

2005-06 Feed Pea Facts¹

Dry Peas for Sale	3.747 Million Tonnes (MT)
Domestic Feed Use	1.207MT
Feed Pea Prices	\$116/MT FOB Saskatoon ²

FEED PEA NET ENERGY RESEARCH UNDERWAY

The Canadian feed industry is a key customer for pulse producers in western Canada; therefore, the Saskatchewan Pulse Growers recently made a major financial commitment to evaluate the Net Energy content of western Canadian feed peas. Dr. Pascal Leterme, who recently joined the Prairie Swine Centre research team, will be examining nutrient component digestibility in a diverse group of pea samples. The objective of the research is to understand the factors affecting nutrient absorption from peas. This knowledge will then be used to determine processing conditions required to optimize nutrient utilization and the DE and NE value of peas for young pigs (15 to 60 kg).

EUROPEAN FEED PEA PERSPECTIVE – Dr. Pascal Leterme

Europe is approximately 20 years ahead of North America in adopting peas as a major feed ingredient. Dr. Pascal Leterme has trained, researched and taught throughout Europe, and offers insight into European research and feed industry practices involving feed peas in various stages of swine production.

Tryptophan

When asked about concerns regarding the intake of pea-based hog diets, Dr. Leterme indicated that European research has attributed reduced intake to tryptophan deficiency rather than to palatability issues. Growing pigs (38kg) showed reduced intake in corn-soy diets containing low levels of tryptophan (0.12 vs. 0.16% tryptophan at 3200 kcal/kg DE as-fed), a situation aggravated by elevated protein levels.³ Tryptophan deficiency is associated with reduced brain serotonin levels, and depressed feed intake and growth performance, particularly in female hogs.⁴ Peas contain a lower relative tryptophan content than SBM; therefore pea-based diets, especially pea-corn rations, should be formulated to ensure adequate tryptophan levels.

Lactating and Dry Sows

Research involving 536 litters from 137 sows showed equivalent performance from the long-term use of feed peas at 240 and 160 g kg⁻¹ in lactating and dry sow rations, respectively.⁵ Providing peas are used in diets balanced for essential amino acids, Dr. Leterme indicated that peas could be used as the sole protein source in sow diets. He cautioned that pea fibre is highly digestible, and that constipation in dry sows should be monitored.

Weanling Pigs

Weaned pigs between 8 and 25 kg received mash diets containing peas that had previously been ground or pelleted (83C, 4x30mm die). Peas were substituted at 400 g kg⁻¹ for barley, wheat and SBM, and diets were balanced for digestible lysine, methionine, threonine and tryptophan levels.⁶ Performance of these very young pigs at high pea inclusion rates was equivalent to those consuming soy-based rations.

Dr. Leterme indicated that although high levels of peas are used in European swine diets, diarrhea has been reported in barns with reduced sanitation conditions.

Growing and Finishing Pigs

In European studies, peas (250 and 450 g kg⁻¹) supported equivalent performance to soy/wheat-based controls in pigs between 23 and 104 kg liveweight.⁷ There is potential for tryptophan deficiency in corn-based diets containing high levels (>300 g kg⁻¹) of peas; therefore, care should be taken to maintain a dietary ratio of 0.18 g digestible tryptophan : 1 g digestible lysine throughout the growing/finishing stages of hog production. Dr. Leterme indicated that an upper inclusion limit of 300 g kg⁻¹ peas in corn-based diets is frequently used to control this issue.

TRYPSIN INHIBITORS

Dr. Leterme has worked extensively in the area of legume antinutritional factors. Although yellow and green feed peas contain insignificant trypsin inhibitor (TI) levels, specialty peas such as marrowfats and winter (Maple) peas (see photo) may contain higher levels and have been shown to depress performance in growing pigs in Europe (see Table 1)⁶. European marrowfat cultivars had TI concentrations of approximately 10 TIU mg⁻¹ DM; however, researchers recommended the use of feed peas with TI levels below 4 TIU mg⁻¹ DM.⁸ Dr. Leterme also cautioned that the trypsin inhibitor molecule is rich in unavailable cystine, which may also result in the overestimation of available sulphur amino acids in the high-TI marrowfat and winter pea varieties.



For information about The Feed Pea Focus or to receive your copy call (780) 986-9398.

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Table 1. European study⁶ comparing green, yellow and high-trypsin inhibitor marrowfat peas (400 g peas kg⁻¹ diet) on the performance of growing pigs (13 to 30 kg).

	Green Pea	Yellow Pea	Marrowfat Pea
Intake (g/d)	1262a	1232 a	1108b
Daily Gain (g/d)	714 a	700 a	560 b
Feed Conversion	1.77	1.8	1.98
Trypsin Inhibitor	1.9	2.0	10.4
(TIU/mg pea DM)			
a,b P>0.01 level of significance within the same row.			

¹ http://www.agr.gc.ca/mad-dam/e/sd2e/2005e/oct2005sc_e.htm

² <http://www.agr.gc.ca/mad-dam/e/arche/wpse.htm>

³ Henry, Y. Seve, B, Mounier, A. and Ganier, P. 1996. Growth performance and brain neurotransmitters in pigs as affected by tryptophan, protein and sex. *J. Anim. Sci.* 74:2700-2710.

⁴ Henry, Y. 1995. Effects of dietary tryptophan deficiency in finishing pigs, according to age or weight at slaughter of live weight gain. *Livestock Production Science.* 41:63-76.

⁵ Gatel, F, Grosjean, F. and Leuillet, M. 1988. Utilization of white-flowered smooth-seeded spring peas (*Pisum sativum hortense*, CV Amino) by the breeding sow. *Anim. Feed Sci. Technol.* 22:91-104.

⁶ Grosjean, F., Jondreville, C, Bogaert, C, Bourdillon, A, Peyronnet, C, Le Guen, M. and Williate, I. 1997. Utilisation d'aliments pour porcelets sevrés contenant 40% de pois. *Journées Rech. Porcine en France.* 29:197-204.

⁷ Gatel, F., Grosjean, F. and Castaing, J. 1991. Utilization of diets with high levels of pea (*Pisum sativum hortense* cv. Finale) by the growing finishing pig. *World Review of Animal Production.* Vol XXVI (1):55-60.

⁸ Grosjean, F., Jondreville, C., Williate-Hazouard, J, Skiba, F., Carrouee, B and Gatel, F. 2000. Ileal digestibility of protein and amino acids of feed peas with different trypsin inhibitor activity in pigs. *Can. J. Anim. Sci.* 80:643-652. These references are available at mfleury@sasktel.net



Typical maple pea



Typical yellow pea



Typical marrowfat pea

