

the feed pea

FOCUS



PEAS: OPPORTUNITY INGREDIENT FOR 2006-2007

2006 was another excellent year for field pea production in western Canada. Statistics Canada estimates that 2.75 MMT¹ of peas were grown this summer and that, combined with nearly 0.5 MMT carried over from 2005, a total of 3.3 MMT of peas will be available for sale this year². Quality of the 2006 crop was excellent due to dry harvest conditions, with 92% of peas eligible for edible grades³. Global factors including the drought in Australia indicate there will be good demand for Canada's edible pea exports. However, supplies of edible peas that exceed export demand will likely remain within the domestic feed marketplace, as several of Canada's traditional European feed markets are not expected to import feed peas.

PULSE PRODUCTS FOR BEEF CATTLE

In response to rapidly increasing pea production, North Dakota has performed a significant body of research involving peas in beef rations. Dr. Vern Anderson and co-workers at the Carrington Research Centre have examined feeding levels and processing requirements for cow-calf and feedlot operations. Their work has identified both performance and meat quality benefits attributed to including peas in beef rations.

PEAS IN CREEP FEED

Peas are an excellent creep feed component for beef calves. Calves consuming pea-based creep rations (500 g kg⁻¹ peas) gained significantly more weight than calves receiving no creep feed, and equaled the performance of calves on SBM/pea-based creep rations. When used in pelleted creep rations containing 8 or 16% salt, intake of pea-based diets was limited to 3.0 and 1.9 kg/day and gain improved by 238 and 190 g/day, respectively (Gelvin et al, 2004)⁴.

RECEIVING RATIONS

Peas are a very palatable protein and energy source for cattle. Newly weaned calves have high stress levels and reduced feed consumption; therefore, they require nutrient-dense rations that stimulate intake. Calves consuming receiving diets had improved intake (16.53 vs. 14.56 lb/day) and gain (3.53 vs. 3.32 lb/day) when peas replaced the barley portion (56%) of an alfalfa/corn silage ration (P<0.05)⁵. This positive effect in receiving rations has also been demonstrated for other pulses, including chickpeas and lentils (Table 1).

Table 1. Intake and weight gain of calves fed pulse grains (160 - 170 kg MT⁻¹ DM) vs. canola meal control post-weaning (20 days)⁶.

	ADG (lb/day)	Intake (lb DM/day)	Feed/gain (lb/lb)
Control	2.48 ^a	10.2 ^a	4.1
Peas	3.18 ^b	11.8 ^b	3.7
Chickpeas	3.12 ^b	11.8 ^b	3.7
Lentils	3.07 ^b	12.2 ^b	4.0
Pulses vs Control	P=0.01	P=0.01	P=0.32

^{ab} Means in the same column with different superscripts differ.

¹<http://www40.statcan.ca/01/cst01/prim11b.htm>

²http://www.agr.gc.ca/mad-dam/index_e.php?s1=pubs&s2=spec&s3=php&page=spec_2006-10-12

³http://www.agr.gov.sk.ca/docs/reports/crop_report/crprptFinal2006.pdf

⁴Gelvin, A.A., Lardy, G.P., Soto-Navarro, S.A., Landblom, D.G. and Caton, J.S. 2004. Effect of field pea-based creep on intake, digestibility, ruminal fermentation, and performance by nursing calves grazing native range in western North Dakota. *J. Anim. Sci.* 82:3589-3599.

⁵Anderson, V. and Stoltenow, C. 2004. Field peas and/or barley in receiving diets for beef calves. <http://www.ag.ndsu.nodak.edu/carrington/livestock/Beef%20Report%2003/Field%20Peas%20and%20Barley%20in%20Receiving.htm>



PEAS IN GROWING/FINISHING RATIONS

Peas support excellent performance when used as a protein supplement or as the sole concentrate source in diets for growing and finishing beef cattle⁷. Researchers calculated that the value of peas was between 1.35 and 1.7 times the price of barley⁸; however, depending upon market prices, other pulse products including off-grade lentils, chickpeas, maple/marrowfat peas and screenings may have better potential to pencil into feedlot rations.

PROCESSING REQUIREMENTS FOR PEA RATIONS

The effects of processing peas in creep feed (400kg MT⁻¹), feedlot finisher (270kg MT⁻¹) and gestating rations (200kg MT⁻¹) are shown in Table 2, below. Dry-rolling peas in creep feed and feedlot rations offers some performance advantages over feeding the whole or ground form (particle size = 3100, 9250 and 701 microns, resp). No processing effects were seen with gestating cows consuming the pea-based TMR; however, the rapid rate of intake in cows fed concentrate once daily may reduce their ability to chew and absorb nutrients from whole peas.

Table 2. Pea processing effects on performance of creep (P=0.10), finishing and dry-cow (P<0.05) rations (lbs/day)⁹.

Ration	Parameter	Ground	Rolled	Whole
Creep feed	Gain	3.11 ^a	3.31 ^b	3.13 ^a
	Intake	6.81	6.87	6.95
Finishing	Gain	3.12 ^{a,b}	3.39 ^a	2.96 ^b
	Intake	21.21 ^a	22.81 ^b	21.33 ^a
Gestation	Gain	1.07	1.27	1.15

^{ab} Means on the same line with different superscripts differ.



For information about The Feed Pea Focus or feeding pulses to livestock, contact Michelle Fleury - Telephone: (306) 873-4132 email:mfleury@explornet.com

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PEAS PRODUCE QUALITY BEEF

Some of the most interesting data showed that the eating quality of beef was improved when heifers received 10, 20 or 30% peas in their finishing rations. Performance and carcass quality was equivalent to the corn-soy control diets; however, the expert taste panel determined that shortloin from the pea-fed animals was more tender (P=0.01), juicy (P=0.04) and tended to have enhanced flavor intensity (P=0.10)¹⁰. Eating quality is critical to beef consumers, and this work will be repeated in order to define the conditions that allow peas to improve it.

Table 3. Average nutrient content of western Canadian field peas (n=72) (DM basis)¹¹

DM, %	91.6
Crude protein, %	23.7
Rumen Undegradable Protein, %	22
ADF, %	9.49
NDF, %	19.61
TDN, %	87
Digestible Energy, Mcal kg ⁻¹	3.84
NE ₁ , Mcal kg ⁻¹	2.01
NE ₂ , Mcal kg ⁻¹	1.48
Calcium, %	0.09
Phosphorus, %	0.41
Magnesium, %	0.13
Potassium, %	1.07
Sulphur, %	0.21
Sodium, mg kg ⁻¹	36.9
Copper, mg kg ⁻¹	6.9
Manganese, mg kg ⁻¹	11.2
Zinc, mg kg ⁻¹	46.4
Iron, mg kg ⁻¹	66.5
Selenium, mg kg ⁻¹	0.11
Molybdenum, mg kg ⁻¹	2.4

⁶ Anderson, V. and Schoonmaker, J. 2004. Effect of pulse grains on performance of newly weaned steer calves. NDSU Carrington Research Extension Center Beef Production Field Day Proceedings. Vol. 27:6-8.

⁷ Anderson, V. Field peas in diets for growing heifers, and backgrounding and finishing steer calves. Beef and Bison Production Field Day. NDSU Agricultural Experiment Station. July 14, 1998. Vol. 21:33-39.

⁸ Anderson, V. and Lardy, G. 2005. Field pea grain for beef cattle. <http://www.ag.ndsu.edu/pubs/ansci/beef/as1301.pdf>

⁹ Anderson, V. and Schoonmaker, J. 2005. Beef Feedlot Research Report and Beef Production Field Day Proceedings. NDSU Carrington Research Extension Center. Vol 28: 26-37.

¹⁰ Anderson, V.L., Carlin, K.M., Ilse, B.R., Lardy, G.P., Maddock, R. and Schoonmaker, J.P. 2006. Effect of field pea level in feedlot finishing diets on animal performance, carcass traits, tenderness, and taste panel response. NDSU Carrington Research Extension Center Feedlot Research Report. Oct. 10, 2006. Vol. 29. Pages 15-19. Oct. 10, 2006.

¹¹ Cited from: Corbett, R.R. 1997. Peas as a protein and energy source for ruminants. Advances in Dairy Technology. Edmonton: University of Alberta. Volume 9. Pages 233-247.