

# CANOLA PRODUCTION

## and utilisation: **An overview**

Canola and rapeseed are collectively the second largest oilseed crops in the world and currently contribute close to 14% of the total global production of oilseeds. The total production of canola/rapeseed is close to 70 million tons of grain per annum, with a mean yield of approximately 1,9 tons of grain per hectare (see Table 1).

The main canola/rapeseed-producing countries are Canada, China and India. The highest mean yield of 4,14 ton per hectare was harvested in Germany, on 1 430 000 hectares of land during 2014/15. South Africa produced only 123 000t on 95 000ha in 2014, although it indicated that domestic production since 2010/2011 has tripled.

Table 1: Rapeseed/Canola world production, 2013 to 2015.

Country	Production (1 000t)		Yield (t/ha)	
	2013/2014	2014/2015	2013/14	2014/15
Canada	17 960	15 800	2,24	2,00
China	11 500	12 000	1,70	1,75
India	7 350	7 200	1,03	1,00
Germany	5 784	5 900	3,95	4,13
France	4 369	5 250	3,04	3,47
Australia	3 950	3 500	1,80	1,72
Global	69 729	68 590	1,95	1,92

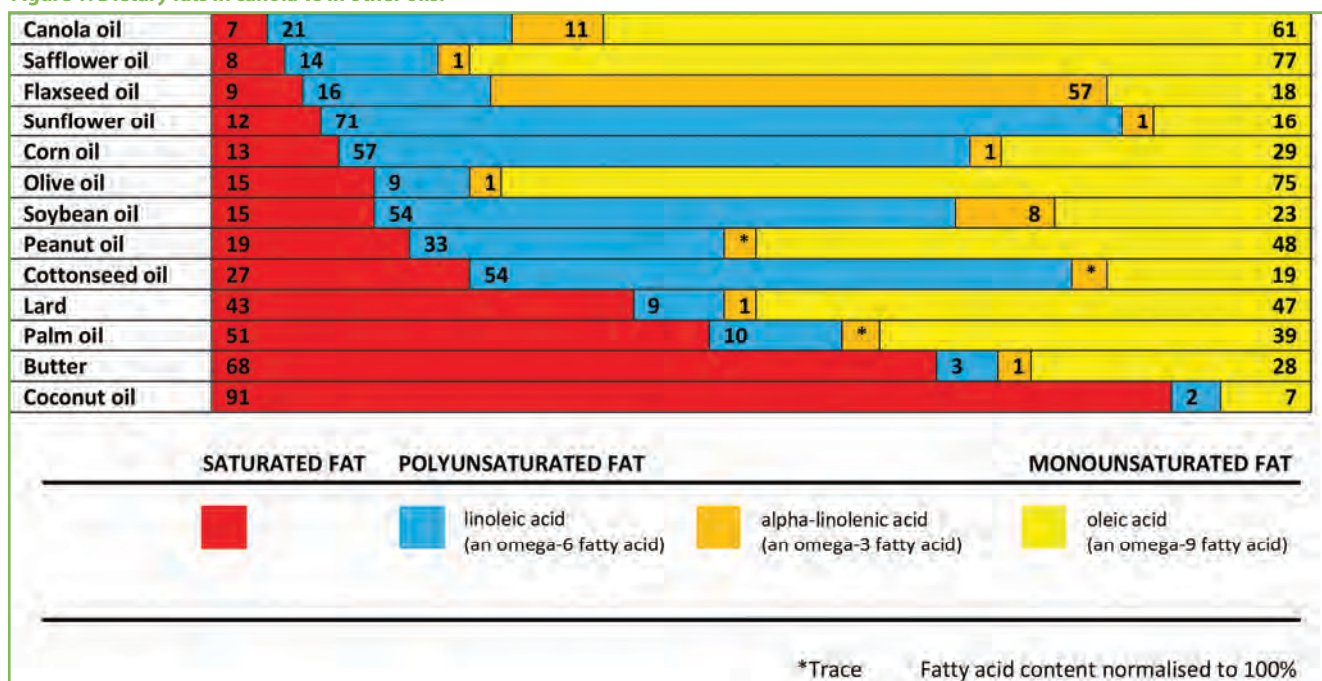
### Human nutrition

Canola seed contains approximately 36 to 46% high-quality vegetable oil and 20 to 24% protein. Canola oil is recognised worldwide for its health properties, and is increasingly being used as cooking oil and in margarine production. It contains low levels of saturated fatty acids and relatively

high levels of oleic and linolenic acids.

Of all the vegetable oils that have been used for human consumption, canola oil has the highest percentage of omega-3 fatty acids, which have been scientifically proven to reduce low-density lipoprotein (LDL) cholesterol levels.

Figure 1: Dietary fats in canola vs in other oils.



### Animal feed

Both full-fat canola (the unprocessed seed) and canola oilcake (the residue after the oil has been mechanically pressed and/or solvent has been extracted from the seed) are high-quality products that are effectively utilised for farm animals.

The canola oilcake available in South Africa has a protein content of approximately 36%, with an oil content of approximately 9% if mechanically extracted and 2% if solvent extracted. The content of bypass protein in canola oilcake is approximately 28% and is comparable to, or even better than, its value in soya bean oilcake.

The relative monetary value of full-fat canola as animal feed, in contrast to soya bean oilcake that contains 47% protein, varies from 58% for dairy cattle to 94% for poultry and 100% for pigs. In contrast, canola oilcake varies from 53% for poultry to 60% for dairy cattle and 65% for pigs.

Studies undertaken at the Elsenburg Agricultural Training Institute and the University of Pretoria, indicate that the optimum inclusion rate of full-fat canola is approximately 12% in the complete diets of lambs, and 6% in that of dairy cows. Canola oilcake can be used at 15% in the complete diets of sheep and at 12% in that of dairy cattle.

In respect of monogastric animals, the ideal inclusion level of full-fat canola and canola oilcake in the diets of pigs is 12 to 18%. High-level inclusion in finishing pigs should be avoided due to the complication of soft fat in carcasses.

For ostriches it is approximately 10% and for broiler chickens the maximum inclusion levels appear to be between 5 and 10%, with the exception of brown-shelled layers where a maximum of 3% is recommended due to glucosinolate levels.

With the inclusion of full-fat canola in the diets of chickens, pigs and dairy cows, a healthier fat and milk-

fat profile is obtained as it contains a higher concentration of unsaturated than saturated fats.

For the best utilisation of full-fat canola, the seeds should either be mixed with the grain in the milling process or used whole in the feed-pelleting process.

### Biofuel

Due to the rising prices of mineral oils and concern about environmental pollution, there is increasing interest in the use of canola oil as a source of biodiesel. According to European research, approximately 1 050kg of canola oil is required to produce 1 000kg biodiesel and 100kg glycerine. Although canola oil is used in the manufacture of biodiesel on a commercial scale in a number of European countries, the profitability thereof in South Africa is still being investigated.

### Canola as rotation crop

The inclusion of canola in a crop-rotation system presents several advantages.

**Improved grain yields:** The inclusion of canola in a crop-rotation system usually leads to an increase in the yield of the subsequent cereal crops. In comparison to a wheat monoculture system, the wheat yields over a five-year period on the Langgewens Experimental Farm in the Western Cape have indicated an increase of 20% in the first wheat year after implementing canola. The wheat yield in the second and third years after canola was used, showed an increase of 11% and 8% respectively. In a system where canola is grown only one year out of every four, the wheat yield in the remaining three years is therefore increased with an average of 13%.

**Reduction in diseases:** By including a non-cereal crop such as canola, which does not host disease pathogens of cereal crops, the

disease chain is broken and diseases are reduced. Various studies have shown that canola also has a bio-fumigation effect that suppresses certain diseases.

**More effective weed control:** The inclusion of canola in a rotation with cereal crops increases the variety of herbicides that can be used, as canola is a broadleaf crop (in contrast to wheat and barley as cereal crops) and both triazine-tolerant (TT type) and imazamox-tolerant (clearfield type) cultivars are available in South Africa. By alternating the use of the greater variety of available herbicides, the development of herbicide-resistant weeds such as ryegrass (*Lolium rigidum*) can be controlled.

**Improved root system:** The canola plant develops a tap-root system that can penetrate the soil to a depth of 1,0m. When these roots die and decay, channels are formed in the soil. Particularly in the case of reduced-tillage systems, this biological ploughing action of canola can give rise to an improved root system in the subsequent cereal crops.

**Planters and harvesters are used more effectively:** Because canola is planted and harvested earlier than wheat, and the same planters and harvesters can be used, this equipment is utilised much more effectively.

**Better distribution of financial risk:** Economic evaluations of long-term crop rotation trials have indicated that the inclusion of canola in crop rotation systems increases returns on the capital investment, when compared with monoculture systems using wheat only.

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