

THE EFFECT OF PELLETING CREEP FEED WITH FIELD PEA GRAIN ON NURSING CALF PERFORMANCE

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Introduction

Field pea grain is an appealing nutrient-dense feed that contains a crude protein level of approximately 24.5% and 88% energy or TDN. Field pea grain has been proven to be an attractive ingredient in creep feeds with increased feed intake and gain with increasing inclusion of peas up to 67% of the diet (Anderson, 1999; Landblom and Poland, 2000 and Anderson and Schoonmaker, 2004). Recent feeding trials that included field pea grain in a creep ration indicated disparity of calf performance due to the processing of the field pea grain. The hull fraction splitting from the endosperm during rolling results in variation to the nutrient density of the feed which may affect calf performance (Anderson, 1999; Bock, 2000; Anderson and Schoonmaker, 2004). The objective of this trial was to determine if there are any effects on calf performance from pelleting a creep feed with field pea grain in the ration versus providing a non-pelleted feed of the same formulation.

Experimental Procedures

One hundred-five cow-calf pairs were allotted by weight (cow and calf weight), breed composition, age of cow, and sex of calf to one of two field pea grain creep diets. The treatments were creep feeds with field pea grain (Table 1) fed as a pelleted feed or a non-pelleted feed. Three replicates were used for each treatment, two pens of mature cows and one pen of first calf heifers were assigned to each treatment. Creep diets contained 16.5% crude protein, and 51.6 MCal/cwt NEg. Field pea grain was included in the creep ration at 40% of the dry matter. The formulation was based on previous findings that indicated approximately 40% is the optimum level for peas in a creep feed (Anderson, 1999). Peas also add binding properties that improve pellet quality (Kim Koch, Northern Crops Inst., Personal communication). Since this study was conducted in drylot pens, a small amount of chopped alfalfa hay (10%, DM basis) was added to the creep feed to simulate forage intake of grazing calves. The Northern Crops Institute, Fargo, North Dakota, pelleted the field pea grain ration and the total-mixed field pea ration was mixed on site.

Table 1. Creep feed formulations.

Ingredient	Dry matter, %
Soy hulls	37
Field pea grain	40
Wheat midds	19
Bovatec/Mineral Suppl	4
Diet Specifications	
Crude protein, %	16.50
NE _m , Mcal	81.20
NE _g , Mcal	51.60
Calcium, %	0.46
Phosphorus, %	0.33

The trial was initiated on August 2 and concluded September 27, 2005, when calves were weaned. Calves were weighed individually at the start of the study, on day 28 and at the end of the study. Two 28-day weigh periods were used to observe feed intake and gain. Cow-calf pairs were housed and fed at the Carrington Research Extension Center feedlot in open drylot pens during the summer of 2005. Each pen was equipped with automatic waterers and fenceline bunks for cows. Creep feed bunks were

placed in each pen with a calf gate to allow entrance of calves only. Respective creep feeds were added to the feeders 2 to 3 times a week on an as-needed basis. Feed for cows was delivered as a totally-mixed ration once daily to appetite. Calves were vaccinated for protection against IBR, BVD, BRSV, P13 (Bovishield-4; Pfizer Animal Health, Exton, PA) and clostridia (7-way+somnus; Pfizer Animal Health, Exton, PA) prior to the initiation of the trial. Health status of the cows and calves was monitored during daily feeding. The research project was approved by the Institutional Animal Care and Use Committee and the animals were cared for according to guidelines recommended in the Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching (FASS, 1998). Data were analyzed using the GLM procedures of SAS (Version 8.0; SAS Inst. Inc., Cary, NC). Pen was the experimental unit.

Results and Discussion

Cow performance data are reported in Table 2. The random allotment appears to have placed cows that gained faster in the pelleted treatment. ($P < 0.05$) This may have inadvertently affected calf gains if milk production was reduced in favor of cow gains.

Table 2. Cow and calf data for creep feed trial.

Item	Treatment		SE	P value
	Mixed Creep Feed	Pelleted Creep Feed		
Number of pairs	54	51		
Cow wt, lbs.				
Initial wt, 8/2/2005	1275	1272	18.40	0.93
Final wt, 9/27/2005	1341	1354	18.60	0.62
Cow gain, lbs.	65.8 ^a	81.4 ^b	5.10	0.04
Cow avg daily gain, lb.	1.17 ^a	1.45 ^b	0.09	0.04
Cow age, years	4.62	4.37		
Calf birth wt, lbs.	89.07	88.90		
Calf birth date	10-Apr-05	8-Apr-05		

^{a,b} Values with different superscripts are different ($P < 0.05$).

Calf gain and average daily gains are reported in Table 3. Calves fed the two creep diets consumed the same amount of feed and gained the same overall ($P < 0.18$). However, during the second 28-day period, the calves fed the mixed-creep ration tended to gain more ($P < 0.06$) at 3.36 lbs. per day vs. 3.14 for the pelleted creep feed.

Table 3. Calf performance for mixed vs. pelleted creep feeds.

Item	Treatment		SE	P value
	Mixed Creep Feed	Pelleted Creep Feed		
Calf weight, lbs.				
2-Aug-05	404.3	401.9	6.80	0.81
30-Aug-05	493.5	491.2	7.60	0.83
27-Sep-05	587.7	579.0	8.30	0.47
Avg Daily Gain, lb/hd/d				
Period 1	3.19	3.19	0.08	0.99
Period 2	3.36	3.14	0.08	0.06
Total	3.28	3.16	0.06	0.18
Dry matter intake, lb/hd/day				
Period 1	5.37	5.57	0.12	0.34
Period 2	10.24	9.78	0.52	0.56
Total	7.81	7.67	0.31	0.77
Feed efficiency, feed/gain				
Period 1	1.68	1.74	0.07	0.56
Period 2	3.07	3.12	0.16	0.85
Total	2.39	2.42	0.12	0.84

Pelleting of field pea grain does not appear to be critical for calf performance. Benefits of pelleting creep feeds with field pea grain include the binding qualities, reduction in fines, storage, handling, and the consistency of a creep ration. Commercial feed manufacturers may use field pea grain in creep feeds to reduce fines and make a more durable pellet. Anecdotal data suggests peas improve pellet binding and durability at as little as 10% of the formulation.

Literature Cited

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Reprinted from the 2006 NDSU Carrington Research Extension Center Feedlot Research Report. Volume 29. Oct 10, 2006