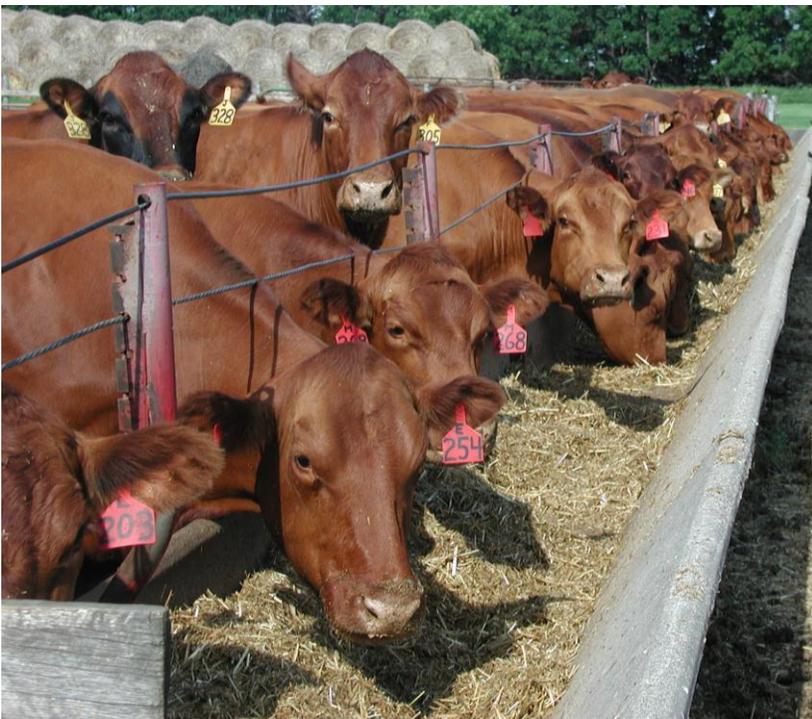


Effects of Field Pea Processing on Performance of Gestating Cows

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Introduction

Field peas contain high levels of protein (approximately 24% CP) and energy (~88% TDN, 48% starch), and are increasingly available as livestock feed. Significant amounts of pulse grains are produced annually in the northern Great Plains of the United States and the prairie provinces of Canada. North Dakota leads the United States in field pea production, giving producers in the region a high quality option for protein in beef cattle rations. Peas may make an excellent winter supplement for beef cows grazing native range or fed low quality forages. This study was undertaken to determine the effects of processing peas on cow performance during the winter feeding period.



Gestating cows fed peas in their winter ration.

Experimental Procedures

One hundred-two Red Angus-cross cows (1301.2 ± 2.3 lbs.) were allotted by weight, breed composition, and age to one of three pea-supplemented diets (2 pens per treatment) to determine the optimum level of pea processing needed to maximize cow performance. All cows were determined to be pregnant prior to initiation of the trial. Cows were housed and fed at the Carrington Research Extension Center feedlot in open drylot pens. Each pen was equipped with automatic waterers and fenceline bunks for cows. Cows were fed 35 lbs. per head (as-fed basis) of a totally-mixed ration once daily. Straw bales, fed in round bale feeders, were offered free choice. The gestation diet consisted of corn silage and wheat straw, with peas added as protein source at 20% of the diet DM (Table 1). Diets contained 9.7% crude protein. Cows were weighed and condition scored at the start of the study (Dec 6) and at the end of the study (March 3) just prior to calving, with intermediate weights taken at 28 day intervals. Additional observations of calving date, calf growth, and rebreeding performance will be reported in the future.

Table 1. Gestation diet for beef cows fed peas.

Ingredient	% DM basis
Corn silage	45.95
Wheat straw	32.00
Field peas	20.00
Limestone	1.05
Mineral supplement	1.00
Diet specifications	
Crude protein, %	9.70
NEm, Mcal/cwt	64.40
NEg, Mcal/cwt	33.70
Calcium, %	0.65

Research protocols regarding animal care followed guidelines recommended in the Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching (FASS, 1998).

Data were subjected to a one-way analysis of variance as a completely randomized design using the GLM procedures of SAS (Version 8.0; SAS Inst. Inc., Cary, NC). The model included effects due to diet and pen was the experimental unit.

Results and Discussion

Particle size of ground, rolled, and whole peas was 701, 3100, and 9250 microns, respectively. Cow weight did not differ among treatments ($P > 0.85$) over the three-month study. Average gain showed some response during the second period with improved gains (1.50 lbs. per hd per day) for rolled peas ($P < .02$) over ground (1.30 lbs.) and whole (.92 lbs.). During the last period, gains from whole peas (.33 lbs. per hd per day) were greatest ($P < .03$), followed by rolled (-.07 lbs.) and ground (-.20 lbs.). This pattern is not consistent. Similarly, Birkelo et al. (2000) observed no effect of processing (dry-rolled vs. whole peas) on performance when peas were included in the diet at 10%. However, Bock (2000) reported that when fed at 40% of the diet DM in a forage-based ration, cattle fed rolled peas gained the least compared to cattle fed ground and whole peas. Cows do not require as much protein and energy as growing cattle, thus the benefit of grain processing may not be realized. Overall, cows appear to be able to utilize field peas whether they are processed or not. Beef cow producers needing to purchase an energy or protein source for their cows should consider growing field peas or seeking peas on the market.

Table 2. Effect of processing peas on beef cow performance during gestation.

	Ground Peas	Rolled Peas	Whole Peas	St Error	P Value
Weight, lbs.					
December 6, 2004	1300.8	1302.8	1300.1	24.8	0.99
January 6, 2005	1364.6	1374.9	1366.5	25.5	0.95
February 2, 2005	1399.7	1415.2	1390.3	25.3	0.78
March 3, 2005	1394.0	1413.2	1398.8	25.2	0.85
Average daily gain, lbs./d					
Period 1	2.06	2.33	2.11	0.15	0.42
Period 2	1.30	1.50	0.92	0.15	0.02
Period 3	-20	-.07	0.33	0.15	0.03
Overall	1.07	1.27	1.15	0.15	0.13
Cow age, years	4.26	4.23	3.91	0.60	0.75
Calf birth weight, lbs.	107.9	100.3	106.5	3.00	0.31

Literature Cited

- Birkelo, C. P., B. J. Johnson, and B. D. Rops. 2000. Field peas in finishing cattle diets and the effect of processing. SDAES Cattle 00-4. South Dakota State Univ. Extension Service, Brookings.
- Bock, E. J. 2000. Effects of processing field peas in steer grower diets. Pages 29 – 31 in Carrington Research Extension Center Beef Production Field Day Report. Vol. 23. North Dakota State Univ., Fargo.

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