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The 10 Hottest Trends in Algae

Health Tips

Tamanu / Undi Oil

Trade News

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Editor's desk

The annual turnover of Indian vegetable oil Industry is more than US$ 25bn (Rs. 150,000 crores). India import various vegetable oil products worth US$ 10bn. (Rs. 60,000 crores) per annum while the export earnings are about US$ 4bn. (Rs. 25,000 crores) from export of oil meals, oil seeds and castor products. There are more than 15,000 oil mills, more than 600 solvent extraction plants, 600 vegetable oil refineries and 250 Vanaspati manufacturing plant engaged in processing of various oil seeds, oil cakes, solvent extracted and expelled vegetable oils.

The edible oil production from kharif oil crop and other sources is estimated at 54.60 lac tons down by 3.35 lac tons of last year produce of 57.95 lac tons. Due to squeezed domestic supply of vegetable oil and high dependence on import, the domestic price will depend on global trends. A strong inflow of cheap oil from overseas will keep the local scenario depressed.

During the oilseed year 2014-15, total soymeal exports between October 2014 and January 2015 were a dismal 438,135 tonnes, compared with 1.5 million tonnes during the corresponding period in 2013-14. The 70 per cent fall in soymeal exports is sharp and is raising viability concerns for crushers. Soymeal is a by-product in the process of crushing soybean to produce soy oil. Lower crushing will lead to higher import of soy oil and other oils.

Import of soy oil have, in fact, grown steadily over the years and touched 1.95 million tonnes in 2014-15. Apart from this development vegetable oil imports were up at 27%, 11 lakh tonnes in March compared to 8 lakh tonnes in the same period last year due to higher demand and lower crushing by domestic mills. The overall import of vegetable oils during last five months, from November 2014 to March 2015, increased by 24% due to zero export duty on palm oil by Indonesia and Malaysia.

As the burden of import of edible oil is increasing year by year on forex reserve, it is high time to think about import of oilseed. Government should consider about the oil seed import keeping in mind that due to shortage of raw material domestic seed crushing and processing units are utilizing only 30% of their capacity.

Yours truly

C S Joshi

Editor

Oil Technologists' Association of India
(North Zone)

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The 10 Hottest Trends in Algae

Algae has been touted as the ultimate platform for fuels, chemicals, nutraceuticals, proteins — even cancer therapies. There's been a rate of progress that would impress any devotee of Moore's Law and a series of wacky claims that would impress any devotee of P.T. Barnun. So, what are the real trends?

We've traveled several years now since the "Summer of Algae" when it seemed like half the venture capitalists in life sciences were forming algae ventures, or thinking about them. Since then — a cluster of research projects and proto-companies have been tackling the real-world challenges of yield, harvesting, dewatering and application development.

In today's Digest, we've identified the Top 10 Trends that should be commanding your attention.

1. Big Oil, L'il algae

This past week, algae observers were startled to learn that Reliance Industrial Investments, the Indian oil holding company, placed a $2.4M purchase order for Algae.Tec algae production technology as a follow-up to an initial investment of A$1.5M by Reliance, with additional investments of AU$1.2 million over the next 2 years. The purchase order for Algae.Tec modules will be supplied and completed over approximately the next nine months. The Algae.Tec solution is less than one tenth the land footprint of pond growth options, while its enclosed module system is designed to deliver the highest yield of algae per hectare, and solves the problem of food-producing land being turned over for biofuel production.

Overall, it's Reliance's third algae investment. A Credit Suisse report on the company, (see page eight of the report, downloadable here), revealed last year that Reliance has invested a total of $116 million (Rs6.2 billion). $93.5 million (Rs5.0 billion) in Algenol and 22.5 million (Rs1.2 billion) in Aurora Algae.

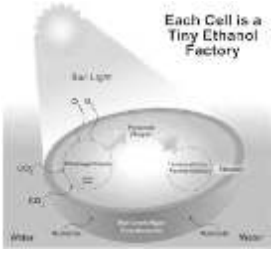
But there's more algae activity stirring in the world of Big Oil. In November, Sapphire Energy and Phillips 66 announced a strategic joint development agreement to work together to collect and analyze data from co-processing of algae and conventional crude oil into fuels, and to complete fuel certifications to ready Sapphire Energy's renewable crude oil for wide-scale oil refining.

Under the agreement the companies will expand Sapphire Energy's current testing programs to further validate that Green Crude can be refined in traditional refineries and meet all of the Environmental Protection Agency's (EPA) certification requirements under the Clean Air Act. This includes determining the optimal operating conditions for processing algae crude oil into American Society for Testing and Materials-certified diesel, gasoline and jet fuel. Once the study is finished, the companies will work together to complete the EPA certification process to register a new fuel product entering the market. Sapphire Energy is now producing crude oil daily from algae biomass cultivated and harvested at the company's Green Crude Farm, located in Columbus, N.M.

Meanwhile, let's not forget the Synthetic Genomics-ExxonMobil relationship, which debuted in spectacular fashion with a $500M initial spending target in 2009. Last year, SGI announced a new co-funded research agreement with ExxonMobil to develop algae biofuels. The new agreement is a basic science research program that focuses on developing algal strains with significantly improved production characteristics by employing synthetic genomic science and technology. Financial details of the agreement were not disclosed. Last year, ExxonMobil CEO Rex Tillerson told PBS, "We've come to understand some limits of that technology, or limits as we understand it today, which doesn't mean it's limited forever. The venture is "probably further" than 25 years away from successfully developing fuels."

The last public update on ExxonMobil's algae efforts was here.

2. Making Mo' Better



Algae is renowned for its production potential — after all, the mass can double in as little as 24 hours — meaning that it could dwarf the productivity of terrestrial plants. But translating potential into

industrail scale “business as usual” hasn’t been a joyride.

Hence it was big news when, last March, Algenolconfirmed that the company had exceeded production rates of 9,000 gallons of ethanol per acre per year — and company CEO Paul Woods said that ” I fully expect our talented scientific team to achieve sustained production rates above 10,000 by the end of this year.” Just last September, in the opening plenary session at the Algae Biomass Summit, Woods revealed that the company, at its 4-acre, outdoor Process Development Unit in Lee County, Florida, had achieved continuous production of ethanol at the 7,000 gallon per acre level.

It was a substantial increase over the company’s original target of 6,000 gpa, and were achieved in outdoor operation under normal operating conditions. With the news, Woods confirmed that the company, after completing major construction activities at their integrated pilot scale biorefinery in 2012, has fully shifted focus to demonstrating the commercial viability of Direct to Ethanol technology at its pilot facility and identifying sites for commercial projects to begin in 2014.

3. Scale

Now, Solazyme doesn’t like to think of itself as an algae company any more than Budwesier wants to be known as a yeast company — both prefer to define themselves by their products rather than around the details of their fermentation technology. Nevertheless, Solazyme does use algae fermentation — and they have been getting to massive scale.

Last month, the company announced that commercial operations have commenced at both Archer Daniels Midland Company’s Clinton, Iowa facility, and the downstream companion facility operated by American Natural Products in Galva, Iowa. Volumes shipped to Brazil are being utilized for market development activity in advance of the opening of the Solazyme Bunge Renewable Oils Moema facility. As stated previously, production at the ADM and ANP facilities is expected to ramp to a nameplate capacity of 20,000 MT/yr within 12-18 months, with targeted potential expansion to 100,000 MT/yr in subsequent years.

The company noted, in a release, that “truckloads of product are now shipping from the Iowa operations for use in applications including lubricants, metalworking and home and personal care. These shipments are being made pursuant to multiple supply agreements as well as spot purchases, and include reorders.” Highlighting the flexibility of Solazyme’s technology platform, Solazyme, ADM and ANP have successfully manufactured three distinct and unique tailored oil products at the facilities, and products are currently being sold and distributed in both the U.S. and Brazil.

The Clinton news is a follow-through from the news in December 2012 that Solazyme has announced the completion of multiple initial fermentations in 500,000 liter fermenters at ADM’s Clinton, Iowa facility — about four times the scale of the vessels in Solazyme’s own Peoria, IL facility. That set of runs broke through the ferment wall: namely that, hitherto, no next-generation producer had successfully achieved linear scale-up in 500,000 liter (or larger) fermenters. It’s simply impossible for fermentation-based technologies to affordably produce fuels and chemicals in small fermentation tanks — its way too much capex, too much opex to produce, say, 10,000 liters at a time.

Also at scale in fermentation? DSM and Alltech.

3. Bring on the Apps

“We’re like the iPhone,” said Heliae CEO Dan Simon, “and companies like Triton are bringing forward the apps”. We may well see companies like Heliae selling licenses for its production technology to customers who in turn license and introduce apps, to generate fuels, chemicals, nutraceuticals, as well as complex proteins, enzymes, and other biologics that are cost-effective and have immediate applications in agricultural, pharmaceutical, and other retail markets.

Progress with the “iPhone” is becoming pretty clear, with Heliae booking $4.2M in sales already in 2014 for their raceway-based algae growing technology, after recently completing a $13 million demonstration plant. Although the company has equipment on site to develop fuels from the algae, and the company has previously turned algae into jet fuel on site, Heliae is focusing on the growing side of the equation. The company brought in more than $1 million in revenue last year.

So, what are the hot apps?

Proteins. Almost 10 years ago, out of Dr. Steve Mayfield's lab at Scripps and later at the University of California at San Diego, a series of discoveries made it possible, for the first time, that algae could be used a platform for synthetic biology and genetic innovation — just as yeast and e.coli had been used for years. Now, There are subtle and microscopic reasons why algae could be a platform to rival e.coli — some related to superior folding (proteins that don't fold properly are generally inactive, or can become toxic or change their function). Mayfield's technology ultimately led to the formation of Rincon Pharmaceuticals in 2004 to pursue commercialization. Sapphire ultimately acquired, and pursued proteins as a side project.

By 2010, Mayfield was reporting in Plant Biotechnology Journal that seven diverse human therapeutic proteins could be produced in Chlamydomonas reinhardtii, a green alga used widely in biology laboratories as a genetic model organism, with a 60 cents-per-gram protein production costs. Even then, that was "about the same cost estimates for the least expensive protein expression systems presently available, and considerably cheaper than mammalian cell culture," Mayfield and his team reported at the time.

With expected improvements in the ability to express proteins in algae, "and the continued reduction in algal biomass cost associated with the large scale efforts to use algae for biofuel production, we anticipate at least a ten-fold reduction in the costs over the next few years, which should make algal protein production the least expensive platform available."

Ultimately, some of the old Rincon IP was spun out of Sapphire and back to Mayfield and Pyle, who then founded Triton last fall. Triton's platform is known as PhycoLogix, and uses algae to produce compounds that other organisms cannot, that can be safely consumed without modification, and can be cultivated at large scale inexpensively. Heliae ibvested $5M late last year.

Nutraceuticals. In September, Algaeon announced the signing of a multi-year, multi-million dollar supply agreement with Valensa International to provide high value "condition specific" nutraceuticals to the marketplace. Algaeon, in cooperation with Valensa, is using its extensive knowledge of algae production to bring a new level of efficiency and quality for algae-based ingredient supply to the nutraceutical market. Algaeon will develop manufacturing processes and technology while Valensa will produce finished form condition specific products that will be sold to marketers with recognized brands.

DHA. This is the secret ingredient in Fish Oil or Omega-3s sold at your pharmacy for its health benefit. In late 2011, Sofiprotéol, the industrial and financial arm of the French plant oils and proteins sector, established a JV with Fermentalg to "industrialize, produce and market oils from microalgae that are rich in oils from the Omega 3 family (EPA-DHA)" — with a goal of assuring "the development of its patented process until the early scale-up phases of its technology." Sofiprotéol is providing the bulk of financing. In early 2013, it was training its focus on "omega-3 fatty acids, coloring agents, antioxidants and biopolymers, etc" according to an interview in Algae Industry Magazine. A signature Series C capital raise in Q3 of this year — which netted $16M and attracted existing investors ACE Management, Demeter Partners, Emertec Gestion, and Picoty Algo plus new investors IRDI and Viveris — was in support of a focus on "industrial scale up and commercialization" of its microalgae production for use in "animal feed, biofuels, cosmetics, food, health, and specialty chemicals."

Also hovering around the DHA scene is Alltech. Their major move into microalgae dates to the acquisition of a former Martek Bioscience plant in Winchester, Kentucky. The plant, which contains 1.26 million liters of fermentation capacity on a 17-acre campus, had been originally built as a yeast production plant, then produced vitamin B2 for Coors, and ultimately was acquired by Martek, before Alltech bought the plant for $14 million. Alltech has publicly discussed a $200 million investment in transforming the plant into heterotrophic algae production facility in Winchester, Kentucky — with a focus on production of DHA. The renovated plant opened in April 2011. Right now, the plant can produce 20 tons of algae per 11-day campaign — a capacity of roughly 1800 tons per year at current productivity. 1800 tons of algae would have a theoretical maximum, at this stage, of a theoretical maximum of 176 tons of DHA production.

Hybrid platforms. Last year, Cellana announced the launch of its ReNew brand and ReNew Omega-3 line of algae-based products. The ReNew brand was developed to meet the growing demand for more sustainable Omega-3 human health products, animal nutrition products, and biofuel feedstocks. The ReNew portfolio is comprised of four main product categories: ReNew Omega-3, including both ReNew Omega-3 products includes ReNewEPA and ReNewDHA, ReNew Feed as a nutritional product for the animal feed market; ReNew Fuel as an algae-based biocrude, particularly for jet fuels for commercial and military aircraft; and ReNew Algae, available in bulk for customers to apply their own extraction technologies and develop customized solutions within these application areas. The ReNew product line is derived from Cellana's scalable, sustainable, and patented ALDUO algae production

technology. Cellana's six-acre Kona Demonstration Facility on Hawaii's Big Island has produced more than nine tons of algal biomass for commercial testing. At this time, Cellana is raising money for a commercial-scale facility.

Another company with multiple product lines is Aurora Algae. Aurora burst onto the scene in June 2008 with the announcement that it had raised $20 million in series A financing from Oak Investment Partners, Noventi and Gabriel Venture Partners. The company completed an 18-month pilot in early 2009 and said that it has more than doubled the productivity of its selected strains. By August 2013 Aurora said it was looking to move its planned commercial-scale project algae project to Geraldton, Australia where it already has a test project. It has stated that it needs to expand from 6-acre system to 250 acres to be commercially successful.

The company's key technology – an optimized strain of salt-water algae that is lighter in color than wild-type algae—allows deeper penetration of sunlight, thereby extending the zone for algae reproduction and increasing yield. That's the Aurora secret sauce: to outcompete, as a form of crop protection, simply to grow too fast for predators and competitors to get a foothold. The four product lines are: A2 Omega-3—a family of Omega-3 oils aimed at the nutraceutical and pharmaceutical markets. The first offering in this family, A2 EPA Pure will make the benefits of EPA available to a broader market since it is derived from an allergen-free, vegetarian source. Plus, A2 Feed—a family of protein-rich algal grains for the animal and aquaculture markets; A2 Fuel—a family of biomass and biodiesel applications; and A2 Protein—a family of protein-rich powder products for the food and beverage industry.

4. No more venting money, er, I mean CO2.

Then there's the flue stack — which you might as well call the Money Stack, becasue of all the money that is vented every time a company vents CO2. One of the most interesting plays in algae to use it as a means of monetizing CO2 ,— turning it from a headache into an opportunity.

BioProcess Algae is helping Green Plains Renewable Energy to scale up its CO2-based algae experiment into a commercial-scale add-on facility. What started out as a lab test that grew and grew until it reached 400 ft-long greenhouses has led to Omega-3 production as well as high value pellets and feed selling from $1,500 to $10,000 a ton, compared to $200 a ton for corn. Omega-3 activity? The company in 2012 announced a commercial supply agreement for EPA-rich Omega-3 oils with KD-Pharma for use in concentrated EPA products for nutritional and/or pharmaceutical applications.

5. Extremophiles

New algae — or rather, undiscovered or otherwise under-appreciated algae — well, algae companies and research organizations have their scouts traveling even more obscure paths than a major league baseball scout.

Microbial mats at Yellowstone contain chemotrophs – key among the terrestrial organisms that inspire researchers working on electrofuels

One of the hottest areas for development — extremophiles. Organisms that love unusual heat or pressure conditions that make them very robust in algae growth systems (for example, algae that can tolerate hot temperatures can out-compete other swimmers in the pond). So, consider this: scientists are researching the production of oil-producing algae, as well the feasibility of commercial-scale biofuel production based on microbes discovered in Yellowstone National Park.

Part of a multi-institutional project funded by a grant through the Sustainable Energy Pathways program at the National Science Foundation, it is one of many algal biofuel research projects at MSU. The project, which also includes the University of North Carolina and the University of Toledo, is part of a federal effort to tackle some of the fundamental problems in developing enough biofuels fuels to provide up to 50 percent of the nation's transportation fuel. The U.S. Department of Energy funding the project.

6. The Pyromaniax

Hitherto, most algae systems have relied on extraction.

That is, grow the algae, dewatering, then extract the valuable oils or proteins. But a number of ventures, such as Sapphire Energy and Algenol,are looking to pyrolylze the whole algae or algae residues.

In Washington state, engineers have created a continuous chemical process that produces useful crude oil minutes after they pour in harvested algae. The research by engineers at the Department of Energy's Pacific Northwest National Laboratory was reported recently in the journal Algal Research. In the PNNL process, a slurry of wet algae is pumped into the front end of a chemical reactor. Once the system is up and running, out comes crude oil in less than an hour, along with water and a byproduct stream of material containing phosphorus that can be recycled to grow more algae.

CO2 services at Sapphire are provided by Linde, who are tasked with figuring out the best way to scale – through co-locating with a CO2 emitter or tapping in to the CO2 pipeline system

With additional conventional refining, the crude algae oil is converted into aviation fuel, gasoline or diesel fuel. And the waste water is processed further, yielding burnable gas and substances like potassium and nitrogen, which, along with the cleansed water, can also be recycled to grow more algae. The system runs at around 350 degrees Celsius (662 degrees Fahrenheit) at a pressure of around 3,000 PSI, combining processes known as hydrothermal liquefaction and catalytic hydrothermal gasification. Cautionary note? The PNNL system runs continuously, processing about 1.5 liters of algae slurry in the research reactor per hour. So, it's pre-pilot. And it is not going to be cheap to build out, at scale, a system that requires 350 degrees and 3000 PSI.

Along those lines, Sapphire and Linde announced last year that they will expand their partnership to commercialize a new industrial scale conversion technology needed to upgrade algae biomass into crude oil. Together, the companies will refine the hydrothermal treatment process developed and operated today by Sapphire Energy at pilot-scale. In addition, they will jointly license and market the technology into an expanded list of industries, including algae, municipal solid waste, and farm waste, in order to upgrade other biomass sources into energy. The agreement spans a minimum of five years through the development of Sapphire Energy's first commercial scale, algae-to-energy production facility.

7. One word. Plastics.

What about new materials? Plastics have been promising. In December, the Institute for Plastic Technology in Valencia profiled its EU program looking into various materials that can be produced from algae to create adhesives, paints and dyes using a technology developed by Alicante-based Biofuel Systems. The 42-month research program includes 13 different companies. The first stage of the project will be to identify fast-growing algae to later be processed.

8. Scrubbers

Then, there is algae's abilities not only as a product, but as a platform for scrubbing wastewater — which has been a use for algae for years. But recently, algae's abilities to scrub out highly toxic materials has been put to the test.

Last month in Japan, a research group led by Yoshihiro Shiraiwa of the University of Tsukuba identified seventeen microalgae,aquatic plants and algae that are able to efficiently remove radioactive cesium, iodine and strontium from the environment were identified. The research was conducted to deal with the The findings add to existing bioremedial options which could help to

decrease radiopollution in the Fukushima area.Such measures are of utmost importance, because a large quantity of radioactivity has been released. The researchers noted that further studies are needed on the mass cultivation and efficient coagulation and sedimentation of these algal strains before their findings can be put into practice.

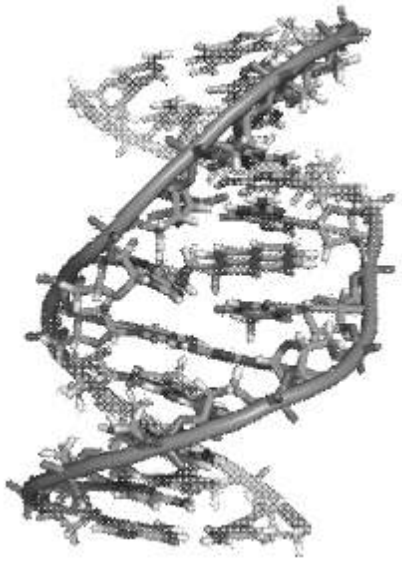
Plus, there are tools to keep the algae ponds free of pests, predators, competitiors and the like. Along those lines, in November OriginOil announced that academic testing has verified its new Algae Screen growth optimizer effectively controls bacteria and microscopic predators in commercial algaeproduction, helping to promote high rates of cultivation of the most valuable species. “Initial test results saw a dramatic drop in contaminant load while the culture still maintained target cell integrity,” said Dr. Matt L. Julius of the Department of Biological Sciences at St. Cloud State University in Minnesota. “This is one technology that will change the industry once it is fully validated.”

9. Kelp is On the Way

What about macroalgae, also known as kelp? In California, researchers from Bio Architecture Lab published in the journal Nature an alginate monomer transporter they discovered that will help to significantly boost the efficiency of cellulosic ethanol production from brown macroalgaes. Using fermentation, the researchers were able to achieve 83% theoretical yield from the sugars.

Several years ago, BAL and Norway’s Statoil announced a wide-ranging strategic partnership for the production of renewable, sustainable and low cost ethanol derived from macroalgae grown off the coast of Norway. Statoil will fund BAL’s research and development (R&D) and demonstration projects, and if successful, will also fund the commercialization of BAL’s technology in Norway and elsewhere in Europe. During the initial phase of the partnership, BAL is responsible for developing the technology and process to convert Norwegian seaweed into ethanol. Statoil is responsible for developing and managing the seaweed aquafarming operations, with consultation from BAL, which already has established aquafarming operations in Chile. Upon the successful achievement of key milestones, Statoil and BAL would develop a demonstration scale facility in Norway.

10. Building the better mousetrap algae.



Final trend? Bulding a better algae through genetic enhancement. That work has been mostly undertaken by Sapphire, which has been engaged in some brute force biology to get the industry going.

In late 2012, for example, Sapphire Energy and Institute for Systems Biology announced a strategic partnership to significantly increase oil yield and improving resistance to crop predators and environmental factors in order to further the advancement of commercialized algae biofuel production. “Sapphire is dealing with one of the most complicated problems known to humans: how to make fuel from a renewable resource,” said Nitin Baliga, director of Integrative Biology at ISB. ”Together, we have complementary expertise that will allow us to understand, reverse engineer and rationally alter the gene networks for fuel production in algae.”

But the effort continues elsewhere. Last November in Tennessee, researchers at Vanderbilt University have found that when the biological clocks of cyanobacteria were stopped in their daylight setting, the amount of several biomolecules that they were genetically altered to produce increased by as much as 700 percent when grown in constant light. “We have shown that manipulating cyanobacteria’s clock genes can increase its production of commercially valuable biomolecules,” said Carl Johnson, Stevenson Professor of Biological Sciences at Vanderbilt University.

Courtesy: Biofuels Digest

Price of olive oil soaring after worst harvest in over a decade

A dreadful 12 months for olives in several major producing countries has led to 2014 being labelled the "black year" for the industry and to the doubling of the bulk cost of olive oil in some areas.

Unusual weather and a proliferation of insects and bacterial blight have devastated the harvest in several countries. Analysts have been predicting a bad year for olive oil since the summer, after it became clear that hot late spring weather in Spain – the world's largest producer of olives – was going to have a key impact on autumn harvests. Other producers have been coming in with equally poor results, adding to the woes of the industry Europe-wide.

Farmers in Italy have suffered so badly from pests and adverse weather that many are reporting harvests 40% to 50% down on 2013. Unusually large flocks of starlings have been reported as further destroying the fruits in parts of southern Italy, leading to calls for a cull. "This is the worst year in memory," said Pietro Sandali, head of the Italian olive growers consortium, Unaprol.

In Greece, the olive output has been more stable, but the other smaller producing countries cannot pick up the strain: Morocco and Tunisia have also suffered bad weather, while Syria, which claims to be the birthplace of the olive tree and which has 74 million trees, has been affected by the civil war.

The International Olive Council (IOC) says production will hit its lowest level in 15 years and admits there will be an upswing in prices; its latest figures show the price from the producers had risen by 121% in the last month of 2014 compared with December 2013, with supply down by almost a third. That increase, the experts say, is likely to be passed on at the supermarkets, meaning a bottle of olive oil is likely to cost British shoppers more than a high-end bottle of wine.

The Italian Olive Oil Company in Hever, Kent, says it is already warning customers that its supplies will be limited. Olive farmers with low harvests are inclined to go for quantity over quality and do fewer of the initial virgin pressings so beloved of foodies in Britain.But worst hit will be the farmers and the economies of the olive oil-producing countries, all of which are still struggling to emerge from several years of dire economic straits. The olive oil industry is worth more than £2bn to southern European producers.

Curtis Cord, publisher of the Olive Oil Times, has called the situation "particularly painful", adding that millions of people rely on the industry in Spain, Italy, Greece, Portugal, Morocco and Tunisia. "This has a profound, profound effect on families and producers in these regions, so it is a crisis," he said. "That's one of the unfortunate parts of producing olives and olive oil. It's cyclical: you're going to have bad years and good years."

Spain and Italy account for just under 70% of output, and the Madrid-based IOC, which publishes benchmark supply and demand estimates, forecasts that Spanish olive oil production will more than halve next year, to 825,700 tonnes. Production in Italy is expected to fall about a third to 302,500 tonnes, the lowest level since 1991.Olive oil comes in so many different types and qualities of pressings that it is difficult to compare prices, but broadly it varies from around £4 a litre in Aldi to £6.50 at Waitrose.

However, Europe, where two-thirds of the world's olive oil supply is consumed, will have cheaper alternatives. Favourable weather elsewhere in the world has meant that harvests of oilseed crops have been plentiful and prices have been falling. The future could also see olive oil coming from the US, where more and more landowners in the increasingly climatically challenged states of California and Texas are planting olive trees.

Courtesy: The Guardian

In Colombia, a palm oil boom with roots in conflict

MAPIRIPAN, Colombia — Long before the massacre, when Mapiripan was just a faraway little place not worth fighting for, Aida Gordilla and her family came to the wide-open grasslands outside town and fenced off a homestead. They called it Macondo, like the enchanted village in the Colombian novel popular at the time, "One Hundred Years of Solitude."Today, a sign at the edge of town still reads "Macondo Way," but the road leads to a palm oil processing plant amid a vast orchard of a million trees, sown in tidy rows by a Spanish-Italian company, Poligrow. Gordilla's family and the others are gone.

What drove them from Mapiripan and Macondo is only one dark little episode in the civil conflict that has scarred Colombia for half a century, leaving at least 220,000 dead and 5.7 million uprooted by four-way violence among leftist rebels, government ¬forces, right-wing paramilitary groups and criminal gangs. The Poligrow mega-project is one of several that have helped make Colombia the world's fastest-growing producer of palm oil, used widely in snack foods, and cosmetic and beauty products, and as biodiesel. Having doubled its output in the past decade, Colombia ranks fourth in total production behind Indonesia and Malaysia, which dominate the market, and Nigeria.

But the palm industry's rapid expansion is yielding new

evidence of a boom that benefited from the displacement of small farmers, indigenous groups and others by the armed conflict. Several of the regions where palm has spread during the past decade are places notorious for paramilitary violence and rural terror, such as the north coast outside Cartagena, the Venezuela border region and the southeastern plains of the Meta department, where Mapiripan is located.

As the government and the country's largest rebel group, the Revolutionary Armed Forces of Colombia (FARC), attempt to reach a peace accord to end the fighting, Colombia faces the painstaking task of trying to sort out what happened in Mapiripan and other places like it, and how to move forward.

Central to the dispute is a clashing vision of rural development, between the traditional model that has been partly destroyed by the violence and an agribusiness vision that promises growth, jobs and modernization through the spread of commodity crops like African palm.War-torn Mapiripan, where children play in the town square under the watch of rifle-toting soldiers, has 24-hour electricity for the first time, thanks to Poligrow. A job with the company is essentially the only one in town that doesn't require a gun.

While the industry's expansion elsewhere in Latin America has extracted a steep environmental cost, as tropical forests have been cleared for palm mono¬cultures, Colombia's growers say they are at the forefront of efforts to produce palm oil that meets guidelines for environmental and social responsibility. They note that the country's plantations are spreading fastest on the grassy eastern plains, where they are primarily replacing low-yield cattle ranches¬. "There is an unfair international perception that the only way to grow palm oil is through deforestation," said Jens Mesa, president of Fedepalma, Colombia's palm industry trade group. "We are encouraging palm to be grown in the right places and with the right practices."

But some of those places have been polluted by violence. It is only recently that Colombian courts and government investigators have begun to sort out the thousands of pending claims from those who say they were driven off their land.

The director of Poligrow, Carlo Vigna, insists that when he selected a location for the company's plantations in 2008, he studiously avoided land with a questionable past. He knew that an investment in Mapiripan would be risky, he said, but he and his partners believed the moment had arrived for the town, and Colombia, to transcend its darkest moments.

Mapiripan, he said, is "the new agricultural frontier of Colombia."

Speaking from his glassy Bogota offices with views of the city, Vigna, who is Italian, said the company has projects to provide child care, host soccer tournaments, train and hire local workers, plant vegetable gardens and restore the habitat of the area's native forests.

With $45 million already invested, the company wants to double the size of its orchards to nearly 35,000 acres and build a much larger processing plant at Macondo. Carbon-emission mandates have created a booming market in Europe for biodiesel.

Yet Poligrow's plans are in limbo. A report this year by Colombia's comptroller general's office cited "irregularities" in the company's land acquisitions, and investigators have questioned the legality of the sale by its former owners.

It noted that Poligrow acquired two parcels under the Macondo name in 2009 whose values had increased more than 12,000 percent since their previous sale a decade earlier, after the massacre. Another Macondo property jumped 7,000 percent in six years.

"No Colombian company was willing to take a chance on Mapiripan," Vigna said. "When we arrived, there were 25 formal jobs in the whole town. Now there are 500. The community supports us. They know that if our company leaves, Mapiripan will disappear. And there won't be another opportunity."

The trees are a cash crop with many virtues, they say, requiring a large, year-round labor force. Palm needs relatively little fertilizer, irrigation or pesticides and can thrive in poor soils ill-suited to growing food.

Every 2.2 acres of mature trees can produce $4,500 worth of oil each year, with annual profit margins of 20 to 30 percent, growers say.

A palm worker skilled in the use of the pole-mounted knives needed to harvest the oily fruit can earn $25 a day or more, slightly better than Colombia's minimum salary but at least twice the wages in Asia, according to industry data.

With backing from the U.S. Agency for International Development, the Colombian government and the palm industry have set up pilot projects to give jobs to demobilized guerrillas and ex-paramilitary fighters, sometimes on the same farms. The industry is also encouraging small farmers to plant palm and pool their ¬resources.

Courtesy: The Washington Times

India's Vegetable Oil Imports up 17 Percent

India's vegetable oil import has recorded an increase of 17 per cent at 3.42 million tonnes during November 2014 to January 2015. During the same period last year, vegetable oil imports were at 2.91 million tonnes, Solvent Extractors' Association of India (SEAI) said in a statement recently.

Attributing the increase, SEAI said: "In last three months,

due to nil export duty on palm products by Indonesia and Malaysia and reduced demand of CPO for biodiesel, pushed the export of palm products to India to reduce burgeoning stock held by the exporting countries." "Also, due to high prices of soybean and lesser realization for oil and soybean meal in export market, resulted in lower crushing and oil availability in domestic market," SEAI adds.

Vegetable oil imports during January 2015 also increased by 21 per cent to 1.09 million tonnes, as compared to 905,814 tonnes imported during the same period last year. During the three month period, import of refined oil (RBD palmolein) share was reduced to 5 per cent from 20 per cent, thanks to nil export duty on RBD palmolein and CPO by Indonesia and Malaysia and reported at 170,823 tonnes, as compared to 580,333 tonnes during the same period of last year. Palm oil import has also increased to 2.29 million tonnes during November 2014 to January 2015, as compared to 2.19 million tonnes during the same period of last year.

Similarly, soft oils import has increased by 61 per cent to 1.06 million tonnes, as against 658,330 tonnes imported during the same period last year. Share of soft oils in total import increased to 32 per cent from 23 per cent last year while palm oil products down to 68 per cent from 77 per cent. As on February 2015, total stock both at ports and in pipelines increased to 2.09 million tonnes from 2.07 million tonnes.

Courtesy: Soyatech

Cargill Completes $12.5 Million Investment in South Africa Animal Feed Facility

Driven by an increase in demand from customers throughout the region for animal feed products, Cargill has completed a USD $12.5 million expansion of its premix facility in Pietermaritzburg, South Africa. The expansion includes new equipment, technology and resources to increase the plant's efficiency and improve product quality. This investment demonstrates Cargill's commitment to an animal production market in sub-Saharan Africa that is experiencing significant growth.

The facility produces poultry, ruminant, swine and pet food, vitamin and mineral premix and base mix products for animal producers' marketed under the Provimi brand throughout sub-Saharan Africa.

The state-of-the-art facility combines the latest feed safety technology and product quality capabilities, including automated barcode scanning and ingredient dosing. The design provides operational flexibility and minimal cross-contamination risk. The Pietermaritzburg facility positions Cargill to achieve its growth plans through increased production capacity and flexibility in product manufacturing, packaging and logistics.

"Our team of dedicated people take great pride in producing high-quality, safe animal feed products to meet our customers' expectations," said Gudo klein Gebbink, Cargill's regional director for the Provimi brand in Sub-Saharan Africa. "Cargill's resources and know-how will play an important role in strategically supporting our customers' future growth needs through on-farm management and technical expertise."

Following the acquisition of half the interest of joint venture partner Astral Foods, Cargill became a majority shareholder with 75 percent interest in the company in 2012 and assumed managerial control. Astral Foods owns the remaining 25 percent interest in the company.

"In addition to producing animal feed products that contribute to feeding billions of animals which ultimately reach the dinner tables of more than 1 billion people every day, our Pietermaritzburg facility employees support the local community and provide assistance to many worthy organizations," added David Webster, president and business leader of Cargill Animal Nutrition's premix business. "We understand how important it is to be both a viable business and a good neighbor in the community, and we work hard to fill both needs."

Courtesy: Soyatech

India Bets on Genetically Modified Rapeseed Crop for a Second Green Revolution

On a fenced plot not far from Indian Prime Minister Narendra Modi's home, a field of mustard is in full yellow bloom, representing his government's reversal of an effective ban on field trials of genetically modified (GM) food crops.

The GM mustard planted in the half-acre field in the grounds of the Indian Agricultural Research Institute in New Delhi is in the final stage of trials before the variety is allowed to be sold commercially, and that could come within two years, scientists associated with the project say.

India placed a moratorium on GM aubergine in 2010 fearing the effect on food safety and biodiversity. Field trials of other GM crops were not formally halted, but the regulatory system was brought to a deadlock.

But allowing GM crops is critical to Modi's goal of boosting dismal farm productivity inIndia, where urbanization is devouring arable land and population growth will mean there are 1.5 billion mouths to feed by 2030 - more even than China. Starting in August last year, his government resumed the field trials for selected crops with little publicity. "Field trials are already on

because our mandate is to find out a scientific review, a scientific evaluation," Environment Minister Prakash Javadekar told Reuters last week. "Confined, safe field trials are on. It's a long process to find out whether it is fully safe or not."

Modi was a supporter of GM crops when he was chief minister of Gujarat state over a decade ago, the time when GM cotton was introduced in the country and became a huge success. Launched in 2002, Bt cotton, which produces its own pesticide, is the country's only GM crop and covers 95 percent of India's cotton cultivation of 11.6 million hectares (28.7 million acres).

From being a net importer, India has become the world's second-largest producer and exporter of the fiber.

However, grassroots groups associated with Modi's Hindu nationalist Bharatiya Janata Party (BJP) have opposed GM crops because of the reliance on seeds patented by multinationals. The Swadeshi Jagran Manch, a nationalist group which promotes self-reliance, has vowed to hold protests if GM food crops are made commercially available.

"There is no scientific evidence that GM enhances productivity," said Pradeep, a spokesman for the group. "And in any case, why should we hand over our agriculture to some foreign companies?"

A handful of agrichemical and seeds companies dominate the global market for GM crops, including Monsanto Co. (MON.N), DuPont Pioneer, a unit of DuPont (DD.N), Dow AgroSciences, a unit of Dow Chemical (DOW.N), and Syngenta (SYNN.VX).

SECOND GREEN REVOLUTION

Largely agricultural India became self-sufficient in food grains after the launch of the Green Revolution in the 1960s, when it introduced high-yielding seed varieties and the use of fertilizer and irrigation.

The challenge now is to replicate that success in edible oils and vegetables, which are increasingly in demand. India imports about 60 percent of its edible oil needs at an annual cost of up to $10 billion - its third-biggest import item after crude oil and gold.

The trials of the mustard plant, which provides the highest yield of all oilseeds, are being led by Delhi University researchers headed by Deepak Pental, a scientist who returned to India in 1985 from Britain. He has said that he has developed a transgenic mustard strain that raises output by up to 30 percent but that further trials were halted after the moratorium.

The federal environment ministry began approving GM field trials in August, although applicants need to seek no-objection certificates from states where the trials are to be conducted. Last month, Maharashtra gave the all-clear to open field trials of rice, chickpeas, corn and aubergine, as well as new varieties of cotton. Punjab, also , gave the go-ahead for mustard in October followed next month by Delhi.

"The (federal) government is, for a change, being decisive," Pental said, adding his mustard strain could be ready to be released for commercial farming in a year or two.

Environmental group Greenpeace however remains opposed.

"The current government's rush with open field trials without addressing the fundamental loopholes in the regulatory mechanism is a matter for serious concern," said Manvendra Singh Inaniya, a campaigner for Greenpeace India.

"This leaves us vulnerable to contamination with untested and potentially hazardous GM food. We urge the Union Government to roll back approvals given to open air field trials of GM crops."

But the environment ministry official said studies have found no ill effects from GM foods and that local firms should partner with multinationals like Monsanto, which has already licensed its Bt Cotton product to several Indian companies.

"Farmers are smart and deserve wider choices," a spokesman for Monsanto in India said. "They will only reward products, practices and partnerships which create value on their farms."

Courtesy : soyatech

Sime Darby Plantation completes acquisition of Papua New Guinea's NBPOL

KUALA LUMPUR: Sime Darby Plantation (SDP), the plantation arm of Sime Darby Bhd, completed its acquisition of Papua New Guinea-based New Britain Palm Oil Ltd (NBPOL), bringing its total land bank to almost one million hectares spread out over five countries.

Sime Darby told Bursa Malaysia that SDP would be focusing on integrating the operations of both companies over the next few months, adding that NBPOL was a strategic fit with its track record on sustainability.

“This is a historic moment for Sime Darby. NBPOL was founded by Harrisons & Crosfield, the company that was part of a merger exercise that created the Sime Darby of today, the world’s biggest producer of certified sustainable palm oil (CSPO). It is a family reunion of sorts,” said Sime Darby president and group chief executive officer Tan Sri Mohd Bakke Salleh in a statement.

SDP is a founder member of the Roundtable on Sustainable Palm Oil and together with NBPOL’s capacity, it can produce almost 26% of the global CSPO

output. The acquisition adds on 135,000ha of land in Papua New Guinea to SDP's total land bank.

SDP managing director Datuk Franki Anthony Dass said that NBPOL will immediately contribute to SDP's bottom line as it was a well-managed company with an experienced management team. "We have been working on identifying the synergies and our immediate priority will be to unlock value from these synergies," he said.

Apart from expanding its upstream business in Papua New Guinea, Sime Darby said that NBPOL provided SDP the opportunity to grow its downstream operations in Europe, as the former's Liverpool refinery will complement the latter's refinery in the Netherlands. NBPOL already supplies to over 110 customers in the United Kingdom and Ireland. "NBPOL has a long-standing commitment to sustainability, similar to SDP. This is a union of like-minded organisations and we are excited to be part of the Sime Darby family," said NBPOL chief executive officer Nick Thompson.

SDP will have five representatives on NBPOL's board, namely Datuk Henry Sackville Barlow (set to be appointed chairman of the board), Datuk Rashidi Che Omar, Rosely Kusip, Mohd Bakke and Franki. They will replace outgoing directors Antonio Monteiro de Castro, Datuk Kamaruzzaman Abu Kassim and Ahamad Mohamad.

Courtesy: Business News

Drone Technology Grows – May Help Malaysian Oil Palm Plantations

In 2014 investment in drone start-up companies doubled to over $100 million, according to CB Insights, and global spending on drones could top $100 billion over the next ten years as commercial uses, including those in agriculture, expand, according to BI Intelligence.

The U.S. Federal Aviation Administration (FAA), however, has yet to act finalize regulations regarding the use of drones in the U.S. and despite issuing draft rules last month, will likely take at least one more year to make rules official. This has allowed overseas companies operating in countries with looser regulations to seize opportunities and get in front of the U.S. in attracting money, innovation and development. UK-based Sky Futures has seen its business soar 700% in the past year, for example, and BioCarbon Engineering, also in the UK, plans to use drones to plant germinated seeds for reforestation. New Zealand-based Martin Aircraft tripled in value in the first days after listing last month. Meanwhile, Japan's government is planning to fast-track new regulations that would benefit its drone industry.

Now that drone technology has taken off, the real opportunity, say many in the industry, is in expanding the enabling technology's ability to help make sense of the data collected for the end-user. In Singapore, Garuda Robotics has been using drones to map the boundaries of palm oil plantations, and has developed drones that can measure the moisture in individual trees. The company is working on developing methods of using this data to extrapolate the overall health of the trees and estimate their expected yields.

These developments and others, including drones developed to create real time 3D maps of construction sites to help keep projects on schedule and cameras to track packs of stray wild dogs to protect agricultural operations, would be difficult to advance under the FAA regulations.

Courtesy: Oilseed and Grain News

Malaysian Palm Oil Exports Slump to Lowest Since 2007

Malaysian palm oil exports experienced a bigger than expected decline, to the lowest level in eight years causing a drop in crude palm oil prices.

Crude palm oil prices fell for five consecutive days after data released by the Malaysian Palm Oil Board showed the country's inventories higher than expected, falling only 1.5% to 1.74 million tons in February, when investors were expecting a decline of 6% to 1.67 million tons.

Malaysia's crude palm oil production was down 3.4% month on month in February as output was pressured by flooding. However, exports fell more than was forecasted, falling 18% in February month on month to 971,640 tons – the lowest since July 2007, on weaker demand from China, Pakistan, the EU, and the U.S., as palm oil fuel is not suitable for cold weather use.

Malaysian exports continued to be weak advancing into March as well, as reports from cargo surveyor, Intertek Testing Services showed shipments falling 12.3% in the first ten days of the month compared to the same period of time in the previous month.

Experts are not expecting a boost to palm oil pricing in the near future, seeing neither a significant decline in production, nor a significant increase in exports, and are retaining a neutral outlook on palm oil pricing.

Courtesy: oilseed and Grain news

Valorisation of healthy lipidic micro-nutrients by optimising food processing of edible oils and fats

OPTIM'OILS was coordinated by the French Institute for Fats and Oils, ITERG (Pessac, France, www. iterg.com).

The consortium was composed of 14 partners, including 9 RTD performers, 1 Food Association and 4 industrials.

1. Institut des Corps Gras, ITERG, France
2. The Swedish Institute for Food and Technology, SIK, Sweden
3. Centre de recherche et d'expérimentation sur les Oléagineux, CREOL, France
4. Asociación de Investigación de la Industria Agroalimentaria, AINIA, Spain
5. Istituto superiore di Sanità- Section of Food Science, Nutrition and Health, ISS, Italy
6. Ecole Nationale Supérieure des Industries Agricoles et Alimentaires, ENSIA, France
7. Instituto de Biologia Experimental e Tecnológica, IBET, Portugal
8. Centre de Recherche en Nutrition Humaine, CRNH, France
9. Faculté Universitaire des Sciences Agronomiques de Gembloux, FUSAGx, Belgium
10. UNILEVER, UNILEVER, The Netherlands
11. LESIEUR, LESIEUR, France
12. LESIEUR-CRISTAL, LC, Morocco
13. Ets ABDELMOULA, ABDEL, Tunisia
14. Association de Coordination Technique pour l'Industrie Agro-alimentaire, ACTIA, France

The project includes 7 WPs, 47 tasks, 443 men-months during 3,5 years and was finished in march 2010. A leaflet and a poster, the main results and the publications are available on the website www.optimoils.com.

OPTIM'OILS OBJECTIVE

The objective of OPTIM'OILS project was to develop new vegetable oils richer in natural micronutrients that have a positive effect on the prevention of the cardiovascular risk

: Phytosterols, tocopherols, phenols, phospholipids and Co-Enzyme Q10.

The OPTIM'OILS concept is an optimization of the traditional industrial process to get softer technological ways, more respecting the micronutrients' content and the quality and nutritional value of the oil, and being more respectful of the environmental impact.

OPTIM'OILS METHODOLOGY

OPTIM'OILS project adopted a methodological approach coupling analytical, technological, environmental, nutritional and food aspects:

i) Analytical objectives: OPTIM'OILS aimed to develop or improve and validate analytical methodologies for analysing the 5 micro-nutrients: phospholipids, tocopherols, phenolic compounds, sterols and Co Enzyme Q10, in different products: seeds, crude and refined oils, gums and deodistillates, from 3 oilseeds : soybean, sunflower and rapeseed.

ii) Technological & environmental objectives OPTIM'OILS aimed to test crushing and soft-refining conditions to can get optimised edible oils with higher levels of micro-nutrients with good sensorial quality and safety. In parallel, the environmental impact of the new optimized process was studied in comparison with the traditional ones. Another explored possibility was an in-situ valorization of some by-products naturally rich in micro-nutrients.

iii) Nutritional objectives: By using animal and human nutritional studies, OPTIM'OILS aimed to demonstrate that the micro-nutrients present in natural and synergistic form in edible oils, in nutritional amounts, have a real physiological interest for the prevention of cardiovascular risk and this, in complement of the beneficial role of poly-unsaturated fatty acids omega 3 & omega 6. Measure of bioavailability will be carried out as well as measure of dose-effect on various biomarkers of the cardiovascular risk.

iv) Food applications objectives: OPTIM'OILS proposes a Food Reverse Engineering approach, taking into account the impact of the industrial and culinary uses of healthy optimised oils on their micro-nutrients content. The operations tested were emulsification for sauces, crystallization for margarines, pan and deep frying and oxidation

stability during storage.

v) Innovation objectives: OPTIM'OILS can give process innovation with the proposition of some new processes softer and more respectful of the natural nutrients.

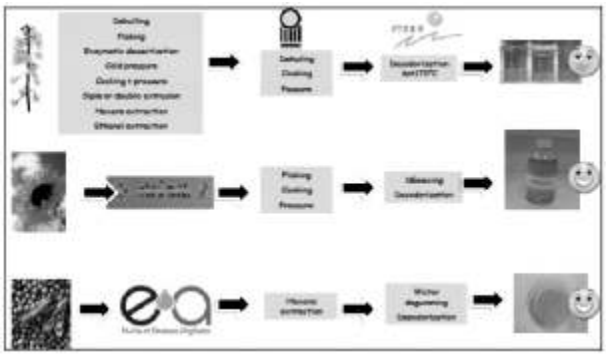
OPTIM'OILS can propose in the European market, new native optimised "healthy oils"; validated on the sensory, quality, storage stability, industrial and culinary processing, as well as for cost and safety, that will bring an added value to the consumer health.

OPTIM'OILS RESULTS

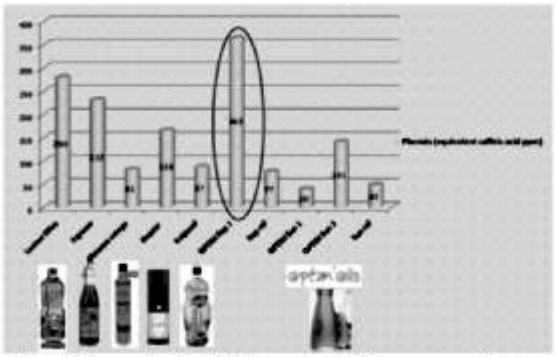
The crushing and refining conditions are optimized for rapeseed, sunflower and soybean oils to get and keep significant higher levels of micronutrients compared with the levels in the classical totally refined oils (+ 20 % to + 100 %.).

- for rapeseed oil : the crude rapeseed optim'oil, is obtained by dehulling + cooking + pressure and the final rapeseed optim'oil is just soft deodorized at 170°c.
- for sunflower oil: the process chosen by lesieur cristal is flaking + cooking + pressure and then dewaxing + soft-deodorization to obtain the final optimised sunflower oil.
- for soyabean oil : after classical crushing, ets abdelmoula proposed to keep a water degumming to eliminate the lecithin (mucilage) before a soft deodorization.

For all the 3 optimised processes, we concluded that some steps of classical crushing and refining can be suppressed; consequently the cost of production is reduced. In parallel, the quantity of by-products and co-products is also reduced. On the other hand, the sensorial quality of the sunflower and soybean optimoils is good for industrials and acceptable for consumers (color, limpidity, odor, taste), but the taste of the rapeseed optim'oil keep strong.

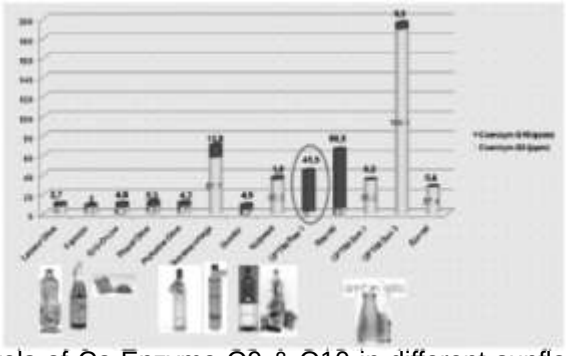


The levels of micronutrients are significantly higher in optim'oils compared with commercial refined oils or even virgin or enriched oils.



Levels of phenols in different sunflower and rapeseed optim'oils compared with some commercial oils

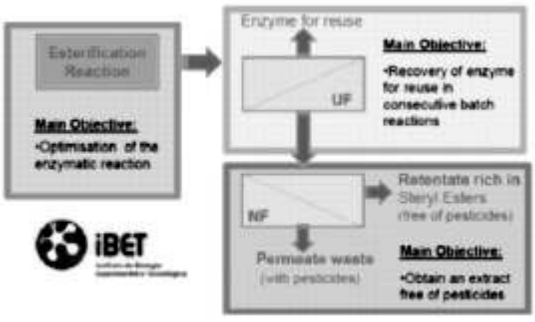
In red enclosure: an rapeseed optim'oil obtained by mechanical crushing



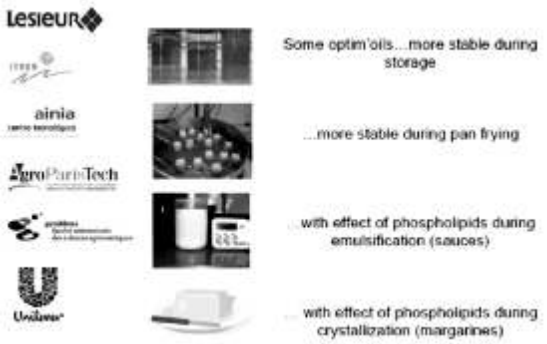
Levels of Co-Enzyme Q9 & Q10 in different sunflower and rapeseed optim'oils compared with some commercial oils

In red enclosure: an rapeseed optim'oil obtained by mechanical crushing

The process of the optim'oils is more in respect of environment with a reduction of the byproducts generation and of the energy consumption. In parallel, an innovative approach for the valorization of the deodistillate obtained as the unique by-product during the deodorization step, is proposed. It involves an "in-situ" enzymatic esterification of the free sterols with the free fatty acids, coupled with a nano filtration, to obtain a fraction rich in steryl esters (patented process of IBET).

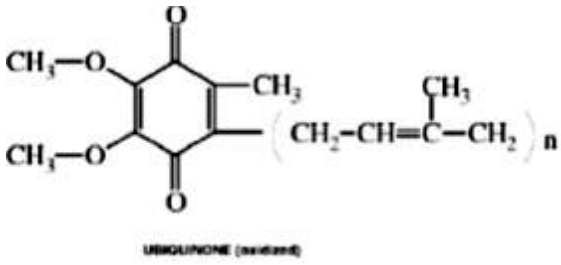


Following a correct selection and storage of the raw material (seeds), the optim'oils are in conformity with the European Regulation and Codex Alimentarius for their quality parameters (colour, acidity, oxidative level) and for the safety specifications. They can be used in different food applications: cooking, pan frying, sauces, margarines...



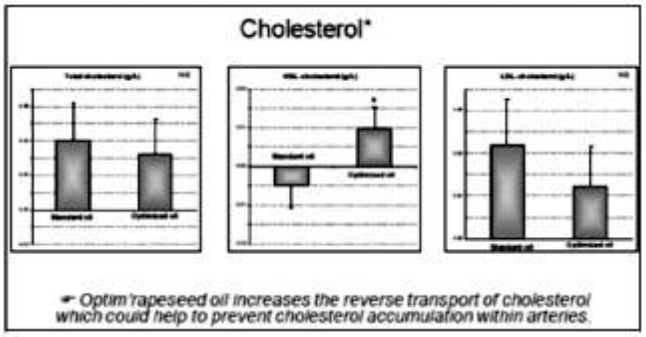
The most innovative oily micronutrients studied in the project are the phenolic compounds and the Co-Enzyme Q10 or ubiquinone.

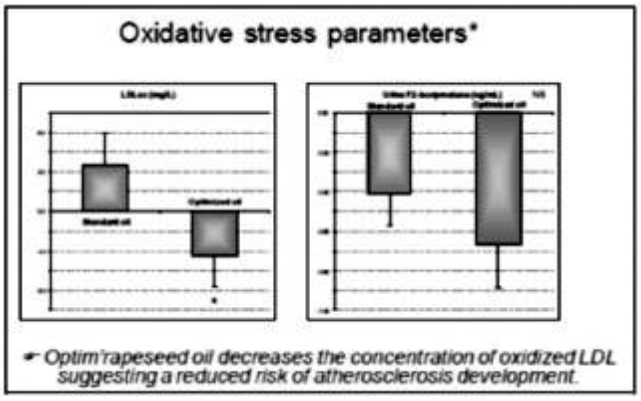
For the both, a new analytical method is now available for oils, seeds and by-products. The phenolic compounds are good antioxidants in oils, in synergistic action with tocopherols and are able to protect poly-unsaturated fatty acids during storage and culinary applications (sauces, cooking, pan-frying).



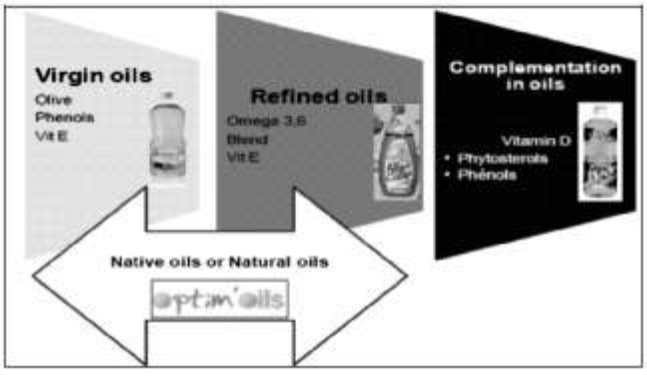
A study on animal model has demonstrated a positive effect of different sunflower, soybean and rapeseed optim'oils richer in micronutrients, on different biomarkers of the oxidative stress.

A long term clinical study showed that a rapeseed optim'oil enriched with antioxidants can protect human lipids from peroxidation and therefore seems to reduce the risk of cardiovascular disease.





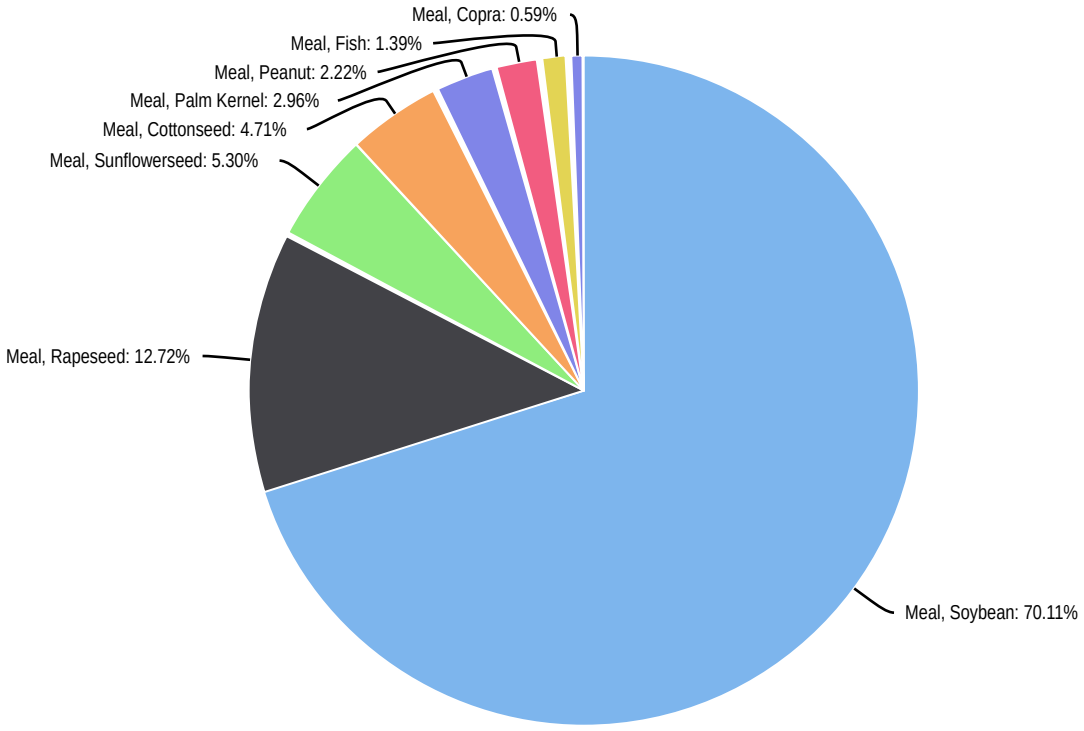
These first interesting results must be validated in further projects and the future marketing, labelling and regulation status of the optim'oils must be more studied. The optim'oils can be defined as natural and native oils. The price of the optim'oils should be intermediate between the price of virgin oils and the price of refined oils.



Courtesy: Optim' oil Project

Important Figures

Meal and Cake Production commodity wise in 2015/16 MY



Worldwide Meal & Cake. Production, in 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	305,447	+8,073 (+2.71%)	297,374	282,519
Beginning Stocks	13,681	+963 (+7.57%)	12,718	11,238
Imports	83,439	+3,127 (+3.89%)	80,312	78,273
Total Supply	402,567	+12,163 (+3.11%)	390,404	372,030
Exports	87,994	+2,763 (+3.24%)	85,231	82,066
Domestic Consumption	301,595	+10,103 (+3.46%)	291,492	277,246
Industrial Dom. Cons.	2,883	+11 (+0.38%)	2,872	2,890
Food Use Dom. Cons.	554	-27 (-4.64%)	581	522
Feed Waste Dom. Cons.	298,158	+10,119 (+3.51%)	288,039	273,834
Crush	446,505	+9,037 (+2.06%)	437,468	419,889
Total Distribution	402,567	+12,163 (+3.11%)	390,404	372,030
Ending Stocks	12,978	-703 (-5.13%)	13,681	12,718
SME	283,683	+10,542 (+3.85%)	273,141	259,471
Extr. Rate, 999.9999	103	+3 (+3.00%)	100	104
Catch For Reduction	14,627	-184 (-1.24%)	14,811	14,570

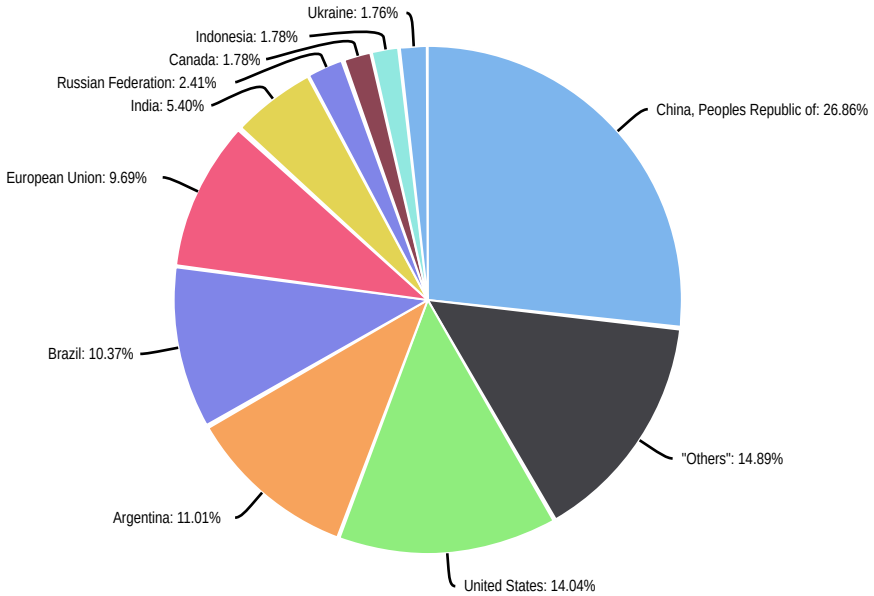
World's Meal&Cake Production is projected at 305,447 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

World's Meal&Cake Production forecast rose by +8,073 (+2.71%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Changes for 2015/16MY in main Production countries:

- - China, Peoples Republic of, Production are up by +3,258 (+4.12%) thd. mt to 82,263 thd. mt
- - United States's Production are down by -45 (-0.10%) thd. mt to 42,485 thd. mt
- - Argentina's Production are up by +2,270 (+7.24%) thd. mt to 33,606 thd. mt
- - Brazil's Production are up by +57 (+0.17%) thd. mt to 31,884 thd. mt
- - European Union's Production are down by -604 (-2.01%) thd. mt to 29,435 thd. mt

Meal and Cake Producing Main Countries in 2015/16 MY



Country wise Meal & Cake Production, in 1000 MT

Country	2015/16	Change	2014/15	2013/14
China, Peoples Republic of	82,263	+3,258 (+4.12%)	79,005	75,200
United States	42,485	-45 (-0.10%)	42,530	39,387
Argentina	33,606	+2,270 (+7.24%)	31,336	29,089
Brazil	31,884	+57 (+0.17%)	31,827	29,934
European Union	29,435	-604 (-2.01%)	30,039	29,132
India	17,191	+1,455 (+9.24%)	15,736	16,610
Russian Federation	7,270	+130 (+1.82%)	7,140	6,937
Indonesia	5,452	+345 (+6.75%)	5,107	4,801
Canada	5,235	-250 (-4.55%)	5,485	5,200
Ukraine	5,075	+46 (+0.91%)	5,029	5,377

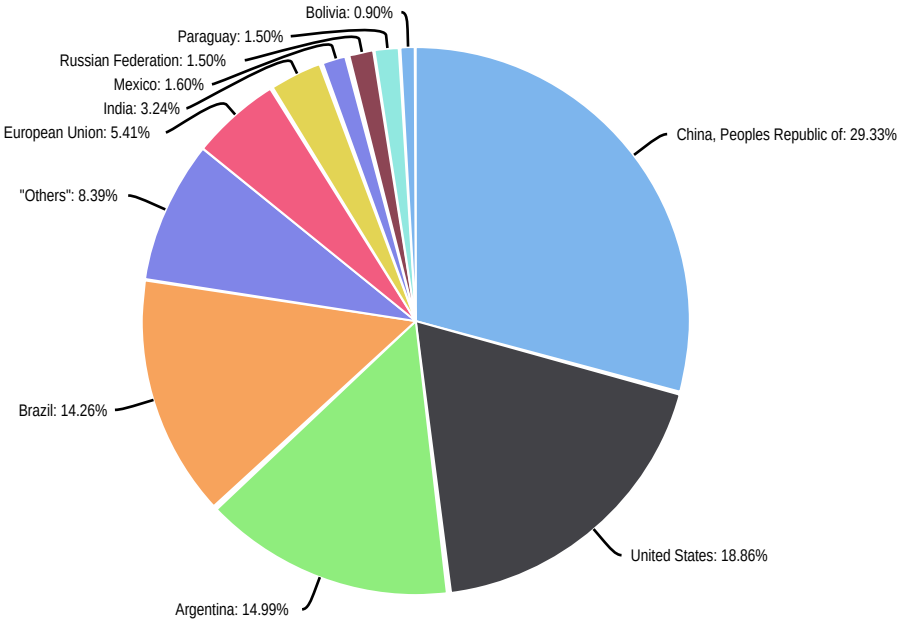
Meal, Soybean. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	214,109	+10,416 (+5.11%)	203,693	189,449
Beginning Stocks	11,699	+1,066 (+10.02%)	10,633	9,713
Imports	62,967	+2,859 (+4.75%)	60,108	57,830
Total Supply	288,775	+14,341 (+5.22%)	274,434	256,992
Exports	66,213	+2,856 (+4.50%)	63,357	60,052
Domestic Consumption	211,284	+11,906 (+5.97%)	199,378	186,307
Industrial Dom. Cons.	1,312	+20 (+1.54%)	1,292	1,272
Food Use Dom. Cons.	539	-27 (-4.77%)	566	507
Feed Waste Dom. Cons.	209,433	+11,913 (+6.03%)	197,520	184,528
Crush	272,176	+13,288 (+5.13%)	258,888	241,665
Total Distribution	288,775	+14,341 (+5.22%)	274,434	256,992
Ending Stocks	11,278	-421 (-3.59%)	11,699	10,633
SME	211,284	+11,906 (+5.97%)	199,378	186,307
Extr. Rate, 999.9999	51	0 (0.0%)	51	51

World's Meal, Soybean Production is projected at 214,109 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.
World's Meal, Soybean Production forecast rose by +10,416 (+5.11%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.
Changes for 2015/16MY in main Production countries:

- - China, Peoples Republic of, Production are up by +4,190 (+7.12%) thd. mt to 62,960 thd. mt
- - United States's Production are up by +23 (+0.05%) thd. mt to 40,120 thd. mt
- - Argentina's Production are up by +2,290 (+7.66%) thd. mt to 32,180 thd. mt
- - Brazil's Production are up by +80 (+0.26%) thd. mt to 30,610 thd. mt
- - European Union's Production are up by +475 (+4.32%) thd. mt to 11,455 thd. Mt

Meal, Soybean. Production, country wise in 1000 MT



Meal&Cake. China, Peoples Republic of. Meal, Soybean. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	62,960	+4,190 (+7.12%)	58,770	54,531
Imports	20	-40 (-66.66%)	60	20
Total Supply	62,980	+4,150 (+7.05%)	58,830	54,551
Exports	1,600	-100 (-5.88%)	1,700	2,017
Domestic Consumption	61,380	+4,250 (+7.43%)	57,130	52,534
Industrial Dom. Cons.	1,000	+20 (+2.04%)	980	960
Feed Waste Dom. Cons.	60,380	+4,230 (+7.53%)	56,150	51,574
Crush	79,500	+5,300 (+7.14%)	74,200	68,850
Total Distribution	62,980	+4,150 (+7.05%)	58,830	54,551
SME	61,380	+4,250 (+7.43%)	57,130	52,534
Extr. Rate, 999.9999	1	0 (0.0%)	1	1

China, Peoples Republic of, Meal, Soybean Production is projected at 62,960 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.
China, Peoples Republic of, Meal, Soybean Production forecast rose by +4 190 (+7,12%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Meal & Cake. United States. Meal, Soybean. Production. 1000 MT

Production	40,120	+23 (+0.05%)	40,097	36,909
Beginning Stocks	272	+45 (+19.82%)	227	249
Imports	295	-23 (-7.23%)	318	347
Total Supply	40,687	+45 (+0.11%)	40,642	37,505
Exports	10,569	-907 (-7.90%)	11,476	10,474
Domestic Consumption	29,846	+952 (+3.29%)	28,894	26,804
Feed Waste Dom. Cons.	29,846	+952 (+3.29%)	28,894	26,804
Crush	50,621	+408 (+0.81%)	50,213	47,192
Total Distribution	40,687	+45 (+0.11%)	40,642	37,505
Ending Stocks	272	0 (0.0%)	272	227
SME	29,846	+952 (+3.29%)	28,894	26,804
Extr. Rate, 999.9999	1	0 (0.0%)	1	1

United States's Meal, Soybean Production is projected at 39,666 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.
United States's Meal, Soybean Production forecast fell by -23 (-0,05%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Meal&Cake. Argentina. Meal, Soybean. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	32,180	+2,290 (+7.66%)	29,890	27,892
Beginning Stocks	4,280	-183 (-4.10%)	4,463	3,543
Imports	-	-	-	-
Total Supply	36,460	+2,107 (+6.13%)	34,353	31,435
Exports	30,200	+2,350 (+8.43%)	27,850	24,972
Domestic Consumption	2,500	+277 (+12.46%)	2,223	2,000
Feed Waste Dom. Cons.	2,500	+277 (+12.46%)	2,223	2,000
Crush	41,500	+2,700 (+6.95%)	38,800	36,173
Total Distribution	36,460	+2,107 (+6.13%)	34,353	31,435
Ending Stocks	3,760	-520 (-12.14%)	4,280	4,463
SME	2,500	+277 (+12.46%)	2,223	2,000
Extr. Rate, 999.9999	1	0 (0.0%)	1	1

Argentina's Meal, Soybean Production is projected at 32,180 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.
Argentina's Meal, Soybean Production forecast rose by +2,290 (+7.66%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Meal&Cake. Brazil. Meal, Soybean. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	30,610	+80 (+0.26%)	30,530	28,540
Beginning Stocks	3,640	+575 (+18.76%)	3,065	3,098
Imports	25	0 (0.0%)	25	25
Total Supply	34,275	+655 (+1.94%)	33,620	31,663
Exports	15,200	+200 (+1.33%)	15,000	13,948
Domestic Consumption	15,400	+420 (+2.80%)	14,980	14,650
Feed Waste Dom. Cons.	15,400	+420 (+2.80%)	14,980	14,650
Crush	39,550	+100 (+0.25%)	39,450	36,861
Total Distribution	34,275	+655 (+1.94%)	33,620	31,663
Ending Stocks	3,675	+35 (+0.96%)	3,640	3,065
SME	15,400	+420 (+2.80%)	14,980	14,650
Extr. Rate, 999.99991	0 (0.0%)	1	1	

Brazil's Meal, Soybean Production is projected at 30,610 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.
Brazil's Meal, Soybean Production forecast rose by +80 (+0.26%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Meal&Cake. European Union. Meal, Soybean. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	11,455	+475 (+4.32%)	10,980	10,614
Beginning Stocks	318	+148 (+87.05%)	170	120
Imports	20,300	+750 (+3.83%)	19,550	18,175
Total Supply	32,073	+1,373 (+4.47%)	30,700	28,909
Exports	400	+60 (+17.64%)	340	297
Domestic Consumption	31,342	+1,300 (+4.32%)	30,042	28,442
Industrial Dom. Cons.	10	0 (0.0%)	10	10
Food Use Dom. Cons.	32	0 (0.0%)	32	32
Feed Waste Dom. Cons.	31,300	+1,300 (+4.33%)	30,000	28,400
Crush	14,500	+600 (+4.31%)	13,900	13,436
Total Distribution	32,073	+1,373 (+4.47%)	30,700	28,909
Ending Stocks	331	+13 (+4.08%)	318	170
SME	31,342	+1,300 (+4.32%)	30,042	28,442
Extr. Rate, 999.9999	1	0 (0.0%)	1	1

European Union's Meal, Soybean Production is projected at 11,140 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.
European Union's Meal, Soybean Production forecast rose by +275 (+2,53%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Meal&Cake. India. Meal, Soybean. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	7,280	+1,360 (+22.97%)	5,920	6,640
Beginning Stocks	319	+117 (+57.92%)	202	347
Imports	7	0 (0.0%)	7	7
Total Supply	7,606	+1,477 (+24.09%)	6,129	6,994
Exports	2,025	+825 (+68.75%)	1,200	2,742
Domestic Consumption	5,255	+645 (+13.99%)	4,610	4,050
Food Use Dom. Cons.	280	+20 (+7.69%)	260	200
Feed Waste Dom. Cons.	4,975	+625 (+14.36%)	4,350	3,850
Crush	9,100	+1,700 (+22.97%)	7,400	8,300
Total Distribution	7,606	+1,477 (+24.09%)	6,129	6,994
Ending Stocks	326	+7 (+2.19%)	319	202
SME	5,255	+645 (+13.99%)	4,610	4,050
Extr. Rate, 999.9999	1	0 (0.0%)	1	1

India's Meal, Soybean Production is projected at 7,280 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

India's Meal, Soybean Production forecast rose by +1 360 (+22,97%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Meal, Rapeseed. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	38,469	-2,051 (-5.06%)	40,520	39,435
Beginning Stocks	562	+133 (+31.00%)	429	391
Imports	5,525	-159 (-2.79%)	5,684	5,923
Total Supply	44,556	-2,077 (-4.45%)	46,633	45,749
Exports	5,618	-119 (-2.07%)	5,737	6,072
Domestic Consumption	38,512	-1,822 (-4.51%)	40,334	39,248
Industrial Dom. Cons.	756	-10 (-1.30%)	766	781
Feed Waste Dom. Cons.	37,756	-1,812 (-4.57%)	39,568	38,467
Crush	65,255	-3,494 (-5.08%)	68,749	66,804
Total Distribution	44,556	-2,077 (-4.45%)	46,633	45,749
Ending Stocks	426	-136 (-24.19%)	562	429
SME	27,399	-1,299 (-4.52%)	28,698	27,925
Extr. Rate, 999.9999	22	0 (0.0%)	22	22

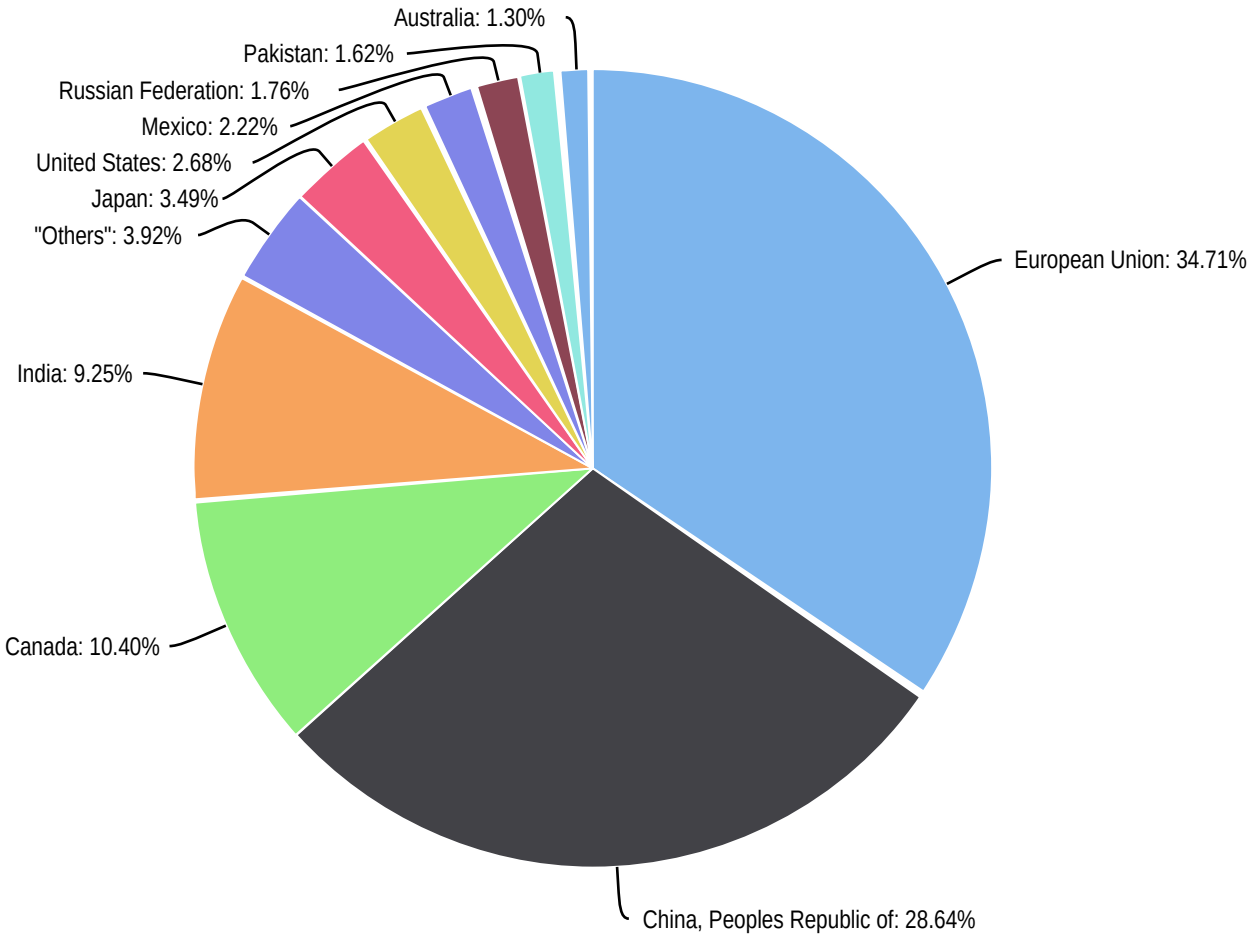
World's Meal, Rapeseed Production is projected at 38,469 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

World's Meal, Rapeseed Production forecast fell by -2,051 (-5.06%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Changes for 2015/16MY in main Production countries:

- - European Union's Production are down by -972 (-6.76%) thd. mt to 13,398 thd. mt
- - China, Peoples Republic of, Production are down by -530 (-4.60%) thd. mt to 10,975 thd. mt
- - Canada's Production are down by -255 (-6.24%) thd. mt to 3,830 thd. mt
- - India's Production are up by +59 (+1.61%) thd. mt to 3,719 thd. mt
- - Japan Production are unchanged

Meal, Rapeseed. Production. Main countries in 2015/16MY



Meal&Cake. European Union. Meal, Rapeseed. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	13,398	-972 (-6.76%)	14,370	13,780
Beginning Stocks	215	0 (0.0%)	215	89
Imports	450	+20 (+4.65%)	430	457
Total Supply	14,063	-952 (-6.34%)	15,015	14,326
Exports	300	-100 (-25.00%)	400	361
Domestic Consumption	13,600	-800 (-5.55%)	14,400	13,750
Industrial Dom. Cons.	-	-	-	-
Feed Waste Dom. Cons.	13,600	-800 (-5.55%)	14,400	13,750
Crush	23,300	-1,690 (-6.76%)	24,990	23,966
Total Distribution	14,063	-952 (-6.34%)	15,015	14,326
Ending Stocks	163	-52 (-24.18%)	215	215
SME	9,676	-570 (-5.56%)	10,246	9,783
Extr. Rate, 999.9999	1	0 (0.0%)	1	1

European Union's Meal, Rapeseed Production is projected at 13,800 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

European Union's Meal, Rapeseed Production forecast fell by -403 (-2,83%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Meal&Cake. China, Peoples Republic of. Meal, Rapeseed. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	10,975	-530 (-4.60%)	11,505	11,631
Imports	125	+25 (+25.00%)	100	314
Total Supply	11,100	-505 (-4.35%)	11,605	11,945
Exports	20	-10 (-33.33%)	30	37
Domestic Consumption	11,080	-495 (-4.27%)	11,575	11,908
Industrial Dom. Cons.	450	0 (0.0%)	450	440
Feed Waste Dom. Cons.	10,630	-495 (-4.44%)	11,125	11,468
Crush	17,450	-850 (-4.64%)	18,300	18,500
Total Distribution	11,100	-505 (-4.35%)	11,605	11,945
SME	7,883	-353 (-4.28%)	8,236	8,473
Extr. Rate, 999.9999	1	0 (0.0%)	1	1

China, Peoples Republic of, Meal, Rapeseed Production is projected at 10,975 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.
China, Peoples Republic of, Meal, Rapeseed Production forecast fell by -530 (-4,60%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Meal&Cake. Canada. Meal, Rapeseed. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	3,830	-255 (-6.24%)	4,085	3,925
Beginning Stocks	185	+87 (+88.77%)	98	101
Imports	12	-10 (-45.45%)	22	11
Total Supply	4,027	-178 (-4.23%)	4,205	4,037
Exports	3,420	-80 (-2.28%)	3,500	3,424
Domestic Consumption	515	-5 (-0.96%)	520	515
Feed Waste Dom. Cons.	515	-5 (-0.96%)	520	515
Crush	6,800	-450 (-6.20%)	7,250	6,979
Total Distribution	4,027	-178 (-4.23%)	4,205	4,037
Ending Stocks	92	-93 (-50.27%)	185	98
SME	366	-4 (-1.08%)	370	366
Extr. Rate, 999.9999	1	0 (0.0%)	1	1

Canada's Meal, Rapeseed Production is projected at 3,830 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

Canada's Meal, Rapeseed Production forecast fell by -255 (-6,24%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Meal&Cake. India. Meal, Rapeseed. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	3,719	+59 (+1.61%)	3,660	3,720
Beginning Stocks	20	0 (0.0%)	20	30
Total Supply	3,739	+59 (+1.60%)	3,680	3,750
Exports	1,050	+125 (+13.51%)	925	1,327
Domestic Consumption	2,669	-66 (-2.41%)	2,735	2,403
Feed Waste Dom. Cons.	2,669	-66 (-2.41%)	2,735	2,403
Crush	6,300	+100 (+1.61%)	6,200	6,300
Total Distribution	3,739	+59 (+1.60%)	3,680	3,750
Ending Stocks	20	0 (0.0%)	20	20
SME	1,899	-47 (-2.41%)	1,946	1,710
Extr. Rate, 999.9999	1	0 (0.0%)	1	1

India's Meal, Rapeseed Production is projected at 3,719 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

India's Meal, Rapeseed Production forecast rose by +59 (+1,61%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Meal&Cake. Japan. Meal, Rapeseed. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	1,360	0 (0.0%)	1,360	1,353
Beginning Stocks	28	+13 (+86.66%)	15	18
Imports	75	0 (0.0%)	75	76
Total Supply	1,463	+13 (+0.89%)	1,450	1,447
Exports	-	-	2	2
Domestic Consumption	1,420	0 (0.0%)	1,420	1,430
Industrial Dom. Cons.	250	-10 (-3.84%)	260	280
Feed Waste Dom. Cons.	1,170	+10 (+0.86%)	1,160	1,150
Crush	2,450	0 (0.0%)	2,450	2,400
Total Distribution	1,463	+13 (+0.89%)	1,450	1,447
Ending Stocks	43	+15 (+53.57%)	28	15
SME	1,010	0 (0.0%)	1,010	1,017
Extr. Rate, 999.9999	1	0 (0.0%)	1	1

Japan's Meal, Rapeseed Production is projected at 1,360 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

Japan's Meal, Rapeseed Production forecast unchanged in the season of 2015/16 in comparison with the season of 2014/15.

Meal, Sunflowerseed. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	16,027	+17 (+0.10%)	16,010	16,769
Beginning Stocks	578	-267 (-31.59%)	845	356
Imports	5,695	+109 (+1.95%)	5,586	5,538
Total Supply	22,300	-141 (-0.62%)	22,441	22,663
Exports	6,104	-140 (-2.24%)	6,244	6,204
Domestic Consumption	15,801	+182 (+1.16%)	15,619	15,614
Industrial Dom. Cons.	62	0 (0.0%)	62	64
Food Use Dom. Cons	-	-	-	-
Feed Waste Dom. Cons.	15,739	+182 (+1.16%)	15,557	15,550
Crush	36,530	-19 (-0.05%)	36,549	38,372
Total Distribution	22,300	-141 (-0.62%)	22,441	22,663
Ending Stocks	395	-183 (-31.66%)	578	845
SME	14,920	+173 (+1.17%)	14,747	14,743
Extr. Rate, 999.9999	4	0 (0.0%)	4	6

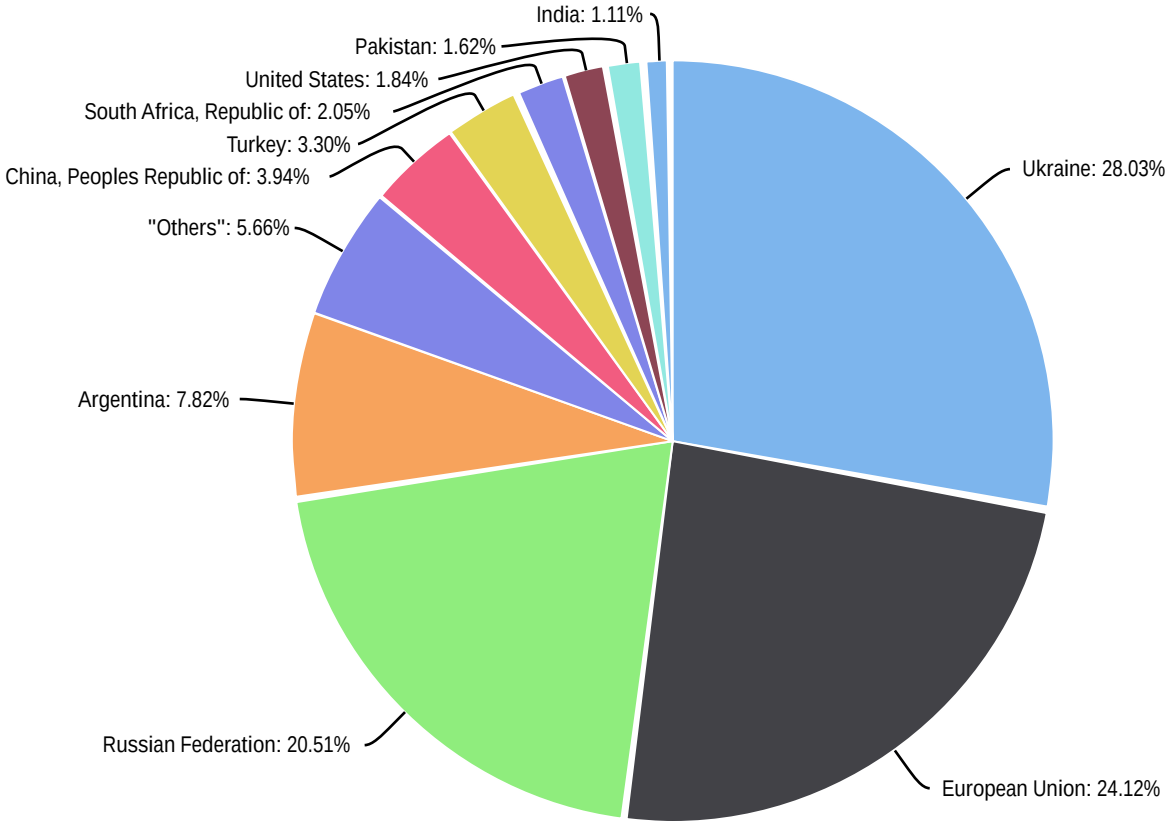
World's Meal, Sunflowerseed Production is projected at 16,027 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

World's Meal, Sunflowerseed Production forecast rose by +17 (+0,10%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Changes for 2015/16MY in main Production countries:

- - Ukraine's Production are down by -60 (-1.40%) thd. mt to 4,200 thd. mt
- - European Union's Production are down by -107 (-2.62%) thd. mt to 3,965 thd. mt
- - Russian Federation's Production are up by +115 (+3.57%) thd. mt to 3,330 thd. mt
- - Argentina's Production are down by -20 (-1.63%) thd. mt to 1,200 thd. mt
- - China, Peoples Republic of, Production are up by +27 (+4.05%) thd. mt to 693 thd. mt

Meal, Sunflowerseed. Production. Main countries in 2015/16MY



Meal&Cake. Ukraine. Meal, Sunflowerseed. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	4,200	-60 (-1.40%)	4,260	4,700
Beginning Stocks	262	-140 (-34.82%)	402	-
Imports	-	-	-	-
Total Supply	4,462	-200 (-4.29%)	4,662	4,700
Exports	3,700	-50 (-1.33%)	3,750	3,648
Domestic Consumption	650	0 (0.0%)	650	650
Feed Waste Dom. Cons.	650	0 (0.0%)	650	650
Crush	10,000	-200 (-1.96%)	10,200	11,250
Total Distribution	4,462	-200 (-4.29%)	4,662	4,700
Ending Stocks	112	-150 (-57.25%)	262	402
SME	614	0 (0.0%)	614	614
Extr. Rate, 999.9999	-	-	-	-

Ukraine's Meal, Sunflowerseed Production is projected at 4,200 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

Ukraine's Meal, Sunflowerseed Production forecast fell by -60 (-1,40%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Meal&Cake. European Union. Meal, Sunflowerseed. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	3,965	-107 (-2.62%)	4,072	4,130
Beginning Stocks	150	-48 (-24.24%)	198	77
Imports	3,400	0 (0.0%)	3,400	3,364
Total Supply	7,515	-155 (-2.02%)	7,670	7,571
Exports	180	-50 (-21.73%)	230	173
Domestic Consumption	7,220	-70 (-0.96%)	7,290	7,200
Industrial Dom. Cons.	-	-	-	-
Feed Waste Dom. Cons.	7,220	-70 (-0.96%)	7,290	7,200
Crush	7,300	-200 (-2.66%)	7,500	7,606
Total Distribution	7,515	-155 (-2.02%)	7,670	7,571
Ending Stocks	115	-35 (-23.33%)	150	198
SME	6,817	-66 (-0.95%)	6,883	6,798
Extr. Rate, 999.9999	1	0 (0.0%)	1	1

European Union's Meal, Sunflowerseed Production is projected at 3,965 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

European Union's Meal, Sunflowerseed Production forecast fell by -107 (-2,62%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Meal&Cake. Russian Federation. Meal, Sunflowerseed. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	3,330	+115 (+3.57%)	3,215	3,466
Beginning Stocks	58	-35 (-37.63%)	93	-
Imports	-	-	-	6
Total Supply	3,388	+80 (+2.41%)	3,308	3,472
Exports	1,500	0 (0.0%)	1,500	1,729
Domestic Consumption	1,850	+100 (+5.71%)	1,750	1,650
Feed Waste Dom. Cons.	1,850	+100 (+5.71%)	1,750	1,650
Crush	8,950	+300 (+3.46%)	8,650	9,330
Total Distribution	3,388	+80 (+2.41%)	3,308	3,472
Ending Stocks	38	-20 (-34.48%)	58	93
SME	1,747	+95 (+5.75%)	1,652	1,558
Extr. Rate, 999.9999	-	-	-	-

Russian Federation's Meal, Sunflowerseed Production is projected at 3,330 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

Russian Federation's Meal, Sunflowerseed Production forecast rose by +115 (+3.57%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Meal&Cake. Argentina. Meal, Sunflowerseed. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	1,200	-20 (-1.63%)	1,220	962
Beginning Stocks	54	-10 (-15.62%)	64	197
Total Supply	1,254	-30 (-2.33%)	1,284	1,159
Exports	460	-40 (-8.00%)	500	365
Domestic Consumption	740	+10 (+1.36%)	730	730
Feed Waste Dom. Cons.	740	+10 (+1.36%)	730	730
Crush	2,700	-100 (-3.57%)	2,800	2,211
Total Distribution	1,254	-30 (-2.33%)	1,284	1,159
Ending Stocks	54	0 (0.0%)	54	64
SME	699	+10 (+1.45%)	689	689
Extr. Rate, 999.9999	-	-	-	-

Argentina's Meal, Sunflowerseed Production is projected at 1,200 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

Argentina's Meal, Sunflowerseed Production forecast fell by -20 (-1,63%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Meal&Cake. China, Peoples Republic of. Meal, Sunflowerseed. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	693	+27 (+4.05%)	666	728
Imports	-	-	-	2
Total Supply	693	+27 (+4.05%)	666	730
Exports	-	-	-	1
Domestic Consumption	693	+27 (+4.05%)	666	729
Industrial Dom. Cons.	62	0 (0.0%)	62	64
Feed Waste Dom. Cons.	631	+27 (+4.47%)	604	665
Crush	1,280	+51 (+4.14%)	1,229	1,343
Total Distribution	693	+27 (+4.05%)	666	730
SME	654	+25 (+3.97%)	629	688
Extr. Rate, 999.9999	1	0 (0.0%)	1	1

China, Peoples Republic of, Meal, Sunflowerseed Production is projected at 693 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

China, Peoples Republic of, Meal, Sunflowerseed Production forecast rose by +27 (+4.05%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Meal&Cake. India. Meal, Sunflowerseed. Production. 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	220	0 (0.0%)	220	280
Imports	40	0 (0.0%)	40	41
Total Supply	260	0 (0.0%)	260	321
Exports	5	0 (0.0%)	5	6
Domestic Consumption	255	0 (0.0%)	255	315
Feed Waste Dom. Cons.	255	0 (0.0%)	255	315
Crush	460	0 (0.0%)	460	585
Total Distribution	260	0 (0.0%)	260	321
SME	241	0 (0.0%)	241	297
Extr. Rate, 999.9999	-	-	-	-

India's Meal, Sunflowerseed Production is projected at 220 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

India's Meal, Sunflowerseed Production forecast unchanged in the season of 2015/16 in comparison with the season of 2014/15.

Health Tips

Mouse study suggests that emulsifiers alter gut bacteria, leading to the inflammatory bowel condition colitis.

Artificial preservatives used in many processed foods could increase the risk of inflammatory bowel diseases and metabolic disorders, according to research published on 25 February in Nature1. In a study done in mice, chemicals known as emulsifiers were found to alter the make-up of bacteria in the colon — the first time that these additives have been shown to affect health directly.

About 15 different emulsifiers are commonly used in processed Western foods for purposes such as smoothing the texture of ice cream and preventing mayonnaise from separating. Regulatory agencies such as the US Food and Drug Administration (FDA) rule that emulsifiers are “generally regarded as safe”, because there is no evidence that they increase the risk of cancer or have toxic effects in mammals.

But when immunologist Andrew Gewirtz at Georgia State University in Atlanta and his colleagues fed common emulsifiers carboxymethylcellulose and polysorbate-80 to mice, they found evidence that the chemicals affected the animals' health. Although their diet was not otherwise changed, healthy mice whose water contained the chemicals became obese and developed metabolic problems such as glucose intolerance. In mice genetically engineered to be prone to inflammatory gut diseases, emulsifiers also seemed to increase the severity and

The most severe health effects were seen in mice that consumed the chemicals at a level similar to a person whose diet consists of only ice cream, says Gewirtz. But the researchers saw effects even at one-tenth of the concentration of emulsifiers that the FDA allows in a food product.

Colonic colonies

To understand why emulsifiers affected the health of mice, researchers analysed bacteria from the animals' colons. They found less diversity in the microbial species than in healthy mice, and found evidence that the microbes had migrated closer the cells lining the gut. Gewirtz and his colleagues suspect that the emulsifiers can break down the heavy mucus that lines the mammalian gut and prevents bacteria from coming into contact with gut cells. If this happens, the bacteria cause inflammation in the gut, which can also lead to changes in metabolism.

Gewirtz says that previous studies may have missed these links because newly developed food additives are tested in large swathes of the population, masking any subtle effects in people whose genetics or gut-microbe composition predispose them to these diseases. For regulators, he says, “the idea that a subset of the population may be sensitive isn’t on the radar.”

This lack of specificity could explain why nutritionists and public-health agencies are constantly revising their dietary guidelines — just this month, for example, an advisory council to the US government recommended eliminating guidelines on cholesterol consumption. “If you look over a 50-year perspective, you would see that the recommendations go back and forth, back and forth,” says immunologist Eran Elinav of the Weizmann Institute of Science in Rehovot, Israel. “No one is lying or cheating, many of these studies are well-designed studies, but they all look at large populations.”

Last year, Elinav and computational biologist Eran Segal, a colleague at the Weizmann Institute, found that artificial sweeteners such as saccharin can cause metabolic diseases such as obesity and diabetes by changing the make-up of bacteria in the gut in both mice and humans2. They are now compiling a database of genetic and microbiome data from about 1,000 volunteers, measuring their metabolic response to different test foods. They hope that this will eventually allow nutritionists to make specific dietary recommendations for individuals based on these parameters.

Additive problems

Elinav and Segal hope to incorporate consumption of emulsifiers, sweeteners and other artificial additives into their study, but caution that there are many components to inflammatory and metabolic diseases. “This is for sure not the only driving factor” for inflammatory bowel disease, Elinav says.

Gewirtz says that many more human and animal studies need to be completed before regulatory agencies would consider changing how additives are approved — after all, removing preservatives from foods would cause them to rot sooner, posing a different health risk. He hopes to do a study in humans soon and is already collecting biopsies from surgery patients to study where different bacteria live in the colon.

But the findings have been enough to convince Gewirtz and co-author Benoit Chassaing, a microbiologist at Georgia State, to start checking the labels of the foods they buy, although both say they are not trying to eliminate emulsifiers entirely. It is not easy to find emulsifier-free food, Gewirtz says, and products marketed as 'organic' are just as likely to contain these agents. “When it comes to people making their own decisions, between our studies and others out there, it’s better to eat less processed food,” he says.

Courtesy: The Nature

Full Circle on What’s Best to Eat

Nina Teicholz criticizes the American dietary guidelines,

based partly on Harvard cohort studies. Compelling data from a large randomized trial — the Predimed trial from Spain — showed that the Mediterranean diet, emphasizing nuts, olive oil, fruits, vegetables and legumes, and discouraging red meat and sugary foods, dramatically cut cardiovascular disease. These results are quite similar to the Harvard cohort studies, which also provided strong evidence for the adverse effects of sugar, refined carbohydrates and trans fat.

In attacking the Harvard studies, Ms. Teicholz quotes the official-sounding National Institute of Statistical Sciences, a private institute. In contrast, the National Institutes of Health, the major federal biomedical research agency, recently provided additional support to the Harvard studies after rigorous peer review, recognizing the high-quality science.

The old diet advice — fat is bad — was wrong. But this new oversimplification — fat isn't bad, carbs are bad — is also wrong. Some fats (polyunsaturates) are essential and some are harmful (trans and saturated), and some carbs are harmful (sugar) and some are helpful (whole grains). More meat and full-fat dairy is bad advice that has no basis in science.

Courtesy: New York Times

Scientists have discovered a simple way to cook rice that dramatically cuts the calories

Rice, the lifeblood of so many nations' cuisines, is perhaps the most ubiquitous food in the world. In Asia, where an estimated 90 percent of all rice is consumed, the pillowy grains are part of almost every meal. In the Caribbean, where the starch is often mixed with beans, it's a staple too. Even here in the United States, where people eat a comparatively modest amount of rice, plenty is still consumed.

Rice is popular because it's malleable—it pairs well with a lot of different kinds of food—and it's relatively cheap. But like other starch-heavy foods, it has one central flaw: it isn't that good for you. White rice consumption, in particular, has been linked to a higher risk of diabetes. A cup of the cooked grain carries with it roughly 200 calories, most of which comes in the form of starch, which turns into sugar, and often thereafter body fat.

But what if there were a simple way to tweak rice ever so slightly to make it much healthier?

An undergraduate student at the College of Chemical Sciences in Sri Lanka and his mentor have been tinkering with a new way to cook rice that can reduce its calories by as much as 50 percent and even offer a few other added health benefits. The ingenious method, which at its core is just a simple manipulation of chemistry, involves only a couple easy steps in practice.

"What we did is cook the rice as you normally do, but when the water is boiling, before adding the raw rice, we added coconut oil—about 3 percent of the weight of the rice you're going to cook," said Sudhair James, who presented his preliminary research at National Meeting & Exposition of the American Chemical Society (ACS) on Monday. "After it was ready, we let it cool in the refrigerator for about 12 hours. That's it."

How does it work?

To understand what's going on, you need to understand a bit of food chemistry.

Not all starches, as it happens, are created equal. Some, known as digestible starches, take only a little time to digest, are quickly turned into glucose, and then later glycogen. Excess glycogen ends up adding to the size of our guts if we don't expend enough energy to burn it off. Other starches, meanwhile, called resistant starches, take a long time for the body to process, aren't converted into glucose or glycogen because we lack the ability to digest them, and add up to fewer calories.

A growing body of research, however, has shown that it might be possible to change the types of starches found in foods by modifying how they are prepared. At the very least, we know that there are observable changes when certain foods are cooked different ways.

Potatoes, for instance, go from having the right kind of starch to the less healthful kind when they are cooked or mashed (sigh, I know). The process of heating and cooling certain vegetables, like peas and sweet potatoes, can also alter the amount of resistant (see: good) starches, according to a 2009 study. And rice, depending on the method of preparation, undergoes observable chemical changes. Most notably, fried rice and pilaf style rice have a greater proportion of resistant starch than the most commonly eaten type, steamed rice, as strange as that might seem.

"If you can reduce the digestible starch in something like steamed rice, you can reduce the calories," said Dr. Pushparajah Thavarajah, a professor who is supervising the research. "The impact could be huge."

Understanding this, James and Thavarajva tested eight different recipes on 38 different kinds of rice found in Sri Lanka. What they found is that by adding a lipid (coconut oil in this case, because it's widely used in Sri Lanka) ahead of cooking the rice, and then cooling the rice immediately after it was done, they were able to drastically change its composition—and for the better.

"The oil interacts with the starch in rice and changes its architecture," said James. "Chilling the rice then helps foster the conversion of starches. The result is a healthier serving, even when you heat it back up."

So far they have only measured the chemical outcome of the most effective cooking method for the least healthful of the 38 varieties. But that variety still produced a 10 to 12 percent reduction in calories. "With the better kind, we expect to reduce the calories by as much as 50 to 60 percent," said James.

Cooking that can change the world

The prospect of lower calorie rice is a big deal. Obesity rates are rising around the world, particularly in the

developing world, where people rely more heavily on cheaper food staples. China and India, which are already seeing rising obesity problems, are huge consumers of rice. Rice, of course, is not the sole cause of weight gain. But reducing the amount of calories in a cup of rice by even as little as 10 percent could have an enormous impact for future generations.

"Obesity has been a problem in the United States for some time," said Thavarajah. "But it's becoming a problem in Asia, too. People are eating larger and larger portions of rice, which isn't good."

The researchers still have to test the remaining varieties of rice, including Suduru Samba, which they believe will produce the largest calorie reduction. They also plan to experiment with oils other than coconut oil, like sunflower oil.

A world where commercially sold rice comes pre-cooked and with much fewer calories might not be that far off. People should already be able to replicate the process at home, although James warns the results might vary depending on the type of rice used. And there's good reason to believe the chemistry could be applied to many other popular but less-than-healthy foods.

"It's about more than rice," said Thavarajah. "I mean, can we do the same thing for bread? That's the real question here."

Courtesy: Washington Post

More embrace animal fat after years of holding at arm's length

Weather, insects and an unpleasant-sounding condition called “tree leprosy” have conspired to cause a catastrophic collapse in this year's Mediterranean olive crop. One Italian olive oil trade association is predicting a 35 percent decrease in production, triggering, naturally, a 30 percent upward tick in price.

Fortunately, the solution couldn't be simpler: There's never been a better time to get over our collective loathing of lard.

The much-maligned tub of said substance, once a supermarket staple, has been reduced to little more than a heartless slur. For shame that such a versatile ingredient receive so much scorn.

Lard enthusiast Morgan Sellon and his wife, Tori, moved to Wilmington from San Diego several years ago. They quickly went about finding local sources of lard, tallow, schmaltz and other animal fats. For Tori, the decision to cook with the largely abandoned lipids was based on their health benefits rather than liabilities. The couple is passionate about raising their daughter Ainsley free from the processed alternatives that have filled lard's void.

“We did a lot of research,” Tori said. “For one thing, if you get your lard from pasture-raised animals it has really high levels of vitamin D.”

The Sellons aren't alone. The past few years have seen a statistically significant uptick in lard consumption. Reaching a low point in 1995, per capita lard use had more than tripled to 1.5 pounds by 2010 according to U.S. Department of Agriculture numbers.

Vegetarians probably don't have to worry about pork fat sneaking into their biscuits anytime soon, though. Total fat consumption in America is more than 70 pounds per person, the vast majority in the form of less expensive and more abundant oils and shortenings, with some butter registering in those numbers.

Recent cookbooks, food shows and restaurant trends have done much to elevate lard's profile. Celebrity chefs have fetishized pigs to the point that a bacon tattoo is practically a required part of a cook's uniform.

“The tide is turning for pork fat,” Jennifer McLagen, author of “Fat: An Appreciation of a Misunderstood Ingredient,” wrote in her 2008 cookbook. “The realization of the dangers associated with trans fats has caused many of us to reconsider the benefits of lard.”

A preoccupation with health glosses over the main reason to keep it in our pantries: Lard is delicious.

Samantha Smith, owner of the bakery Sugar Island in Surf City, is an unabashed fan. She maintains a roster of customers who prefer their pie crusts made with lard – the fat gives them an unrivaled flakiness – and regularly renders pounds of it in her kitchen.

Lard doesn't work in all cases. Smith eschews the substance for cake batters and admits that rendering can be both messy and smelly.

Wilmington couple Kimberley Ray Jessup and Jonathan Jessup were inspired to give lard a chance after watching North Carolina chef Vivian Howard make applejacks – a kind of fried pie – on the PBS show “A Chef's Life.” She said it took her husband three grocery trips to find the ingredient and it produced less than desirable results when he tried to recreate the recipe in their kitchen.

“He didn't really love cooking with it, thought it made it greasy,” Jessup said.

Others find lard indispensable. At home, Smith employs lard in unexpected dishes.

“It's kind of my secret weapon in chicken Parmesan,” she said, citing lard's legendary frying properties. “Same thing with chicken wings.”

With practice, lard is easy to incorporate into everyday cooking. Vegetables, particularly potatoes, roasted in lard take on a delightful crunch. The Sellons prefer it for nearly all pan frying, limiting olive oil use to unheated finishing touches such as salad dressings.

“I think our bodies were made with a lot of wisdom, and we've kind of lost our North Star about what we're supposed to be eating,” Tori Sellon began, with her husband, Morgan, finishing the thought: “That God would give us something that tastes so wonderful and make it bad for us, that's not a kind and loving God.”

Courtesy: Star News Online .com

TAMANU / UNDI OIL

Undi or Tamanu tree is of African, Asian, Polynesian and Pacific origin. The plant oil and body parts are being used for several purpose in many countries of these regions. The botanical name of the plant is Calophyllum Inophyllum Linn (Syn. Calophyllum Bintagor Roxb.) (Guttiferae). It is a member of the mangosteen family. Mesua ferrea Linn has also been seen as an alternative Latin name.

Common Names: Known in English as Alexandrian Laurel, Tamanu, Pannay Tree, Sweet Scented Calophyllum. In India it is known as undi , nagchampa , Undee-phal, Nameru , Ponnvittulu. And in Burmese as Pongnyet. Cutchi and in Hawaiianas Kamani. The wood used to be sold as Borneo Mahagany.

It is native to Tropical Asia and its geographical distribution area also includes Melanesia and Polynesia. It grows near the sea coast throughout India. In French Polynesia, the Tamanu tree is widespread on most of the islands. It grows primarily in the coral sands and on the sea shore, although specimens may be found in valleys. Its seeds sprout easily in muddy and saline soils. The Motu (coral reefs), which surround the volcanic islands, are covered with Tamanu trees, they are very much appreciated for their fragrant flowers and elegant foliage and are thus planted along avenues.

The tree is 2 to 3 meters tall, and has a thick trunk covered with a rough, black and cracked bark. It has elliptical, shiny and tough leaves. Its flowers, arranged in auxiliary cymes, have a sweet, lime like fragrance. The tree, which flowers twice a year, is said to attain a great age. The numerous fruits, arranged in clusters, are spherical drupes. Once ripe, their smooth, yellow epidermis discloses a thin layer of pulp, which tastes somewhat like apple. The gray, ligneous and rather soft nut contains a pale yellow kernel, which is odourless when fresh. Once chewed, it coats the mouth and emulsifies saliva, and its insipid taste becomes bitter. Kernels have a very high oil content (75%). It is obtained by cold expression and yields a refined, greenish yellow oil, similar to olive oil, with an aromatic odour and an insipid taste. Once grown, a tree produces up to 100 kg fruits and about 18 kg of oil.

Unlike most vegetable oils, oil is not contained in fresh ripe fruits. It forms in the course of the nuts' desiccation. The oil production process is as follows : Ripe and non-germinating seeds are slightly crushed in order to crack the shells without damaging the kernels. The latter are quickly removed, arranged in thin layers and exposed to the sun. They must not be exposed to humidity in any case. In spite of these precautions, some kernels develop moulds and must be eliminated. During the desiccation process, kernels loose weight (from a mean 7 g for fresh kernels to about 4.5 g for dry and oil-rich ones). They become brownish, develop an aromatic odour and increase their oil content. In the meantime they loose their germinative power. The transformation is completed within 2 months provided the weather has been dry enough. Kernels can then be stored for a long time. Undi / Tamanu oil and cake is available between February to April. Cake is generally used for preparing manures or bio-insecticides.

A lamp oil for light was produced from the kernel and was used at times instead of other oils. The oil is dark, green, thick and called Undi oil. Sometimes this oil is useful for massage, especially when enhanced with coconut oil or

flower fragrances. The oil may have been useful in water proofing cloth and is used as a varnish. In the old days an extract from the fruit was used to make a brown dye to colour cloth. The oil can also be used to make soap.

In Southern India, the oil of the seeds of the plant is used specifically for treating skin diseases and also applied topically in cases of rheumatism. It is also used as lamp oil and for manufacture of soap. The two main active components in this oil were discovered. A totally new fatty acid, Calophyllic acid and a lactone endowed with antibiotic properties to be at the origin of the oil's amazing cicatrizing power. The dark yellow oil extracted from the seeds, contains a poisonous resin, which has a parsley like odour. The resin is similar to myrrh and is alcohol soluble.

Tamanu oil has been thoroughly researched, and the conclusive evidence on its ability to heal damaged skin is overwhelming. Its benefits are notable for scarring, stretch marks, minor cuts and abrasions, rashes, sores, and much more. It can be used directly on the skin or mixed within formulations. Stores well under any condition but extreme heat will lessen the shelf life. Tamanu oil has a rich, deep scent with a bold dark color and because of this it may alter the color and aroma of cosmetic creations. Tamanu oil may naturally separate or solidify at cold temperatures. It may be liquefied in a pot of simmering water, in a microwave, in the sun, or at a temperature exceeding 85 degrees. While the internal uses for tamanu have been documented, the material offered by Mountain Rose Herbs was manufactured for external use only.

Tamanu oil is a remarkable topical healing agent with skin healing, antineuralgic, anti-inflammatory, antimicrobial, antibiotic, and antioxidant properties. The tamanu tree is indigenous to tropical Southeast Asia; it is found in Thailand, Vietnam, Myanmar, Malaysia, South India, Sri Lanka, and the Melanesian and Polynesian islands. It grows up to three meters tall, sporting cracked, black bark and elliptical, shiny leaves. The tamanu tree blooms twice annually with fragrant, white flowers, which later yield clusters of yellow-skinned spherical fruit. The fruit's pulp tastes similar to an apple, within which a large nut is embedded. The nut contains an odorless pale kernel, called punnai in some Pacific areas. This kernel is dried in the sun for two months until it becomes sticky with a dark, thick, rich oil; it must be protected from humidity and rain during drying.

This sticky oil is cold-pressed to make a greenish yellow oil. It takes 100 kilograms of tamanu fruit, the amount that one tree produces annually, to yield just 5 kilograms of cold pressed oil! Natives believed the tamanu tree was a sacred gift of nature and that gods hid in its branches. It was their answer to skin protection from hot sun, high humidity and ocean wind.

TYPICAL ANALYSIS
Color- Dark Green
Odor- Heavy, fatty and odoriferous
Free Fatty Acids- 0%
Peroxide Value- 0.68
Non-Saponifiables- 0.6
Saponification Value- 194
Iodine Value- 84.1 Specific Gravity- 0.91
pH- 4.11
Fatty Acids
Oleic- 41.4%
Palmitic- 14.5%
Linoleic- 29.7%
Linolenic- 0.2%
Stearic- 12.9%

Tamanu oil contains 3 essential classes of lipids: neutral, glyco-, and phospholipids. Additionally, the oil contains 3 unique and novel compounds:
Calophyllic acid
An anti-inflammatory called calophyllolide
An antibiotic called lactone
Along with coumarins – another powerful type of anti-inflammatory agent — these ingredients are the source

of the oil's remarkable healing power. In addition, Tamanu Oil contains Sc Glucan which provides natural UV protection in that it prevents 85% of the DNA damage and oxidative stress induced by UV radiation at 1% concentration as a new biological UV filter with a SPF 18-22. (Eur J Pharm. Sci 2007 Mar;30(3-4):203-10. Epub 2006 Nov 9).

TAMANU OIL BENEFITS FOR THE SKIN AND BODY

1. Relieves and protects the skin against inflammation, skin redness, sunburn and insect bites. EVIC-CEBA laboratory study June 2000 - Ih268/01. (ABICH oct.2005 - REL/244/05/FUNZ/ELB).
2. Has a regenerating effect on the skin (especially the epidermis cells) and so it is effective for healing wounds, burns, cuts etc. Microna laboratory feb. 2003 - N°03/0607i.
3 Reduces scarring, especially the appearance of scars that are one or more years old). BioScience Laboratories conducted a study of Tamanu oil's ability to improve the appearance of scars. Tamanu oil was applied to the scarred area twice daily for nine consecutive weeks. There was significant improvement in appearance of scars after six weeks, and improvement continued through week nine. Also scar length was reduced by an average 0.28 centimeters, and width was reduced by an average 0.12 centimeters. [Beausoleil] Australian Society of Cosmetic Chemists Annual Congress, Hamilton Island 2003.
4. Is an anti-septic and anti-acne (Phytochemistry. 2004 Oct;65(20):2789-95).
5. Has anti viral properties (Bioorg Med Chem Lett. 1998 Dec 15;8(24):3475-8) & (Med Res Rev. 2000 Sep;20(5) : 323-49).
6. Has antibiotic, antibacterial, anti-fungal and anti-coagulative properties (Yao Xue Xue Bao. 2004 Apr;39(4):305-8); (Microna laboratory oct.2002 - °02/4500i) & (Indian J Exp Biol. 1970 Jan;8(1):39-40).
7. Contains 4-Phenylcoumarins from Calophyllum (ie. anti-tumor-promoting agents or cancer chemopreventive agents. Cancer Lett. 2001 Aug 10;169(1):15-9. In Nagoya, Japan the Faculty of Pharmacy at Meijo University found that Tamanu Oil benefits indicated that of ten 4-phenylcoumarins isolated from Calophyllum Inophyllum, all of them showed inhibitory activity against Epstein-Barr virus (BV), without any cytotoxicity. Of these, Calocoumarin-A (5) showed more potent activity than the others and calocoumarin-A (5) exhibited a significant inhibitory effect on skin tumor promotion in mice. Even though their test subjects were rats, the results of the studies strongly indicate that some of these 4-phenylcoumarins might be valuable as potential cancer chemopreventive agents (anti-tumor-promoters) in humans. Source: Cancer Letters, Volume 169, Issue 1, Pages 15-19 M. Itoigawa.
8. Has anti ageing and anti wrinkle qualities - Moisturizes, nourishes and repairs the epidermal cells of dry and damaged skin...) Microna laboratory feb.2003 - N°03/0607i.
9. Increases microcirculation (heavy legs, bruising...) Dermscan - april 2007 - study N°07D0458
10. Body hygiene (body odors, infections, skin rashes, dermatitis, psoriasis...) Phytochemistry. 2004 Oct;65(20):2789-95
11. Hypoallergenic (non irritant, non sensitizing). Dermscan April 2007- study DN-730/07EO398
12. Is exempt of the 26 allergen substances listed in 2003/15/CE European directive.

As a result, Tamanu Oil benefits include everything from anti-aging skin care to acne scar treatments and a natural solution for acne and many other common skin conditions.

Laugh Out Loud

Q:- What do you do with a dead scientist?
A:- Barium (Burry Him)

Q:- How do you spell CHOCOLATE chemically?
A:- Carbon-Holmium-Cobalt-Lanthum-Tellurium

Two Chemists walk into a Bar.
The first chemist says "I will have H2O".
The second chemist says "I will have H2O too".
The second chemist die . How ???????.

The unjust salary theorem asserts that
Scientists can never earn as much as sales people .
The theorem is proved as Follows:-
POWER = WORK/TIME
Probably, you know that knowledge is
also defined as 'Power' and time as 'Money'.
Substitute these into the Formula of power to
obtain KNOWLEDGE = WORK/MONEY
Solving for money, one finds:
MONEY = WORK/ KNOWLEDGE, i.e
'THE LESS YOU KNOW THE MORE YOU EARN'.

A man is talking to GOD,
"GOD, how long is a Million Year."?
GOD answered," To Me it is about one minute."
"GOD , and how much is Billion Dollar"?
To Me it is a Penny only. GOD replied.
"OH GOD" , may I have a Penny please,
GOD answered " you will have to wait for one minute.

Q:- What is difference between a Mathematician and an Experimentalist ?
A:- A Mathematician thinks that two points are enough to define a straight line but the experimentalist wants more data.

TEN FACTS ABOUT YOU
1-You are reading this now.
2-You are reading this that it is a stupid fact.
4.-You did not notice that I have skipped No.3..
5.- You are checking it now.
6.- You are smiling.
7.-You are still reading it even though it is stupid .
9.- You did not realize that I have again skipped No,8.
10.- You are checking it and smiling because you fell for it again.
11.-You are enjoying this.
12.- You did not remember that I said 10 facts and not 12.

Q:- What is ' IT '?
- Astronomers do IT All night
- NEWTO N did IT with Force.
- MAXWELL did IT with Magnetism
- WATT did IT with Power.
- JOULE did IT with Energy
- OHM did IT with resistance
- PASCA L did IT with Pressure.
- Hertz did IT frequently
- AMPERE let IT flows
For FRANKLIN IT was an Electrifying experience EDISON claims to have invented IT'

After death a Scientist was sent to 'HEAVEN' He tried to call the Lab. but it was ' very costly'. He saw one of his colleague keep calling lab from the 'Hell'. He inquired from the Gate keeper…Why it is so…? Gate keeper replied "Hell to Lab" calls are always considered to be 'LOCAL.'

A REFEREE reports :-
This Paper contains much that is 'NEW' and much that is' TRUE'. Unfortunately, that which is 'TRUE' is not' NEW' and which is 'New' is not ' TRUE'.

Why are Scientists Perfect in solving problems ?
Because they have all the solutions

A Proton, Neutron and Helium walk into a BAR and ordered three Beers.
The bar - tender appears with three Beers and ask the Proton " Are you sure' you are above 21.
Proton said , "Yes , I am Positive ".
So the bartender gives the first Beer to Proton.
He gives the second Beer to Neutron and say "No Charge" please.
He throws the third Beer on Helium Face , but Helium does not react.

In a Police Station :
ATOM – I would like to report a missing electron.
Policeman :- Are you sure ?
ATOM:- Yes, I am positive.

Member's PAGE

CHOICE OF VEGETABLE OIL FOR HUMAN CONSUMPTION

The most common vegetable oils are Rapeseed, Soyabean, Safflower, Sunflower, Peanut and are being extracted from respective seeds. However, Olive and Coconut oils are being obtained by pressing process and are also fairly consumed.

Have you ever been confused about which vegetable Oil is healthiest ?

Which one is to be used for what purpose ?

Whether we should use Unrefined, Refined or Semirefined oil ?

Oils with Mono or Poly unsaturated fat is better.

With so many options it is very difficult to make a choice as to what is Healthy and what is not.

To sort out the confusion, a few facts have to be kept in mind while choosing the OIL.

1- Oils should be expeller pressed rather than chemically extracted.
2- Cooled-pressed oils are better because due to lower processing temperature , it preserves the natural flavour and characteristics.
3- Always buy Organics; because use of heavy pesticides(as in case of Ground nut Oil) is harmful.
4- Refined oils are generally odourless and because of high smoke point can be used for high-heating or deep frying. However unrefined oils have more natural flavour and tends to go Rancid quickly. Also, having low smoke point makes it undesirable for deep frying.
5- All vegetable oils are mixture of Mono-Polyunsaturated fats . Although both fats raise good cholesterol in the blood but mono-unsaturated fat is preferred.

Following are a few oils which are considered to be a better choice amongst all available oils:-

OLIVE OIL:

This is the oil which is well known for Heart –healthy effects. It can raise HDL (Good cholesterol) and lower the amount of oxidised LDL (Bad Cholestrol) circulating in the blood stream . The oil is good for normal cooking in the kitchen but not for high heating.

PEANUT OIL :

It is fairly high mono-unsaturated fat . Unrefined oil has great flavour and high smoke point than any other oils. Semirefined or Refined oil should be used for deep frying or stir frying.

AVOCADO OIL:

The composition of Avocado oil is similar to that of Olive Oil. Nutritious and full of good fat, highest smoke point . However, being expensive it has limited use as frying medium. Also it is highly perishable.

SAFFLOWER AND SUNFLOWER OIL:

These are better options as these are high in mono-unsaturated fat and not highly processed. These are good all-purpose oils

BUTTER :

REAL BUTTER is good as it is fairly Nutritious and contains Vitamin A, E and K2. Also presence of conjugated Linoleic and butyrate Fatty acids both of which have powerful health benefits is considered to be a good cooking medium.

CANOLA OIL :

This is an improved form of Rapeseed oil, where from all Euricic Acid has been removed,. It is primarily monounsaturated with some saturated and poly unsaturated fat, and is widely used cooking oil. Since its processing is very harsh only well established brands should be preferred.

By : R.C. Arora
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