

World high-oleic canola/rapeseed oil markets, trends and patterns

The purpose of this literature survey is to determine to what extent high-oleic canola/rapeseed oil is produced and used in the international marketplace. This document is submitted for consideration by the Protein Research Foundation. Appended to this document is a table, reflecting the typical fatty acid composition of selected oils and fats, for your interest. (*Source: Handbook of vegetable oils and fats / edited by Jan-Olof Lindeveldt. 2nd ed. Sweden: Aarhus Karlshamn, 2007*)

Competition in the oils and fats marketplace – focused on growth to meet mega market trends

In its 2007 presentation to the Agricore United General Meeting, Rabobank estimated that world usage of the major oils would grow from 96 million tonnes in 2005 to 125 million tonnes in 2010. This 29 million tonne increase is projected to be split between food and fuel, 13 and 16 million tonnes respectively. The major competitors are soybean, palm, canola/rapeseed, sunflower and corn.¹ All are focused on growth to meet mega market trends, which are biodiesel growth and rising demand for healthy food.⁵ Global income growth will trigger increased demand for vegetable oils and movement toward healthier fats. Increased use of vegetable oils is a result of increasing world population, wealthier consumers, and higher per capita consumption, especially in developing areas, most significantly, China and India.³

Health and nutrition – no longer a fad

Health and nutrition are now firmly established as a core part of the food business and functional foods have become a mainstream category. Health and food functionality are long term consumer trends. Trans fatty acids are the current “health driver” in the oils and fats segment. TFA’s are a type of unsaturated fatty acid that can impact on health, adversely affecting cholesterol levels. Low levels of TFA’s occur naturally in the fat of dairy products and meat, and are also formed during hydrogenation, or partial hydrogenation, of oils.³

According to an article in the April 13, 2006 issue of *The New England Journal of Medicine* (NEJM), trans fats in amounts as small as 20 to 60 calories a day can have adverse effects. Therefore, no amount of trans fat is healthy. It should be alarming then, that a medium-sized order of French fries, the most popular “vegetable” among kids over the age of two, contains five grams of trans fat. The same NEJM article, “Trans Fatty Acids and Cardiovascular Disease,” noted that “given the 1.2 million annual myocardial infarctions and deaths from CHD in the United States, near-elimination of industrially produced trans fats might avert between 72,000 (6 percent) and 228,000 (19 percent) CHD events each year.”² Many countries including the United States, Canada and some European countries, have either placed limits on the permissions for TFA’s in processed foods, or, more commonly, mandated labelling requirements for TFA’s in foods.

Increasing consumer awareness is moving consumption away from foods containing trans fatty acids and high saturates.³ One of the biggest motivators for restaurants to clean up their acts is growing consumer awareness about the unhealthiness of trans fat. In a 2006 consumer survey by the International Food Information Council, 81 percent of consumers reported that they are aware of trans fat and 51 percent are trying to consume less of it.²

Food industry leaders are changing product formulations to move from trans fatty acids to healthier oils. High oleic or high stability oils have been introduced to capture this emerging market opportunity.³ Currently the race to provide large quantities of trans fat free alternatives comes down to a few major crops, with canola or rapeseed, soybean and corn leading the charge.⁴

What is high oleic or high stability canola oil?

High stability (high oleic) canola oil is well suited for high-heat applications like frying in restaurants and big commercial kitchens. Like commodity canola, it is virtually trans fat-free and has the lowest saturated fat content of any commercial oil (less than seven percent). Because of its high oxidative stability, high stability canola oil has a longer fry and shelf life, making it cost effective. In addition to its health and cooking benefits, its bland flavour imparts a light, clean taste that doesn't compete with natural food flavors. A consumer study conducted by DowAgroSciences shows that people actually prefer the taste of French fries made in high oleic canola oil to fries fried in a lowlinolenic soybean oil.²

How does it differ from traditional canola oil?

High stability canola oil's biggest leg up on its traditional cousin is its higher oxidative stability. Generally, the more stable the oil, the longer it can be used before it starts to break down and impart off flavors to food during cooking. That means that the oil has an extended fry life – more than twice that of traditional canola oil. This trait makes high-heat applications like frying healthier for consumers and gives restaurateurs and food service companies more bang for their buck. Commodity canola oil used in deep fryers has to be discarded more often. This difference can be seen in the oil's fatty acid makeup, according to David Dzisiak, global business leader for oils at Dow AgroSciences. High stability canola oil contains 70 percent oleic acid (monounsaturated), which increases an oil's stability, and only three percent of alphanolenic acid (ALA, an omega-3), which makes an oil unstable. By comparison, traditional canola oil contains 61 percent oleic acid and 11 percent ALA.²

How is high stability canola oil made?

Plant breeding, rather than hydrogenation, yields a healthier, higher stability oil. This is done by changing the oilseed's fatty acid mixture. By identifying the genes that control canola's fatty acid profile, scientists can increase the amount of stable oleic acid and decrease the amount of unstable ALA. The resulting high oleic, low linolenic oil is as stable as a fully or partially

hydrogenated oil, minus the nasty byproduct of trans fat. Dow AgroSciences and Cargill have been producing high stability canola for nearly 10 years. But mounting medical evidence and growing public concern are increasingly pushing restaurants and food service companies to consider high stability canola as a *trans* fat alternative.²

What is available in the market place?

“The trans fat issue isn’t new to us” says Brent Zacharia, Canola Trait marketing specialist for Dow AgroSciences. “We’ve been developing Nexera canola varieties and promoting Natreon canola oil properties for commercial use for many years. Dow AgroSciences has been producing Nexera canola varieties since 1997, but they also saw the need to develop end-use markets right along with these varieties. Ernie Unger, Cargill’s Director of Operations, says his company markets IMC high stability canola varieties that produce Clear Valley oils.⁶

In the spring of 2004, Dow AgroSciences introduced Nexera 800 Brand canola with the Clearfield trait. In 2005, the company introduced Nex 828CL and Nex 830CL, which can also be grown using the Clearfield Production System herbicides. Cargill introduced the RoundUp-tolerant high stability hybrid Victory V1010 in 2004. In 2005, it offered IMC111RR and IMC209RR canola varieties.⁶

In 2004, Bunge and DuPont launched their various brands of zero or lowtrans oils, joining ADM’s NovoLipid, in a bid to tackle the growing market for alternatives to partially hydrogenated oils.⁷

Spearing the growing transfat alternative market, Germany’s Bayer CropScience will link up with private ag firm Cargill to bring a new specialty oil to the market. Although Europe has yet to introduce the labelling of transfat on the nutritional panel, consumer organisations are pressing for such transparency and food makers are feeling market pressure to slice TFA’s from their products. In 2003 Denmark became the first country in the world to introduce restrictions on the use of industrially produced trans fatty acids. Bayer CropScience provided its InVigor line of hybrid rapeseed and Cargill the “desirable oil traits” for producing high oleic rapeseed oil. The speciality oil seed was launched on the EU market in 2007.⁷

Monola™, a product of Nu Seed (Nufarm Limited), is currently leading the market in Australia.⁸ Nufarm consolidated its business in Australia with the acquisition of two Australian seed businesses, Dovuro Seeds and Nutrihealth.⁹ According to the Australian Oilseeds Federation (AOF), new canola varieties could garner the Australian food industry an extra AU\$ 80 000 million a year, and could also replace 50 000 tonnes of imports of palm oil and tallow per year. That is the equivalent of 125 000 tonnes of canola per year.³

Japan has been a primary market for Natreon oil. The light taste of Natreon oil as well as its health attributes has made it a Japanese preference. It is labelled under descriptive names such as Healthy Lite in Japan.⁶

Following findings from a report released in 2005, the French food watchdog AFSSA (Agence Francaise de Securite des Aliments) recommended slashing trans fat levels in a wide range of bakery products, suggesting that trans fatty acids should not exceed 1g/100g of the product as consumed. For table oil, trans fats should represent under 0,5% of total fatty acids, and for margarine and shortenings, trans fats should be a maximum of one per cent of total fatty acids.¹⁰ Sweden, Norway and Finland are next in line to see high-oleic/low-lin oils. The oil used in Europe will be a blend of high-oleic rapeseed oil and/or high oleic sunflower oil.¹¹

McDonald's Europe announced in 2006 that it would reduce trans fats in its frying oils to 2% by late 2007. By mid-2008, McDonald's planned to have no more than 6 300 restaurants across Europe using a blend of high oleic rapeseed from UK oil and/or high oleic sunflower from Spain. McDonald's has asked its suppliers to plant sufficient high oleic rape and high oleic sunflower seed to ensure supply of the new oil blend for all restaurants across Europe. The company is working with farmers in the UK to increase the acreage of these varieties under production, and expected to reach its targets by 2007.¹²

A note of interest: McDonald's announced in 2007 that it intended to convert its British delivery fleet to run on biodiesel made largely from its own recycled cooking oil. Matthew Howe, senior vice president with McDonald's UK, said the fast food restaurant should eventually be able to replace the six million litres of diesel its fleet used during 2006 with cooking oil from its 1 200 restaurants in Britain. "We may even have a little bit of excess we can sell into the market" he told Reuters. Howe added that the fuel would not smell of the company's food ☺¹³

What about the yield barrier associated with high oleics?

Canadian canola breeder Dr Van Ripley, a keynote speaker at the 2005 GRDC Research Updates, says the yield barrier associated with high oleic acid has been broken in Canada, with Cargill varieties under test in 2005 yielding 97 to 110 per cent of the benchmark and Dow Chemical lines yielding 91 to 100 per cent. He expects the next step in lifting yield and Canadian grower acceptance to be a collaboration between Cargill and Bayer CropScience to produce hybrid high oleic acid InVigor ® varieties (InVigor is a GM variety).

Cargill is also collaborating with the Victorian Department of Primary Industries. Dr Phil Salisbury, the department's oilseeds research leader, says that while the collaboration will provide access to Canadian germplasm, local varieties also need to be bred for blackleg resistance. Dr Salisbury says the best of the high oleic acid varieties on trial in Australia are yielding only 85 to 90 per cent of the benchmark, and estimates that the first "really competitive" high oleic acid variety is about three years away (2009). He expects that hybrids will soon begin to play a key role in high oleic production.¹⁴

However, according to a report in the Australian Oilseeds News, dated 06 September 2006, Nutrihealth's non herbicide tolerant High Oleic Monola variety NMC130 was the highest yielding non-hybrid, non-herbicide tolerant variety on average in the Australian National Variety Trials in NSW and Victoria, with a good oil content and excellent blackleg resistance. Dr Keith White, Nutrihealth's Technical Director, said this was the first time that an Australian developed high oleic low linolenic (HOLL) canola had yielded comparably to some of the leading non-specialty conventional or Clearfield varieties. He said the variety's performance was very consistent across the trials, including all average to better rainfall zones in southern NSW and north central Victoria, which are the primary target regions for production of HOLL canola in Australia. The Australian Oilseeds Federation lists the development of the specialty canola as its top priority ¹⁵.

The National Research Council Canada (NRC) and the Oil Crops research Institute of the Chinese Academy of Agricultural Sciences have signed an agreement to collaborate on genetic research to improve the production of canola. They are hoping to increase the yield of canola to capitalise on the skyrocketing demand for healthy oils. Australia has also sought to improve the yield of canola, with permission now granted for GM canola to be grown in NSW and Victoria. ¹⁶

The food industry is also contributing to research to help increase canola yield. Cargill is to open a new research and production centre for specialty canola oils in November 2008, which will demonstrate the performance of both current and future canola varieties. The Specialty Canola Oils Research and Production Centre, located near Cargill's canola crush facility in Clavet, Saskatchewan, Canada, will support the company's specialised hybrid breeding and production trials, with a focus on developing high-yielding agronomic traits and the next generation of output traits. ¹⁷

Premiums payable to producers

The premiums paid for high stability canola varieties offer growers a means to boost net returns over commodity canola. From grower, to processor, to end-user, Nexera canola contracts bring value. It is estimate that growers have received over US\$34 million of incremental value over growing commodity canola by 2005. ⁶

Legislative and Legal Action

Legislation and labelling rules have not been the only incentive for food makers to slice TFA's from formulations; litigation threats have also contributed. In a landmark settlement in February 2005, food giant McDonald's has agreed to pay US\$8,5 million to settle a lawsuit over artery-clogging trans fats in oils. ¹⁰

Room for Growth

As with traditional canola, the domestic supply can't keep up with US demand for high stability canola. That's why Dow AgroSciences announced in July that it will double the amount of high oleic oils it produces in 2007. Currently, less than 5 percent of all US-grown canola is high stability. But Northern Canola Growers Association Executive Director Barry Coleman said he's heard projections that high stability canola could make up as much as 40 to 50 percent of the crop in five to seven years. There's good reason to believe those figures. Each year, 9 billion pounds of partially hydrogenated oil and 6 billion pounds of hydrogenated oil are used in the United States. In that 9 billion pounds, there are 1.5 billion pounds of trans fat. If partially hydrogenated oils were replaced by high stability canola oil, 500 million pounds of trans fat and another 500 million pounds of saturated fat could be taken out of the American diet.

There is the potential to produce more high stability canola and replace those hydrogenated oils. High stability canola has a very good opportunity for growth. Dow AgroSciences is currently researching ways to reduce canola oil's saturated fat content, which is already lower than any other common edible oil. Medical research has shown that trans and saturated fats have equally negative impacts on health, so it makes sense that the next wave of research and products will revisit reducing saturated fats.

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