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## HYDROLYZED FEATHER MEAL AS A PROTEIN SUPPLEMENT FOR STEER CALVES FED CORN SILAGE

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### Summary

Hydrolyzed feather meal (HFM) was evaluated for soybean meal replacement value in corn silage diets fed to steer calves. One hundred ninety-two steers (692 lb) were fed corn silage diets formulated to contain 11.5% crude protein. Hydrolyzed feather meal was substituted for soybean meal at levels providing 0, 25, 50 or 75% of the supplemental protein. Overall performance for the 98-day feeding trial was as follows: 2.10 lb average daily gain; 17.91 lb/day dry matter (DM) intake and 8.58 DM/gain. Protein supplements had no effect on performance, indicating that cost per unit protein is the primary consideration when formulating supplements containing HFM for growing calves fed high quality corn silage.

(Key Words: Hydrolyzed Feather Meal, Corn Silage, Crude Protein, Steer Calves.)

### Introduction

Limiting input costs is a more important consideration than increasing production under current economic conditions. Hydrolyzed feather meal (HFM), a by-product of the poultry industry, holds possibilities as a lower cost alternative protein supplement for ruminants. Crude protein content of HFM is high (80%) and has been shown useful in previous cattle feeding research.

The objectives of this study were to determine whether HFM could be effectively incorporated into corn silage growing diets for steer calves.

### Materials and Methods

This trial utilized 192 crossbred steer calves (692 lb) previously processed and maintained at the feedlot for 60 days prior to this study. Assignment to light, medium or heavy replicates was based on a previous weight. Allotment of steers to pens (8 head) by replicate group was done randomly.

Treatments included replacing 0, 25, 50 or 75% of the supplemental crude protein contributed by soybean meal with HFM. Corn was included with HFM to maintain caloric density of these supplements (table 1). Two pens of each weight group were randomly assigned to each protein supplement such that six pens (48 head) were represented in each treatment.

Initial weights were taken after a 12-hour food and water deprivation. Interim weights were monitored at 28-day intervals and final weight was determined by feeding 4 lb dry matter per head 24 hours before weighing. Water

deprivation occurred 16 hours before weighing. Duration of the feeding trial was 98 days.

Variables considered included average daily gain, average daily dry matter intake and feed efficiency. Data were statistically analyzed on a pen mean basis.

#### Results and Discussion

Actual crude protein content of the diets averaged 13% and did not vary between treatments. This was considerably higher than the 11.5% crude protein level intended and was due primarily to the higher than anticipated crude protein content of the corn silage (9%). Supplements contributed 37.5% of the dietary protein in the diets.

The level of HFM included in the diet had no effect on steer performance (table 2). Overall, performance was low and could be attributed to the weights of the steers and the prevailing inclimate conditions during the feeding period.

Closer evaluation of the crude protein levels fed indicate that the diet had considerably higher crude protein content than NRC recommendations for the weights and average daily gains recorded in this study. Gains of 2.1 lb per day require only 9.8% crude protein. Under these conditions even on diet S75, HFM contributions would not have been necessary to meet crude protein requirements.

Whether or not 9.8% crude protein diets would have been adequate is debatable. Higher levels are probably necessary if for no other reason than to maintain dry matter intake. However, evaluation of the supplemental protein value of HFM may have been limited by excessive dietary crude protein.

TABLE 1. DIET FORMULATION FOR EVALUATING HYDROLYZED FEATHER MEAL FOR GROWING STEERS<sup>abc</sup>

Item	Diet <sup>d</sup>			
	S0	S25	S50	S75
Corn silage, %	90.68	90.68	90.68	90.68
Soybean meal, %	8.52	6.30	3.96	2.13
Feather meal, %	--	1.18	2.37	3.29
TM salt, %	.40	.40	.40	.40
Limestone, %	.40	.40	.40	.42
Ground corn, %	--	1.04	2.19	3.08
Crude protein, %	11.51	11.56	11.57	11.57
NEm, Mcal/cwt	72.0	71.8	71.6	71.5
NEg, Mcal/cwt	44.0	43.9	43.5	43.5

a Values expressed on a dry matter basis.

b Vitamin A provided as 1600 IU/lb feed dry matter.

c All components except corn silage were included in pelleted form.

d Percentage of supplemental crude protein provided by feather meal.

TABLE 2. PERFORMANCE OF STEER CALVES WHEN HYDROLYZED FEATHER MEAL IS SUBSTITUTED FOR SOYBEAN MEAL

Item	Diet				SEM
	S0	S25	S50	S75	
Initial wt, lb	690	691	692	694	1.5
Avg daily gain, lb/day	2.09	2.16	2.09	2.06	.08
DM intake <sup>a</sup> , lb/head/day	17.62	18.13	18.08	17.81	.15
Feed/gain <sup>a</sup>	8.51	8.42	8.70	8.70	.25
Final wt, lb	894	903	896	895	8.2

<sup>a</sup> Dry matter basis.