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# Diet Roughage Ingredients for Newly Weaned Calves

## **Abstract**

Several commodity feeds that are high in fiber are available that may substitute for corn cobs in a complete starting ration. This study was designed to evaluate the use of soyhulls and sunflower meal as substitutes for corncobs as a roughage source for newly weaned calves. One-hundred-and-fifty calves from the ISU Rhodes Research Farm were weaned, weighed, sorted by sex, and stratified by weight to eight pens. Two pens of each sex were assigned to one of two diet treatments. Calves fed the corncob diet consumed two pounds more feed dry matter, gained 1.5 pounds more per day, and were more efficient the first 14 days on feed. The soyhull diet was quite fine in particle size, and some feed particle separation occurred in the bunk. Some compensatory performance may have occurred with the soyhull diet the second 14 days on feed, although no statistical differences existed. This suggests that palatability, feed presentation, and bunk characteristics are important considerations in selecting roughage sources for complete starting diets for newly weaned calves.

## **Keywords**

ASL R1346

## **Disciplines**

Animal Sciences

# Diet Roughage Ingredients for Newly Weaned Calves

## A.S. Leaflet R1346

Dan Loy, professor of animal science

### Summary

Several commodity feeds that are high in fiber are available that may substitute for corn cobs in a complete starting ration. This study was designed to evaluate the use of soyhulls and sunflower meal as substitutes for corncobs as a roughage source for newly weaned calves. One-hundred-and-fifty calves from the ISU Rhodes Research Farm were weaned, weighed, sorted by sex, and stratified by weight to eight pens. Two pens of each sex were assigned to one of two diet treatments. Calves fed the corncob diet consumed two pounds more feed dry matter, gained 1.5 pounds more per day, and were more efficient the first 14 days on feed. The soyhull diet was quite fine in particle size, and some feed particle separation occurred in the bunk. Some compensatory performance may have occurred with the soyhull diet the second 14 days on feed, although no statistical differences existed. This suggests that palatability, feed presentation, and bunk characteristics are important considerations in selecting roughage sources for complete starting diets for newly weaned calves.

### Introduction

The nutrition of beef calves the first 28 days after weaning is essential to minimize the threat of losses due to respiratory disease and prepare calves for a rapid transition to a finishing diet. The cattle feeder may choose to feed a complete diet or supplement available feed grains and forages. In complete feeds, economically priced roughage sources that are acceptable in milling feed handling characteristics are difficult to find locally. Corncobs are an excellent roughage source for complete starting feeds. However, corncobs are not always available or reasonably priced in Iowa. Several high-fiber commodity feeds are available that may substitute for corncobs in a complete starting ration. This study was designed to evaluate the use of soyhulls and sunflower meal as a substitute for corncobs as a roughage source for newly weaned calves.

### Materials and Methods

One-hundred-and-fifty calves from the ISU Rhodes Research Farm were weaned, weighed, sorted by sex, and stratified by weight to eight pens (four of each sex) and immediately placed on feed. These calves were weaned from first- and second-calf heifers and weighed 434±6 pounds. Two pens of each sex were assigned to one of two diet treatments. Long-stem hay was fed in addition to the experimental diets for three days. Calves were weighed at 14 and 28 days on feed.

The diets fed are shown in Table 1. The corncob diet has been used successfully for starting calves at this location for many years. The soyhull diet was formulated to approximate the neutral detergent fiber (NDF) and protein content of the corncob diet. To achieve this required the addition of a high-fiber protein source. Sunflower meal was an available commodity that met this criterion. The resultant diet (Table 2) was similar in NDF or total fiber content but higher in acid detergent fiber (ADF). Therefore, the calculated net energy value was slightly lower for the soyhull diet.

### Results and Discussion

Results of performance are shown in Table 3. Calves fed the corncob diet consumed two pounds more feed dry matter, gained 1.5 pounds more per day, and were more efficient the first 14 days on feed. Plausible explanations for this difference include palatability and/or physical form. The soyhull diet was quite fine in particle size and some feed particle separation occurred in the bunk. Pelleting of the diet or its fibrous components may have reduced this problem but at a cost. Some compensatory performance may have occurred with the soyhull diet the second 14 days on feed, although no statistical differences existed. Overall, the corncob diet improved daily gains and tended to increase feed intake ( $P < .07$ ) over the soyhull diet.

### Implications

**In this experiment, corncobs were a superior fiber source to soyhulls and sunflower meal in starting diets for newly weaned calves. The performance response occurred in the first 14 days. Performance for the second two-week period was not different. This suggests that palatability, feed presentation, and bunk characteristics are important considerations in selecting roughage sources for complete starting diets for newly weaned calves.**

**Table 1. Diet compensation (as-fed basis).**

Ingredient	Diet	
	Corncoobs	Soyhulls
	----- Pounds/ton -----	
Cracked corn	767.2	704
Corn cobs	730	-
Soybean hulls	-	731
Sunflower meal	-	403
Soybean meal	380	49
Molasses	84.2	84.2
Ground limestone	24.8	20
Dicalcium phosphate	5.0	-
Iodized salt	4.4	4.4
Trace mineral premix	0.4	0.4
Vitamin A premix <sup>a</sup>	2.2	2.2
CTC-50 <sup>b</sup>	1.8	1.8

<sup>a</sup>Contains 2 million I.U. vitamin A/lb.

<sup>b</sup>Contains 50g chlortetracycline/lb.

**Table 2. Nutrient composition of diets<sup>1</sup>.**

	Diet	
	Corncoobs	Soyhulls
Crude protein (%)	14.2	14.4
NDF (%)	39.5	36.9
ADF (%)	16.2	26.9
Neg (Mcal/lb)	.47	.45
Ca (%)	.69	.66
P (%)	.34	.43

<sup>a</sup>Calculated, dry matter basis.

**Table 3. Performance of calves fed corncobs or soybean hulls as a roughage source in complete starting feeds.**

Item	Roughage source		S.E.
	Corncoobs	Soyhulls	
Number of pens	4	4	
Number of cattle	75	75	
Initial weight, lb	434	434	6.3
Final weight, lb	526	513	7.2
Days 0-14			
- DMI, lb	11.73**	9.73	.19
- ADG, lb	3.43**	1.92	.23
- F/G, lb	3.50*	5.12	.36
Days 15-28			
- DMI, lb	15.25	15.35	.56
- ADG, lb	3.15	3.66	.25
- F/G, lb	5.20	4.47	.62
Overall, days 0-28			
- DMI, lb	13.53	12.53	.33
- ADG, lb	3.29**	2.79	.13
- F/G, lb	4.14	4.60	.27

\*Means differ (P < .05)

\*\*Means differ (P < .01)