

Drivers for high oleics

High oleic oils offer nutritional and application advantages including less saturated fatty acids, more monounsaturated acids, and a good shelf life. Yet factors such as segregation costs and volatile premiums for farmers limit their production.

Serena Lim

High oleic oils are high in oleic (monounsaturated) acid, with consumer demand for better quality and healthier oils driving the market, along with regulations limiting trans fatty acids and saturated fat intake.

HO oils have improved oxidative stability and also offer traceability – as the crop and oil must be segregated during harvest, storage, transport and crushing – as well as a non-GM alternative in the case of HO sunflower oil.

Typically, high oleic (HO) oils have a fatty acid profile of more than 80% oleic acid in HO sunflower oil, more than 75% oleic acid in HO rapeseed/canola oil, around 70-75% oleic acid in HO soyabean oil and more than 55% oleic acid in HO palm oil, and (see Figure 3, page 20).

HO oils have been on the market for more than 10 years, responding to a growing demand from industry, according to Lionel Lordez of Monsanto, who was speaking at the April Trade Essentials Oils & Fats conference in the UK.

“At the beginning, it was to replace hydrogenated oil, then came issues of health, sustainability, functionality and traceability.”

Today, it is the search for technical and nutritional advantages, for a specific fatty acid profile, for locally-sourced oil, and cost and supply management factors



High oleic oils offer benefits such as a better nutritional profile and shelf life Photo: United Soybean Board

which are driving the market, he says.

Food accounts for more than 80% of global HO oil usage and Lordez believes the market will see organic growth of 1.2M tonnes by 2025, doubling the HO market in the EU from the 700,000 tonnes produced in 2015. Globally, production of HO oils stands at some 2M tonnes, with HO sunflower accounting for around two-thirds of the market, canola 30%, rapeseed 3%, soyabean 3% and safflower 1%, according to Lordez.

Production of HO sunflower oil worldwide has ranged from 1.207M tonnes in 2011/12, to a high of 1.560M tonnes in 2015/16 to 1.183M tonnes in 2017/18 (see Figure 1, page 20), Jose Angel Olivero, sales director of Spanish edible and speciality oil refiner Lipidos Santiago, told the conference.

Europe, Argentina and the Ukraine are the main producers of HO sunflower. Ukraine, for example, produced 232,000 tonnes and exported 224,000 tonnes of HO sunflower oil in 2016/17, according to APK Inform. However, for 2017/18, exports are forecast to fall to 180,000 tonnes, due to a fall in planted area.

HO rapeseed/canola is grown in the EU, Canada and Australia and totals about 50,000 tonnes/year, Olivero said. World production of HO canola ranged from 847,000 tonnes in 2014, to a high of 1.075M tonnes in 2016 to 869,000 tonnes last year (see Figure 2, page 20). World HO soyabean hectareage is around 250,000ha, yielding some 150,000 tonnes of oil, all from GM seeds, said Olivero.

“There is a big question mark over HO

soya oil with production perhaps only in USA because of the GM issue.”

According to the United Soybean Board, HO soyabeans are currently grown in 12 US states throughout the soyabean belt and Dr Stéphanie Marty-Terrade, senior lipid scientist at Nestlé Product Technology Centre, told the Gatwick conference that HO oils accounted for less than 1% of all US soyabean oil production.

Production of HO palm oil, which has a fatty acid profile of 55% oleic acid, 30% palmitic acid and 33% saturated fats, totals around 150,000 tonnes/year but is growing at an annual rate of 15-20%, Olivero said. HO palm oil is produced in Colombia and Ecuador and often has a lower free fatty acid (FFA) content than conventional palm oil, which can help reduce the formation of 3-monochloropropane-diol (3-MCPD) esters and glycidyl esters (GE) during oil processing, he added.

Limiting factors

Despite the benefits, production of HO oil has stagnated due to several factors.

Olivero said conventional oilseed and oil had more buyers than the HO alternative and there was a yield loss when switching from the conventional to the HO variety.

“Segregation also has a cost, which is not understood by buyers.”

Farmers would like a premium for planting HO seeds but the high volatility in premiums was discouraging.

Cold winters in Russia and Ukraine meant crushing could not take place in

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► winter as oil was frozen in tanks, giving producers less selling options as they could not export between December and March/April.

Access to HO seeds could also be an issue as breeders disliked holding a surplus of seeds, he added.

According to a market report by France's FAT & Associés, large fluctuations in commodity prices and the fact that HO varieties are almost exclusively grown on contract also mean that supply of HO oils is unpredictable and supply/demand is frequently unbalanced.

"This poses critical dilemmas for countries which consume much more than they produce.

"For example, Europe and North America are top consumers and also the main HO oil producers but domestic production cannot meet local demand and some imports are still needed to plug the gap," the report said.

Benefits and applications

Speaking at the conference, Dr Marty-Terrade of Nestlé said there was now a broad range of commercially available HO oils.

While most HO oils targeted industrial frying, they had wider applications.

"HO oils have clear technological advantages over their commodity counterparts and bring a unique combination of technological advantages."

They had a favourable nutritional profile with a lower level of saturated fatty acids, a higher level of monounsaturated acids, and the presence of oil-soluble vitamins E and K.

They were valuable oils to reduce SFAs and replace partially hydrogenated oils (PHOs), the primary dietary source of artificial trans fat in processed foods.

"They have good shelf life and are liquid and therefore easier to handle and transport. They also work as a heat transfer medium."

Dr Marty-Terrade said key parameters guiding food development included sensory factors, shelf life, processing and technical constraints related to the product, nutritional and regulatory requirements and a company's internal quality policies. "The consumer is in the middle of this as the product needs to taste good."

Nestlé operated to both internal and external time lines. For example, the US Food and Drug Administration's final determination that PHOs are not Generally Recognized as Safe (GRAS) came into force on June 2018. Parallel to this, Nestlé's policy was to completely

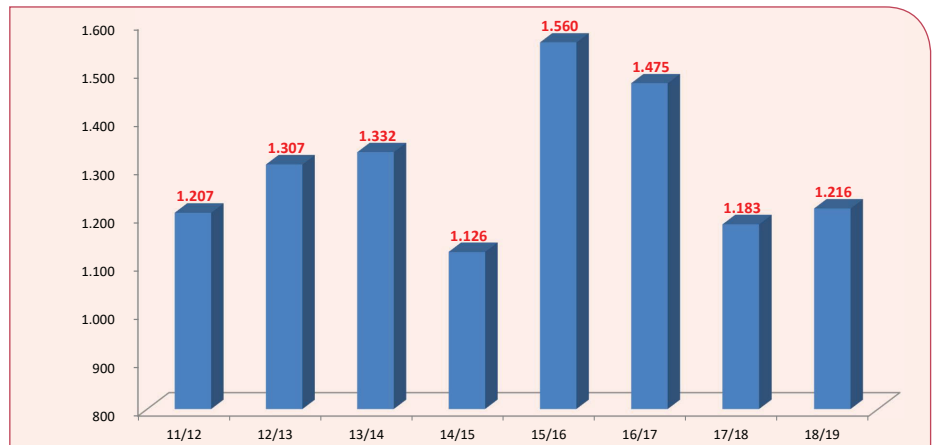


Figure 1: World production of high oleic sunflower oil

Source: Lipidos Santiago

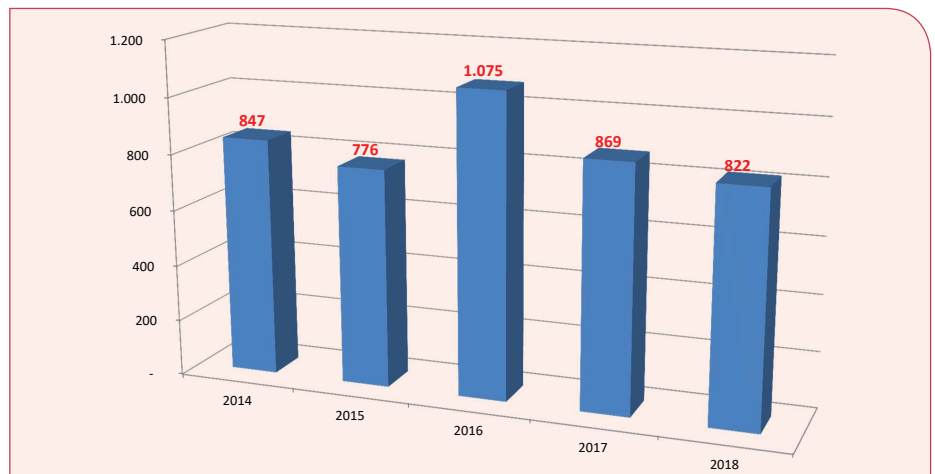


Figure 2: World production of high oleic canola

Source: Lipidos Santiago

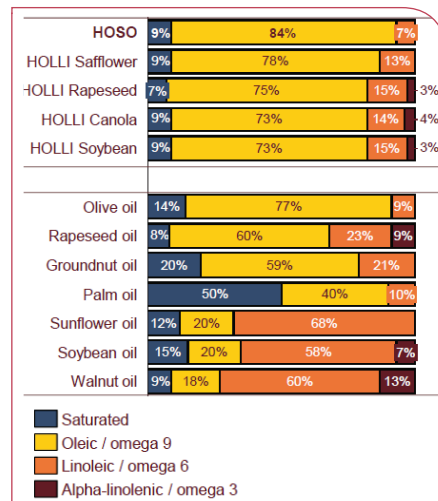


Figure 3: Fatty acid profiles of high oleic and conventional vegetable oils

Source: Cedric Delavert, Eurails

Nestlé had used HO soybean oil to reformulate its liquid coffee creamers and, by the end of 2015, it had achieved a 45% reduction in the product's SFA content and replaced PHO, leading to the removal of trans fatty acids, without compromising the taste.

Dr Marty-Terrade said Nestlé had also used HO sunflower oil to reformulate its instant soup recipe.

"HO sunflower oil is often used in nutritional applications because its fatty acid profile is neutral. There is a minor impact on linoleic content and no impact on alpha-linolenic acid content.

"It does not compromise the oxidative stability of products and it maintains the non-GMO status of products."

In the case of instant soup, Dr Marty-Terrade said the company had reduced the SFA content from 1.7g/250ml to 0.8g/250ml.

The goal was to maintain oxidative stability in the fat phase, provide creaminess and maintain compatibility with current manufacturing processes. The solution was a HO sunflower oil encapsulated into a carbohydrate/milk protein matrix.

eliminate PHO from all its foods and beverages by the end of 2016.

The company's policy on saturated fat was to further reduce saturated fat by 10% in products that did not meet the criteria set for different food items in Nestlé's nutritional profiling system.

"This policy is ongoing and highly challenging."