



Australian Export Grains Innovation Centre



Australian canola meal for dairy cattle

Australian canola meal is a proven, reliable, high-quality animal feed. Australian canola meal can be an important source of protein for cattle.



Key benefits of Australian canola meal for dairy cattle

Plant breeding has seen canola step away from the anti-nutritional aspect of rapeseed from which it was derived. The absence of any glucosinolates and erucic acid in the oil, as well as the balance of RDP and UDP, coupled with a high biological value of the protein, makes canola meal a very palatable and effective protein supplement for dairy cows.

- ✓ Australian canola meal is an excellent alternative to other protein meals such as copra, palm kernel and soybean meal.
- ✓ The protein in Australian canola meal is well balanced in terms of rumen degradable (RDP) and un-degradable dietary protein (UDP or bypass protein).
- ✓ Australian canola meal is palatable with a very low risk of mycotoxins.

Canola meal is the by-product left after canola seeds have been crushed and the oil extracted. The methods of oil extraction result in three main forms of canola meal:

- Cold pressed (**14–20%** residual oil)
- Expeller (**7–10%** oil)
- Solvent (**1–4%** oil)

The extraction method can affect the digestibility and bypass characteristics of the protein. Protein content ranges from 33% - 40%.

The critical features of a bypass protein are:

- 1.** A significant proportion of the protein must escape rumen degradation.
- 2.** The escape protein must be digestible in the abomasum.
- 3.** The amino acids released need to be appropriate to meet the animal's needs for protein synthesis (milk or muscle).

Relative to most other sources, canola best meets these prerequisites.



Production and export

Australian canola is sought after globally for its use as high-quality human food-grade oil, for biofuel production and as a stockfeed.

Australia produces **3.3** million metric tonnes (mmt) of canola seed each year.

Australia supplies approximately **2.5–3** mmt of canola (**15–20%** of world trade) to Europe, China, Pakistan, Japan and other international markets annually.



Storage and processing

Canola seed is produced and delivered by Australian growers in accordance with **strict receival and grade standards ensuring the highest quality**. The Australian Oilseeds Federation and Grain Trade Australia publish grower delivery standards for Australian canola.

Although processed by different methods the resulting canola meal is traded to a specific description in terms of protein, oil, moisture and fibre content.



Nutrition

Dairy cows require nutrients, not specific ingredients. They are remarkably flexible animals, able to utilise a wide range of forages and feedstuffs. The nutrients they require are water, carbohydrates (sugar, starch and fibre), fats, protein, minerals and some vitamins.



The objective in dairy cow feeding is to meet the cows' nutrient needs without excesses and within the cows' intake limits to achieve good feed efficiency (converting feed to milk) and optimal feed cost.





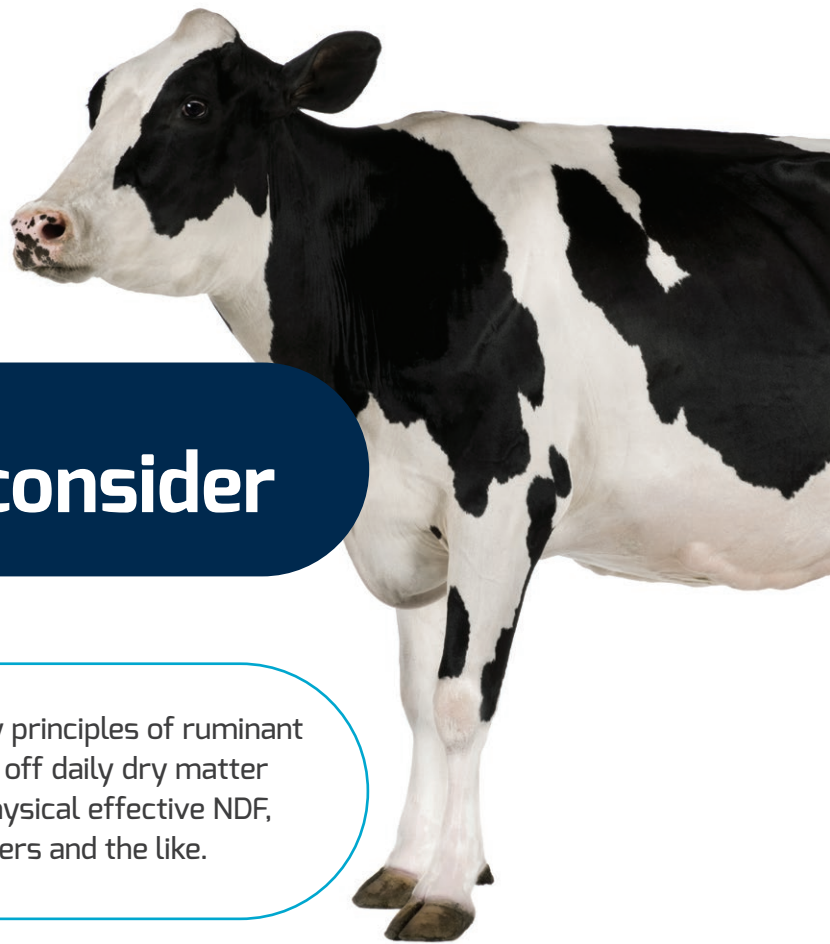
Opportunities to use canola meal in dairy cattle diets

Canola meal is a proven high-quality cattle feed and is the primary protein supplement for Australian dairy cows. Its RDU and UDP components work in a complementary manner and meet the amino acid requirements of the cow for maintenance and production (milk and muscle protein synthesis).

The RDP component stimulates rumen activation resulting in improved feed intake and elevates microbial protein synthesis. Microbial protein has an amino acid profile similar to milk protein and hence is almost a perfect protein source for milk production.

The amino acid profile of canola bypass protein is complemented by the amino acids released from the breakdown of the bypass protein (UDP) in the abomasum. The amino acid profile of bypass protein is also of high biological value not dissimilar to soya protein. Table 1 compares the amino acid profile of canola protein relative to milk, microbial protein and other protein sources.





Things to consider

When considering dairy cow diets, key principles of ruminant nutrition must be applied, referencing off daily dry matter intake and regulating levels of NDF, physical effective NDF, starch, sugars, protein, minerals, buffers and the like.

Table 1: The essential amino acid profiles (gm/16gm N) of milk protein, rumen microbial protein and various protein meals

	Milk	Microbial protein	Canola	Soya	Copra	Palm kernel
Lysine	8.4	8.5	5.6	6.0	2.6	2.7
Methionine	2.4	2.4	2.0	1.4	1.4	1.8
Cysteine	1.0	1.2	2.6	1.5	1.3	1.1
Threonine	4.4	5.4	4.3	3.9	3.0	3.0
Isoleucine	5.6	5.7	4.0	4.4	3.0	3.5
Tryptophan	1.3	1.3	1.4	1.3	1.3	0.7
Arginine	3.5	5.2	5.9	7.1	10.6	11.2
Valine	6.6	6.0	4.9	4.8	4.7	5.0
Phenylalanine	4.9	4.9	4.4	5.0	4.1	3.9
Tyrosine	5.0	4.4	3.2	3.8	2.0	2.1



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