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EDITOR'S COMMENT



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UK food prepares for 'no deal' Brexit



With the clock ticking for the UK to agree a Brexit deal with the EU by 29 March, the UK government recently published a series of 'notices' on how leaving the EU without an agreement would affect British households and businesses. Ranging from flight disruptions, to shortages of medicines and Danish sperm, the guides also confirm the "grisly prospects" for UK food and drink if no deal is agreed, the Food and Drink Federation (FDF) says.

"We face chaos at the ports, serious disruption to food supplies, increasing business costs, rising consumer prices and ever more administrative burdens," FDF chief executive lan Wright says.

Labelling would need to change as UK-produced food will not be able to carry an EU origin label. British companies selling products in the EU would also need an EU address.

UK lorries driving goods to Europe would have to revert to an old set of international arrangements where Britain had just 103 permits for the 300,000 journeys made by British trucks to Europe every year. Ports will also lack the capacity and infrastructure, such as plug-in points for temperature-controlled containers and vehicles, to deal with the expected increase in food inspections if Britain reverts to WTO rules applicable to the 'rest of the world', says the United Kingdom Warehousing Association.

Food manufacturers are expecting ingredient and packaging prices to rise while there is worry that a 'no deal' Brexit would put a strain on the food industry's 'just-in-time' supply chains, with a government study showing that the UK could be hit with food shortages within weeks of leaving the EU if a deal is not reached.

Mondelēz International, owner of Cadbury's chocolate, Ritz crackers and Oreo biscuits, has said it is stockpiling ingredients and finished products. "Like the whole of the food and drink industry in the UK, we would prefer a good deal that allows the free flow of products," Hubert Weber, president of Mondelēz Europe, told the *Times* newspaper. "However, we are also preparing for a hard Brexit and, from a buffering perspective for Mondelēz, we are stocking higher levels of ingredients and finished products."

The wider effects on the food industry all have implications for oils and fats, as products and ingredients. They also illustrate the trade and the interdependence of the UK and EU. "Sixty per cent of UK food, feed and drink exports are to EU countries and 70% of our imports in these products are from the EU," says the National Farmers Union. "This trading relationship is worth US\$458.5bn."

The UK also has strong trade links with the EU in terms of oilseeds, oils and meals and is highly dependent on imports. Most of its imports of rapeseed (345,500 tonnes), rapeseed oil (82,800 tonnes) and rapeseed meal (207,700 tonnes) came from the EU in 2017, according to *Oil World* figures. And the 75,900 tonnes of butter the UK imported in 2017 came almost exclusively from the EU, while the majority of its butter exports of 52,300 tonnes went to the EU. However, the UK also has also sizable imports of palm, soyabean and sunflower oils, as well as meals, coming from outside the EU. More than two years on from when the UK voted in 2016 to leave the EU, what Brexit will mean for this trade is still unclear.

Serena Lim serenalim@guartzltd.com

NEWS

IN BRIEF

INDONESIA: The government has imposed a three-year moratorium on new palm oil plantations and ordered a review of existing ones in an effort to address sustainability and environmental concerns.

Prabianto Mukti Wibowo, deputy minister at the Coordinating Ministry for Economic Affairs, said the ban was needed to clarify the legal rights of smallholders and because many planned plantations were inside natural forests, *Business Insider UK* said on 20 September.

Indonesia enacted a similar policy in 2010 after a US\$1bn deal with Norway and in 2015 in the aftermath of massive wildfires.

WORLD: The US Department of Agriculture (USDA) has projected a record high global vegetable oil production of 204M tonnes for 2018/19, with supplies of palm and soyabean oils seeing a particularly sharp increase, says Germany's Union for the Promotion of Oil and Protein Plants.

The USDA forecasts 2018/19 world vegetable oil production to rise more than 3% from 2017/2018, with palm, soyabean, rapeseed and sunflower oils accounting 87% of that figure.

Soyabean oil was expected to see the biggest growth at 5% as a result bumper harvests in Brazil and the USA this year.

Favourable growing conditions in Southeast Asia and surprisingly high yields at oil palm plantations were likely to lead to a 4.5% increase in palm oil production from 2017/18 to 72.8M tonnes.

Production of sunflower oil was expected to rise 4%, helped by a 6% increase in Ukrainian sunflower production. In contrast, the 28.1M tonnes of 2018/19 rapeseed oil output is projected to be 1% lower than in the 2017/18 marketing year.

PepsiCo and Nestlé halt palm oil sourcing from Indofood

Global consumer food giants PepsiCo and Nestlé are ending direct and indirect sourcing of palm oil from Indofood, Indonesia's largest food company, because of concerns over deforestation and human rights abuses, reported *Eco-Business* on 5 October.

In an updated statement on its palm oil policy in Indonesia, PepsiCo said it had taken steps to ensure that its direct suppliers placed a moratorium on sourcing from IndoAgri – a Singapore-listed subsidiary of Indofood – but would continue to review this decision on a regular basis.

PepsiCo said that in 2016, it bought approximately 480,000 tonnes of palm oil globally, representing less than 0.8% of global supply, from 60 direct palm oil suppliers.

Nestlé said it had bought around 460,000 tonnes of palm oil in 2016.

In December 2016, it agreed with Indofood to take over palm oil sourcing for its products man-

ufactured under its joint venture with Indofood. On its website, Nestlé said the two companies had agreed to close their joint venture in September 2018 for commercial reasons.

Nestlé said it aimed to achieve 100% responsibly sourced palm oil by 2020 and could now trace over 90% of its palm oil back to the origin mill and almost half back to the plantation level.

Indofood is one of Indonesia's largest agribusiness groups, with operations in seed breeding, oil palm cultivation and milling, and the manufacture of cooking oils, margarine and shortening. It has a total oil palm planted area of over 301,000ha and has 26 palm oil mills and five edible oil refineries.

Eco-Business quoted IndoAgri's chief executive officer Mark Wakefield as saying that the company had done its bit by working with the RSPO including 18 RSPO audits for recertification and some corrective actions.

Olive oil likened to Viagra



Regular intake of olive oil could help middle-aged and elderly men improve their performance in the bedroom, according to a study by scientists from the University of Athens.

Christina Chrysohou, lead researcher of the study, said men who followed the Mediterranean diet and consumed nine tablespoons of olive oil a week had their risk of impotence decrease by up to 40%, wrote *The Independent* on 30 August.

During the study, 660 men with an average age of 67 adopted the Mediterranean diet, which was rich in olive oil, fruit, vegetables, legumes, fish and nuts.

The men were found to have fewer problems when it came to amorous activities.

According to the researchers, olive oil could boost testosterone levels, thus reducing the risk of erectile dysfunction.

Chrysohou noted that diet and exercise were both key to improving sexual capacity, but small lifestyle changes could prove more beneficial to those looking for long-term solutions than potency drugs such as Viagra. "[The Mediterranean] diet keeps blood vessels healthy and lowers the risk of diabetes, high blood pressure and obesity. It offers men a long-term solution without taking any medication," she said.

LDC opens new plant in Tianjin

Dutch agritrader Louis Dreyfus Company (LDC) has opened a new oilseeds processing plant in Tianjin, China, to increase its production capacity and move down the edible oil supply stream in the country.

The plant – LDC (Tianjin) Food Technology Company Limited – located in the Binhai New Area District in the Tianjin Free Trade Zone, had a soyabean crush capacity of 3,600 tonnes/day and an oil refining capacity of 1,100 tonnes/day, reported *World Grain* on 6 September.

LDC said the plant would strengthen its capability to supply soyabean meal, crude soyabean oil and refined edible vegetable oil to customers within China, while its bottling, filling, packaging and storage facilities would allow the firm to move downstream in the supply chain by introducing packaged oils.

The facility's refined oil production line became operational in June, while small-packaged edible oil production was projected to begin by the end of the year.

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Report urges measures on ultra-processed food

The French parliament has approved a report calling for strict measures to improve the quality of ultra-processed food, including mandatory limits on trans fatty acids, salt and sugar, reported FoodNavigator on 1 October

The report - approved in late September by a committee of 29 cross-party politicians - also proposed limiting the number of additives in processed foods and banning junk food marketing to children and health claims on unhealthy products.

However. French food and drink trade association ANIA said the proposals had "put the food industry on trial" without taking into account voluntary efforts

and commitments.

ANIA said over the past decade, French food and drink manufacturers had reduced salt by 20% and sugars by 30%, and cut oils, fats and additives when relevant.

A spokesperson said it was not realistic to reduce the number of authorised additives to just 48 by 2025 as a lot of time was needed to adapt recipes. Reducing the number of additives would also require consumers to accept food and drink products with shorter shelf lives.

Earlier this year, a French study suggested that people who eat more ultra-processed foods have a higher cancer risk.

The study of 104,980 people in France.

published in the British Medical Journal in February, found that a 10% increase in eating ultra-processed foods was associated with a 12% rise in overall cancer and an 11% increase in breast cancer risks.

According to the French study, ultra-processed foods included soft drinks: sweet or savoury snacks; industrialised confectionery and desserts; mass-produced breads; reconstituted meat such as hot dogs; instant soups and noodles; industrially pre-prepared pizzas and ready meals; and other food products made mostly or entirely from sugar, oils and fats, and other substances such as hydrogenated oils, modified starches and protein isolates.

IN BRIEF

WORLD: Louis Dreyfus Company (LDC) said on 25 September that the surprise resignations of its chief executive, Gonzalo Ramirez Martiarena, and finance head, Armand Lumenson, were "unrelated and coincidental". As part of the 'ABCD' group of agribusiness giants that included ADM, Bunge and Cargill, Louis Dreyfus had experienced several management changes in recent years as it strove to recover from weak agricultural markets, the New York Times said.

WORLD: Anglo-Dutch food giant Unilever announced on 5 October that it would not move its corporate headquarters from London to Rotterdam.

Unilever - which buys around 1M tonnes/year of crude palm oil - had announced in September that it was scrapping its structure of two legal entities (UK and Dutch) to become one single company, having reviewed its structure after an attempted US\$143bn takeover by Kraft Heinz last year. However, the plan was rejected by a group of UK institutional shareholders who feared they would need to sell Unilever stock if the group was removed from the FTSE 100 index.



The European Commission (EC) is asking food manufacturers and retailers to comment on a proposal to limit the amount of artificial trans fats in foods sold in the EU to 2g per 100g of fat.

The deadline for comments was 1 November, after which the draft regulation could

be approved by an expert committee of representatives from member states, Nutrition Insight wrote on 5 October.

If approved, the EU Council of Ministers and European Parliament would have two months to make objections. If there were no objections, the 2g limit would become

EU law, although retailers and manufacturers would not have to comply until 1 April 2021, the report said.

Artificial trans fats are formed through the partial hydrogenation of vegetable oils to improve their shelf life and produce hardened fats such as margarine. They have been shown to raise bad cholesterol and lower good cholesterol levels, increasing the risk of heart disease.

The USA's total ban on trans fats came into force in June and Canada's ban on partially hydrogenated oils took effect in September. While some EU member states have their own trans fats regulations, there is no EU-wide legislation in place.

China retaliates against US tariffs with edible oil duty

The USA and China exchanged more blows in their ongoing trade war, with China imposing 25% and 20% duties on a number of US food products, including soyabean oil.

The new duties were in response to US 10% tariffs which came into effect on 24 September targeting US\$200bn worth of Chinese imports, Reuters said on 19 September. The 10% tariffs would rise to 25% on 1 January 2019.

The 25% tariff list by China targeted a wide range of food products, including several edible oils, chicken, beef, lamb, mustard, sugar, milk powder, stuffed pasta and jams. The 20% tariffs would hit unshelled peanuts, chocolates and sugar confectionery, among others.

US sovabean oil exports to China - set to be impacted by the 25% duty - generated US\$23M in sales in 2017, Reuters said.

Meanwhile, Chinese soyabean imports in 2018/19 are expected to fall year-on-year despite a growing demand for meal from the country's livestock sector. The imports were projected to fall by 1M tonnes to 94M tonnes, with total oilseeds intake also decreasing to 100.2M tonnes, reported the US Department of Agriculture (USDA) in its 10 September GAIN report.

However, demand for oilseeds was forecast to keep rising due to persistent growth in protein meal consumption by the Chinese livestock industry. The total oilseed consumption rate would increase by 2% to 159.8M tonnes in 2018/19, Forecast growth for soyabeal meal equivalent feed use was down at 3.04M tonnes, compared with earlier estimates of 4M tonnes.



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BIOFUEL NEWS

IN BRIEF

USA: The Environmental Protection Agency (EPA) aims to publish a draft rule allowing year-round sales of higher ethanol blends in petrol by February, reported *Reuters* on 17 October.

In the previous week, President Donald Trump had announced his plan to lift the summertime ban on sales of petrol with up to 15% ethanol (E15), which had been imposed by the EPA to reduce smog.

"The announcement marked a win for farmers eager to expand the market for corn-based ethanol, and was seen as a political victory for Trump ahead of congressional elections in November," *Reuters* said.

INDONESIA: Korean car

and technology firms Hyundai and LG are planning to build two biodiesel plants, using waste oil palm fruit bunches, in West Kalimantan province as part of the Indonesian government's efforts to boost its biodiesel mandate to 20% (B20), the *Jakarta Post* said on 10 September. The plants would be built in Kubu Raya regency, near an airport and seaport.

CHINA: Chinese green fuels company MotionEco has launched a scheme in Nanjing city to collect and covert used cooking oil (UCO) into renewable fuels to address the illegal selling of UCO, wrote *China Daily* on 24 August.

China generated millions of tonnes of UCO annually, around which had formed an illegal industry that filtered UCO from restaurant fryers, sewer drains, grease traps and other sources for resale, *China Daily* said.

The illegal 'gutter oil' had been linked to illness and some forms of cancer.

MotionEco aimed to supply 50,000 litres of renewable diesel to Nanjing this year.

EC rules against immediate tariffs on cheap biodiesel from Argentina

The European Commission (EC) has decided not to impose provisional import tariffs on Argentine biodiesel even though it considers the fuel to be subsidised, *Reuters* reports.

The EC's decision on 21 September has been described as "incomprehensible for European oilseeds farmers" by the European Oilseed Alliance (EOA).

"While the US administration decided to introduce countervailing duties against subsidised biodiesel from Argentina at the beginning of the year, the inaction of the EU leads to even greater volumes of Argentinian biodiesel entering the EU," EOA president Arnaud Rousseau said.

Some 1.5M tonnes of Argentinian soya biodiesel had entered the EU between September 2017 and July 2018, according to the EOA.

The EU cut its import duties on Argentine biodiesel at the end of September 2017 after a World Trade Organisation ruling in favour of Argentina. In response, the European Biodiesel Board launched a challenge and asked the EU for an investigation into Argentina's alleged subsidies, with a final decision due in February.

"The Commission's preliminary conclusions are that Argentinian [biodiesel] imports into the EU are subsidised and there appears to be a threat of material injury to the Union industry," the EC said in a document.

Argentina provided support to its industry through a set of measures, including export duties on soyabeans that depressed prices to an artificially low level to the advantage of the downstream biodiesel industry, the EC said.

"However, the Commission finds it necessary to collect further information on developments ... and will continue its investigation without the imposition of provisional measures."

Reuters said the EU's removal of duties on biodiesel from Argentina and Indonesia had led to major producers such as Saipol, Bunge and ADM cutting output or closing plants in the EU.

Norway first to introduce mandate for jet fuel



The Norwegian government announced on 4 October that airlines operating in Norway must blend 0.5% advanced biofuel with aviation fuel from 2020.

Norway's Climate and Environment Minister Ola Elvestuen said the mandate would correspond to around 6M litres of second-generation biofuels, a product of waste and leftovers, and could not be based on palm oil.

Elvestuen told *Reuters* that "as far as we are aware, no other country has proposed legislation similar to the Norwegian plans," adding that the quota could correspond to a price increase for airlines of around 54 million Norwegian crowns (US\$6.6M) annually.

Finnish biofuels producer Neste (*see p18*) welcomed the announcement. The world's largest producer of hydrotreated vegetable oil is planning to expand biofuel production capacity at its Singapore plant (*pictured left*) to produce sufficient volumes for the aviation market.

■ In August, Swiss authorities cancelled a pilot project with Neste to replace 1% of Geneva airport's fuel consumption with biofuels.

Indonesia asks to build biofuel plants before buying planes

The Indonesian government has requested permission to build palm oil jet fuel plants in France and the USA in return for purchasing Boeing and Airbus planes for its airlines.

The condition, set by Indonesian Trade Minister Enggartiasto Lukita, was the latest way in which the world's largest palm oil producer was trying to increase the exports of palm oil increasingly shunned by the EU, according to a *Reuters* report on 21 August.

Indonesia was facing pressure to limit the destruction of rainforests at risk from the oil palm and mining industries.

The EU announced in June 2018 that it would remove palm oil-based biofuels from its list of approved sustainable biofuels by 2030 and the USA imposed a 341% anti-dumping tariff in April on Indonesian biodiesel.

Lukita said the country had asked that Indonesian companies be allowed to produce jet biofuel in the USA, with all raw materials sourced from Indonesia. The USA had responded positively, according to the minister, and he had conveyed the same requirement to Airbus in France.



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BIOTECH NEWS

IN BRIEF

UKRAINE: German chemicals and agrichem firm Bayer has opened Ukraine's largest corn seed processing facility as a part of a longterm plan to expand the use of the company's corn seeds in the country.

Located in Pochuiky, Zhytomyr region, the US\$200M facility featured two dryers and logistics centres and would begin supplying Ukrainian farmers with Bayer's DEKALB brand corn seed in time for the 2019 planting season, the firm said on 5 September.

It would process 750,000 units/year of seed and supply 2,500 farmers with the DEKALB seeds, developed through traditional breeding.

"This facility is conveniently situated in one of Ukraine's most productive agricultural regions," said Bayer

Judge grants Bayer reprieve in glyphosate cancer case

A US court has issued a tentative decision to allow a new trial that could overturn an August ruling awarding US\$289M in damages against German chemicals and pharmaceutical giant Bayer AG for failing to warn users of the alleged cancer risk of its weedkillers.

Shares in Bayer – which completed its US\$63bn acquisition of Monsanto in June – rose after the 10 October decision by San Francisco Superior Court of California Judge Suzanne Bolanos, *Reuters* reported.

Bayer lost 10% of its value when a jury in California found on 10 August that ex-groundskeeper Dewayn Johnson had contracted cancer from years of exposure to Monsanto's glyphosate-containing Roundup and Ranger Pro herbicides and that the firm had neglected to warn him and others of the cancer risk.

Monsanto asked Bolanos in court filings on 18 September to set aside the entire verdict, reduce the award or grant a new trial.

In her ruling, Judge Bolanos said that Johnson had failed to meet his burden of producing clear and convincing evidence of malice or oppression by Monsanto, a requirement for allowing a jury to award punitive damages.

However, investors and analysts still cautioned that the tentative ruling was just one step in an uncertain legal battle, the *Wall Street Journal* (*WSJ*) reported. "It isn't yet clear when Judge Bolanos may complete the ruling and Johnson is likely to appeal if it is completed," the *WSJ* wrote.

Obtaining a new trial or achieving a significant reduction in damages is crucial for Bayer, as it works to integrate Monsanto, the US seed and pesticide giant that also produces GM seeds such as soyabeans and corn.

Johnson's case was the first to go on trial over allegations of glyphosate causing cancer but Bayer is facing more than 8,700 similar cases from plaintiffs in the USA, with cases set to start in February.

The US Environmental Protection Agency found in 2017 that glyphosate was not likely to cause cancer in humans, contradicting a 2015 World Health Organization report that classified glyphosate as "probably carcinogenic to humans."



French agricultural research and international cooperation organisation CIRAD has completed sequencing the sugarcane genome, unlocking the genetic map of the last major cultivated plant.

The sugarcane genome had so far proved challenging to researchers due its extreme complexity, comprising 10-12 copies of each chromosome, compared to only two in the human genome, CIRAD said on 10 July.

The CIRAD team refined its approach based on the 20-year-old discovery of collinearity – or high similarity caused by numerous genes occurring in the same order in both genes – between sugarcane and sorghum. "Thanks to this novel method, the reference sequence obtained for a cultivar from Réunion, R570, is very good quality," said CIRAD geneticist Angélique D'Hont, who coordinated the study.

The reference sequence was a crucial step to fully sequencing the sugarcane genome and analysing the variations between sugarcane strains more accurately.

D'Hont said that having a reference sequence for a species "radically changed" all the genomic and genetic approaches for that species.

With its genome now unlocked, CIRAD said it would now be possible to modernise the methods used to breed sugarcane varieties, enabling the creation of new varieties for wider applications.

FDA approves sugar from Brazil's first GMO sugarcane for sale in USA

The US Food and Drug Administration (FDA) has approved raw and refined sugar produced from Brazil's first genetically modified (GM) sugarcane variety as safe, approving it for sale in the USA.

The FDA focused its safety assessment on sugar as it was the primary sugarcane-derived product imported from Brazil to the USA, said agritech company Centro de Tecnologia Canavieira (CTC) on 10 August.

The CTC20BT sugarcane variety was approved for cultivation in Brazil in June 2017. It was developed in response to the threat posed by the sugarcane borer, a major pest in Brazil that caused damages and losses worth an estimated US\$1bn each year. To combat the borer, CTC20BT was modified to produce the Cry1AB Bt protein, which CTC said had a long history of safe use and had been used in agriculture for more than 20 years in biotech crops, such as maize and cotton.

Researchers unlock sugarcane genome

CTC said that the evidence it had submitted to the FDA

showed that sugar produced from CTC20BT was as safe as sugar from conventional sugarcane varieties and that highly refined sugar produced from it was compositionally identical to conventionally-produced sugar.

The FDA approval followed an approval by Health Canada earlier in the year.

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Canadian Pacific transports 25.8M tonnes of grain

Canadian railway operator Canadian Pacific (CP) moved 25.8M tonnes of western Canadian soyabeans, grain, grain products and other non-regulated principal field crops during the 2017/18 crop season.

The total haul was up 1% against the 2016/17 crop year and also 1% above CP's three-year average, the firm said on 20 August. In addition, September 2017 was the company's biggest-ever single month for moving grain.

On 31 July, CP also published its plans for moving this season's crop, stating that it would be closely watching crop forecasts and maintaining regular communication with farmers and supply chain partners to validate any forecasts.

"Our agricultural shippers have needs that are unique within our business and we believe an ongoing dialogue is essential to understanding and meeting their needs," said Joan Hardy, CP vice president of sales and marketing for grain and fertilisers.

CP's current estimate for western Canadian crop in the coming year – based on Statistics Canada data – stood at 70.8M tonnes, with possible carryover from the 2017/18 production bringing the total to 83.4M tonnes, 5% above the five-year average. However, the firm highlighted the "limited visibility" of upcoming crop sizes early in the crop year and added that the 2016/17 crop was forecast at 65M tonnes but actually ended up being nearly 10% higher at 71M tonnes.

Based on current forecasts, CP planned to spot 5,500 hopper cars for each week throughout the autumn until the Port of Thunder Bay on the St Lawrence Seaway closed for the winter, after which the capacity would be lowered to 4,000 cars/week.

The company intended to spend more than CAN\$1.55bn (US\$1.19bn) in capital investments in 2018 to replace depleted track assets and upgrade its network.

It also planned to invest half a billion dollars to replace the low-capacity Government of Canada fleet with new high-capacity hopper cars that could carry up to 10% more grain and allow 5% more cars per train due to their shorter design, resulting in 15% more grain per train.

Additionally, CP was continuing the development of its 8,500 foot train model that could haul up to 20% more grain per train than the current 7,000 foot model, and up to 44% more grain per train when combined with the new high-capacity hopper cars.

IN BRIEF

CANADA: Viterra Inc opened its new high throughput grain facility in Wadena, Saskatchewan on 10 October.

The facility has a storage capacity of 34,000 tonnes and is capable of loading up to 156 railwcars through a loop track.

Viterra stores, ships, cleans and blends grains and oilseeds in Canada and northern America and is part of global commodity trading firm Glencore Agriculture.

VIETNAM: Australia-based Kilic Engineering made its first international sale of a drive-over hopper at a river port facility near Ho Chi Minh City, Vietnam.

The machine would load soyabean meal, wheat and corn and was designed to simplify the unloading of grain from trucks, *World Grain* wrote on 16 August.

Kilic said its BunkerStacker3000 was self-propelled and had a capacity of 600 tonnes/hour for wheat and slightly less for canola, with the ability to unload three B-double trucks in 16 minutes.

G3 opens two new elevators to expand grain origination G3 said its new elevators in Melville and Saskatoon were similar to other high-efficiency



G3 elevator in St Adolphe, Manitoba

Canadian grains and oilseeds trader G3 Canada has opened two new grain elevators in the province of Saskatchewan as part of its plan to increase its grain origination network in western Canada. G3 said its new elevators in Melville and Saskatoon were similar to other high-efficiency facilities the company operated on the Canadian prairies, featuring 134-car loop tracks capable of loading a full unit train in continuous motion, wrote *World Grain* on 14 August.

They also featured high-capacity drags under their driveways that allowed farmers to unload a super B type truck in five minutes or less without moving, said G3.

Both elevators were located on a Canadian National Railway line, which gave them good access to G3's Thunder Bay and St Lawrence River terminals.

G3 Canada's assets included primary grain elevators and port terminals throughout Canada, a Great Lake grain transport vessel and the largest private fleet of grain hopper cars in Canada, wrote *World Grain*.

Paterson Grain reopens Vancouver terminal

Canadian agrifood company Paterson Grain has reopened its Alliance Grain Terminal (AGT) in Vancouver, Canada, after completing a large-scale ship loader and dock conveyor upgrade.

The upgrade, which began in 2017 and was completed in August, would facilitate quicker ship loading, increased capacity, a higher degree of dust control and better overall functionality at AGT, wrote *World Grain* on 6 September. According to Paterson, the facility could now load up to 2,000 tonnes/day of grains even during challenging weather conditions and was able to load on two berths. In addition, it now had an integrated dust suppression system, which would ensure clean operations from receiving to shipping.

The terminal had the ability to load Panamax size vessels without the need to spin the ship to complete loading.

The AGT reopening was

the most recent for Paterson, which also opened a new CAN\$25M (US\$19.4M) terminal in Bowden, Alberta, on 29 August, the firm's fourth terminal in the province.

NM Paterson & Co Ltd, Paterson GlobalFoods is a private agribusiness active in Canada, operating 36 terminals, elevators and agri centres in the country.

It handles and markets grains and oilseeds including wheat, rye, canola, soyabeans, corn and flaxseed.











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BASF invests in alkoxylate capacity expansion

BASF is increasing capacity at its alkoxylation plant in Antwerp, Belgium, in response to rising demand for alkoxylates in the European market, the company announced on 6 September.

Alkoxylation is a downstream technology of ethylene oxide production and is used in the manufacture of surfactants for the home care industry and in industrial and institutional cleaning applications.

The first additional capacities at the plant would be available from as early as third quarter 2018, BASF said.

"With the planned significant capacity expansion, we are expanding our market position as a leading supplier of alkoxylates in Europe," said Soeren Hildebrandt, BASF senior vice president, home care, I&I and industrial solutions, Europe. "Overall, we plan to step up our alkoxylation capacities at the Antwerp site by up to 25% by 2021, supporting the growth of our customers."

BASF said its customers used surfactants in the formulation of products such as laundry detergents, surface cleaners and dishwasher detergents.

Alkoxylates are also used in technical applications for industrial solutions such as the production of raw materials for the manufacture of plasticisers, emulsifiers for emulsion polymerisation, crop protection additives and polyurethane foams for the rubber industry.

According to the European Committee of Organic Surfactants and their Intermediates (CESIO), more than 3M tonnes of surfactants were produced in western Europe in 2015. Surfactants can be produced from petrochemical feedstocks, or natural feedstocks such as coconut and palm kernel oil.

The resulting synthetic or fatty alcohols can be further processed through alkylation, ethoxylation or sulphation to produce a range of surfactant molecules.

IN BRIEF

WORLD: Saudi Basic Industries Corp (SABIC) has been cleared to buy a 24.99% stake in Swiss speciality chemicals firm Clariant. Reuters reported on 10 September. Delays in approvals from authorities in countries including Mexico and Brazil had forced Clariant to delay its tie-up with SABIC, which had bought its stake in January after activist investors forced Clariant to abandon its planned merger with US-based Huntsman Corporation. The 24.99% stake would make SABIC - the world's third largest diversified chemical company - the largest shareholder in Clariant, with the Süd Chemie family group holding 14%. Reuters said.

Clariant supplies the edible oil industry with its Tonsil brand bleaching earths.

FINLAND: Renewable fuels producer Neste announced on 3 September that it had completed its acquisition of a 51% stake in Dutch animal fats and proteins trader IH Demeter BV. which has 150 rendering facilities througout Europe. Neste said the move was an important step in its strategy to build a global waste and residue raw material platform to secure feedstock availability and competitiveness.

Unique fatty acids found in orchid seed oil

A US-Chinese research team has discovered an unusual seed oil component in Orvchophragmus violaceus – or the February orchid (pictured) - that could lead to the development of more effective plant oil-based lubricants.

During a study by the Huazhong Agricultural University in Wuhan, China, scientist found that this native Chinese orchid contained seed oils that were highly unusual, Indiana University -Purdue University Indianapolis (IUPUI) said on 27 August.

IUPUI bio-organic chemist Robert Minto then discovered that nearly half of the seed oil was made up of fatty acids never before identified.

During fatty acid formation, each molecule link requires a four-reaction cycle to add further carbon atoms into the



fatty acid. However, in O. violaceus fatty acids, one of the reaction cycles is only partially completed, leading to a unique fatty acid structure.

"This is the first time it's ever been observed in any fatty acid biosynthesis that a partial cycle happens and then more cycles occur afterwards," said Minto.

The discovery could help determine what in the chemical structure of O. violaceous seed oil made it a superior lubricant, IUPUI said. Compared to castor oil, a common bio-based lubricant in engine oils, O. violaceus oil had better friction and wear reduction and could withstand higher temperatures, IUPUI added.

Thyssenkrupp commissions bioplastics plant in China

German industrial group thyssenkrupp has commissioned a bioplastics plant for Jilin COFCO Biomaterial Corporation, a subsidiary of COFCO, China's largest food and agriculture group and a domestic leader in the production and processing of edible oils and oilseeds.

The new plant, located in Changchun city, produced all types of bioplastic polylactide (PLA), a 100% bio-based and compostable plastic which could replace conventional petroleum-based polymers used to produce packaging, fibres, textiles and engineering plastics, thyssenkrupp said in a news release on 18 October

"The starting material for PLA production is

lactic acid, which is recovered from renewable resources such as sugar, starch or cellulose.

"The bioplastics market will continue to grow in the coming years, not least due to the increasing environmental awareness of industry, governments and consumers," said Sami Pelkonen, CEO of the electrolysis & polymers technologies business unit of thyssenkrupp Industrial Solutions. "With our PLAneo technology we want to do our bit to make the plastics sector more sustainable and resource-friendly."

Thyssenkrupp said its PLAneo technology was transferable to large-scale plants with capacities of up to 100,000 tonnes/year.

DIARY OF EVENTS

8-9 November 2018

8th ICIS Asian Surfactants Conference

Parkroyal on Pickering, Singapore www.icisevents.com/ ehome/index.php? eventid=200179365

12-15 November 2018

16th Annual Roundtable Meeting on Sustainable Palm Oil (RT16)

Magellan Sutera Resort Kota Kinabalu, Malaysia **www.rspo.org**

14 November 2018

China International Oils and Oilseeds Conference (CIOCEN) 2018

Shangri-La Hotel Guangzhou, China www.dce.com.cn/CIOCEN

15-17 November 2018

PORAM Annual Forum/ Dinner Kuala Lumpur, Malaysia www.poram.org.my

28-29 November 2018

KazOil 2018 Radisson Hotel Astana, Kazakhstan www.apk-inform.com/en/ conferences/kazoil2018

6 December 2018

Fats & Oils Istanbul/Feeds & Grains Istanbul InterContinental Istanbul, Turkey www.agripro.com.tr

21-22 January 2018

Fuels of the Future 2019 CityCube, Berlin, Germany www.fuels-of-the-future.com

12-14 February 2019

International Rendering Symposium at the International Production & Processing Expo (IPPE) Georgia World Congress Center, Atlanta, USA www.ippexpo.org

4-6 March 2019

Palm & Lauric Oils Conference & Exhibition (POC) 2019 Shangri-La Hotel

Kuala Lumpur, Malaysia www.pocmalaysia.com

1-3 April 2019

World Bio Markets Amsterdam, the Netherlands www.biobasedworldnews. com/events/ world-bio-markets

10-11 April 2019

Black Sea Grain 2019 Intercontinental Hotel Kyiv, Ukraine www.ukragroconsult.com/ bsg/2019/en/conference

5-8 May 2019

110th AOCS Annual Meeting & Expo

St Louis, USA www.annualmeeting.aocs.org

14-17 May 2019 The 9th ICIS World Surfactants Conference Hyatt Regency, Jersey City, USA www.icisevents.com/ ehome/index.php?

3-5 June 2019

eventid=200178918

CESIO 11th World Surfactant Congress Infinity Hotel & Conference Resort, Munich, Germany www.cesio-congress.eu

12-15 June 2019

EFPRA Congress 2019 La Baule, France www.efpra.eu/ efpra-congress-2019-france/

16-19 June 2019

15th GCIRC International Rapeseed Congress BCC, Berlin, Germany www.irc2019-berlin.com

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PROCESSING

Extrusion-pressing offers a mechanical alternative to the traditional method of soyabean processing, which involves the use of volatile hexane as a solvent

The

mechanical alternative

he mechanical processing of soyabean is a convenient alternative to chemical extraction, particularly for local processing at small and medium capacities of up to 400,000 tonnes/year.

Extrusion-pressing using screw presses and extruders offers a number of benefits, primarily low operating costs and the elimination of the risks associated with the handling of the solvent, hexane.

The traditional method of soyabean processing extracts oil from dehulled and flaked beans by a chemical solvent, usually hexane. Hexane is a very volatile and explosive substance, requiring strict safety measures. Being a toxic substance, hexane also needs to be removed entirely from the oil and meal, which is an energyhungry process that requires a large amount of steam to achieve legislative limits for the residual hexane content.

Hexane free

Mechanical processing involves the extrusion of dehulled, or even hulled soyabean, with a subsequent pressing of the oil in a screw press.

As there are no chemical solvents involved throughout the entire process, there are also no special safety measures regarding toxicity and explosiveness.

Thanks to its compact dimensions, the whole technology demands less installation space, further reducing investment costs.

The availability of presses and extruders at different performance capacities allows the construction of a line at a capacity from 2,000-400,000 tonnes/ year of soyabeans. These capacities fit well with the current trend of local processing of agricultural commodities for the production of feed and food. The products of mechanical extraction are just raw vegetable oil and press cake, with no residual solvents.

Press cake – an added value

Mechanical pressing of oil offers a number of advantages over chemical extraction. The resulting oil contains less phospholipids, which makes subsequent oil refining easier. There is also a higher content of phospholipids in the cake, an advantage for its use in the feed industry.

Pressing with extrusion combines the advantages of both processes. Extrusion causes disruption of cellular structures, the removal of anti-nutritional substances, gelatinisation of starch and the heating of raw soyabeans.

This increases the oil yield in the subsequent pressing process as well as improving the digestibility of the cake.

Increasing heat exposure affects the soya proteins in a way that protects them from digestion by the rumen organisms in ruminants, increasing their usability for nutrition. Conversely, a lower heat exposure in extrusion-pressing leads to higher digestibility of protein, which is very convenient for the nutrition of monogastric animals such as pigs, poultry, and fish.

Because mechanical extraction does not involve the perfect separation of vegetable oil from the seeds, the residual press cake contains more oil (around 6-8%) and therefore more metabolisable energy compared to chemically extracted soya meal. In addition, the oil in the cake is bound in the cells, rather than distributed freely, which further improves its use, especially in ruminants. This 'bound' oil also increases the mechanical resistance of granules in the production of granular compound feed from the cakes.

Consequently, due to the different feed-related qualities, press cake is not just a simple replacement for extracted meal. It is a different product, superior in many important characteristics, and thus also in its market value.

Energy savings

During extrusion and pressing, a considerable amount of heat is produced, particularly in the form of flash steam at the outlet of the extruder, and from the heat convection from the screw press.

A complex multi-stage recuperation system can recover up to 40 kWh/t of energy, which brings significant operational savings and makes mechanical extraction 150 kWh/t more energyefficient than chemical extraction.

The low energy demands of the process and the possibility of local processing of locally grown soyabeans help reduce the carbon footprint of the production of soya cake-based feed.

A significant advantage of local processing is the ability to control quality all the way from the seed to the final product, including the processing of certified products such as GMO free, Certified Organic and Clean Label. • This article has been supplied by Czech engineering firm Farmet, which last year installed an extrusion-pressing system with a processing capacity of 65,000 tonnes/year for soyabean processing for Gamota JR sro in Slovakia

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BIOFUELS



The Neste HVO production facility in Rotterdam, the Netherlands, is the largest in Europe and among the largest in the world

Hydrotreated vegetable oil boasts a great number of advantages over traditional biodiesel, among them lower emissions, higher fuel efficiency and a chemical structure identical with petroleum diesel. With the growing interest in all markets, particularly in Asia, and the many new production facilities scheduled to come online in a few years, HVO could be the fuel of the future. *Ile Kauppila*

he times in the biofuel sector are a-changin'. In the last decade, the marketplace for diesel based on hydrotreated vegetable oil (HVO) has developed rapidly. Production has increased exponentially and new producers keep popping up to try their luck as demand ramps up in both traditional and new markets. But the greenhorns face tough competition as Finland's Neste – the world's largest HVO producer – seems to reign supreme in the sector.

But what is HVO? Isn't it just another name for biodiesel or is it something different altogether? Neste's head of technical services Markku Honkanen and head of market intelligence Anselm Eisentraut talked to *Oils & Fats International* to explain the basics of HVO and its future prospects.

Feedstock flexibility

HVO can be produced through several processes, such as hydrocracking, but perhaps the most common is hydrodeoxygenation, also known as hydrogenation or simply hydrotreatment. In this process, hydrogen is added to either a plant- or animal-based feedstock. It combines with oxygen, thus removing water from the mix and resulting in a renewable, paraffinic fuel product.

Honkanen and Eisentraut say that in the last decade or so, the feedstocks used to produce HVO mostly consisted of vegetable oils. For example, in 2007, when Neste opened its first commercial scale facility – which was also the world's first HVO plant of this scale – in Porvoo, Finland, co-located with the company's crude oil refinery, it processed mostly palm oil. According to the firm, at this point, palm oil made up 90% of its HVO feedstock.

Palm oil, however, suffers from a bad reputation regarding its sustainability. The EU has decided to phase high ILUC-risk vegetable oils out of its list of sustainable renewable fuels by 2030m including palm oil. Combustion engine manufacturer Volvo Penta – which in the beginning of 2016 approved HVO as a fuel in all of its diesel engines – also notes that other vegetable oils, such as soya and rapeseed, require immense areas of land to produce the quantities of oil needed for HVO production.

As a result, HVO producers have begun to move away from vegetable oils. "These days HVO is produced to a growing degree from waste and residue oils and fats. These come from food, fish and slaughterhouse industries and nonfood grade vegetable oil fractions," say Honkanen and Eisentraut.

Neste – a member of the Rountable on Sustainable Palm Oil (RSPO) since 2006 and the holder of the world's first RSPO-RED Supply Chain sustainability certificate – has cut the share of palm oil in its feedstock mix from 90% palm oil to 80% waste and residue materials, such as used cooking oil (UCO). In addition, other possible waste feedstocks include animal and fish fat and camelina, soya and rapeseed oil refining residues.

"Neste uses more than 10 different raw materials to produce our renewable products," say Honkanen and Eisentraut. "An extensive raw material base provides flexibility, as it allows us to respond to the needs of different markets and customers."

Differences with biodiesel

The large number of feedstocks from which HVO can be produced and the fact that HVO is often marketed as a petroleum diesel replacement means the product often gets confused with 'traditional' biodiesel. However, Honkanen and Eisentraut say that the two are completely different products, despite



their superficial similarities.

"The chemical composition of HVO is similar to that of conventional diesel. It can be blended with fossil diesel in all proportions or used as a 100% pure product. The maximum allowed concentration of fatty acid methyl ester (FAME) biodiesel in regular diesel in Europe is usually 7% due to quality reasons," they say.

Unlike most traditional biodiesels, HVO can be stored for a long period of time without major changes to its properties. Additionally, HVO does not accumulate water, which Honkanen and Eisentraut say is sometimes a challenge with biodiesel. "Biodiesel should be used within six months from its manufacturing date to minimise the potential of changes in product quality and the risk of microbial growth," the two note.

HVO also benefits from better cold weather performance when compared to biodiesel – an important property in northern countries like Neste's home Finland. For example, the cloud point, indicating the lowest possible storage temperature, of Neste's HVO fuel is -34°C, while the cloud point of rapeseed biodiesel is only -10°C, say Honkanen and Eisentraut. The cold weather characteristics of HVO can be adjusted during the manufacturing process.

The cetane number of HVO – the indicator of how easily a fuel ignites in the engine, with a higher number signifying better ignitability – is higher than traditional biodiesel's or even fossil diesel's. Biodiesels generally have cetane numbers in the range of 50-60, which is roughly similar to petroleum diesel.

HVO, on the other hand, boasts cetane numbers above 70. Honkanen and Eisentraut say the high cetane number helps engines start in cold weather and lowers fuel consumption, particularly in urban environments.

Last, but not least, HVO does not contain any sulphur or aromatics, and so generates few impurities in an engine. According to an August 2017 study by Gladstein, Neandross and Associates for two southern California air quality management districts, HVO reduces nitrogen oxide (NOx) and particulate matter (PM) emissions by 13% and 29%, respectively.

Honkanen and Eisentraut say that the savings are higher the older the vehicle in which the fuel is burned is. It also generates no ash, which may extend the service life of particle filters. Biodiesel, on the other hand, can generate more NOx emissions than fossil diesel due to its oxygen content. Honkanen and Eisentraut note that the emissions from fossil diesel may also decrease the life span of motor oil and particle filters.

Growing production

In the global HVO marketplace, demand is set to be growing and there may soon be a supply stream changing geographical shift eastward. So far, according to second generation biofuels broker Greenea, most of the fuel demand has come from Europe and North America, but there is growing interest coming from Asia, which could change the map of the HVO supply sector.

Currently, the global installed HVO production capacity stands at 4.745M tonnes (*see Figure 1, pg20*). Neste is the largest producer in the HVO market with a capacity of roughly 2.6M tonnes/year,



Markku Honkanen, head of technical services, Neste

divided between four plants in Finland, the Netherlands and Singapore. In Italy, ENI has started production at its Venice plant, which has a 350,000 tonnes/year capacity, while in France, Total's La Mede refinery is set to come online soon, adding 500,000 tonnes/year of production capacity to the EU sector.

On the other side of the Atlantic, Renewable Energy Group and Diamond Green Diesel have a combined production capacity of 750,000 tonnes/year, says Greenea. Out of the two, Diamond holds more capacity, having in 2017 expanded its full capacity to more than 800,000 tonnes/year. However, most companies are planning expansions and new players are entering the marketplace. Greenea expects global capacity to grow by more than 40% by 2020, reaching 6.7-7.5M tonnes, if all the expansion projects go through.

While the EU and the USA are poised to remain the top markets, Asia is rising in the marketplace both due to increasing interest of Asian economic superpowers – like China and Japan – to boost their share of the renewable fuels market and the number of planned new production capacity in Asia. HVO-based aviation fuel is also an up-and-coming market segment, says Greenea, although full realisation of HVO's potential could take several years.

Regulatory daydream

Because of the shift to waste feedstocks, Honkanen and Eisentraut note that the name HVO is, in fact, becoming an inaccurate term to describe the product manufactured by most current producers. Indeed, since the product is to an increasing degree not manufactured from vegetable oil, the title HVO sounds like an oxymoron.

"However, product names cannot be



Anselm Eisentraut, head of market intelligence, Neste

BIOFUELS



▶ easily changed to better describe the origin of the fuels, as they are common in European regulation, fuel standards and biofuel quality recommendations set by automotive companies," they explain.

As the fuel is popularly called HVO, despite the actual feedstock used to make it, the term might cause some confusion among consumers. Therefore, producers often give their products different brand names. Neste, for example, calls its product Neste MY Renewable Diesel, while both Diamond Green Diesel and ENI have titled their fuels Green Diesel.

Regulations-wise, HVO is a relatively non-problematic fuel. Due to its identical chemical composition with petroleum diesel, it does not suffer from the limits imposed on the blending of conventional biodiesel. The EU, for example, limits conventional biodiesel blending at 7% based on the EN590 diesel standard, while elsewhere in the world blending limits of 10% and 20% can be found. High concentrations of traditional biodiesel can cause problems with engines, says Neste, but HVO poses no such problems.

"In fact, HVO is the biocomponent recommended by the latest and strictest Worldwide Fuel Charter (WWFC) specification. WWFC 5 does not allow the use of traditional biodiesel, but it does recommend the use of renewable diesel because of its high cetane number, for example," say Honkanen and Eisentraut.

To ensure compliance with EU renewable fuel regulations, Neste spearheaded the development of the HVO Verification Scheme (HVO-VS). Approved by the EU Commission, the HVO-VS is a sustainability verification system designed to verify biofuels' compliance with the sustainability criteria embedded in the EU Renewable Energy Directive (RED). The scheme is audited by an independent third party and is currently used to verify RED compliance of waste- and residue-based biofuels.



Others catching up?

Both Honkanen and Eisentraut and Greenea trust that the future can be very bright for HVO. "We believe that the demand for renewable diesel will continue to increase globally, going forward, as more and more countries and regions are stepping up their emissions reduction ambitions," say Honkanen and Eisentraut.

For the sovereign market leader Neste, development of pre-treatment capabilities is a key focus area. Additionally, Honkanen and Eisentraut list nontechnical challenges such as regulatory developments, ensuring and further developing sustainability and developing new customer segments for renewable diesel and jet fuel as issues producers will be concentrating on.

Greenea notes that HVO price development will be an interesting factor to keep an eye on. US producers are expected to increase their output in the next few years, which should positively influence liquidity on the market. Greenea says this might put pressure on prices, breaking Neste's near-monopoly.

But Honkanen and Eisentraut are not worried, saying that while some might consider the price of Neste's HVO fuel a disadvantage, that is not the case.

"Indepedent research shows that HVO - such as Neste MY Renewable Diesel - is one of the cheapest options to reduce emissions in transport. And it is the only option that can be adopted now, without any modifications into engines or fuel distribution systems," they say. *Ile Kauppila is the former assistant editor* of OFI

Canola farmers fight clubroot

A telltale sign of clubroot infection in canola are root galls that hinder the plant's nutrient and water intake

The clubroot disease was found in Canadian canola crops only 15 years ago but since then, it has spread throughout the country and left farmers scrambling for a cure. They are not alone, however, as clubroot is the bane of canola and rapeseed producers all over the world. *Ile Kauppila*

anada's US\$21bn canola industry awoke to an unpleasant reality in 2003. Clubroot, a problematic plant disease that can threaten entire canola crops, was discovered in the province of Alberta's farming regions.

Until then, clubroot had been a serious problem in European rapeseed fields, but had also been found all over the world, from Australia to China and the USA.

Canadian farmers had been able to take it easy when it came to this particular disease. The Canola Council of Canada (CCC) tells *Oils and Fats International* that they, in fact, had no reason to believe clubroot was even present in the country or would ever affect their crops. After 2003, this was no longer the situation.

Now, 15 years later, thousands of fields have been infected and clubroot has spread from Alberta to Atlantic Canada and virtually every province in between. Farmers and seed producers are fighting against the scourge, but it seems that no matter what they do, clubroot is constantly one step ahead.

What is clubroot?

Clubroot is a virulent soil-borne disease that affects plants in the *Cruciferae* – or cabbage – family. In addition to rapeseed and canola, this diverse plant group also includes common vegetables and weeds like cabbage, broccoli, Brussels sprouts, cauliflower, turnip, stinkweed and wild mustard. All of them are related and, as such, vulnerable to clubroot.

The disease is caused by a pathogen in soil called *Plasmodiophora brassicae*. This pathogen is classified as a protist – a kind of microscopic organism that is not an animal, plant or fungus but exhibits characteristics of all of them.

As an 'obligate parasite', *P. brassicae* cannot grow or multiply without a living host, says the Canola Council of Canada (CCC). The parasite spends the winter buried in the soil as incredibly hardy

Photo: The Canadian Canola Council

resting spores that can remain viable for up to 20 years.

In spring, secretions from various plant roots cause germination in the spores, which transform into short-lived zoospores that begin to swim around in water or water-film in the soil, looking for root hairs to infect. This mobility allows the zoospores to actively search for host plants. Once it finds and infects a suitable host, the zoospore transforms into an amoeba-like cell that multiplies and joins up with other cells formed by its zoospore brethren, ultimately forming what is called a plasmodium. The plasmodium then releases secondary zoospores that reinfect other roots of the same plant.

The second generation infection is able to invade the interior – or the cortex – of the canola root.

Once they reach the cortex, the amoeba cells form second generation plasmodia, which begin to alter plant hormones. The hormonal imbalance causes the infected interior root cells to swell up.

Clusters of these enlarged cells ultimately result in the signature club-like root galls, which give the clubroot disease its name. Come autumn, as these galls decay, they release millions upon millions of resting spores back into the ground, ready to start the infection cycle again the following spring.

Symptoms and identification

In rapeseed and canola, the most distinctive symptom of clubroot is the formation of the galls or swellings in the roots of the plant.

According to the CCC, the root galls not only tie up nutrients that the crop could have used, they also hinder the transport of adequate water and nutrients up to the aboveground plant tissues.

While the root galls are a telltale sign of the disease, without specific inspection they will be hidden underground. The visible symptoms of the disease could mislead farmers and cause them to misdiagnose their ailing crops.

Depending on local conditions and the life phase when the canola becomes infected, the aboveground symptoms could be confused with a number of other diseases – such as sclerotinia, blackleg or fusarium wilt – or with simple water or nutrient stress, notes the CCC.

If canola becomes infected at the seedling stage, clubroot infection can result in wilting, stunted growth of yellowing symptoms in the rosette or early podding states, says Alberta provincial government's "Alberta Clubroot Management Plan". In later life stages, canola that was infected early can experience premature ripening or even total plant death.

Canola infected in later growth stages may not display wilting, stunting or yellowing, but can still ripen prematurely and reduce yield by 50% or more due to shrivelled seeds with low oil content.

"Since aboveground symptoms of clubroot may be incorrectly attributed to moisture stress or diseases, proper diagnosis of clubroot should always include digging up plants to check for gall formation on roots," the CCC instructs in its clubroot identification guide.

The galls can get surprisingly large before aboveground symptoms become noticeable, so in clubroot hotspots – such as field entrances – it is a good idea to check the roots occasionally even before any problems are detected.

However, even this may not be a foolproof method. Canola roots can exhibit swellings of unknown origin called hybridisation nodules, which can be mistaken for young clubroot galls.

A touch test, however, often reveals that the hybridisation nodules are firmer and more spherical than clubroot galls.

Additionally, the nodules do not decay in the same way as clubroot galls, which turn both themselves and the root into a brown, peaty mass as they mature.

Some phenoxy herbicides could also result in swelling on lower stems and roots



Above-ground symptoms of clubroot, such as yellowing and wilting leaves, can be mistaken for water stress

in canola, but these growths are generally much smaller and do not have the lobed appearance of clubroot galls, says the Alberta government.

However, the differences between the various possible root growths can be negligible even to a trained eye, so the CCC recommends sending any noduleridden roots for testing.

Apart from uprooting, another identification option is to identify patches of concern during swathing and collect samples afterwards, notes the CCC.

"Since the entire field is traversed during swathing, this will give the most detailed indication of the incidence in the field. If suspicious plants are not sampled until several weeks after swathing, the root galls may have decayed already and typical whitish galls will no longer be present," the organisation says.

Spread and prevention

The introduction of *P. brassicae* resting spores to a field is nearly uniformly the cause behind a clubroot infection.

The most common method of spread is the introduction of soil infested with resting spores into a field, having been carried over from an area where an infection has already taken place.

The soil is usually carried from field to field by farm machinery or tools such as spades and shovels. However, wind and water erosion can also move infested soil around.

Another way for the infection to spread is for the resting spores to attach to seeds and tubers or crops such as hay and straw, through dust or earth tag.

The Alberta government suspects that this is how the disease originally arrived in Canada, and it is not unlikely that this method has also spread clubroot around the world, having travelled on infected vegetables.

Due to the extreme hardiness of the resting spores, the CCC lists practising good sanitation as the most important tool in clubroot prevention.

All farm equipment – including vehicles, tools and clothing – should be thoroughly cleaned to restrict the movement of possibly contaminated materials.

The cleaning procedure should be proportional to the perceived risk of infection. Equipment moving from infested to non-infested fields should undergo the most rigorous sanitisation. It may also be necessary to restrict access to infested fields.

The CCC also recommends avoiding common untreated seeds and tubers as earth tag from infested fields could result in a clubroot infestation.

Similarly, farmers should avoid straw bales or manure from infested or suspicious areas, as the resting spores can survive the digestive tract of livestock.

Direct seeding and other soil conservation methods can reduce erosion, which will result in less soil movement and lower the risk of possibly infested soil ending up in canola fields.

Crop rotation, while unable to prevent clubroot introduction or its spread between fields, can be a good tool for preventing the buildup of clubroot resting spores in the field soil, says the CCC.

Farmers in clubroot infested areas should have a rotation period of at least two years between canola crops in order to prevent spore numbers from increasing in the soil. The break may also have to be longer if spore levels have become too high or if new clubroot pathotypes have showed up.

Clubroot thrives in acidic soil with a pH lower than 7.0. As such, liming fields until they have a soil pH of more than 7.2 has been effective in hindering the movement and survival of clubroot zoospores.

Unfortunately for canola farmers, liming is often too expensive to perform at the scale required for large-scale canola fields.

Nonetheless, the CCC notes that finding clubroot early will allow growers to manage and lime smaller patches effectively.

Resistant varieties

One more weapon in the fight against clubroot is planting canola varieties that are resistant to the disease. The CCC says that using canola varieties

with no history of the disease can greatly reduce the disease's development and establishment, compared with using susceptible varieties.

However, various strains of clubroot exist and genetic clubroot resistance can decrease over time. The introduction of canola varieties resistant to a certain pathotype might cause selection pressure and boost the presence of less common pathotypes when exposed to soils with high spore levels.

To combat this issue, work is ongoing to discover and develop canola strains that exhibit stronger and more widely applicable clubroot resistance.

Major biotech companies, including big names such as DowDuPont and Bayer/ Monsanto, are engaged in efforts to rid canola farmers of the scourge of clubroot. Through the use of traditional breeding and genetic engineering, they are working to introduce newer and better varieties to the market.

DowDuPont's subsidiary, DuPont Pioneer Canada, is launching a new clubroot-resistant canola seed in 2018, having already introduced it on a smaller scale in the previous year. Bayer/ Monsanto is also hoping to introduce a new variety in two-four years by crossbreeding canola with related plants, such as rutabaga, according to *Reuters* reports.

But it's not just large private companies that are engaged in the fight against clubroot. Scientists at Canada's Agriculture and Agri-food Ministry are using Canadian Light Source (CLS) – a large-scale synchrotron or a machine that uses a brilliant light to enable scientists to gather data about structural and chemical properties at molecular level – to examine why some canola varieties are more resistant to clubroot and how their cell walls change in response to infection.

"The goal is to be able to use the resistant genes judiciously either by rotating them in a variety or by stacking or pyramiding them in the same variety to carry multi-resistant genes," Gary Peng, a scientist at Agriculture and Agri-Food Canada's Saskatoon Research and Development Centre, tells Canadian *Global News*.

Yet clubroot is giving both companies and governments a run for their money. Marcus Weidler, vice president of seeds operations at Bayer Crop Sciences, says that *P. brassicae* adapts very quickly to changes and that there are still unidentified pathotypes lurking out there.

"Sooner or later, the pathogen will find a way around [genetic resistance]," Weidler says.

As an example, Monsanto's first clubroot-resistant canola seed was introduced in 2009. But in 2011 – only three years later – clubroot infections were discovered in fields planted with the resistant variety.

Agriculture and Agri-Food Canada's Peng agrees with Weidler's evaluation.

"We need to find new resistant genes and use them efficiently. It is important to have resistance diversity in our arsenal because we know that a single gene will not be long lasting. We need to be more prepared in order to better manage the disease using the resistance strategy," says Peng.

Meanwhile, clubroot continues to be a serious headache for farmers. The best they can do at the moment is to use a multitude of different approaches and careful sanitation practices to limit the damage to their crops until science develops more long-term solutions. *Ile Kauppila is the former assistant editor* of OFI



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The US oil crops industry relies on five major crops, with soyabeans being the leader of the pack in plantings, production and exports. But the volatile trade situation with China is creating uncertainty over soya and the future is hard to predict *lle Kauppila*

n US agriculture, one may often hear the saying "corn is king". However, in the oilseed industry – with five main crops – the soyabean is the undisputed ruler, Bill George, senior agriculture economist at the US Department of Agriculture (USDA) tells Oils & Fats International.

The recent political upheavals, mainly the USA-China 'trade war', could impact the sector, though, and whether soya can stay where it is remains unclear.

Currently, soya alone makes up 85% of all oilseed plantings in the US and is responsible for 92% of oilseed production. In the overall farming sector, soyabean is right at the top with corn, making up 34% of total planted crop area (*see Figure 1*, pg26).

According to USDA data, soya actually overtook corn in planted area in 2017 and remains ahead in 2018 with 36.24M ha (*see Figure 2, pg26*). The area is ever so slightly – roughly 1% – behind 2017's record of 36.48M ha.

Harvested area is expected to fall slightly as well, from 36.22M ha in 2017 to 35.96M ha in 2018. The largest soyabean producing US state is Illinois with 4.29M ha of planted area, followed by Iowa (4.04M ha) and Minnesota (3.29M ha).

Together with planted area, soyabean production reached a record in 2017 at 119.5M tonnes, or 4.39M bushels. In 2018, soyabean production is expected to dip, with USDA projections from May saying that production was likely to fall roughly 2.5% to 4.28M bushels.

In exports, 2017 saw exports of 56.2M tonnes (2.06bn bushels), which was roughly 3M tonnes below 2016's all-time record. In May 2018, USDA still projected

this year's exports to be above 2017's at roughtly 2.29bn bushels, but the deteriorating trade relationship with China led the agency in July to reduce that forecast dramatically by 11% to 2.04bn bushels (*see Figure 3, pg26*).

According to agricultural economist David Widmar, writing for *Forbes*, growth in soyabean exports until 2015 has been a significant contributor to US farm economies.

The expected downturn in both production and in exports is likely to leave markets and farmers crossing their fingers and hoping for the China-USA trade dispute to come to an end. Unfortunately, such a situation seems unlikely, says Widmar.

Cottonseed heading down

The second largest US oil crop – far behind soyabeans – is cottonseed, produced alongside the USA's large cotton industry.

According to USDA's George, cottonseed – grown mostly in the southeastern states in addition to Arizona and California –makes up 10% of oilseed planted area and 4% of production.

Total cotton planted area (for all purposes, including cottonseed) in the USA in 2017 was 5.1M ha, says the USDA, with a harvested area of 4.49M ha. The agency does not provide specific data on cottonseed planted area due to the same plants being used for the production of both cotton and the seed. In 2018, the total cotton planted area is expected to grow by 7.18% to 5.47M ha.

Cottonseed production in 2017 stood at 5.82M tonnes. While the USDA did not in June have a projection for

2018 production, the National Cotton Council (NCC) says that – contrary to the increasing planted area – production is expected to drop by nearly 10% to 5.26M tonnes in 2018.

The NCC expects US cottonseed imports to remain at the same level as in 2017, that level being zero. Exports, which were at 430,900 tonnes in 2017, are forecast to fall roughly 10% to 385,500 tonnes. The export dip corresponds roughly with the fall in production.

Interestingly, despite the falling production and exports, domestic US cottonseed crush is projected to grow, going from 2017/18 to 2018/19. The crush figure in 2017 was 1.68M tonnes, but the NCC says this could grow 2.7% to 1.72M tonnes in 2018.

The other three

The remaining 5% of the US oilseed planting area is split roughly equally with the three other major oil crops in the USA, says Bill George. This trio includes peanuts, rapeseed and sunflower seed, which respectively make up approximately 2%, 1% and 1% of total US oilseed production.

Peanuts are grown mostly in the same

southeastern states as cotton, alongside New Mexico. Both planted and harvested areas dropped rather drastically from 2017 to 2018, from 757,000 ha to 607,840 ha and from 718,570 ha to 591,250 ha, respectively.

Production in 2017 was 3.28M tonnes, according to the USDA. The agency does not have an official forecast for 2018, but several analysts and media reports expect peanut production to fall in 2018.

Rapeseed and canola cultivation in the USA is confined mostly to the northern plains area, particularly North Dakota. The USDA projected the 2018/19 season not to be a strong one for rapeseed, with plantings falling by nearly 50% from 4,090ha to 2,190ha.

Production in 2017 was 983,720 tonnes and – while official forecasts from the USDA are not yet out – it is highly unlikely that the halved planted area could produce a total crop anywhere near the 2017 level. However, the US rapeseed crop has an extremely fluctuating history, rising from the low of 136 tonnes in 2008 to last season's record production.

Canola, on the other hand, is looking at a better 2018 than its sister crop. Although canola planted area has fallen from 840,540ha in 2017 to 831,030ha, USDA reports harvested area increasing from 810,190ha in 2017 to 815,900ha. Production is likely stay around the same level as in 2017, when it hit a record of 1.41M tonnes.

Sunflower seed, grown primarily in the northern plains and Kansas, is looking to be a bright spot among the three smaller oil crops. While both peanut and rapeseed areas are falling, the USDA projects sunflower planted area to grow 4% from 567,780ha to 591,250ha.

Production could pick up in 2018 as well, following the crash in 2017 when the final harvest was 983,720 tonnes, a far cry from 1.2M and 1.3M tonnes produced in the prior two years.

In addition to the main five oil crops listed by George, the USA produces some other minor crops as well. These include safflower (983,720 tonnes in 2017), flaxseed (97,590 tonnes) and mustard seed (27,330 tonnes). Corn is also processed into oil, but is not counted amongst oil crops by the USDA.

ABCDs dominate vegetable oil

George explains that the US vegetable oil processing sector is dominated by the **>**





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 ABCD quartet – ADM, Bunge, Cargill and Louis Dreyfus. Several smaller oil producers and processors exist as well, some of them being significant regional operators.

Latest USDA data from July 2018 predicts the USA to produce a total of 12.15M tonnes of major vegetable oils (copra, cotton seed, palm kernel, peanut, rapeseed, soyabean and sunflower). As with oilseed production, soyabean holds the lion's share of oil output.

George says soyabean oil production accounts for an 88.5% share of total US vegetable oil production, with 2018 soyabean oil output forecast at 10.714M tonnes.

Rapeseed oil is the number two product, holding a 6.6% share of total production with a projected output of 832,000 tonnes in 2018, marking a nearly 10% increase from 2017.

Sunflower (199,000 tonnes), cottonseed (268,000 tonnes) and peanut oils (124,000 tonnes) account for the remaining 5% of vegetable oil production, respectively accounting for 2%, 2% and 1% of total production.

"In addition, we produce a small quantity of olive oil, mostly in California, that represents a tenth of one percent of total vegetable oil produced in the USA," says George. The USDA projects olive oil production to be at 16,000 tonnes in 2018.

"We also produce corn oil and others such as linseed oil," George adds.

In exports, soyabean continues to dominate the sector, with its 2017 exports of 1.07M tonnes representing 43.1% of the total 2.48M tonnes of vegetable oil exports.

Behind soya is corn oil at 464,219 tonnes, peanut oil at 436,907 tonnes and rapeseed oil at 101,382 tonnes as the leading single oil categories.

On the import side, rapeseed oil is number one, with 2017 imports standing at 1.99M tonnes, representing 38.8% of the total imports of 5.14M tonnes.

Palm oil (1.4M tonnes) is the next largest single oil, followed by coconut oil (434,867 tonnes), palm kernel oil (398,651 tonnes) and olive oil (317,041 tonnes).

Future outlook

When asked by *Oils & Fats International* to give his opinion on the short-term future outlook for the US oilseeds and vegetable oils sectors, George politely passed on a detailed answer.

Indeed, the entire US agri industry is currently holding its breath as 2018 has brought with it the greatest uncertainty in



quite some time.

The difficulties facing farmers stem from US President Donald Trump imposing 25% tariffs on certain Chinese imports in June, with the aim of reducing the country's trade deficiency with China. China retaliated by imposing tariffs of its own on US imports, including soyabeans. China is the largest importer of US soya and farmers have been hit hard by the move.

Davie Stephens, vice president at the American Soybean Association, said at the time that the tariffs could have devastating consequences for US farmers.

"Crop prices have dropped 40% in just the last five years and farm income is down 50% compared to 2013. "A recent study by Purdue University economists predicts that soyabean exports to China could drop by a whopping 65%. As a soya grower, I depend on trade with China – it imports roughly 60% of total US soyabean exports," said Stephens.

In an attempt to remedy the situation, the USDA in July authorised US\$12bn in funding for programmes aimed at farmers impacted by the tariffs.

A Market Facilitation Program will provide direct payments, while a Food Purchase and Distribution Program would buy up unexpected surpluses and the Trade Promotion Program would develop new export opportunities. Secretary of Agriculture Sonny Purdue called the measure a "short-term solution".

At the same time in July, EU Commission President Jean-Claude Juncker promised in a meeting with Trump that the EU would ramp up soya imports from the USA.

However, the EU almost certainly cannot make up for the entirety of losses from trade with China and – with Trump threatening additional tariffs on US\$200bn worth of Chinese imports – the situation could develop in any direction.

lle Kauppila is OFI's formers assistant editor





TRANSPORT & LOGISTICS

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Karachi Port Qasim

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Pakistan's imports grow

As the world's third largest importer of edible oils, Pakistan's growing demand will put pressure on port infrastructure and logistics. Sunder Singh

akistan is the third largest importer of edible oil after China and India. With a population of 195M, the revival of the local economy, and increased disposable income, demand is surging for edible oil.

The country imports crude and refined cooking oil mainly from Malaysia and Indonesia, and soyabean oil from North America and Brazil.

Consumption

In 2017, total consumption of oils and fats was about 4.41M tonnes in Pakistan. Rising disposable incomes, an increasing population, and shifting of consumer tastes from transitional at-home meals to dining out and the growth of fast food industry are all driving the surge in edible oil consumption.

Currently, a total of 124 companies manufacture edible oil products. There are 95 solvent extraction plants, of which 33 are in working condition. In addition, there are over 150 ghee manufacturing units.

The industry is divided into organised and unorganised segments and is highly competitive, due to fragmentation and low barriers of entry, resulting in limited pricing power and thin profit margins for domestic producers.

However, a number of large players have been operating for a long time and thus enjoy stronger brand awareness.

Major players in the organised segment

in order of descending market share are: Dalda Foods Limited, Habib Oil Mills Limited, Sufi Banaspati & Cooking Oil, Seasons Edible Oil, Mezan Cooking Oil & Banaspati, Punjab Oil Mills Limited and Kashmir Cooking Oil & Banaspati.

Dālbandin

o Panjgūr

Local production of edible oil (cotton seed/rapeseed/sunflowerseed and canola oils) was reported at 0.4M tonnes in 2016. Domestic production of oil extracted from imported seeds amounted to 0.7M tonnes. A remaining 2.9M tonnes is directly imported. Palm oil is the major import, followed by soyabean, sunflower and canola oils.

Huge imports

Nok ^o Kund

o

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Gwadar

Port

Pakistan imports a huge volume of edible oils. In fact, edible oil imports cost more than US\$3.1bn/year, making it the second largest import after petroleum products.

Pakistan imports crude and refined cooking oil (palm and palm olein) from Malaysia and Indonesia and brings in soyabean oil from North America and Brazil.

Indonesia still dominates Pakistan's oil trade. During 2017, imports of palm oil products from Indonesia totalled some 2.2M tonnes (with an 80% share) and 0.57M tonnes from Malaysia (with a 20% share).

From the import of 2.7M tonnes of edible oil in 2015, Pakistan's imports rose to 3.05M tons in 2017, the highest volume to date. In 2017, imports rose by 18.69% compared with 2016 figures.

o Chitrā

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Rahīmyār Khān

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Jacobābād Sukkur

Nawābshah

Hvderābād

Mīrpu Khās

Gilgit

Gujrānwā Faisalābād Skārdu ^o

The rise in imports was partially a result of increased demand, as well as a need to maintain a higher inventory, which put pressure on domestic edible oil producers.

The country also imported 97,280 tonnes of soyabean oil, amounting to US\$122.785M, down sharply by 32% vear-on-vear. Pakistan also imports oilseeds, such as sunflower and canola, to add to the local production.

"We have not succeeded in producing oilseed crops locally on a large scale with a view to meeting local requirements despite being an agrarian economy," says Tanvir Ahmad Sufi, a key executive of Sufi Group of Industries, one of the leading names in Pakistan's edible oil industry.

"There is the potential to grow oil palm trees in coastal areas of the country in addition to cultivating canola and sunflower in other provinces."

According to a report by the State Bank of Pakistan (SBP), a lack of policy support and research, as well as a low planted area, keep Pakistan dependent on edible oil imports. The report says the country's dependence on imported edible oil continues unabated due to the lack of any advances in domestic oilseed crop cultivation.

'Oilseed crops, such as sunflower, have failed to take hold on a large scale due to farming issues such as the overlapping

TRANSPORT & LOGISTICS

Product	2015	2016	2017	Jan-Feb 2018		
Olein	1,305,586	1,301,212	1,544,703	292,546		
Refined, bleached and deodorised palm oil (RBDPO)	1,077,194	994,122	1,162,975	137,443		
Crude palm oil (CPO)	125,319	115,348	121,815	20,000		
Crude degummed soyabean oil (CDSBO)	191,309	159,448	221,150	-		
Total	2,699,408	2,570,130	3,050,643	449,989		
Table 1: Imports of edible oils in Pakistan (tonne) Source: Economic Survey of Pakistan						

Product	2015	2016	2017	Jan-Feb 2018
Soyabean	579,724	934,935	1,907,902	270,361
Canola/rapeseed	806,766	1,156,578	1,070,771	241,665
Suflowerseed	30,486	121,981	40,950	-
Total	1,416,976	2,213,494	3,019,623	512,026
Table 2: Imports of edible oilseeds in Paki	ource: Economi	c Survey of Pakistan		

of the sowing period with that of other major crops such as wheat and cotton," the report says. "Moreover, technological handicaps, the lack of research orientation and the absence of any meaningful policy support are other major impediments to import substitution."

In order to reduce the amount of edible oil imports, the Federal Board of Revenue (FBR) asked the government to raise taxes on edible oil imports for the 2018/19 financial year.

The FBR proposed a rise in the federal excise duty from 16% to 21.5% and a 1% levy in income tax at the import stage on edible oil. It also sought an increase in the excise duty on the import of cooking oil, ghee, vegetable and edible oil from 15% to 20% in the Federally Administered Tribal Areas (FATA).

However, the proposals were rejected by the federal cabinet in the annual budget presented in April 2018.

Importing ports

Edible oil imports into Pakistan currently enter through Qasim and Karachi ports. The bulk of the edible oil cargo arrives at Port Qasim as it has more advanced liquid cargo handling facilities and a liquid cargo terminal, while a very limited portion is handled by Karachi Port.

However, a number of edible oil importers have stated that the higher cost of edible oil transportation from Port Qasim terminals to industrial units throughout Pakistan has been a major cause of concern.

As fuel prices rise, the cost of transport increases, which adversely impacts the industry that is already suffering because of the Punjab Food Authority's ban on the manufacturing, sale and purchase of vanaspati ghee.

Oilseed importers have their own set of problems. Congestion at Port Qasim has resulted in berthing delays of 8-10 days, resulting in demurrage expenses. Karachi Port has less of a congestion problem but its discharge rate is comparatively lower than Port Qasim, which also results in demurrage costs.

The Pakistani Edible Oil Refiners Association (PEORA) has suggested transporting edible oil in bulk via railways, which was the case until 1995. Many ghee units in Punjab and Khyber Pakhtunkhway (formerly North-West Frontier) provinces have railway sidings and decanting facilities while most ghee mills are near railway stations, making this solution feasible.

As the demand for edible oils is likely to increase further, the existing cargo handling and storage facilities at Karachi and Port Qasim are likely to come under stress. As a result, a robust port infrastructure and storage and logistic issues need to be addressed by the Pakistani government to ensure a smooth inflow of the edible oil.

Port Qasim: The Port Muhammad Bin Qasim, also known as Port Qasim, is a deep water seaport in Karachi, Sindh province, on the coastline of the Arabian Sea. It is Pakistan's second busiest port, handling about 40% of the nation's cargo.

To cater for edible oil imports, the Liquid Cargo Terminal (LCT) has been established on a Build, Operate and Transfer (BOT) basis by Felda Westbury Qasim (Pvt) Limited (FWQ). FWQ is a joint venture between Malaysia's Felda group and the Westbury Group of Pakistan.

LCT is the first state-of-the-art dedicated liquid cargo jetty in the private sector, capable of berthing vessels of up to 35,000dwt, carrying liquid cargoes of edible oils, molasses and its derivatives.

The 4M tonnes/year capacity terminal was developed at a cost of US\$15M. The jetty can handle ships of up to 185m long and 33m wide. The facility comprises a jetty, interchanges and pipeline systems. LCT is connected to all storage terminals in edible oil/molasses area through its two interchange systems.

Karachi Port: The Port of Karachi is one of South Asia's largest and busiest deep water sea ports, handling about 60% of the nation's cargo. It is located between the Karachi towns of Kiamari and Saddar, close to the main business district and several industrial areas. The geographic position of the port places it in close proximity to major shipping routes such as the Strait of Hormuz. The administration of the port is carried out by the Karachi Port Trust, established in the 19th century.

The port comprises a deep natural harbour with an 11km long approach channel, which provides safe navigation for vessels of up to 75,000dwt. The port has two wharves. The East Wharf has 17 vessel berths and the West Wharf 13 vessel berths. The maximum depth alongside the berths is currently 11.3m. The two wharves extend in opposite directions along the upper harbour – the East Wharf northeast from Kiamari Island and the West Wharf southwest from Saddar town.

Gwadar Port: In coming years, Gwadar Port is expected to take a lion's share of total edible oil imports into the country. The port was inaugurated in 2007 and is situated on the shores of the Arabian Sea in the city of Gwadar, located in the province of Baluchistan.

The port is roughly 620km from Pakistan's largest city and economic hub, Karachi, and is approximately 120km from the Iranian border. It is administratively managed by the Gwadar Port Authority, although the China Overseas Port Holding Company handles operation.

Gwadar Port currently has three 200m long conventional berths with a turning basin of 45m diameter and a 4.5km approach channel that is dredged to 12.5m. The port also has all necessary handling equipment including tug boats, pilot boats and survey vessels. *Sunder Singh is a freelance journalist*

TESTING & STANDARDS

Global testing round-up

Oils & Fats International reports on some of the latest testing and standards news and developments around the world

IN BRIEF

GERMANY: German engineering firm VTA Verfahrenstechnische Anlagen GmbH & Co KG acquired compatriot UIC GmbH on 18 July from BDI-International GmbH.

UIC is active in providing technologies for thin film, short path and fractional distillation. Applications for oils, fats and food include separation of free fatty acids and pesticide removal from edible and fish oils, fractionation of tall oil, and concentration of monolgycerides, tocopherols, carotene and EPA and DHA.

VTA said that UIC would retain its independence while the merger with VTA would expand both firms' technological expertise and market presence. The UIC brand would remain unchanged.

INTERNATIONAL LABORATORIES



The use of krill oil in supplements is authorised under the new EU novel food regulation

New novel food approval processes for the EU

On 1 January, the EU rolled out a new novel food regulation that has changed the landscape for food operators, particularly by imposing generic authorisations and simplifying the approval process for traditional foods from third countries, according to inspection and testing firm SGS.

The most immediate impact came from the replacement of old and new authorisations with generic, instead of applicant specific, ones, meaning that once firm had provided data enabling a novel food to be sold in the EU, any company could subsequently sell the same item, SGS said on 11 April.

However, in order to encourage innovation, a data protection provision had been set up to allow an applicant to apply for an individual authorisation granting them five years of proprietary protection.

The new regulation also created more categories of novel foods.

These included standard categories like vitamins, minerals and food supplements, alongside foods derived from specific production or technological innovation, those with molecular structure intentionally changed, and insects.

A simplified online authorisa-

tion procedure had also been introduced.

SGS said the "real impact" of the regulation would come with the approval of novel foods that had a history of safe use and consumption outside EU countries.

Provided that no member state could produce proof of safety concerns, traditional foods from third countries would be allowed into the EU and a notification system for them would be developed.

Makers of products currently being sold without a novel foods approval had to submit authorisation applications by 2 January 2020.

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EU asks for olive oil labelling feedback



The EU Commission's (EC) directorate-general for agriculture and rural development has requested stakeholder feedback for two proposed changes to EU regulations covering the requirements of two optional olive oil labelling indications.

The regulatory draft addressed two main clarifications covered by article five of Regulation (EU) No29/2012 concerning marketing standards for olive oil, wrote *The Olive Oil Times* on 27 March.

One of the two proposed changes concerned the labelling of certain physicochemical parameters when acidity was mentioned on the label, and the other proposed new rules on when the harvest year should be mentioned.

In the first case, current parameters such as peroxide value, wax content and ultraviolet absorption had to be mentioned on the label only if acidity was printed.

The proposed change would specify that any such parameters must correspond to the "date of minimum durability" – better known as the "best before" date – as such parameters could change after bottling and thus mislead consumers.

The second proposed change stemmed from Italian producers requesting the EU to allow member states to decide for themselves whether labelling of the harvest year should be compulsory on extra virgin and virgin olive oil when the final product was intended for the domestic market.

Under the current regulation, labelling the harvest year was optional if the oil was from a single harvest.

India updates oils and fats standards

The Food Safety and Standards Authority of India (FSSAI) has published a draft regulation revising existing standards for oils and fats and adding new ones to bring Indian standardisation in line with the international Codex Alimentarius standards.

The top food regulator issued new standards for palm stearin, palm kernel olein, palm kernel stearin, superolein and avocado oil, and included peroxide value in the standards of all vegetable oils, wrote *FnBnews.com* on 2 April.

FSSAI also revised the existing standards of kachi ghani mustard oil and palm oil with regards to their melting points.

Mahua Ghosh, professor at the Department of Chemical Technology at the University of Calcutta, called the standards revision a "wise move" responding to the oil industry's needs.

"By these regulations, we could have a proper gradation of the oils and consumers will have a clear idea about what they're buying," she said.

The draft regulation revised the standards of rapeseed oil, deeming that the oil should be extracted from "clean and sound" seeds belonging to the compestris, junceaor napus varieties of Brassica.

Avocado oil was determined as oil obtained from the Persea Americana avocado fruit, with a refractive value limit of 40°C (1.46501.4740), a saponification value between 177 and 198 and an iodine value of 63-95.

Unsaponifiable matter should not be higher than 12% by weight, acid value not more than two and peroxide value not more than 15 milliequivalent of oxygen per kg of fat.

Palm stearin was defined as the high melting fraction derived from palm oil fractionation, while palm kernel stearin was defined as the solid faction derived from palm kernel oil fractionation.

Palm kernel olein was described as the liquid fraction derived from palm kernel oil fractionation, with the refractive index set at 40°C (1.451-1.465), a saponification value between 231 and 244, an iodine value between 20 and 28 and unsaponifiable matter not more than 1.5%.

Palm superolein was defined as the liquid fraction derived from palm oil produced through a special crystallisation process to achieve an iodine value of 60 or higher. The refractive index parameter for palm superolein was set at 40°C (1.463-1.465), saponification value at between 180-205, iodine value at not less than 60, unsaponifiable matter at 1.3% maximum and a slip point under 19.5°C. The limit set for acid value was a maximum of 0.5 and the peroxide value at 10 milliequivalents of active oxygen per kg of oil.

GOED releases new oxidation guidelines for omega 3



The Global Organization for EPA and DHA Omega-3s (GOED) has released a new guideline document to help the omega 3 industry avoid oxidation issues and improve product quality.

The 'GOED Best-Practice Guidelines on Oxidation Control' was designed to provide assistance in reducing the risk of oxidation of EPA/DHA-containing oils at all points along the supply chain, from the refinery to consumer, GOED said in October 2017. "Because oxidation can happen at any stage of handling an EPA/DHA-containing oil or finished product, these best-practice guidelines provide specific approaches on how to handle, store, and sample omega-3 products," said GOED director of compliance and scientific outreach Gerard Bannenberg.

Bannenberg added that implementing the document's guides could significantly improve product quality and reduce the risk that products reaching consumers are out of specifications for oxidation.

The guidelines did not replace GOED's voluntary monograph, which specified the maximum limits of oxidation for the ingredients and products that fell within its range.

The oxidation guideline was the third set of technical and analytical documents GOED has released for the omega 3 industry. The other two were included in the voluntary monograph released in 2002 and the Technical Guidance Document published in 2015.

ISO publishes new food safety management system standard

The International Organization for Standardization (ISO) has published the ISO 22000:2018 standard, the long-awaited update to its Food Safety Management System (FSMS), first published in 2005.

The ISO 22000 was a food safety management system that could be applied to any organisation working along the food value chain, giving them the ability to produce high quality and safe food and demonstrate their commitment to hygiene and safety, ISO said on 29 June.

A significant difference between the old 2005 standard and the new one was the development of the Global Food Safety Initiative (GFSI) and its benchmarked standards, which ISO said was the "pinnacle" for many food producers to demonstrate their food safety principles.

However, the GFSI standards could be complex and, as such, they left a place open for ISO 22000 as a standard providing the foundation of a good food safety system, ISO said.

Joy Franks, food market director for Europe at testing firm Bureau Veritas, said the revised ISO 22000 brought clarity for organisations using the 2005 standards.

"It's crucial that organisations get to grips with

the revised standard as soon as possible in order to ensure a smooth transition process ahead of the compliance deadline of June 2021," said Franks.

The latest version of ISO 22000 was aligned with the High Level Structure (HSL) convention or Annex SL, which allowed an organisation's FSMS to be integrated with other ISO standards.

Adopting the HSL convention translated into major changes in the structure of the new standard and the revision had involved a complete review of its requirements and provided greater clarity by redefining the standard's concepts.

The 2018 version was also more closely aligned with the Hazard Analysis and Critical Control Point (HACCP) Codex, which ensured that implementing the ISO 22000 followed HACCP Codex methodology.

The 2018 standard still required compliance with Codex HACCP but further supplemented it with organisational consideration of risk.

ISO said adhering to the ISO 22000:2018 benefitted food producers in several ways, including giving them better control over food safety activities and assuring customer trust and satisfaction.

> The effective technology and complex services

IN BRIEF

TUNISIA: Swiss inspection and testing firm SGS' olive oil laboratory in Sfax, Tunisia, has received ISO17025 accreditation and entered into an agreement with the International Olive Oil Council (IOOC) for the provision of sensory analysis of virgin olive oil.

The sensory analysis laboratory would offer a panel test (PT) service formed of 8-12 qualified tasters trained to express their perceptions of the organoleptic properties of virgin olive oil, said SGS in May. The analysis team enabled exporters to save time and offered them greater international approval.

SGS said the PT service built upon the laboratory's existing capabilities and accreditation for analysis with chemical tests, achieved in 2008.

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RUSSIA/UKRAINE

The Russian and Ukrainian margarine and industrial fats sector share many similarities. Production has been volatile in recent years but the forecast has become more positive.

Olga Mozgova

he production of margarines and industrial special fats is well developed in both Russia and Ukraine, according to the report "Ukraine and Russia: Margarine and Industrial Fats Market", presented by Olga Mozgova of UkrAgroConsult at the Malaysian Palm Oil Council POINTERS Web Seminar earlier this year.

Russian producers have enjoyed a steady upward trend for the past few years while Ukraine has just started recovering from the impact of the Russia-Ukraine crisis of 2014-15.

Both countries have a high level of market consolidation, with the lion's share of products produced by a small number of enterprises.

Industrial fats and margarines are mostly produced by large specialised oils and fats plants. However, some of these plants are undergoing structural changes with the establishment of vertically integrated companies combining all the processes from oilseed growing to finished products marketing into a single system.

Russian and Ukrainian companies are also optimising their product portfolios in response to changes in demand patterns. The markets in both countries are characterised by strong competition and high demand volatility in the domestic market among the food industry, catering and food service sectors.

Production follows seasonal trends, peaking in autumn and winter and declining in summer. There has also been a fall in the purchasing ability of the population due to inflation, says Mozgova.

Country specific developments

In Ukraine, market development has been affected by three main factors. Firstly, the country lost some of its domestic market following Russian incursions in eastern Ukraine in 2014.

Secondly, the country still struggles with strained trade relations with Russia following the annexation of Crimea. Finally, the recovery of export demand has not been up to expectations.

In the Russian market, the development



Facing similar ch

of an import substitution programme is a specific feature that has led to some production growth and a decrease in imports.

As a result of the programme, in 2017, Russia produced 1.12M tonnes and imported 37,000 tonnes of margarine and industrial fats, according to the Russian Federal State Statistics Service.

There has been a notable increase in production, which in 2014 was 983,600 tonnes, and a decrease in imports, which stood at 69,100 tonnes in 2014.

Also specific to Russia has been a new standard for the *trans* fatty acid content in oils and fats products, which came into effect on 1 January 2018. The standard states that the *trans* fat content in solid margarines, soft and liquid margarines, milk fat substitutes and special purpose fats should not exceed 2% of the total fat content in food products.

In Ukraine, restrictions on the content of *trans* fatty acids are only applicable

to certain products. Soft and sandwich margarines, spreads and fatty mixtures and minarines (low fat margarines) should contain no more than 8% *trans* fats, while fats based on dairy products have a limit of 15%.

Standards for *trans* fat content in confectionery products have not been introduced yet. In May 2017, a draft bill containing restrictions on *trans* fatty acid content in food products, titled "On the Amendments to the Law of Ukraine: On the Basic Principles of Requirements to the Safety of Food Products", was submitted to the Verkhovna Rada, the Ukrainian parliament. The law has not yet been adopted.

Production

The uses of industrial fats and margarines are similar in both Russia and Ukraine. The oils and fats industry produces margarines, special fats and universal vegetable fats, which Mozgova says are used primarily by

RUSSIA/UKRAINE



allenges

three sectors (see Figure 1, right):

- The dairy industry, which processes these fats into milk-containing products and spreads.
- The catering and food retail networks, which prepare bread and flour products, creams and desserts, ready meals, retail margarines, cooking fats and other products.
- Finally, the bakery and confectionery industry, which produces bread and flour products, cookies, wafers, cakes and other baked goods.

In both countries, palm oil represents a significant portion of the raw materials used for the production of margarines and special fats.

The key sources of palm oil are Indonesia and Malaysia. Russia and Ukraine have specialised port facilities for handling palm oil, notes Mozgova.

In Ukraine, the consumption of palm oil has remained fairly stable between 2011

Industrial margarine and fats are used in the bakery and confectionery industries in Russia and Ukraine to manufacture consumer goods such as bread products; cookies, wafers and chocolate items; and cakes and muffins

and 2017, averaging roughly 650,000 tonnes/year. During the same period in Russia, palm oil consumption has grown to roughly 3M tonnes in 2016/2017 from 2.4M tonnes in 2011/12.

The margarine production structure in both Ukraine and Russia corresponds to the geographical spread of the major producing companies.

Core production is concentrated in the hands of the five largest enterprises, which have accounted for nearly 85-90% of total production in both Ukraine and Russia in recent years, says Mozgova.

In Russia, the top five margarine and industrial fat firms are Cargill and its subsidiaries, Nizhniy Novgorod Oil and Fat Plant, Efko-Pischevue Ingredienty, Soyuz Corp and Holding Solnechniye Producti.

In Ukraine, the top companies are Trade House Schedro, Delta Wilmar Group, Food Development Ltd, Industrial Group Vioil and the Kiev Margarine Plant.

Production areas in Russia are centred in the western parts of the country, near the major export and import outlets to the EU. Western Russia is also the area with the highest consumption of major industrial fats, although this area also stretches to central Russia.

In Ukraine, the largest production areas are split between the southeastern and southwestern parts of the country, around the regions of Kharkiv, Odessa, Vinnytsia and Zaporizhia (*see Figure 4*, *pg35*).

The oils and fats markets in the two countries show strongly pronounced seasonality. The products enjoy the greatest demand in autumn and winter and it traditionally slackens in the summer.

Russian margarine production has been volatile in recent years, showing both drops and rises. The same trend is seen in Ukraine, where margarine production fell 22% between 2012 and 2017, says Mozgova.

However, a production increase in 2017 points to a process of stabilisation and recovery in the margarine products market in both countries (*see Figures 2 and 3, pg34*).

Production of industrial fats varies between Ukraine and Russia. While there is a stable upward trend in Russia, ithe situation is unclear in Ukraine.

Since a significant share of Ukrainian production was focused on the Russian market, the practical closure of this market ►

BAKERY & CONFECTIONERY INDUSTRY

Bread and flour products

Cookis, wafers, chocolate items, candies etc

Tortes, cakes, muffins etc

(Margarines, bakery, confectionery, cooking fats, milk fat substitutes (MFSs)



Source: UkrAgroConsult

RUSSIA/UKRAINE





► in 2015 led to a considerable fall in production. The annexation of Crimea and eastern Ukraine, where some production was located, also had a negative impact on industrial fats manufacturing.

Only in 2017 did some positive change in the industry take place, with production nearly doubling from around 40,000 tonnes in 2016 to more than 80,000 tonnes in 2017. This was largely due to the expansion of geography and volumes of export.

Current market situation

The size of the industrial fats and margarine market in Ukraine was estimated to be about 210,000 tonnes in 2017 and around 890,000 tonnes in Russia.

According to Mozgova, the major export markets for Russian products are the

Commonwealth of Independent States (CIS) countries (around 71%), Mongolia (13%) and China (7%). There has been a decrease of exports to CIS countries in recent years.

Growth of exports to EU countries - the Baltics, Poland and Romania – in the 2016-2017 season stems from the implementation of the Association Agreement between Ukraine and the EU.

The Ukrainian and Russian food industries are both seeing demand for high quality raw materials, particularly for specialised industrial fats.

The use of processes such as fractionation, interesterification and hydrogenation of vegetable oils allows for the production of not only margarines, but high-technology fats for applications such as cocoa butter equivalents and substitutes, confectionery fats and milk fat replacers.

In Ukraine, cocoa butter substitutes made up 97% of all margarine and industrial fat imports in 2017. According to a sales structure analysis of oil products in the B2B segment, there is strong demand for fats for special purposes in Ukraine and Russia, including milk fat replacers, cocoa butter substitutes and confectionery fats.

In total, these products account for about 40-45% of wholesale sales volume, says Mozgova. Given their high cost, technological value and demand, these products are the most valuable.

Industrial fats and margarines are products of average value with a share of 30-35% in the wholesale structure.

Each group of products requires a special margarine with specific functional properties, to ensure the required physical and chemical criteria, manufacturability and shelf life in the finished product. However, the value of these groups can be reduced as they can be substituted with cheaper products, including less valuable vegetable oils.

As raw materials for the production of all other kinds of oil and fat products, multi-purpose vegetable fats remain the least valuable in the sales structure of the B2B segment.

World prices for tropical oils, which have seen a negative trend over the last three years, have a considerable impact on this product sector. The share of multipurpose vegetable fats equals 25-30% of overall sales volume.

Over the last two years, there has been increased demand for margarines in the B2C segment in Russia.

This is associated with the 2014 introduction of a food embargo, which restricts imports of animal fats, dairy products, and oils and fats products from a number of countries.

A reduction in income and purchasing power has triggered increased consumer demand for margarine, which is a substitute for sunflower oil. In Russia, demand for margarine always increases in times of crisis.

Soft margarines belong to another growing category of margarine products. Over the last two years, sales of these products have increased in Russian retail networks. This is a sign of its use as a sunflower oil substitute by consumers. The production of spreads used as substitutes for sunflower oil is growing actively as well.

An increasing demand for products containing milk fat substitutes is also a typical feature of the Ukrainian market. This is mainly due to lower incomes among the population.

Surveys organised by retail chain operators have revealed that products of average value take the largest share in the margarine sales structure, namely margarines for baking and confectionery, as well as multipurpose margarines.

These products are in high demand among consumers with average and above average income.

Soft margarines are the most valuable product and hold the largest market share. This is largely related to strong competition from oil spreads.

Soft margarines are bought mainly by consumers with average and above average income. Solid margarines are the least valuable product, and experience strong demand mainly among consumers with low income.

Future prospects in Russia

The markets for margarines and special fats in Russia and Ukraine are driven mainly by development trends in the food sectors consuming these products, as well as by foreign trade activity and consumer preferences, notes Mozgova.

In Russia, Mozgova lists further development of the food industry as a driving factor as well. The need to increase the competitiveness of products will lead to the use of low cost but high quality raw materials with pre-defined properties, which is expected to give rise to the development of new oils and fats products.

Russians are also striving for healthier diets and the trend towards consuming less animal fat could pave the way for the wider introduction of different vegetable fat and margarine products.

There is also a question over Russia's dependence on foreign imports. Currently, several countries in western Europe and the USA have imposed trade sanctions on Russia that have restricted food imports.

Russia's ability to secure imports from non-sanction countries is forecast to have an effect on the Russian margarines and special fats industry and markets.

A decline in vegetable oil production in Russia could negatively impact the availability of raw material for margarine and industrial fat production and hinder further development of the industry.

The global price volatility of vegetable oils could also hinder development of new, innovative products, as well as changes in state regulation of the margarine and speciality fats sector.

New tariffs on vegetable oil imports could prove highly disadvantageous to Russian producers due to the highly competitive nature of the marketplace. A growing demand for tropical oil imports for the production of margarines and fats could pose logistical risks. Russia's southern ports, says Mozgova, lack the capacity for large-scale handling of tropical oils and difficult transport routes across Russia's vast land area will rack up the cost of these oils.

The challenging transport conditions could also lead to commercial risks if raw materials or products are not delivered on time.

Environmental questions, both about the production of tropical oils and transport, could also hamper consumer demand.

Finally, changing consumer preferences could see weaker demand for margarines. This would work in opposition to the Russian industry goal of widening the range of export destinations and developing logistics systems focused on both exports and imports.

Future prospects in Ukraine

In Ukraine, Mozgova outlines five major growth trends. Food production volumes, particularly in the confectionery sector, are stable with an upward trend.

This is mainly due to the small business and catering sectors, which will continue to grow in the future.

Development of scientific technology has led to significant production potential and enabled the industry to respond promptly to changing market needs, Mozgova says.

Ukrainians are becoming more health aware and there is a growing trend to consume foods with low animal fat content, promoting the wider use of

RUSSIA/UKRARINE

vegetable fat products. This is also generating demand for low calorie foods.

The developing demographic and economic situation in Ukraine is also expected to continue fuelling demand for margarines and similar foods in the coming years.

Finally, growing food demand in the world market, particularly in developing countries and undeveloped economies, is projected to drive growth.

However, expansion of exports will require new products, says Mozgova. Entering new markets usually also comes with significant monetary expense, which might force companies to choose between developing products or trying to break into foreign markets.

Any decline in vegetable oil production in Ukraine would force producers to turn to import markets, where they will be faced with price volatility and any potential regulation and tariff changes.

Overall, the Russian and Ukrainian margarine and industrial fats industries and markets share many similarities.

Apart from the impact of the Crimean crisis in Ukraine, their production patterns move along similar lines, with highly seasonal and competitive marketplaces.

Their future growth prospects and risks also resemble each other. The effects of any large changes in either country will be felt in the other country as well.

This article is based on the report 'Ukraine and Russia: Margarine and Industrial Fats Market', presented by Olga Mozgova of UkrAgroConsult, Ukraine, at the Malyasian Palm Oil Council POINTERS Web Seminar earlier this year



STATISTICS







Prices of selected oils (US\$/tonne) July 18 Sept 18 Oct 18 2017 June 18 Aug 18 Soyabean 829.0 782.0 771.9 755.4 744.4 757.3 690.0 638.3 604.2 586.7 570.3 590.3 Crude palm 569.0 5854 Palm olein 661.0 615.6 5833 580.1 1,537.0 937.3 915.4 875.0 Coconut 916.4 931.9 855.0 811.9 833.1 849.6 841.7 873.0 Rapeseed Sunflower 800.0 759.6 758.2 731.8 712.1 711.3 Palm kernel 1.250.0 851.4 871.1 905.4 874.5 815.8 Average 946.0 771.0 763.0 763.0 747.0 744.0 Index 224.0 183.0 181.0 181.0 177.0 176.0

STATISTICAL NEWS FROM MINTEC

Soyabean oil

Soyabean oil prices in the USA have followed a downward trend overall in 2018 as China shifts its attention elsewhere to fulfil its soyabean demand.

Brazil is currently meeting the demand from China following the tariffs imposed on the USA by China. Brazil saw a 7% month-on-month increase in August for exports of soyabean to China. Overall, South America is seeing a 5% increase in production year-on-year in 2018/19. However, there are concerns that this may still not be enough to meet China's high demand.

Rapeseed, sunflower oil

Rapeseed oil prices have fallen in October, following high production in 2017/18. Production for 2018/19 is expected to fall 1% year-on-year to 28.2M tonnes but consumption is also forecast to decrease, keeping prices low.

Sunflower oil prices are also expected to remain low as production forecasts of seeds from the Ukraine, a major producer, are predicted to come close to the record numbers seen in 2016. Exports are also likely to reach record numbers. Sunflower oil production in 2018/19 is forecast up 4% globally, with ending stocks also expected to increase further by 17%.

Corn oil

Corn oil prices remain low following an increase in forecasts for 2018/19. Despite a recent downward revision of 2018/19 figures in October, prices remain up 3% year-on-year. Further downward pressure is also being applied to pricing as a result of a general downward trend in the vegetable oils market as overall supply is good.

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