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Creating a Global Regulatory Plan

Health Tips

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Trade News

Oil Technologists' Association of India (North Zone)

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Editor's desk

The ever increasing demand and supply gap in the edible oil sector is a cause of concern. The edible oil consumption in India has increased three fold in last 20 years while the production has increased by less than one third. The oil output may remain stagnant due to consecutive draught, which may further increase our dependence on imported oil. According to an estimate, edible oil import bill may touch all time high to US$ 14 billion in 2015/16, as compared to US$ 10 billion last year. In order to safeguard the domestic industry, government has hiked import duty on raw oil from 7.5% to 12.5 % and on edible refined oil from 15% to 20%.

The recent plan of government to invest Rs. 10,000 crores in next three years to help and encourage the farmers to grow the palm tree can change the scenario. It is a welcome step in the area of self-reliance in the field of edible oils. Recognition of palm as plantation crop may further encourage the big farmers and corporate both to realise the goal, as in present circumstances the small farmers cannot invest in a crop whose output will come up after several years.

The stagnant oil seed output and heavy dependence on import has subdued the inherent potential of edible oil industry. This is high time to think about opening of oilseed import. This one step can bring a sea change in the edible oil industry in India and help this industry to regain its lost importance.

Yours truly

C S Joshi

Editor

Oil Technologists' Association of India
(North Zone)

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Creating a Global Regulatory Plan

Having and maintaining strong global regulatory strategy and plans can help your business not only stay in compliance but can be an integral part of corporate market growth strategies. How many of us have jumped into a new market before fully understanding the regulatory requirements and the potential impact of those requirements? If you have, you are not alone. Mapping the requirements as part of your strategic planning may help you identify a great new market or help you avoid a costly mistake.

Before delving any further, we need to make sure we are all using the terms "regulatory strategy" and "regulatory plan" in a similar way.

- Regulatory Strategy: aligns the regulatory activities required to bring a new or modified product to market with the business or marketing strategy. It provides overall direction to the team by identifying the important regulatory elements.
- Regulatory Plan: Describes specific steps and action required to meet the regulatory strategy objectives. It contains the specific elements required to assemble the regulatory submissions.

The benefits of developing and maintaining effective global regulatory strategies and plans are far-reaching. Some of those benefits include:

- Clear communication within project team
- Clear communication with the management team
- Clear definition of the required resources (both human and financial)
- Avoid delays due to new last-minute requirements
- Improve efficiency
- Improve accuracy and timeliness of filings
- Save money because of efficiency improvements and avoidance of delays
- Help your business stay in compliance
- Can be an integral part of corporate marketing strategies
- Identify a great new market
- Avoid costly mistakes

o Discover you don't have some required information and it may be prohibitively expensive to get the necessary information to support a filing for a market.

o Identify early in the process that the project requires more resources than you currently have available.

An effective strategy or plan is compatible with the business/marketing strategy for the product and the company. The strategy or plan must also have cross-functional buy-in from at least regulatory, marketing, product development, and executive management functions and must be feasible with the available internal and/or external resources. It is important to remember that no strategy or plan should be static. They should be updated as the project progresses or as conditions within the company evolve.

The strategy should include the following elements:

- Define the device or product

o Will claims be different or the same across markets?

o Will device risk be the same or different across markets?

- Defines which markets are of interest preferably with a market analysis to support the viability of the market
- Type of submission(s) based upon the desired markets
- Considers life cycle issues that may be applicable

Elements of an effective regulatory plan include the following:

- Defines the market specific requirements and how those requirements may be met.
- Defines the submission requirements for each market including timing and any applicable fees.
- Contains specific project deliverables including timing, responsibilities, and resources.
- Defines specific testing that may be required such as preclinical and clinical (note this may be different across markets)
- Defines which standards and/or regulations may be applicable for each potential target market.
- Defines specific country regulatory references
- Defines appropriate predicate device(s) if the device will be marketed in the US.
- Includes the desired claims for each market (possible claims matrix)
- Includes a plan for how the claims will be supported (labeling, bench testing, clinical, etc.)
- Contains the specific elements required to assemble the regulatory submission.
- Defines any special requirements such as facility inspection
- Defines any anticipated post-market surveillance
- Describes any pre-sub interaction with regulatory agency officials
- May be a separate document for each potential market or one global plan for all markets

In order to accomplish cross-functional buy-in and to successfully develop and execute global regulatory plans, it is critical to establish interfaces and to define the roles of each function. All roles are responsible for clear communications across the project team and with management to ensure that any necessary adjustments can be made in a timely way. For example, the roles might look something like this, depending upon your organizational structure:

- Management
  - Provision of resources
  - Provision of strategic direction
  - Visibility to reimbursement landscape
- Quality
  - Product acceptance activities for pre-production and production product
  - Labeling review and release
  - Post-market surveillance
- Regulatory
  - Clinical Evaluation Report (CER)
  - Define the regulatory requirements for all markets
  - Identify appropriate guidance, regulations, etc.
  - Define predicate(s)
  - Confirm that all claims are adequately supported
  - Work with marketing and product development to create labeling
  - Assemble/submit applications
  - Post-market surveillance
- Product Development
  - Define the device and its function
  - Risk analysis
  - Pre-clinical testing
  - Clinical Evaluation Report (CER)
  - Provide technical support for applications
  - Work with regulatory and marketing to create labeling
  - Intellectual property
- Clinical
  - Clinical testing
  - Clinical Evaluation Report (CER)
  - Post-market surveillance
- Marketing
  - Define the desired claims and provide support for claims if possible
  - Work with regulatory and product development to create labeling
  - Provide market analysis to help management determine if market is viable
  - Trademarks and copyright
- Regulatory Agency
  - Pre-submission interaction to define any special

requirements if applicable

- o May require post-market surveillance reporting

Now that you know how what elements belong in a global regulatory plan and strategy and understand how important cross-functional collaboration will be to your success, let's address some common challenges that can arise.

Pressure to get the project started:

- Starting without at least a draft of a plan typically leads to major delays
- Contributes to inadequate communication
- Remind management and project team that investing the time up front will save time later

Scatter approach:

- Trying to enter every market at the same time, especially without a carefully considered plan, often results in:
- o Insufficient resources to do the work,
- o Significant time delays,
- o Product never getting cleared/approved, or
- o Inability to sell the product despite clearance / approval due to IP, reimbursement, trademark or other similar concerns

Unforeseen setbacks:

- Much of this can be avoided with a well-conceived plan
- Sometimes happens anyway
- Communicate, communicate, communicate

Time overruns:

- Can often be avoided with a well-conceived plan
- Get creative about how to get back on track. Is there a resource that can help in the short term?
- Sometimes happens anyway
- Communicate, communicate, communicate

Cost overruns:

- Can often be avoided with a well-considered plan
- Sometimes happens anyway
- Communicate, communicate, communicate

Changes to the regulations:

- Regulatory changes do happen but typically there is a long lead time
- Stay abreast of the regulations that can impact your business
- Subscribe to news that provides updates
- Subscribe to updates to the FDA website

Difficulty with a regulatory agency reviewer:

- Establish a professional working relationship with the reviewer that engenders trust
- Be prompt and professional in responding to any inquiries from the reviewer
- If you are communicating via email, ask for a phone call to resolve any issues
- If appropriate, ask a physician to interact with the reviewer to address his/her concerns
- Make sure you keep accurate records of all interactions with the reviewer
- Communicate with your project team and management

At the end of the day, effective execution of global regulatory strategies and plans should save your company time and money and may help you get product to the markets more efficiently.

Courtesy: GxP Lifeline

Trade News

High Oleic Soybean Debut Delayed Again

The commercial launch of high oleic soybeans planned for last year has been pushed back to next year at the earliest because of a lack of global approval for the varieties.

Monsanto is still awaiting approval of its Vistive Gold high oleic soybeans from the EU and China. DuPont Pioneer has recently received approval for its Plenish high oleic soybeans from China, but is still waiting an approval from the EU. Until these approvals are received, both companies are proceeding with tight stewardship and production is being carefully controlled so as to avoid the situation the U.S. corn industry faced when China rejected shipments containing Syngenta's genetically modified strain of corn, MIR162.

Demand from farmers for the varieties is high, as it is expected to earn them a premium of between 40 and 50 cents per bushel. Pioneer expects to allow farmers to plant between 200,000 and 300,000 acres of Plenish soybeans in 2015 and Monsanto expects a small amount of Vistive Gold to be planted through its Ground Breakers on-farm trial program.

It is estimated that the U.S. soybean industry has lost between 10 and 12 million acres of soybeans to competition from high oleic varieties of canola over the past seven to eight years. Once the approvals are processed, the soybean industry aims to regain its lost acreage. The United Soybean Board (USB) has set a goal for farmers to plant 18 million acres of high oleic soybeans by 2023, making it the fourth largest crop in the U.S. behind corn, regular soybeans, and wheat.

Courtesy: Oilseed and Grain News

Australian Demand for Sunflower Seeds Outstrips Supply

As demand outpaces supply, the Australian Oilseed Foundation (AOF) is encouraging farmers to lift production of sunflowers for both oil and seed production.

Australia uses approximately 60,000 tons of sunflower oil per year, but produces only 20,000 tons, leaving the country to rely on imports from South America for the balance. Cargill is currently paying approximately $700 per ton for sunflower seeds to be processed into oil at its plant in Narrabri, New South Wales, and small businesses which source whole sunflower seeds for bird or horse feed are paying upwards of $1,000 per ton.

While the AOF has programs in place to support sunflower production and reduce reliance on imports, it is understood that because of Australia's climate, there are limitations on where sunflowers will thrive. Usually sunflowers are not grown in the country's southern grain regions because they require adequate rainfall. However, new technology, developments in equipment, better soil management, and learning to store moisture under dry mulch and stubble have given southern farmers the ability to grow the crop which will prove to be more profitable than canola.

The spread of propagation of sunflowers to the south will also benefit the soil as they have a significant tap root system that breaks up the soil; they are proficient nutrient recyclers, and work very well in rotation with wheat.

Courtesy: Oilseed and Grain News

Malaysia's Golden Land Buys Two Oil Palm Plantations Abroad

Malaysia's Golden Land Bhd announced that it has entered into purchase and sales agreements to acquire controlling shares in two oil palm plantation companies with permits to develop 26,600 hectares in Indonesia for US$5.73 million.

Golden Land has secured an agreement with Hery Hermawan Herijanto to acquire 68.75% of Parimo Agri Holding Pte Ltd (PAH) for US$3.25 million and Parigi Plantation Holding Pte Ltd (PPH) for US$2.49 million. Although both companies are incorporated in Singapore, they both have registered subsidiaries in Indonesia with land permits. PAH holds 80% in PT Ampibabo Agro Lestari that has a permit for 15,067 hectares. PPH's subsidiary, PT Agri Toribulu, has a land permit for 11,533 hectares, giving Golden Land the ability to expand elsewhere, after finding expansion in Malaysia difficult due to a scarcity of arable land and a significant shortage of labor.

The purchase price, which will be funded through internally generated funds and bank debt, will be paid in two tranches. The first tranche will be 20% of the total price, with the remaining 80% being paid upon closing of the deal, which is expected within five months.

Golden Land expects the acquisition to positively affect its long term earnings on expectations that global dependence on palm oil will climb as more soyoil is demanded for biodiesel production.

The acquisition is not subject to approval by shareholders, but will require approval by regulatory bodies in Indonesia.

Courtesy: oilseed and Grain News

Cargill African Expansion Moves Forward as Oilseed Refinery Acquisition Nears

Although the global ag giant has been in Africa for 30 years, Cargill employs only about 1% of its staff in sub-Saharan Africa and earns only 1% of its revenues from its business in the region.

In its latest annual report, the company underlined its intent to expand on the continent with the progress it has made toward its $25.7 million purchase of Zamanita Ltd, the oilseed crushing and refining subsidiary of Zambeef, and its recent completion of a $12.5 million expansion of its animal feed operation in South Africa.

Zamanita is one of the largest edible oil and soymeal producers in Zambia, serving both the domestic and export markets for soybean meal. Upon completion of the deal, Cargill will acquire all of Zamanita's debts, assets, brands and employees. Zambeef's shareholders have voted to approve the transaction, however, approval is still needed from all relevant competition authorities. These approvals are expected to be granted within weeks.

As oilseed crushing and refining is a core business for Cargill, this acquisition fits well with Cargill's growth strategy and will allow the company to bring its expertise in the sector to Zambia as a step toward fulfilling its strategic intent on the continent.

After closing, Cargill intends to further expand Zamanita's capacity; leveraging its existing maize and cotton origination network to provide opportunities for farmers to access the soybean market.

Cargill recognizes the great importance and potential for global food production and future food security that lie within Africa, which is home to 60% of the world's potential arable land. The report stated, "Raising productivity on existing farmland and allowing suitable acreage to come into production can help Africa realize its agricultural potential."

Courtesy: oilseed and Grain News

Insects Equal Soy Nutrition in Animal Feed

A research team at the UK-based Food and Environment Research Agency (FERA) and AB Agri have found that insects perform at par with soy as a source of protein in chicken, fish, and pig feed according to nutritional tests.

The EU is only 25% to 30% self-sufficient in crop protein, prompting the team to research insects as a viable alternative and supplement to soy imports, as they can live on waste products and have a rapid conversion rate of turning that waste into protein-rich insect biomass.

Nutritional profiling of the larvae of Musca domestica, or the housefly, indicated that protein levels were generally higher than 50% of dry matter. Levels of the amino acids, methionine and lysine matched or exceeded those for soy in feeds, and the content levels for some minerals exceeded those of soy as well. These results have given the team reason to conclude that the amino acids and fatty acids in insect meal were comparable to soy and fishmeal, and suitable for inclusion in animal feeds.

Trial testing in chickens is underway to determine digestibility of insect feed in comparison with fishmeal, with initial testing providing promising results.

Although insect meal may prove viable to be used in animal feeds, more research will be needed to develop methods for the commercial scale production of the insects as current methods are too labor-intensive and too inefficient to be profitable. In addition, current laws in the EU making it illegal to feed insects to animals would need revision before commercial use can be explored.

Courtesy: Oilseed and Grain news

Viterra buys Canada oilseed plant from Malaysia's Felda

Viterra Inc , the agriculture segment of Glencore PLC, said on Thursday that it agreed to buy Eastern Canada's

largest oilseed processing plant from Malaysia's Felda Global Ventures Holdings Bhd.

Felda, the world's third-largest palm plantation operator, said it would sell the TRT-ETGO plant at Bécanour, Quebec to Viterra for C$190 million ($143.43 million).

The sale, expected to close this year, is part of Felda's plan to boost revenues and cut costs and become one of the world's biggest agribusiness companies, it said in a statement.

The plant can crush 1.05 million tonnes of canola and soybeans annually, producing vegetable oil for food and industrial markets and meal for livestock feed.

Viterra already operates a canola crushing plant in Western Canada, at Ste. Agathe, Manitoba. ($1 = 1.3247 Canadian dollars) (Reporting by Rod Nickel in Winnipeg, Manitoba; Editing by Meredith Mazzilli)

Courtesy : Reuters

U.S. soybean farmers could be hurt by China's economic woes

The downturn in China's economy is causing concern for local farmers trying to sell their soy beans. China is the biggest soy bean importer in the world and the fear surrounding their economy is showing a low price for soy beans.

But, there's also competition overseas that could be driving down the markets, which is worrying local farmers. "Soybeans right now look very good," said farmer Robb Ewoldt. Out in his fields, his soy bean plants look very healthy. "The soybeans have fared very well compared to what the corn was doing," said Ewoldt.

But in the farm markets, the price of soy beans is not so healthy. "I think the American farmer does a very good job producing the food and sometimes we can over produce very easily," he said.

At the lowest right now in Iowa, beans are around $8.50/bushel, about a dollar below the cost of production. Ewoldt said whenever the price goes down into the single digits, it's concerning. "There's always concern when it's costing you to go to work every day," he said.

China is a key factor in the soy bean market, because they're the largest bean importer in the world. "We've really seen a dramatic increase of Chinese buying of U.S. beans the last decade as their economy has strengthened the last decade," said economist Brian Basting.

He said the demand for soy beans are directly tied to China. Turmoil in their economy is spreading fear across the market for U.S. beans. "The forward sales to China this year are well below what they were last year," said Basting. But it's not just China's economic woes that are driving down the price of beans. "We have other competition," said Ewoldt. He said South America is taking away business. "South America is really good at growing soybeans now and their cost of production is a little bit cheaper than ours," he said. "There's more supply from our competition in this case – Brazil and Argentina," said Basting.

Ewoldt said they hope to see a rebound in the price of beans. "We had several good years. A lot of people upgraded their equipment and now they need to tighten their belts and just hold on," said Ewoldt. But, he said the problem they're having right now is simple economics of supply and demand. "We grow too much and we don't have a enough customers right now," he said. "We need more customers."

Basting said it's hard to estimate how long China's economic downturn will last. However, the South American supply of soy beans will be with us for quite some time.

He said to expect U.S. soy bean markets to be slow through the end of the year and possibly into the beginning of 2016. He said he believes China will still buy U.S. beans, just in smaller volumes for now.

Courtesy: KWQC

THE PHYSICAL-CHEMICAL MECHANISM OF THE EDIBLE OILS DEEP REFINING

„Dunarea de Jos" University of Galati, Food Science and Engineering Faculty.

Abstract: Deep or soft degumming mechanism was treated in the present research paper. Deep degumming is a physical-chemical refining process, which involves the complete removing of total oil phosphatides by using a chelating agent (EDTA) in the presence of an emulsifying additive (sodium dodecyl sulfate – SDS).

The direct hydratable phosphatides are, in the first stage, separated from the crude oil by water classic degumming process and, in the second stage, a chelating treatment is applied in order to remove the heavy metals which imposed the non-hydratable phosphatides to separate from the partial degummed oil.

Keywords: deep degumming, oil, phosphatides

INTRODUCTION

Purification of the neutral part from crude oils is the major objective of the oils refining process. Crude vegetable oils contain variable amounts of nonglyceride impurities, including free fatty acids (FFA), gums or phosphatides, color pigments, sterols, tocopherols, waxes, hydrocarbons, water, pesticides, and traces of metals [1-3].

The refining of edible oils and fats is conducted by using two technological routes: chemical and physical refining. In the chemical refining, wastewater and discharge are produced and higher refining oil losses are caused especially for oils with high FFA content. Physical refining is a modern refining procedure, ecological and with low processing costs. The reducing of the phosphorous content in the degummed oil less than 5 ppm (optimum 2 ppm) is the principal goal of the degumming process [4].

The removal of phospholipids (oil degumming) is the first stage of crude edible oil refining process.

In the classic water/acid degumming process, the crude oil is treated with water, salt solutions (NaCl, CaCl2), or dilute acid (citric acid, phosphoric acid) to remove phospholipids. The phosphatides are changed into hydrated gums, insoluble in oil, which are separated by sedimentation, filtration or centrifugation.

The classic water degumming process leads to a considerable loss of neutral oil, large amount of wastewater and energy consumption. The phospholipid content of soybean oil is reduced to 1800 ppm, which correspond to phosphorus content of 60 ppm.

The acid degguming process induced an increasing of the phosphatidic acid salts hydratability by addition of either phosphoric or citric acid, which determined the decreasing of the phospholipid content to 1500 ppm.

Super-degumming and total degumming are modified processes of acid degumming.

Super-degumming process determined degummed oil with a maximum residual phospholipid content of 900 ppm. The amount of acid used in the acid-degumming process varies between 0.05 and 0.2% of the oil weight and 0.5% in the case of oils that contain an initial phospholipid content of 6000 ppm and higher.

Enzymatic degumming is the biotechnological process in which lipase enzymes are used to hydrolyze nonhydratable phospholipids and transform them in hydratable form.

Enzymatic degumming under optimal technological conditions leads to a low residual phosphorous content (10–15 ppm) in degummed oil. For successful industrial applications, only three enzymes, a phospholipase A2 from porcine pancreas and two kinds of microbial phospholipase A1 from Fusarium oxysporum and Thermomyces lanuginosus/ Fusarium oxysporum are available for enzymatic oil degumming [5].

Membrane degumming is a simple procedure of vegetable oils refining, characterized by the low energy consumption, ambient temperature operation, free chemical technology and retention of nutrients and other biological active oil compounds [6].

Deep degumming is a physico-chemical methods of primary edible oils refining which eliminated the acid degumming, as a dramatically method of chemical processing for remove the non-hydratable phosphatides. In deep degumming, the water pre-

degummed oil is softly treated with a sequestrant agent, such as EDTA or one of its salts [7-8].

MATERIALS AND METHODS

The physical-chemical mechanism of the soybean oil deep degumming is analyzed in a

two stage refining process:

(i) The water degumming, applied for the removing of the easily hydratable phosphatides and extracting these phospholipids (the hydratable, or easy-toextract phosphatides) with hot water (2 wt% of water to the oil at 75 °C);

(ii) The de-salting treatment of pre-degumated oil and the extracting of the remaining heavy hydratable phosphatides from a W/O stabilized emulsion.

The chelating agent is EDTA and the emulsifying agent for W/O emulsion is SDS.

RESULTS AND DISCUSSIONS

The deep-degumming mechanism can be separated into four stages:

(i) The preliminary water degumming process, in order to remove the easy hydratable fraction of the phosphatides;

(ii) The Ca, Mg, Fe salts complexing, leading to increased the hydration degree of the phosphatidic acid and phosphatidylethanolamine;

(iii) The transfer of residual phosphatides phase into the aqueous phase with an emulsifying additive;

(iv) The separating of the complete degummed oil from the aqueous phases by decanting (in a batch operation) or by centrifuging (in a continuous processing).

The mechanism of deep degumming is based on the different stability of EDTA salts created by the interaction with the heavy metals of crude/pre-degummed oil and the stability of EDTA non-hydratable phosphatides salts.

In the chemistry of EDTA complexes, the pK value represents the ability to form stable entities; the higher the pK, the more stable the complex. The pK values of complexes of phosphatidic acid/calcium and of phosphatidic acid/magnesium are 4.6 and 4.0, respectively. The metal ions can easily be displaced with the addition of EDTA to form EDTA/calcium and EDTA/magnesium complexes with pK values of 10.7 and 8.7, respectively. The EDTA/iron complex is even more stable, with a pK for EDTA/Fe of 14.3 or 25.1, depending on its stage of oxidation.

The hydratable phosphatides are removed, in the current industrial procedure, by water degumming.

Table 1. *The phosphatides content of crude edible oils [9]*

Edible Oil	Phosphatides content [%]	Phosphorus content [ppm]
Sunflower	0.5-1.3	200-500
Soybean	1.0-3.0	400-1200
Colza	0.5-3.5	200-1400
Corn	0.7-2.0	250-800
Cottonseed	1.-2.5	400-1000
Groundnut	0.3-0.7	100-300
Palm	0.03-0.1	15-30

The nonhydratable phosphatides, mainly present as Ca or Mg salts of phosphatidic acid and phosphatidylethanolamine, are lyposoluble. EDTA is an effective sequestrating agent, which forms a very stable chelate complex with all polyvalent metal ions from oil, especially with Ca2+, Mg2+ and Fe2+.

In contact with the nonhydratable phosphatides and in the presence of endogenous hydratable phosphatides, EDTA breakdown phosphatides/metal complexes and increase the hydratability degree of the phosphorus compounds, separated by centrifugation.

The technological factors which influence the deep degumming process are the followings:

(i) The influence of chelating agent and emulsifying additive concentrations. Degumming process is directly related with the increasing concentration of the sequestrating and emulsifying agent. For the oils with initial lowphosphatides concentration (under 50 ppm P), the degumming is quasi complete at the concentrations up to 100 mM in EDTA or 50 mM in SDS.

(ii) The influence of the W/O emulsion ratio. The effect of the W/O phase ratio is enhanced by increasing the proportion of the aqueous emulsion phase. The chelating agent concentration relative to the phospholipid concentration was maintained constant with diluted solution of EDTA. For constant chelating agent/phosphatides ratio, the effect of increased W/O phase ratio on degumming degree is significant for value

under 2.

(iii) The influence of temperature. The degumming degree is in a direct relationship with the temperature. The increasing of the temperature in the range of 75-85 °C determines a more rapid and effective contact of the phases involved in the process and an efficient separation process of the gum fraction from the deggumed oil.

(iv) The influence of degumming time. The optimum phase's reaction time is 20 minutes, which is necessary for the interaction and complete and stable hydrating effect of the phosphatides.

CONCLUSION

The production of refined oil requires phosphatides removal from crude oil. Most phosphatides are hydratable and can be separated by aqueous degumming. The increment of nonhydratable phosphatides diminishes the degumming efficiency. In the water degumming process, water is mixed into crude oil, and phosphatides hydrate and settle out as gum. The physical stability of the degummed oil is improved and bleaching & drying processes generate the commercial lecithin.

Chemical refining leads to important neutral oil loss and removes the bioactive oil compounds.

The conventional phosphoric acid treatment is unable to remove completely the phosphatides.

Enzymatic degumming using phospholipase is reported to be successful in reducing the phosphorus content under the level of 5 ppm, but it's a high cost refining method. The re-esterification of FFA through enzyme biorefining and by chemical methods was unsuccessful because of its poor refining efficiency high processing costs.

The membrane physical refining for the removing of the gum and wax is a future alternative method for physical refining of commercial edible oils.

The deep degumming is the most efficient method of edible oils degumming (residual phosphatides under 0.01%, below 5ppm phosphorus respectively). Applicable for the most edible oils, such sunflower, canola or corn oils, is a gently procedure of industrial processing in which the degumming degree is similar with the ultrafiltration degumming and much better than the water/degumming process (residual phosphatides under 0.01-0.04%, under 5-15 ppm phosphorus respectively), but at a lower processing costs and in the ecological condition of refining, with the protection of the active biological compounds of edible oils (tocopherols, orysanol, fitosterols, vitamins).

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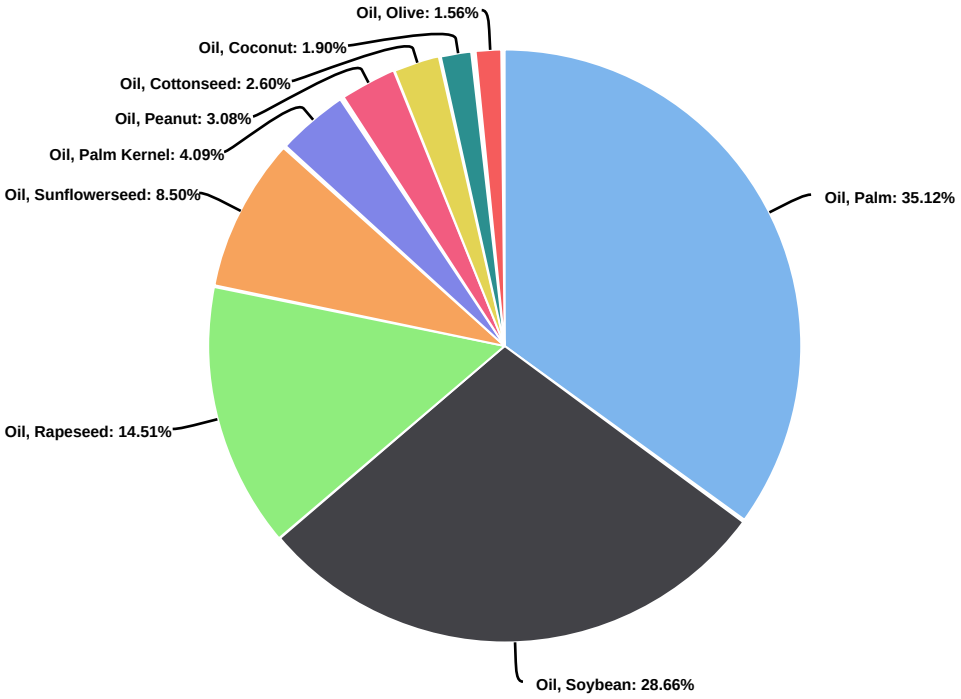
Important Figures

Oils. Production. Commodities structure in 2015/16 MY



World Oils Production, in 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	178,278	+2,048 (+1.16%)	176,230	170,772
Beginning Stocks	18,947	-225 (-1.17%)	19,172	18,017
Imports	71,837	+2,014 (+2.88%)	69,823	66,472
Total Supply	269,062	+3,837 (+1.44%)	265,225	255,261
Exports	76,025	+511 (+0.67%)	75,514	70,004
Domestic Consumption	176,900	+6,136 (+3.59%)	170,764	166,085
Industrial Dom. Cons.	40,841	+1,793 (+4.59%)	39,048	39,743
Food Use Dom. Cons.	135,006	+4,324 (+3.30%)	130,682	125,379
Feed Waste Dom. Cons.	1,053	+19 (+1.83%)	1,034	963
Crush	445,380	+5,275 (+1.19%)	440,105	419,247
Total Distribution	269,062	+3,837 (+1.44%)	265,225	255,261
Ending Stocks	16,137	-2,810 (-14.83%)	18,947	19,172
Extr. Rate, 999.9999	15	-1 (-6.25%)	16	17

World's Oils Production is projected at 178,278 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

World's Oils Production forecast rose by +2,048 (+1.16%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Changes for 2015/16MY in main Production countries:

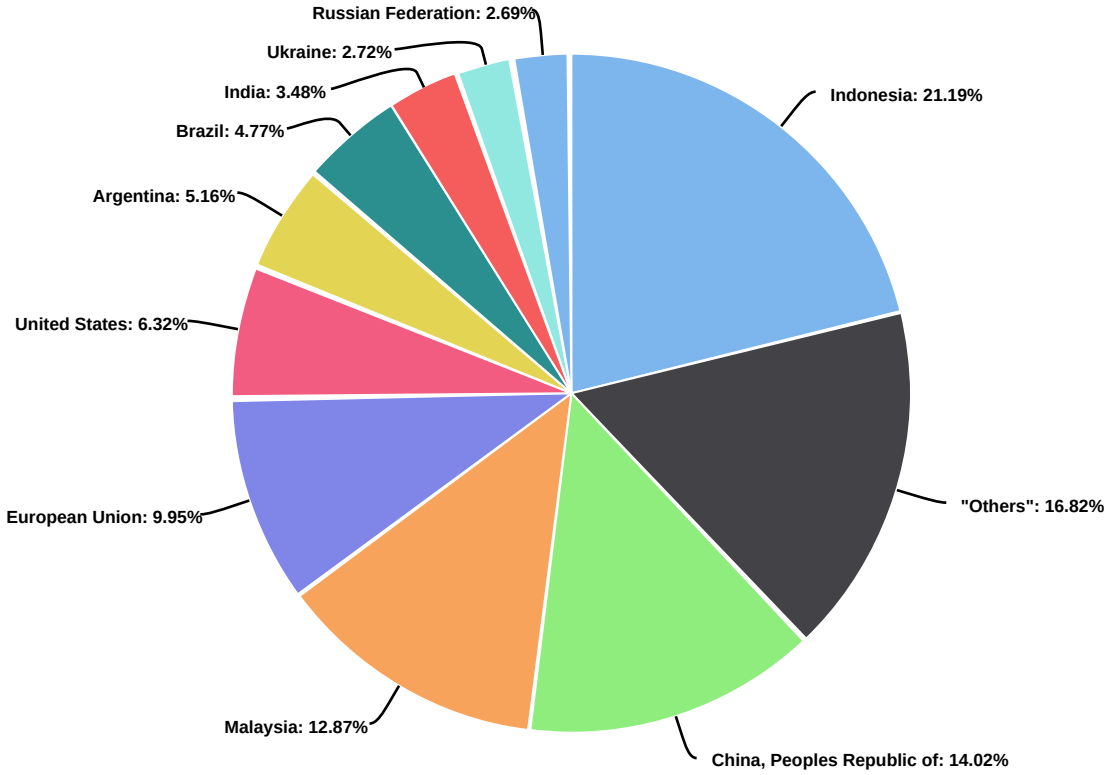
- - Indonesia's Production are up by +10 (+0.02%) thd. mt to 37,786 thd. mt
- - China, Peoples Republic of's Production are up by +570 (+2.33%) thd. mt to 25,000 thd. mt
- - Malaysia's Production are up by +659 (+2.95%) thd. mt to 22,943 thd. mt
- - European Union's Production are down by -113 (-0.63%) thd. mt to 17,739 thd. mt
- - United States's Production are up by +304 (+2.77%) thd. mt to 11,273 thd. Mt

Indian Oils, Production, in 1000 MT

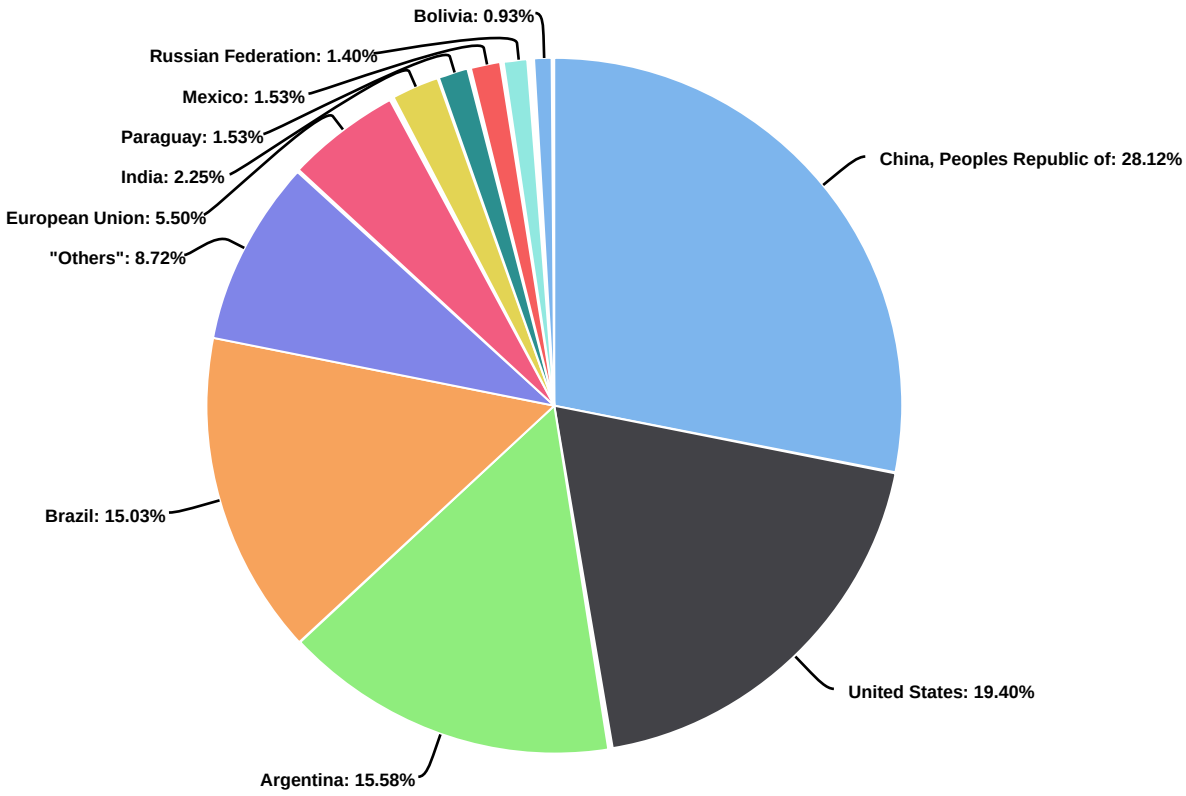
Attribute	2015/16	Change	2014/15	2013/14
Beginning Stocks	1,425	+221 (+18.35%)	1,204	1,525
Crush	24,860	-1,220 (-4.67%)	26,080	28,600
Domestic Consumption	21,670	+1,358 (+6.68%)	20,312	19,064
Ending Stocks	1,177	-248 (-17.40%)	1,425	1,204
Exports	33	+3 (+10.00%)	30	18
Extr. Rate, 999.9999	1	0 (0.0%)	1	1
Feed Waste Dom. Cons.	-	-	-	-
Food Use Dom. Cons.	20,775	+1,298 (+6.66%)	19,477	18,269
Imports	15,258	+1,188 (+8.44%)	14,070	11,571
Industrial Dom. Cons.	895	+60 (+7.18%)	835	795
Production	6,197	-296 (-4.55%)	6,493	7,190
Total Distribution	22,880	+1,113 (+5.11%)	21,767	20,286
Total Supply	22,880	+1,113 (+5.11%)	21,767	20,286

- India's Oils Production is projected at 6,197 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.
- India's Oils Production forecast fell by -296 (-4.55%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Oils. Production. Main countries in 2015/16 MY



Oil, Soybean. Production. Main countries in 2015/16 MY



World Soybean oil Production, in 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	51,087	+2,101 (+4.28%)	48,986	45,015
Beginning Stocks	3,574	+35 (+0.98%)	3,539	3,849
Imports	10,721	+679 (+6.76%)	10,042	9,265
Total Supply	65,382	+2,815 (+4.49%)	62,567	58,129
Exports	11,577	+561 (+5.09%)	11,016	9,424
Domestic Consumption	50,202	+2,225 (+4.63%)	47,977	45,166
Industrial Dom. Cons.	8,756	+65 (+0.74%)	8,691	8,169
Food Use Dom. Cons.	41,316	+2,155 (+5.50%)	39,161	36,872
Feed Waste Dom. Cons.	130	+5 (+4.00%)	125	125
Crush	274,252	+11,372 (+4.32%)	262,880	241,715
Total Distribution	65,382	+2,815 (+4.49%)	62,567	58,129
Ending Stocks	3,603	+29 (+0.81%)	3,574	3,539
Extr. Rate, 999.9999				

World's Oil, Soybean Production is projected at 51,087 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

World's Oil, Soybean Production forecast rose by +2,101 (+4.28%) 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's Production are up by +977 (+7.29%) thd. mt to 14,364 thd. mt
- - United States's Production are up by +205 (+2.11%) thd. mt to 9,911 thd. mt
- - Argentina's Production are up by +273 (+3.55%) thd. mt to 7,960 thd. mt
- - Brazil's Production are up by +20 (+0.26%) thd. mt to 7,680 thd. mt
- - European Union's Production are up by +131 (+4.88%) thd. mt to 2,810 thd. Mt

Peoples Republic of China, Soybean Oil, Production, in 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	14,364	+977 (+7.29%)	13,387	12,335
Beginning Stocks	845	-113 (-11.79%)	958	1,021
Imports	850	+77 (+9.96%)	773	1,353
Total Supply	16,059	+941 (+6.22%)	15,118	14,709
Exports	80	-27 (-25.23%)	107	94
Domestic Consumption	15,228	+1,062 (+7.49%)	14,166	13,657
Food Use Dom. Cons.	15,228	+1,062 (+7.49%)	14,166	13,657
Crush	80,250	+5,750 (+7.71%)	74,500	68,850
Total Distribution	16,059	+941 (+6.22%)	15,118	14,709
Ending Stocks	751	-94 (-11.12%)	845	958
Extr. Rate, 999.9999				

China, Peoples Republic of's Oil, Soybean Production is projected at 14,364 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

China, Peoples Republic of's Oil, Soybean Production forecast rose by +977 (+7.29%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

USA, Soybean Oil, Production, in1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	9,911	+205 (+2.11%)	9,706	9,131
Beginning Stocks	825	+296 (+55.95%)	529	750
Imports	102	-18 (-15.00%)	120	75
Total Supply	10,838	+483 (+4.66%)	10,355	9,956
Exports	1,043	+129 (+14.11%)	914	851
Domestic Consumption	8,822	+206 (+2.39%)	8,616	8,576
Industrial Dom. Cons.	2,449	+164 (+7.17%)	2,285	2,272
Food Use Dom. Cons.	6,373	+42 (+0.66%)	6,331	6,304
Feed Waste Dom. Cons.	-	-	-	-
Crush	51,437	+462 (+0.90%)	50,975	47,192
Total Distribution	10,838	+483 (+4.66%)	10,355	9,956
Ending Stocks	973	+148 (+17.93%)	825	529

United States's Oil, Soybean Production is projected at 9,911 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

United States's Oil, Soybean Production forecast rose by +205 (+2.11%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Argentina, Soybean Oil, Production, in 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	7,960	+273 (+3.55%)	7,687	6,785
Beginning Stocks	251	+15 (+6.35%)	236	258
Imports	15	-7 (-31.81%)	22	9
Total Supply	8,226	+281 (+3.53%)	7,945	7,052
Exports	5,500	+407 (+7.99%)	5,093	4,087
Domestic Consumption	2,440	-161 (-6.18%)	2,601	2,729
Industrial Dom. Cons.	2,030	-170 (-7.72%)	2,200	2,350
Food Use Dom. Cons.	410	+9 (+2.24%)	401	379
Crush	42,000	+1,767 (+4.39%)	40,233	36,173
Total Distribution	8,226	+281 (+3.53%)	7,945	7,052
Ending Stocks	286	+35 (+13.94%)	251	236

Argentina's Oil, Soybean Production is projected at 7,960 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

Argentina's Oil, Soybean Production forecast rose by +273 (+3.55%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Brazil, Soybean Oil, Production, in 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	7,680	+20 (+0.26%)	7,660	7,070
Beginning Stocks	272	-114 (-29.53%)	386	399
Imports	10	-1 (-9.09%)	11	-
Total Supply	7,962	-95 (-1.17%)	8,057	7,469
Exports	1,390	-120 (-7.94%)	1,510	1,378
Domestic Consumption	6,365	+90 (+1.43%)	6,275	5,705
Industrial Dom. Cons.	2,865	+60 (+2.13%)	2,805	2,275
Food Use Dom. Cons.	3,500	+30 (+0.86%)	3,470	3,430
Crush	40,000	+75 (+0.18%)	39,925	36,861
Total Distribution	7,962	-95 (-1.17%)	8,057	7,469
Ending Stocks	207	-65 (-23.89%)	272	386

Brazil's Oil, Soybean Production is projected at 7,680 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

Brazil's Oil, Soybean Production forecast rose by +20 (+0.26%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

European Union, Soybean Oil, Production, in 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	2,810	+131 (+4.88%)	2,679	2,553
Beginning Stocks	269	-79 (-22.70%)	348	202
Imports	150	-102 (-40.47%)	252	329
Total Supply	3,229	-50 (-1.52%)	3,279	3,084
Exports	970	-40 (-3.96%)	1,010	766
Domestic Consumption	2,000	0 (0.0%)	2,000	1,970
Industrial Dom. Cons.	950	0 (0.0%)	950	900
Food Use Dom. Cons.	1,000	0 (0.0%)	1,000	1,000
Feed Waste Dom. Cons.	50	0 (0.0%)	50	70
Crush	14,800	+700 (+4.96%)	14,100	13,436
Total Distribution	3,229	-50 (-1.52%)	3,279	3,084
Ending Stocks	259	-10 (-3.71%)	269	348

European Union's Oil, Soybean Production is projected at 2,810 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

European Union's Oil, Soybean Production forecast rose by +131 (+4.88%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

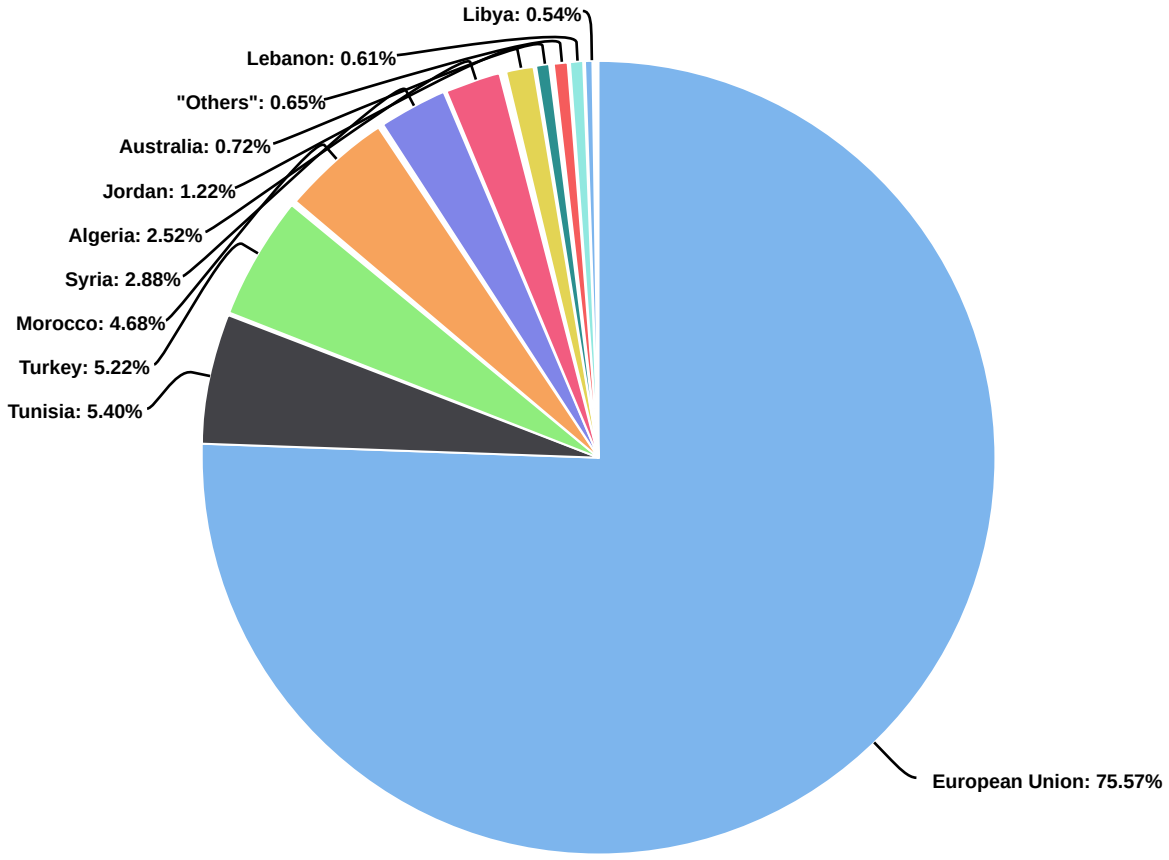
India, Soybean Oil, Production, in 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	1,150	-95 (-7.63%)	1,245	1,478
Beginning Stocks	249	-6 (-2.35%)	255	248
Imports	3,350	+551 (+19.68%)	2,799	1,830
Total Supply	4,749	+450 (+10.46%)	4,299	3,556
Exports	-	-	-	1
Domestic Consumption	4,500	+450 (+11.11%)	4,050	3,300
Food Use Dom. Cons.	4,500	+450 (+11.11%)	4,050	3,300
Crush	6,450	-550 (-7.85%)	7,000	8,300
Total Distribution	4,749	+450 (+10.46%)	4,299	3,556
Ending Stocks	249	0 (0.0%)	249	255
Extr. Rate, 999.9999				

India's Oil, Soybean Production is projected at 1,150 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

India's Oil, Soybean Production forecast fell by -95 (-7.63%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Oil, Olive. Production. Main countries in 2015/16 MY



World Olive Oil Production, in 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	2,779	+381 (+15.88%)	2,398	3,085
Beginning Stocks	181	-351 (-65.97%)	532	506
Imports	667	-115 (-14.70%)	782	584
Total Supply	3,627	-85 (-2.28%)	3,712	4,175
Exports	804	-165 (-17.02%)	969	844
Domestic Consumption	2,587	+25 (+0.97%)	2,562	2,799
Industrial Dom. Cons.	21	0 (0.0%)	21	41
Food Use Dom. Cons.	2,566	+25 (+0.98%)	2,541	2,758
Feed Waste Dom. Cons.	-	-	-	-
Total Distribution	3,627	-85 (-2.28%)	3,712	4,175
Ending Stocks	236	+55 (+30.38%)	181	532

World's Oil, Olive Production is projected at 2,779 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

World's Oil, Olive Production forecast rose by +381 (+15.88%) 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 up by +550 (+35.48%) thd. mt to 2,100 thd. mt
- - Tunisia's Production are down by -170 (-53.12%) thd. mt to 150 thd. mt
- - Turkey's Production are down by -25 (-14.70%) thd. mt to 145 thd. mt
- - Morocco's Production are up by +10 (+8.33%) thd. mt to 130 thd. mt
- - Syria's Production are up by +20 (+33.33%) thd. mt to 80 thd. mt

European Union, Olive Oil, Production, in 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	2,100	+550 (+35.48%)	1,550	2,475
Beginning Stocks	106	-325 (-75.40%)	431	356
Imports	130	-130 (-50.00%)	260	54
Total Supply	2,336	+95 (+4.23%)	2,241	2,885
Exports	600	+35 (+6.19%)	565	674
Domestic Consumption	1,570	0 (0.0%)	1,570	1,780
Industrial Dom. Cons.	20	0 (0.0%)	20	40
Food Use Dom. Cons.	1,550	0 (0.0%)	1,550	1,740
Total Distribution	2,336	+95 (+4.23%)	2,241	2,885
Ending Stocks	166	+60 (+56.60%)	106	431

European Union's Oil, Olive Production is projected at 2,100 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

European Union's Oil, Olive Production forecast rose by +550 (+35.48%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Tunisia, Olive Oil, Production, in 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	150	-170 (-53.12%)	320	70
Beginning Stocks	14	-24 (-63.15%)	38	78
Imports	-	-	1	2
Total Supply	164	-195 (-54.31%)	359	150
Exports	110	-205 (-65.07%)	315	77
Domestic Consumption	30	0 (0.0%)	30	35
Food Use Dom. Cons.	30	0 (0.0%)	30	35
Total Distribution	164	-195 (-54.31%)	359	150
Ending Stocks	24	+10 (+71.42%)	14	38

Tunisia's Oil, Olive Production is projected at 150 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

Tunisia's Oil, Olive Production forecast fell by -170 (-53.12%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Turkey, Olive Oil, Production, in 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	145	-25 (-14.70%)	170	140
Beginning Stocks	31	+10 (+47.61%)	21	9
Imports	-	-	-	-
Total Supply	176	-15 (-7.85%)	191	149
Exports	15	-5 (-25.00%)	20	28
Domestic Consumption	145	+5 (+3.57%)	140	100
Industrial Dom. Cons.	-	-	-	-
Food Use Dom. Cons.	145	+5 (+3.57%)	140	100
Total Distribution	176	-15 (-7.85%)	191	149
Ending Stocks	16	-15 (-48.38%)	31	21

Turkey's Oil, Olive Production is projected at 145 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.

Turkey's Oil, Olive Production forecast fell by -25 (-14.70%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Morocco, Olive Oil, Production, in 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	130	+10 (+8.33%)	120	120
Beginning Stocks	-	-	2	4
Imports	10	0 (0.0%)	10	6
Total Supply	140	+8 (+6.06%)	132	130
Exports	45	+10 (+28.57%)	35	15
Domestic Consumption	95	-2 (-2.06%)	97	113
Food Use Dom. Cons.	95	-2 (-2.06%)	97	113
Total Distribution	140	+8 (+6.06%)	132	130
Ending Stocks	-	-	-	2

Morocco's Oil, Olive Production is projected at 130 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.
Morocco's Oil, Olive Production forecast rose by +10 (+8.33%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Syria, Olive Oil, Production, in 1000 MT

Attribute	2015/16	Change	2014/15	2013/14
Production	80	+20 (+33.33%)	60	135
Beginning Stocks	7	-9 (-56.25%)	16	40
Imports	1	0 (0.0%)	1	1
Total Supply	88	+11 (+14.28%)	77	176
Exports	10	0 (0.0%)	10	30
Domestic Consumption	70	+10 (+16.66%)	60	130
Industrial Dom. Cons.	-	-	-	-
Food Use Dom. Cons.	70	+10 (+16.66%)	60	130
Total Distribution	88	+11 (+14.28%)	77	176
Ending Stocks	8	+1 (+14.28%)	7	16

Syria's Oil, Olive Production is projected at 80 thd. mt in 2015/16MY in the current USDA World Markets and Trade report.
Syria's Oil, Olive Production forecast rose by +20 (+33.33%) thd. mt in the season of 2015/16 in comparison with the season of 2014/15.

Health Tips

High temperature cooking may increase Alzheimer's risk

Large intakes of foods cooked at high temperatures could increase the risk of developing Alzheimer's disease, according to a study published in the Journal of Alzheimer's Disease. Using dietary data from cohort studies, the French and US researchers estimated the presence of advanced glycation end products (AGEs) in national diets and compared them to Alzheimer's rates. AGEs can be formed by the body, but are also produced when foods are cooked at high temperatures – particularly meats, but also fish, cheese, vegetables and vegetable oil.

They found that diets containing larger quantities of AGEs were correlated with higher incidence of Alzheimer's disease, while those containing fewer AGEs were linked to lower incidence.

"Our newly published paper is the first that estimated the AGE content of diets from observational studies in various countries, which estimated the link between dietary factors and risk of Alzheimer's disease," the authors wrote.

"…In typical national diets, we found that meat made the highest contribution of AGEs, followed by vegetable oils, cheese, and fish. Foods such as cereals/grains, eggs, fruit, legumes, milk, nuts, starchy roots, and vegetables generally make low contributions to the total amount of AGEs in a diet, either because they are generally prepared at low temperatures or since they comprise smaller portions of diets."

Researchers previously have linked AGEs with Alzheimer's, and have suggested that these compounds could be one possible cause of the accumulation of amyloid plaques in the brain associated with the disease.

Increasingly, researchers have been investigating nutrition's role in Alzheimer's disease development, and dietary patterns including traditional Japanese and Mediterranean diets – which typically contain less meat – have been linked to lower Alzheimer's risk.

While this latest study supports an association between increased meat and high fat dairy intakes and Alzheimer's risk, the researchers cautioned that mechanisms other than high temperature cooking could also explain the link.

For example, meat and cheese are sources of cholesterol, which has also been linked to incidence of Alzheimer's. "Further dietary AGE restriction studies are necessary," they concluded. "However, our data strongly underline the relevance of these cohort AGE restriction studies with the aim to find a nutrition strategy to prevent AD."

Courtesy: Journal of Alzheimer's Disease

How hemp seed oil could offer new hope to epilepsy sufferers

It is well established that the brain has metabolic requirements that must be satisfied by what we

eat or in the case of infants, "what their mother eats". In particular, dietary fats are fundamentally

important for thinking, learning and memory abilities, as well as resisting or repairing brain damage.

The brain can build itself from saturated and monounsaturated fats but it has a preference for Omega 3 and 6 fatty acids. Research on humans and animals suggests that optimal brain health is achieved when linoleic acid (LA) and alpha linoleic acid (ALA) are consumed in a ratio of between 3.5:1 and 4:1—a ratio only naturally found in hemp.

The brain also has a requirement for cannabinoids, which regulate most of the major functions of the body including alertness, emotions, inflammation and cancer defences. The brain can make a small number of its own cannabinoids, but as 4,000 years of history and decades of scientific research indicate, it operates optimally when supplied with dietary cannabinoids, which

can also only be found in hemp.

In many forms of epilepsy, damage to or faulty development of glucose receptors on brain cell membranes can starve brain cells of their preferred energy source. Going hand in hand with demand for glucose is oxygen delivery to brain cells. Depletion of either can result in a significant decrease in mental function.

Furthermore, essential fatty acid deficiency can lead to instability of brain cell membranes. This leaves the brain susceptible to damage and can cause aberrant electrical activity, resulting in seizures which in turn can cause further brain damage. This is a vicious circle of

deficiency, dysfunction and deterioration.

A ketogenic diet is one in which a dietary emphasis on the medium chain triglycerides found in coconut oil leads to the production of ketones that can serve as an alternative energy source for brain cells. It has shown some limited success in improving function in metabolic conditions such as epilepsy, Alzheimer's disease and Parkinson's disease.

One possible reason for the modest success of some ketogenic approaches was the substitution of real food with highly processed powdered formulas consisting mostly of synthetic chemicals. Some even include synthetic omega 3 and 6 compounds, the synthetic sweetener sucralose and genetically modified high fructose corn syrup, all of which are suspected of actually causing brain damage and/or seizures.

In addition to trying an alternative energy source, what if it were possible to address the underlying source of the brain's energy problems? Here are five ways hemp could be the answer to combating epilepsy.

1. Glucose transport

It has been shown that glucose receptor dysfunction in the brain is related to membrane instability from dietary essential fatty acids (EFA) deficiency. Restoration of adequate membrane EFA content increases glucose uptake and utilisation in brain cells.

2. Membrane stability

Researchers from Israel tested the idea that optimising EFAs could help prevent seizures in rats. The rats underwent four different treatments known to cause seizures. One group of rats was fed an EFA mixture of LA and ALA in a ratio of 4:1 for three weeks prior to the experiments and the control group was fed a diet deficient in EFAs.

At the end of the period, all rats underwent procedures to cause seizures. Over 90% of the deficient rats suffered seizures as expected, though the EFA fed rats had profoundly better outcomes.

In total, 84% of the EFA rats stopped having seizures altogether. Of the remaining EFA rats, the onset of seizures was delayed by 2,200% and the duration of seizures was reduced by 97%.

The researchers attributed the success to stabilisation of brain cell membranes in the EFA fed

rats. It is worth noting, however, that rats have a faster membrane turnover of EFAs, so while three weeks may be sufficient time to replenish membrane EFAs in the rodents it may take much longer in humans.

3. Cellular oxygenation

One of the functions of omega 3 and 6 fatty acids is to act as oxygen magnets and transporters. It is known that Haemoglobin carries oxygen around the body; however, before oxygen can bind with the haemoglobin in red blood cells, it first has to be attracted to and released into the cell. This is exactly what omega 3 and 6 do.

Research in cystic fibrosis has shown that as cell membrane levels of linoleic acid (Omega 6) decrease, and levels of oleic acid increase, the amount of oxygen entering the cell decreases. Linoleic acid, aas found in hemp seed oil, undergoes "reversible oxygenation" much more easily than oleic acid.

The researchers concluded that a diet overly rich in oleic acid and too low in linoleic acid can impair the oxygenation of cells.

4. Cellular energy

Human cells run on electrical energy. The more of this electrical energy we have, the more alive we feel and healthier we become.

This energy ultimately comes from the sunlight energy that green plants absorb and store electrically in their leaves and fruits. When eaten, the body uses some energy to break down the plant until its stored electrical energy is released and available to power the cell.

LA and ALA are especially electron rich molecules. In the 1950s, German physicists discovered that the vibration frequency of the electrons in LA and ALA matches the vibration frequency of sunlight energy. This makes LA and ALA perfect receivers and carriers of sunlight energy.

They pick up this energy through the skin as the blood circulates the oils near the surface of the body, and release it directly into cells. If we consume enough EFAs and regularly expose our body to sunlight, we literally act like plants and freely absorb this life giving energy from the sun directly into our blood cells. As the Bible says: "The life of the flesh is in the blood."

It is these oxygenating and energising processes that acclaimed German cancer doctor Johanna Budwig attributes to the rapid recovery her patients experienced when increasing their intake of EFAs and exposing

themselves to sufficient sunlight each day.

5. Cannabinoid production and function

As mentioned, the brain can produce its own cannabinoids, all of which are made from metabolites of linoleic acid as found in hemp seed oil. The receptors cannabinoids interact with are also made from omega 3 and 6. Recent research showed that omega 3 deficiency leads to destruction of cannabinoid receptors resulting in various mental, emotional and physical dysfunctions. The entire endocannabinoid system is best fuelled by Hemp Seed Oil.

In summary, hemp seed oil's unique content of omega 3 and 6 fatty acids may be capable of addressing a number of medically neglected metabolic issues in epilepsy, as well as optimising the function of the endocannabinoid system and transporting little parcels of sunlight energy around the body.

Courtesy: Food Navigator -Asia

Omega - 3 may help fight prostate cancer

Omega3 fatty acids inhibit the growth and spread of prostate cancer cells, say scientists –

challenging a 2013 study which claimed omega3s increase the risk of prostate cancer by 71%.

The scientists, led by Kathryn Meier of Washington State University, say they had discovered a new

mechanism by which omega3 fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) – halt the proliferation of cancer cells. They bind to a receptor called FFA4 or 'free fatty acid receptor 4,' which in turn acts as a signal to inhibit cancer cell growth.

Meier said: "We're the first to show that [omega3s] work this way in cancer. The attention has mostly been on inflammation and diabetes but there has always been an interest in cancer, and we were the first to show this mechanism in any cancer cell at all. And we're using prostate cancer, which is the most controversial subject in omega 3s."

These results conflict with a 2013 study , published in the Journal of the National Cancer

Institute, which found that high blood concentrations of long chain omega3 polyunsaturated fatty acids (PUFAs) led to a 71% higher risk of developing high grade prostate cancer. At the time, chief researcher Alan Kristal claimed that this had "once again" showed that nutritional supplements may be harmful, provoking a backlash from both industry insiders and other leading scientists.

The Washington State University researchers recognised that the benefit of omega3s

on prostate cancer was "quite controversial" but said that it was worthy of further investigation. They said their findings had been unexpected.

The study

Prostate cancer cells were first treated with lysophosphatidic acid (LPA) to activate the cancer cells, with EPA or DHA then added. The scientists found that if added before the LPA, EPA but not DHA reduced the number of viable cancer cells at 48 and 72 hours. The rapidity of EPA effect suggested that it had activated the FFA4, which then bound to omega3 fatty acids and inhibited cancer cell growth. "This study presents unexpected findings showing that omega3 fatty acids and FFA4 agonists can inhibit growth factor–induced signalling. To our knowledge, ours is the first study to examine the roles of FFA4 in prostate cancer cells."

Potential for a new drug?

Meier has said the results had "important implications for the administration of n3 fatty acid supplements or FFAR agonists with the intention of preventing cancer".

However she called for more research into the dosage required, suggesting that to fight an existing cancer it may be more efficient to isolate the pharmaco dynamic properties of omega3s and create a new drug, rather than supplementing with omega3s.

"It's very difficult in dietary studies to tell how much to take or what form to take. Should you be eating fish?

Should you be taking pills? But now we have a potential drug. Once you have a drug you can test very precisely whether it works or not in a certain disease and you would know exactly how much to give people," she said.

Courtesy: The Journal of Pharmacology and Experimental Therapeutics

Wheat germ oil

Wheat germ oil is extracted from the germ of the wheat kernel, which makes up only 2.5% by weight of the kernel. The oil content of the wheat germ is around 10%.

The oil from the germ can be obtained either by mechanical extraction or by chemical extraction.

As oil content is very low and high pressure is required to extract the oil by mechanical presses, yield and quality both are low.

In chemical extraction process the extraction can be done either by using super critical extraction by using hexane or by doing sub critical low temperature extraction with the help of n-butane .

Wheat germ oil is particularly high in octacosanol, 28-carbon long-chain saturated primary alcohol found in a number of different vegetable waxes. Octacosanol has been studied as an exercise- and physical performance-enhancing agent. Very long chain fatty alcohols obtained from plant waxes and beeswax have been reported to lower plasma cholesterol in humans. Wheat germ oil is also very high in vitamin E (255 mg/100g), and has the highest content of vitamin E of any food that has not undergone prior preparation or vitamin fortification. As a cooking oil, wheat germ oil is strongly flavored, expensive and easily perishable.

CHEMICAL COMPOSITION AND OTHER DETAILS

Color- Amber/Brown

Odor- Heavy

Acid value: less than 3.0

Specific gravity: 0.91-0.93

Refractive index: 1.46-1.49

Iodine value: 120-140

Peroxide value: less than 10

Total Vitamin E content- 300-500 IU/100g

Alpha Tocopherols- 280-500 IU/100g

Beta and Gamma Tocopherols- 20-40 IU/100g

The fatty acid composition of Wheat germ oil is as given hereunder,

Fatty Acid	%
Linoleic acid (omega-6)	55
Palmitic acid	16
Oleic acid	14
Linolenic acid (omega-3)	7

Uses of Wheat Germ Oil:

Because of its anti-oxidant and regenerative properties, wheat germ oil is a wonderful ingredient to add to body care and cosmetic products. Wheat germ oil can be taken alone, drizzled on top of salads, vegetables, pasta, pesto, or other meals. Wheat germ oil should not be heated. For massage oil blends, it is recommended that you incorporate 10-15%. The dark color and heavy odor must be considered before using it.

The unrefined wheat germ oil is a great ingredient, and has been applied externally for numerous irritations including roughness of the skin, cracking, and chaffing. Many crafters of cosmetics use it successfully to help reverse the effects of wrinkling. Unrefined wheat germ oil is a very sensitive oil that will degrade quickly when exposed to extremes in temperature fluctuation, oxidization, and light. Refrigeration is highly recommended.

Wheat Germ Oil is widely used as both a cosmetic ingredient and as a dietary supplement.

Wheat germ oil is a rich source of vitamin B6 and folic acid of the Vitamin B complex, magnesium, potassium and phosphorus and many other essential nutrients, and is a healthy addition to your diet.

Wheat germ oil has a high nutritional value when compared to the other vegetables or grains. It constitutes almost 25% of the total nutrients of the wheat grain and hence is a pack of many health benefits.

Wheat Germ Oil Benefits:

Given below are the top10 benefits of wheat germ oil.

1. Antioxidant and Anti-Aging Properties:

Wheat germ has antioxidant and anti-aging properties, which help in preventing many diseases like cancer, cardiovascular disease, etc. It also helps in reducing the signs of aging like fine lines and wrinkles, and also reduces premature aging signs. It preserves the texture of your skin and hair, and even protects your skin from damage.

2. Reduced Bad Cholesterol:

It lowers the bad cholesterol levels to a great extent and increases the blood circulation which, in turn, helps in keeping your heart healthy. The increased blood circulation also helps in making the skin and hair healthy.

3. Repairs Tissues:

Wheat germ oil contains vitamin B, which helps in repairing tissue damage and in tissue growth. It also helps minerals, vitamins and nutrients to reach our cells.

4. Boosts Energy:

Wheat germ oil is high in a long chain, saturated, primary alcohol called octacosanol that improves the muscular energy. Thus, wheat germ oil is highly recommended for sportspersons. It gives energy and oxygen during exercise and makes you energetic too.

5. Regulates Nervous System:

Wheat germ oil is also beneficial in lifting the mood as it contains the goodness of omega-3 fatty acids, which help in regulating the nervous system systematically. It makes you energetic and also reduces the stress to a great extent as it contains vitamin-B complex.

6. Prevents Birth Defects:

It also prevents many types of birth defects like impotence and miscarriages. It is high in vitamin E. Wheat germ oil is advisable even for pregnant women as it has many benefits and it also prevents birth defects. It also allows healthy red blood cells.

7. Prevents Skin Problems:

Wheat germ oil helps in providing you with a healthy skin as it prevents many skin problems like psoriasis, eczema, and dry skin. It contains vitamin E oil, which is considered to be very good for the skin.

8. Fights Fat Accumulation:

Wheat germ oil is a fat-fighter and, when used regularly, it helps in reducing the extra fat from the body. It can be part of any weight loss program as it gives you noticeable effects.

9. Control Blood Sugar Level:

Wheat germ oil is rich in magnesium. Thus, when used regularly, it helps in blood sugar control and is especially beneficial for diabetic patients.

10. Improves Overall Health:

The regular consumption of wheat germ oil gives you a healthy, long and disease-free life. It prevents many diseases, reduces your stress, and makes you energetic.

PRECAUTIONS

It should not be used by those with wheat or gluten allergies, either externally or internally.

Laugh Out Loud

● A frog went to visit a fortune teller, “What do you see in my future?” asked the frog.

“Very soon you will meet a beautiful young girl who will want to know everything about you,” replied the fortune teller.

“That’ great!” said the frog, hopping up and down excitedly.” But when will I meet her?”

“ Next week in the Science Class,” said the fortune teller.

● A student comes into his Lab class right at end of the hour. Fearing he’ll get an “ F “, he asks a fellow student what she’s been doing.” We’ve been observing water under the Microscope. We are supposed to write up what we see.” The page of her notebook is filled with little figures resembling circles and eclipses with hair on them. The panic- stricken student hears the bell go off, opens his note book and writes, “ During this Laboratory, I examined water under the Microscope and I saw twice as many H’s as O’s”.

● A biologist and a Physicist got married but soon had to divorce because there was no chemistry

● A man ,complaining of headaches entered a hospital for diagnostic tests. The Doctor, after examining the results of the brain scan, told the patient,” I have two news for you, one is good while the other is bad.” The bad news is that you have a serious brain disease and will die without treatment. The good news that this hospital has developed a new procedure for brain transplants and fortunately, due to an accident this morning, two ‘Fresh’ brains are also available . One brain is of the Driver which costs Rs 2 crore, while the other brain of a scientist is only for RS.20,000/-. Surprised, the patient asked the doctor, ”Why the Scientist’s brain is so cheap?.” The doctor replied “ It’s used”

● A Computer Scientist , a Physicist and a Mathematician discuss “ what is better : a girlfriend or a wife”

The Mathematician replied ‘ Wife, you have security ‘

The Physicist said ,’ Girlfriend . you still have freedom to experiment’.

● The Computer Engineer told ‘ Both’ and explained :” when I am not with my wife, she thinks I’m with my girlfriend and it’s vice versa with my girlfriend. And I can be with my computer without any one disturbing me …..”

● A psychoanalyst shows a patient an inkblot and asks him what he sees. The patient replied “ A man and woman making love’. The Psychoanalyst shows him an another inkblot and the patient says,’ That’s also a man and woman making love’. The psychoanalyst says, You are obsessed with sex.” The patient says “ What do you mean I am obsessed ? You are the one with all dirty pictures”.

Member's PAGE

Solvent Extraction

Now a days solvent extraction plants are having a very important cost centre for achieving best price of solvent extracted oil & De-oiled cake. In order to run the plant in an efficient manner we are submitting some important parameters for efficient operation of Solvent Extraction plant for Mustard Oil Cake processing :-

Operating System	Temperature	Vacuum
1. Extractor	55 – 58°c	2 mm
2. D.T.	70 - 75°c	3 mm
3. Condenser	-	5 - 7 mm
4. 1st Flasher	-	350 – 400 mm
5. 2nd Flasher	-	450 – 550 mm
6. 1st Heater	90 - 95°c	-
7. 2nd Heater	100 - 105°c	-
8. Stripping Column	105 - 111°c	Above 720 mm

9. Inlet & Outlet temp difference of condenser water of plant should be 5°c to 6°c & Maximum outlet temperature should not be more than 38°c.
10. Vent steam pressure - 0.25 – 0.5 kg/ cm
11. Vent Temperature - Not more than 55°c
12. Re crumpression hot & cold oil should be checked once in a day & difference should not be more than 4 to 5%.
13. Miscella flow should be 8000 – 12000 Ltr./ hr and for Recrumpression 1500 – 2000 Ltr./ hr.
14. Miscella concentration should be 18 – 20 % & for 1st spray between 0.06 – 0.15 %.
15. Bed height & spray modification should be monitor as per flow of Mustard Cake in the extractor.

It is observed that by following above mentioned parameters for solvent plant operation , good results are observed with respect to Hexane losses & oil in De-oiled Cake.

M.C. Pandey
Vice President
JVL Agro Foods,
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207, MIA, Alwar (Raj.) - 301030

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C. S. Joshi, Editor, LIPID UNIVERSE
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Phone : +91-124-4034205
Telefax : +91-124-4036038
E-mail : lipiduniverse@gmail.com
: csjoshi@farelabs.com

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