

Comparison of Cottonseed Hulls, Rice Mill Feed, Soybean Hulls and Beet Pulp as Roughages

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Story in Brief

Intake and digestibility of dry matter (DM) and acid-detergent fiber (ADF) of cottonseed hulls, rice mill feed, soybean hulls and beet pulp by mature crossbred wethers was measured. Intake and DM and ADF digestibility of rice mill feed were the lowest. The data indicate that soybean hulls and/or beet pulp would be much better alternative roughages to cottonseed hulls to decrease the energy density of grain fed free-choice to stocker cattle on pasture.

Introduction

Stocker cattle on wheat pasture are frequently given free-choice access to supplemental feed in self-feeders. If grain is fed, it is usually necessary to decrease the energy density with a roughage such as cottonseed hulls. Because of decreased availability of cottonseed hulls and cost, there has been interest in alternate roughage sources that are suitable for this use. Intake and digestibility of dry matter (DM) and acid-detergent fiber (ADF) of cottonseed hulls, rice mill feed, soybean hulls and beet pulp fed to mature sheep were measured in this study.

Experimental Procedure

Twenty crossbred wethers with a mean initial weight of 92 pounds were allotted by weight to four treatments. The lambs had been fed cottonseed hulls and .44 lb/day of a soybean meal based supplement for 10 days prior to allotment to treatments. Lambs were individually fed cottonseed hulls, rice mill feed, soybean hulls or beet pulp ad libitum and .44 lb/day of a supplement that consisted of soybean meal, 92 percent; dicalcium phosphate, 7 percent; trace-mineralized salt, 1 percent; and supplemental vitamins A and D. Consumption of roughages by the lambs was measured for 14 days. Total fecal excretion of the lambs was measured by use of fecal collection bags during the last 5 days of the trial. The roughages were limit fed at a level of 2 percent of body weight for 2 days prior to the fecal collection period and during the fecal collection period. Digestibility of roughage DM and ADF was calculated by "difference" (Schneider and Flatt, 1975). Digestibilities of supplement DM and ADF of 83 and 70 percent, respectively, were assumed in the calculations. The lambs were weighed at the beginning and end of the trial after feed and water were withheld for 24 and 18 hours, respectively.

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Results and Discussion

Crude protein and ADF contents of the roughages are shown in Table 1. Roughage intake, digestibility of roughage DM and ADF and weight gains of the lambs are shown in Table 2. Consumption of rice mill feed was lowest and consumption of soybean hulls was highest. Digestibility of DM and ADF of rice mill feed was lower than that of the other roughages. Digestibility of DM and ADF of soybean hulls and beet pulp were good and much higher than that of cottonseed hulls. Weight gains of lambs fed soybean hulls and beet pulp were two-fold greater than lambs fed cottonseed hulls. Gains of lambs fed rice mill feed were the lowest. The results indicate that soybean hulls and beet pulp would be excellent alternative roughages to cottonseed hulls to decrease the energy density of grain fed free-choice to stocker cattle on pasture. Prices of soybean hulls and beet pulp vary markedly with season and location. There are times in which they can economically be used for this purpose.

Table 1. Crude protein and acid-detergent fiber (ADF) content of roughages

	Roughage			
	Cottonseed hulls	Rice mill feed	Soybean hulls	Beet pulp
Crude protein, % of DM	5.54	8.98	13.32	10.63
ADF, % of DM	67.2	48.3	47.2	31.2

Table 2. Roughage intake, digestibility of roughage dry matter (DM) and acid-detergent fiber (ADF) and weight gains of lambs

	Roughage			
	Cottonseed hulls	Rice mill feed	Soybean hulls	Beet pulp
Number of lambs	5	5	5	5
Roughage intake				
lb DM/day	2.75 ^a	2.09 ^b	3.00 ^a	2.65 ^a
% of body wt	2.75 ^{ab}	2.33 ^b	3.12 ^a	2.77 ^{ab}
DM digestibility ^d , %	41.1 ^a	30.9 ^b	75.0 ^c	81.4 ^d
ADF digestibility ^d , %	34.9 ^a	3.2 ^b	73.4 ^c	76.4 ^c
Weight gain of lambs, lb	5.5 ^a	1.6 ^a	11.5 ^b	13.7 ^b

^{abc}Means with common lettered superscripts are not different ($P > .05$).

^dRoughages limit-fed at a level of 2% of body weight during fecal collection period.

Literature Cited

Schneider and Flatt. 1975. The Evaluation of Feeds Through Digestibility Experiments. p. 165.