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HYDROLYZED FEATHER MEAL SUPPLEMENTATION FOR LACTATING RANGE COWS

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Summary

A 2-year study involving 178 cow/calf pairs was conducted to evaluate hydrolyzed feather meal[4] as a protein supplement for cows grazing native range during early lactation. Calving season occurred from mid-March until late April. Within a week after calving, cows were fed either a soybean meal or feather meal-corn supplement that provided approximately .83 lb crude protein per cow daily. Cow weight and condition score changes from calving until early May and percentage of cows cycling early in the breeding season (early June) were similar between supplement groups. Calf average daily gains from birth until May were not affected by supplement fed to cows. In this study, supplementing lactating cows with hydrolyzed feather meal resulted in similar performance, regardless of cow age, as supplementing with soybean meal.

(Key Words: Supplementation, Hydrolyzed Feather Meal, Range Cows, Protein, Lactation.)

Introduction

Research indicates that methionine, a sulfur-containing amino acid, is one of the first limiting amino acids for milk production and animal growth. Supplementing lactating cows with a protein source that provided this limiting amino acid to the small intestine may increase milk levels, weight gains and improve reproductive performance. Hydrolyzed feather meal is 85 to 95% crude protein and high in the sulfur-containing amino acids methionine and cystine. Feather meal is also relatively undegraded (70% rumen escape) in the rumen and it could be expected that a greater percentage of those amino acids would be presented intact to the small intestine where they could be absorbed and used for milk synthesis. The objective of this study was to evaluate hydrolyzed feather meal as a protein supplement for beef cows grazing native range during early lactation.

Materials and Methods

One hundred seventy-eight cow/calf pairs wintered on native range at the SDSU Range and Livestock Research Station near Cottonwood were fed either a soybean meal or hydrolyzed feather meal-corn supplement (Table 1) during early lactation.

TABLE 1. SUPPLEMENTS FED LACTATING COWS[a]

Ingredient	Soybean meal	Feather meal
Soybean meal	93.0	--
Corn	--	48.0
Hydrolyzed feather meal	--	39.0
Liquid molasses	5.0	5.0
Sodium sulfate	1.0	--
Sodium bentonite	1.0	5.0
Potassium chloride	--	2.5
Dicalcium phosphate	--	.5

[a] Percent, as fed basis.

Supplements were formulated to provide .83 lb crude protein per cow daily and were balanced for energy, calcium, phosphorus, potassium and sulfur. Actual nutrient composition of supplements as determined by laboratory analysis are reported in Table 2. Equal amounts of prairie grass hay were fed to cows on each treatment when weather prevented grazing. Simmental x Angus cows calved from mid-March to late April. Calves were sired by Simmental and Angus bulls. During the second year, thirty-five 2- and 3-year-old cows were included in the study. Within a week after calving, cows were weighed (after overnight feed and water removal), condition scored (1-9, 1 = severely emaciated) and allotted by calving date and within cow

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[4]Thanks to Central Bi-Products, Redwood Falls, MN, for donating the hydrolyzed feather meal.

TABLE 2. POUNDS OF NUTRIENTS PROVIDED LACTATING COWS[a]

Item	Supplement	
	Soybean meal	Feather meal
Crude protein	.77	.82
Calcium	.0069	.0077
Phosphorus	.0104	.0075
Potassium	.0413	.0361
Sulfur	.0106	.0160
Methionine + cystine	.0258	.0571
Mcal ME[b]	2.37	2.40

[a] Lb per head daily.
[b] Calculated values.

age to supplemental treatments. Pasture groups were rotated every 10 to 15 days over the treatment period. In early May, shrunk weights on two consecutive days and cow condition scores were recorded. Calves were weighed within 24 hours of birth, in early May and at weaning in late October. For the first year, two blood samples taken 8 days apart from cows in early June were used to determine cyclic activity. Cows with greater than 1.0 ng progesterone per ml of serum (determined by radioimmunoassay) in either sample were considered to be cycling. Estrus was determined by visual observation during the second year. Pregnancy was determined by rectal palpation in late October.

Data were analyzed by least squares procedures using General Linear Model procedure of the Statistical Analysis System. For the second year, treatment, cow age, calf sex and treatment x cow age were included as independent variables in each model with calving date as a covariate. Data for mature cows was then combined over the two year study and analyzed separately, with cow age and supplemental treatment x cow age variables excluded from the model.

Results and Discussion

Hydrolyzed feather meal supplemented cows had similar early lactation weight and condition score changes compared to cows supplemented with soybean meal (Tables 3 and 4). No differences in the percentage of cows cycling early in the breeding season or pregnant in late October were observed for the different supplement groups. Hydrolyzed feather meal did not appear to affect milk production of mature cows as indicated by calf weight gains during early lactation or adjusted calf weaning weights in late October. During the second year when 2- and 3-year-old cows were included in the experiment, supplemental treatment x cow age interactions were not significant for cow or calf weight changes. Although weight gains from birth to early May tended to be higher (P=.14) for calves of 2- and 3-year-old cows fed hydrolyzed feather meal, this trend was observed with a limited number of animals.

Potential benefits in increased cow and/or calf weight gains or cow reproductive performance by feeding a bypass protein high in sulfur containing amino acids were not observed in this study.

TABLE 3. EFFECTS OF SUPPLEMENTATION ON MATURE COW PERFORMANCE

Item	Supplement: Soybean meal	Supplement: Feather meal
No. of cows	72	71
Cow weight following calving, lb	1186	1180
Cow condition score at calving	6.1	6.0
Calf birth weight, lb	90	89
Cow weight change, lb		
Calving - early May	-40	-39
Cow condition score, early May	5.5	5.4
Percent cows cycling, early June	88.1	86.0
Percent cows pregnant, Fall[a]	91.9	91.1
Calf weight change, lb/day		
Birth - early May	2.37	2.44
Calf weaning weight[ab]	627	621

[a] Data from first year only.
[b] Weight adjusted for sex and age of calf.

TABLE 4. EFFECTS OF SUPPLEMENTATION ON 2- AND 3-YEAR-OLD COW PERFORMANCE

Item	Supplement: Soybean meal	Supplement: Feather meal
No. of cows	17	18
Cow weight following calving, lb	1002	966
Calf birth weight, lb	80	78
Cow weight change, lb		
Calving - early May	-13	-27
Percent cows cycling, early June	72.4	74.3
Calf weight change, lb/day		
Birth - early May	1.67	2.00