Oil and meal

Oil is the main product from rapeseed. Rapeseed meal is the by-product of the extraction of oil.

The way that oil is extracted has a direct effect on how the oil tastes in food and the amount of nutrients it has to offer. Using heat to extract the oil produces more of it, but heat can degrade the oil's flavor and nutritional quality. Using low-heat (cold pressed) methods gives a higher quality oil, albeit in lesser quantities.

Tests have shown that cold pressed oil from white flowering rape varieties do have a milder taste as compared to cold pressed oil from yellow flowering varieties. For this reason white flowering varieties are used to produce **gourmet oils**.

The fatty acid composition of oil from white and yellow flowering varieties is the same. The table shows fatty acids in 'normal' rapeseed oil (canola oil), source Wikipedia, Canola.

Compound	Family	% of total
Oleic acid	n-9 (ω -9)	61 %
Linoleic acid	n-6 (ω -6)	21 %
Alpha-linolenic acid	n-3 (ω -3)	11 %
Saturated fatty acids		7 %
Palmitic acid		4 %
Stearic acid		2 %
Trans fat		0.4 %
Erucic acid		< 0.5 %

Furthermore, special varieties with high oleic acid, low linolenic acid and high erucic acid have been developed and can be found on the market. The fatty acid composition as shown in the table is by far the most common. It is also the healthiest.

Rapeseed oil is healthy

Health claims for rapeseed oil (canola oil) approved in the EU:

- Maintaining normal level of cholesterol in the blood serum due to
  - High amount of unsaturated fats (EU Comm Reg 432/2012 of 16.05.2012)
  - High amount of -ω 3 fatty acids (alpha linolenic acid) (432/2012 of 16.05.2012)
  - High amounts of plant sterols (Commission Reg. 384/2010 of 05.05.2010)
- Preventing oxidative stress of human cells
  - High content of vitamin E (especially alpha-Tocopherol) (EU Commission Regulation (EU) 432/1012 of 16.05.2012)

Further to this oils as shown in the table with a high content of oleic acid and a 2:1 ratio of linoleic: linolenic acid are considered to be healthy for humans.

Stability. The contents of vitamin E (Tocopherols) prevent oxidation of the polyunsaturated fatty acids. Furthermore, traces of carotenoids in the oil prevent undesired oxidation of the alpha linolenic acid in the seed upon heating. Also, small amounts of erucic acid in the oil may inhibit lipoxygenase which is known to enhance the oxidation of unsaturated fatty acids, especially 18:3, linolenic acid.

So, cold pressed unrefined oil is more heat stable compared to refined oil due to higher contents of anti-oxidants. It is also less prone to rancidity.

Rape meal (press cake)

The protein fraction of the seed, the rapeseed meal, is the by-product of the extraction of oil from rapeseed. It is a protein-rich ingredient that is widely used to feed all kinds of domestic animals. The rapeseed meal represents almost the entire protein fraction of the seed. Rapeseed protein has a well-balanced content of amino acids.

In animal feeding the protein quality of rape meal is considered excellent partly due to its high content of lysine, threonine and methionine + cysteine. However, the use of rapeseed meal as an animal feed is limited by the presence of glucosinolates (GL's), which are anti-nutritional factors detrimental to animal performance. As the content of GL in the seeds have been reduced over the last 30 years, the GL's are now less important, but GL's still give rise to limitations for the use of rape meal in animal feeding.