

# Triticale: stock feed guide

The Seed Professionals

## Triticale as a feed for livestock

Triticale has been developed mainly as a feed grain for livestock as it has much less versatility for the human food/beverage market compared to the other common cereal grains. Triticale is primarily included in livestock diets as an energy source and has similar chemical and physical properties to wheat. However triticale is a softer grain than wheat and barley, which may make it easier to mill for livestock diets, but may cause it to be more susceptible to insect damage in long term storage.

Early varieties of triticale developed prior to the mid 1970s may have contained levels of trypsin inhibitors and other anti-nutritional factors that may have limited the use of triticale in livestock diets. However since then, more recent plant breeding programs have produced triticale varieties with low levels of anti-nutritional factors which no longer limit the use of triticale in livestock diets.

## Composition of triticale compared to other cereal grains

The nutritive value of cereal grains for livestock is generally expressed in terms of available energy and available protein or amino acids. Available energy, expressed as digestible energy (DE) for pigs, apparent metabolisable energy (AME) for poultry and metabolisable energy (ME) for ruminants is the major determinant of the nutritive and economic value of cereal grains. The protein and amino acid contents of cereal grains

differ and these levels also contribute to the economic value of a cereal grain but to a lesser extent than available energy value.

Of all the major cereal grains used in livestock feeding in Australia, the composition of triticale is most closely aligned with wheat. Although triticale may have marginally lower available energy value than wheat for most livestock species, the level and balance of essential amino acids is usually superior to that of most other cereal grains (Table 1).

**Table 1** Average composition of cereal feed grains

	<b>Triticale</b>	<b>Wheat</b>	<b>Barley</b>	<b>Sorghum</b>
<b>Available energy</b>				
Pigs DE (MJ/kg as fed)	13.5	13.8	12.9	14.6
Poultry AME (MJ/kg as fed)	12.8	12.7	11.4	14.3
Cattle ME (MJ/kg DM)	12.6	12.7	12.4	10.5
<b>Crude protein (% as fed)</b>				
Lysine (% as fed)	0.44	0.31	0.38	0.20
Methionine (% as fed)	0.20	0.15	0.16	0.12
Threonine (% as fed)	0.42	0.29	0.37	0.27
<b>Starch (% DM)</b>	63	66	58	74
<b>ND fibre (% DM)</b>	15.9	15.9	21.3	12.7

Data derived from AusScan calibrations of Australian feed grains and "Feeding Standards for Australian Livestock-Pigs (CSIRO, 1987)

## Triticale for pigs

The relatively high DE content of triticale, together with its greater levels of essential amino acids, makes triticale a very attractive feed ingredient in pig diets. When compared to other cereal grains, the digestibility of the major limiting amino acids in triticale is similar to that measured in wheat and sorghum and is often superior to that found in barley.

The Pork CRC, together with The University of Sydney have undertaken a triticale breeding program to identify high yielding lines of triticale that also have high DE levels. This program has resulted in the release of **Berkshire<sup>®</sup>** which is a high yielding variety of triticale that is suited to many regions of Australia, but contains about 0.5 MJ DE/kg more energy than the average level found in other triticale varieties.

Preliminary analysis of samples collected from the first commercial crops of Berkshire grown in 2009 show that



Photo: Pork CRC

the DE content of Berkshire ranges from 13.7 to 13.9 MJ DE/kg which is close to the average energy level in wheat (13.85 MJ DE/kg, as fed). Thus the triticale, Berkshire, may be regarded as having a similar energy value for pigs as wheat, but will also have higher amino acid levels which would make Berkshire triticale a very attractive feed ingredient for pig diets.

There should be no restriction on the inclusion level of triticale in pig diets. Triticale can be the sole cereal grain in both mash and pelleted diets and can be included in all pig diets from starter through to dry sow diets. In a Pork CRC study involving the evaluation of 32 different cereals in starter diets fed to weaner pigs, the performance of pigs fed either wheat, barley or triticale was similar and significantly better than pigs fed sorghum diets (Table 2). In addition, the best feed efficiency observed on any diet was on one of the triticale diets.



Photo: Dairy Australia

### Triticale for poultry

Triticale has comparable energy content to that of wheat (Table 1). Furthermore, the variation of the energy value of triticale between varieties and between growing sites appears to be much less than that of other cereal grains, particularly wheat (Table 3). Thus more consistent growth and laying performance of poultry may be obtained with triticale based diets. The use of commercial feed enzymes is often used

**Table 2** Performance of weaner pigs fed diets containing different cereal grains

Cereal grain	N	FCR (kg gain/kg feed)		Gain (g/day)	Intake (g/day)
		Mean	Range	Mean	Mean
Triticale	5	1.26	1.08–1.39	424	522
Wheat	9	1.26	1.20–1.39	423	532
Barley	7	1.27	1.23–1.34	427	537
Sorghum	11	1.43	1.28–1.53	355	488

in wheat based diets to alleviate wet, sticky droppings. These enzyme preparations are similarly effective in triticale based diets for broiler chickens and laying hens.

**Table 3** The range in energy value in cereal grains for poultry

	Energy (MJ AME/kg, as fed)	
	Hughes and Choct (1999)	AusScan NIRS results
Triticale	11.3–12.9	12.4–13.1
Wheat	9.4–14.3	11.9–13.6
Barley	9.4–11.0	10.7–12.1
Sorghum	13.4–14.0	13.4–14.7

### Triticale for ruminants

Triticale represents a high energy, medium protein grain for use in rations for dairy cows and feedlot beef and sheep. Starch from cereal grain is hydrolysed rapidly in the rumen, which may adversely affect rumen function and cause sub acute ruminal acidosis. However, careful management of the diet with adequate roughage reduces the risks associated with feeding high grain based diets to ruminants. The nutritive value of triticale for ruminants is very similar to wheat and will provide a valuable alternative to wheat based diets for cattle and sheep.

Triticale is often preferred by dairy farmers over other grains as it appears to provide more consistent results. In addition, the softer triticale grain may be processed more easily on farm than the harder varieties of wheat and barley. As such, triticale is also a valuable feed grain for the Australian dairy industry.

#### Acknowledgement

This guide was written by Ray King, Program Leader, Pork CRC

#### Further information

Waratah Seed Co Ltd, 'Avondale', Henty NSW 2658

To find your closest Waratah Seed Co Ltd member:

Email: [info@waratahseeds.com.au](mailto:info@waratahseeds.com.au) or go to [www.waratahseeds.com.au](http://www.waratahseeds.com.au)

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