



Feed Peas

The global feed industry has recognized the benefits of feeding peas (*Pisum sativum*) to animals. Feed peas are an excellent source of energy and amino acids that are suited to diets for all livestock. Generally regarded for both their protein and energy content, feed peas are considered a multi-purpose feed ingredient. They have high levels of lysine and other important essential amino acids. Feed peas can be used as an individual ingredient or in combination with other ingredients such as canola meal and can avert the need for using animal-based feed ingredients in livestock rations.

Canadian feed peas are derived from white flowered spring seeded, green and yellow varieties. There is no difference in nutrient content between green and yellow peas, however there may be small differences between some pea varieties mainly due to differences in the size of the pea and the thickness of the hull. The nutrient composition of feed peas is shown in Table 1.

The energy value of feed peas for pigs is similar to corn and wheat, however the relative energy value of feed peas for poultry is lower. The energy values of feed peas for cattle are quite high and are comparable to cereal grains. Feed peas are low in calcium and phosphorus and the standard phosphorous availability is approximately 30%. Feed peas have low levels of anti-nutritive factors and generally no special precautions are required before using them in animal feed. Processing will enhance nutrient digestibility, particularly in poultry and in most applications, simple grinding through a hammermill will be sufficient.

Canadian feed pea protein averages 23% (as fed) with an excellent amino acid balance. Peas, like most legumes, have relatively low levels of methionine and cystine. The amino acids in feed peas are highly digestible by swine and poultry. The amino acid content of feed peas is shown in Table 2 and the amino acid digestibilities for pigs and poultry are shown in Table 3. The energy values of feed peas are shown in Table 4.



Table 1
Typical composition of feed peas (10% moisture basis)

Component	Average
Moisture, %	10.0
Crude Protein (N x 6.25), %	23.0
Rumen Bypass Protein, %	22
Oil, %	1.4
Starch, %	46.0
Ash, %	3.3
Crude Fibre, %	5.5
Trypsin Inhibitor Activity, TIA/mg	3.5
Phytic Acid, %	1.2

Table 2
Amino acid composition of feed peas (23% crude protein basis)

Amino acid	Average, %
Alanine	0.92
Arginine	2.31
Aspartate	2.38
Cystine	0.22
Glutamate	3.68
Glycine	0.95
Histidine	0.72
Isoleucine	1.10
Leucine	1.80
Lysine	1.67
Methionine	0.28
Methionine + Cystine	0.50
Phenylalanine	0.98
Proline	0.97
Serine	0.99
Threonine	0.84
Tryptophan	0.19
Tyrosine	0.73
Valine	1.05

Table 3
Digestibility coefficients of essential amino acids for swine* and poultry **

Amino Acid	Swine true ileal digestibility, %	Poultry true digestibility, %
Arginine	90	90
Cystine	79	74
Histidine	89	87
Isoleucine	85	84
Leucine	86	86
Lysine	88	87
Methionine	84	82
Methionine + Cystine	82	78
Phenylalanine + Tyrosine	87	86
Threonine	83	83
Tryptophan	81	82
Valine	83	81

*NRC Swine, 1998

**Rhône-Poulenc, 1993

Practical Considerations of Feeding Peas to Animals

Feed peas can be used in diets for all classes of livestock and poultry (Table 5). They can be used as the sole protein source as an alternative to animal based proteins. They can improve pellet quality and as little as 10% to 15% peas in the diet will negate the need for pellet binders in most feed formulations. Feed peas are often used at high inclusion levels in grower-finisher pig diets. Research and practical experience has shown that feed peas have a high rumen degradable protein and more slowly rumen degradable starch that makes them a very effective ingredient for ruminants. This means that peas can be an integral part of a total dietary mix to provide a staged release of protein and energy to the rumen.

Peas for Pigs

Feed peas are an ideal ingredient for pigs because they are a good source of energy and amino acids. Feed peas are often used in combination with canola meal or canola seed since the amino acid balance of these ingredients complements each other very well. Relative to soybean meal, feed peas have a higher net energy value. In practical grower-finisher diets, where feed peas often replace corn and soybean meal in approximately a 2/3 to 1/3 ratio, the overall NE/DE ratio in the feed does not change. Producers find that diets balanced with feed peas perform equivalently to those balanced with soybean meal.

Feed peas are used for lactating sows under stressful environmental and dietary factors to improve feed intake. Since peas are palatable, they can be used to encourage feed consumption in the summer and to improve the taste of feeds that contain high levels of by-product ingredients.

For more detailed information regarding the use of feed peas in livestock diets, obtain a copy of Canadian Peas: Feed Industry Guide (3rd edition, 2003). This publication can also be found on the Internet at: www.pulsecanada.com. As well, Internet users are encouraged to visit the searchable Pulse-Canola Feed Literature Database at www.infoharvest.ca/pcd.

Table 4
Energy value of feed peas

Animal	Energy Type	Average Value
Adult Chicken	AMEn, kcal/kg	2600
	TMEn, kcal/kg	2640
Growing Pig	DE, kcal/kg	3485
	ME, kcal/kg	3240
	NE, kcal/kg	2450
Cattle	TDN, %	78
	DE, Mcal/kg	3.47
	ME, Mcal/kg	3.08
	NEM, Mcal/kg	1.95
	NEG, Mcal/kg	1.33
	NEL, Mcal/kg	1.81

Table 5
Recommended inclusion levels of feed peas
in animal diets.

Animal type		Recommended pea inclusion level, %
Poultry	Broiler chickens	20
	Layer chickens	30
	Turkeys	25
	Geese	20
Pigs	Starter	10
	Grower – Finisher	30
	Sow	20
Cattle	Beef	25
	Dairy	25
Specialty Species	Sheep	45
	Rabbits	30
	Salmonids	15
	Other Finfish	25
	Shrimp	25