLOCKS ON INTAKE AND DIGESTION BY STEERS FED BROME HAY WITH OR WITHOUT ALFALFA

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Summary

This study was conducted to determine how cattle fed medium to high quality forages respond to supplementation with cooked molasses blocks. Responses to blocks were measured for steers fed each of three different hays ad libitum: 1) brome containing 8.4% CP and 72% NDF, 2) alfalfa containing 19.2% CP and 52% NDF, and 3) brome fed ad lib and supplemented daily with 5 lb/day of the alfalfa (MIX). Eighteen steers (622 lb) were used for two periods. Six steers received each of the forages, and each steer was supplemented with the block in only one of the two periods. Blocks were fed once daily and removed after the appropriate amount had been consumed. Block intakes averaged .66 lb of dry matter daily (.55 lb OM) and were similar among forages. Forage organic matter (OM) intake was not affected by the block when brome (9.8 lb/day) or MIX (11.6 lb/day) was fed, but it decreased from 15.4 to 14.4 lb/day when the block was supplemented to alfalfa. Digestibility of OM was greater (P<.05) for alfalfa (61.0%) than brome (55.7%) or MIX (57.5%) and was not impacted by block supplementation. Digestible OM intake was greater (P<.05) for alfalfa (9.3 lb/day) than brome (5.6 lb/day) or MIX (6.8 lb/day) and was not greatly impacted by block supplementation. Thus, supplementation with a cooked molasses-urea block had only small effects on intake and digestion of medium to high quality forages.

(Key Words: Steers, Forage, Supplementation.)

Introduction

Previous studies conducted at Kansas State University have demonstrated clearly that cattle fed low quality forages (prairie hay containing 5 to 6% crude protein) respond to supplementation with cooked molasses-urea blocks with increased forage intake and digestion. Much of this response is attributable to the supply of protein, which has been demonstrated to be the most limiting nutrient under those conditions.

However, it is unclear how cattle fed higher quality forages may respond to block supplementation. Higher quality forages typically contain reasonable quantities of protein, so response to protein supplementation per se may be limited. In addition, substitution effects (reductions in forage intake in response to supplement consumption) are usually greater with high-quality forages than with poor-quality forages, suggesting that increases in forage intake are less likely to occur.

Experimental Procedures

Eighteen steers (622 lb) were used in an intake/digestion trial to evaluate supplementation with cooked molasses blocks at a level of 0.10% of body weight. The blocks were obtained from a commercial company and were analyzed to contain 33.2% crude protein on a dry basis (not more than 12% crude protein from urea). Responses to block supplementation were measured for steers fed each of three different forage treatments: 1) brome hay containing (dry basis) approximately 8.4% crude protein and 72% NDF, 2) alfalfa hay containing approximately 19.2% crude protein and 52% NDF, and 3) the brome hay supplemented daily with 5 pounds of the alfalfa hay. All forages were coarsely chopped.

Six steers received each of the forages, and each steer was supplemented with the block in only one of the two periods; consequently, six observations were made for each treatment,

except for one missing observation on the MIX without block.

Steers were provided access to the blocks once daily, and the blocks were removed after the intended amount had been consumed. Plain salt (20 g/day) was provided to each steer. Each period was 18 days long, with 12 days for adaptation and 6 days for total collection of feces with the use of fecal collection bags.

Results and Discussion

Block intakes averaged .66 lb/day of dry matter (.55 lb/day OM, Table 1) and were similar among forages. These were slightly higher than projected, because steers occasionally consumed the block faster than anticipated.

Forage quality was reflected clearly by differences in intake and digestion. Digestible OM intake, a measure of energy available to the animal, was 65% greater for alfalfa than for the brome hay (9.3 vs 5.6 lb/day). Providing 5 lb/day of alfalfa to the brome-fed steers increased digestible OM intake by 22% (6.8 vs 5.6 lb/day). OM digestibility was greater ($P<.05$) for alfalfa (61.0%) than brome (55.7%) or MIX (57.5%).

Block supplementation had little effect on intake or digestion of these medium- to high-quality forages. Although the interaction between forage and block was not statistically significant, forage OM intake was barely changed by the block when brome (9.8 lb/day) or MIX (11.6 lb/day) was fed, but it decreased from 15.4 lb/day to 14.4 lb/day when the block was supplemented to alfalfa-fed steers. Organic matter digestibility was not impacted by supplementation with the block.

In conclusion, supplementation with a 30% crude protein cooked molasses block had very little impact on forage intake or digestion when alfalfa (19% crude protein, dry basis), brome (8% crude protein, dry basis), or a mixture of these two forages was fed to growing steers.

Table 1. Effect of Treatment on Intake and Digestion of Organic Matter

	No Block			Block Supplementation			
Organic matter	Alfalfa	Brome	MIX[1]	Alfalfa	Brome	MIX[1]	SEM
Forage OM intake, lb/d[a]	15.4	9.9	11.6	14.4	9.8	11.7	.52
Block OM intake, lb/d	-	-	-	.60	.52	.53	.019
Total OM intake, lb/d[a]	15.4	9.9	11.6	15.0	10.3	12.2	.52
Dig. OM intake, lb/d[a]	9.4	5.5	6.6	9.1	5.7	7.1	.40
OM digestibility, %[b]	60.9	56.1	56.9	61.0	55.4	58.0	1.0

[1]MIX = Ad libitum brome supplemented with 5 lb/d alfalfa.
[a]Effect of forage: Alfalfa >MIX>Brome ($P<.05$).
[b]Effect of forage: Alfalfa >MIX=Brome ($P<.05$).