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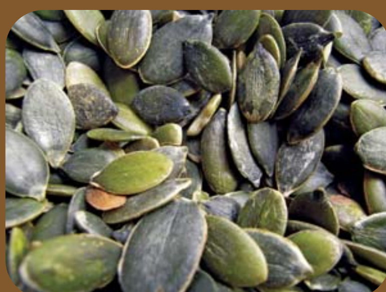




Ohmic Heating System for Stabalization of Rice Bran

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Editor's desk

The edible oil import bill last year has touched rupees fifty eight thousands cores mark and expected to grow over the years. The gap between demand and supply is increasing year by year and India is importing more and more oil to meet domestic demand.

With the new and majority government at center, edible oil sector can expect some far reaching, long term decisions for edible oil sector. Oil sector has a lot of expectations from new government. The problem of edible oil and allied industries sector can be addressed by making policies more industry friendly. As huge capacity of refineries and solvent extraction plant is lying unused from last several years, there is urgent need to formulate policies for promoting oil seed production. The increased production of oil seeds will provide raw material to solvent extraction plants, refineries, cattle feed plants and allied industries. The increased availability of the seed will benefit all the segments of edible oil industries. Till the policy for increasing oil seed production is discussed, formulated and implemented the government can allow import of oil seed. This will help in not only revival of edible oil sector but also help in uplifting the mood of economic well being in the country.

With strong dollar and good oil seed crop in India and other major oil seed producing countries, oil sector has a lot of opportunity to grow if government policies are favorable.

Yours truly,

C. S. Joshi, Editor

Oil Technologists' Association of India
(North Zone)

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Ohmic Heating Syatem for Stabalization of Rice Bran

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Abstract

Ohmic heating is an alternative to conventional heating. It can be used for processes such as pasteurization, extraction, dehydration, blanching, thawing, microbial inactivation or inactivation of enzymes. An ohmic heating system having a capacity of 10 kg/batch was fabricated. It consists of a HDPE cylindrical container of 300mm diameter. The bottom electrode was fixed and the upper electrode was placed on top of the material after filling the cylindrical chamber. The electrodes were made of stainless steel. A step-up isolation transformer having a rating of 10 kW and output of 450 V, 50 Hz AC was used to supply electrical power to the system. The hydrated rice bran having a moisture content of ~30 % (w.b.) was filled into the container and the upper electrode was securely placed. The electrodes were then connected to the electrical supply. The heating of rice bran started immediately and the temperature rose to around 100°C in ten minutes. The heated rice bran was taken out from the system and dried. The free fatty acid (FFA) of treated and raw rice bran was measured at regular intervals. The % FFA in treated (ohmically heated) bran was observed to be 4.77% after 75 days of storage whereas it was 41.84% in case of raw bran. Ohmic heating effectively checked the development of FFA in rice bran. The peroxide value and acid value of ohmically heated samples after 75 days of storage were 4.7 meq/kg & 9.34% respectively.

Key Words : Ohmic heating, rice bran, free fatty acid, peroxide value, acid value, storage

Introduction

Rice bran obtained from milling of raw paddy is classified as full fat raw rice bran. It is light coloured oily, unstable meal of various particle sizes. The most important and crucial property of full fat raw rice bran is the instability of its oil caused by oil-splitting lipase enzymes, inherently present in it. The enzyme, lipase acts as a catalyst. The fat and enzyme are spatially distributed in aleurone and testa layers respectively in intact rice grain. As soon as the bran surface is ruptured and separated from the brown rice in milling operations, the lipase enzymes comes in contact with the oil bearing layers resulting in a very rapid rate of hydrolysis of fats into free fatty acids. Immediately after milling the FFA content of bran is normally below 3%. After milling the rate of increase of FFA in bran may be as high as 1% per hour under favourable conditions. Bitterness develops very soon after milling whereas soapy unpleasant taste develops during long-term storage. The higher the temperature of storage, greater is the rise in FFA. It indicates that in tropical weather the bran can undergo much more spoilage during storage than in a cool or temperate environment.

The process to produce stable rice bran by inactivating the deteriorating enzymes is called stabilization. Physical, chemical & enzymatic methods have been reported for stabilization of rice bran. Various physical stabilization methods, applied to protect rice bran oil degradation, have been reported such as steaming (Juliano B, 1985), extrusion (Kim C J et al. 1987), roasting (Akinso & Adeyanju, 2010) dielectric heating (Sreenarayanan & Chattopadhyay 1986), microwave heating (Lakkakula et al. 2004, Ramezanzadeh et al. 2000), and ohmic heating (Ramezanzadeh et al., 2000).

Dielectric heating (0.5 kV/cm, 13.56 MHz) to treat rice bran (21 % moisture content) was tried. It resulted in an increase of FFA from 4.2% to 6.2% during a six week cold storage period (Sreenarayanan & Chattopadhyay, 1986). Rice bran stabilised by microwave heating at 2450 MHz for 3 min was found to be stable for up to four weeks in storage. Free fatty acid (FFA) content of microwave stabilised bran increased from 4–4.9% in long grain rice bran and from 4.6–6.25% in medium grain rice bran, even when stored under unfavourable conditions (33oC±2oC, 75±5% RH). In contrast, increases in the untreated bran FFA ranged from 4–68.3% and 4.6-56.8% in long grain and medium grain bran, respectively (Tao J et al. 1993). Rice bran adjusted to 21% moisture content wet basis was stabilized satisfactorily with ohmic heating and microwave heating. The free fatty acid content of treated rice bran samples after six weeks of storage (at 4°C) was observed to be 3.89 % and 5.47 % for microwave heated and ohmic heated samples respectively (Lakkakula et al., 2004). The effect of ohmic heating on lipase activity, bioactive compounds and antioxidants of rice bran, at electric field strengths in the range of 140–225 V/cm was studied (Knirsch et al. 2010).

Ohmic heating is based on the passage of alternating electric current through a food product that serves as an electrical resistance and thereby heat is generated instantly inside the food (Reznick D 1996). The amount of heat generated is directly related to the current induced by voltage gradient applied and electrical conductivity of the food (Sastry & Li 1996). This technology provides rapid and uniform heating whereas the absence of a hot surface in ohmic heating reduces fouling problems and thermal damage to a product (Sastry & Barach 2000). The electrical conductivity (EC) of foods is a key parameter of the electrical properties due to its potential influence on ohmic heating (de Alwis & Fryer 1990). The effects of insoluble solids & applied voltage on electrical conductivity of pre-pasteurized carrot and tomato juices during ohmic heating have been studied (Palaniappan & Sastry 1991). Evaluation of electrical conductivity of blanched 2cm cubic particles (carrot, potato, radish, beef muscle, pork muscle and commercial ham) dispersed in carrier fluid (5% w/w starch-water solution with 0.15-1.5% w/w/ salt concentrations) has been reported. Electrical conductivity was observed to be highly co-related to sample temperature and salt concentration (Zhu et al. 2010). Electrical conductivity of a two phase food systems comprising of a liquid phase using 4 % w/w starch solution with 0.5% w/w salt and a solid phase containing carrot puree and cubes of different sizes (6 & 13 mm) in different concentrations (30 & 50% w/w) ranged from 0.2 to 1.8 S/m. The electrical conductivity increased with the process temperature from 20-80°C (Zareifard et al. 2003). Ohmic heating rates are critically dependent on the electrical conductivity of the foods (Halden et al. 1990).

The effect of ohmic heating on lipase activity, bioactive compounds and antioxidants of rice bran, at electric field strengths in the range of 140 – 225 V/cm has been studied (Loypimai et al. 2009). It is very expensive to achieve high electrical field strength for small scale system. The aim of this study was to investigate electrical characteristics of full fat raw rice bran to design and evaluate an ohmic heating system for its stabilisation on small scale. The present study was thus undertaken with the following objectives:

- To determine the electrical characteristics of full fat raw rice bran.
- To design, fabricate and evaluate ohmic heating system for stabilization of rice bran with respect to FFA formation.

Materials & methods

Measurement of electrical parameters (resistance and capacitance) of the hydrated rice bran

L-C-R-Q Bridge 6018 (Make Scientific MES-TECHNIK Pvt Ltd Indore India) employing four point measurement technique was used to measure the capacitance and resistance of the test sample. A cylindrical test cell having internal diameter 20 mm, outer diameter 25mm and 40mm length was used for measurement of electrical parameters of rice bran samples at known moisture contents. The thickness of the samples was 30mm. Hydrated rice bran sample held between two parallel plates have the capacitor and resistor elements in parallel (as shown in Fig.1). The test frequency of 100 Hz was selected for measurement. The measurements were carried out in triplicate.

The impedance of the RC circuit was calculated according to the formula expressed in Eq. 1

$$|Z|=\frac{1}{\sqrt{(1/R)^2+(2\pi fC)^2}} \qquad (\ldots 1)$$

Where Z is the impedance, R is the resistance, in ohms, f is frequency in Hz and C is the capacitance, in Farads.

Calculation of specific resistance & dielectric constant of hydrated rice bran

The specific resistance of rice bran was calculated using the equation 2

$$\rho=(R\,A)/L \qquad (\ldots.2)$$

Where ρ is the specific resistance, R is resistance, A is area of cross section of the sample and L is the distance between electrodes or thickness of the sample. The R, A and L values, are measured to calculate the specific resistance.

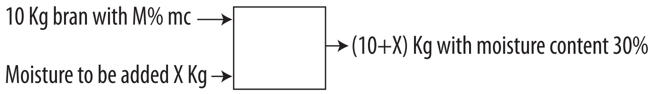
The dielectric constant ϵ of rice bran was calculated using the equation 3

$$\in=(C\,d)/A \qquad (\ldots 3)$$

Where ϵ is the dielectric constant, C is capacitance of the sample, d is the diameter of the sample and A is the area of cross section of the sample. The C, d and A values, are measured to evaluate the dielectric constant ϵ.

Operation of the ohmic heating system

Moisture content of raw rice bran was determined by hot air oven method. The amount of water required to increase the moisture content to 30% (w.b.) was calculated using mass balance on moisture. The amount of water was calculated according to the method described below :



Applying balance on moisture, the moisture to be added to 10 kg of raw rice bran, is 'X".

X = (30-M) / 7 kg; where M is the initial moisture content of rice bran in % on wet basis. 'X' kg of water was thoroughly mixed with the rice bran and allowed to equilibrate. The hydrated rice bran was filled in the ohmic heating system and the upper electrode was placed on the top of free surface of rice bran. Then the system was connected to electricity for ohmic heating of rice bran. After ohmic heating the bran was dried. The treated bran was then stored and per cent FFA was calculated as oleic acid and expressed as percentage of the total lipids.

Results & discussions

Calculation of specific resistance and dielectric constant of hydrated rice bran

The average values of capacitance and resistance of rice bran having a moisture content of 30 % (w. b.) was observed to be 2.32 nF and 9.01 kΩ. The specific resistance of rice bran was calculated using the equation 2. Knowing the R, A and L values, the specific resistance was calculated to be 94.3 Ωm.

The dielectric constant ϵ of rice bran was calculated using the equation 3. Knowing the C, d and A values, the dielectric constant ϵ was calculated to be 2.32 × 10-7 F/m.

Design parameters of the ohmic heating system

The design of the ohmic heating system was carried out on the basis of following parameters:

- Bulk density of hydrated rice bran (30% moisture content w. b.): 400-425 kg/m3
- Diameter of the heating system: 300 mm
- Voltage across the electrodes: 415 V
- Depth of the sample: approx. 200 mm

Calculation of Resistance and Capacitance of hydrated rice bran

The resistance and capacitance of the hydrated rice bran having a moisture content of 30% was calculated using the eqn. 2 and eqn.

Resistance of the material in ohmic heating system = ρL/A = 268 Ω

Capacitance of the material in ohmic heating system= ϵA/d = 0.02 μF

Impedance of the material |Z| was calculated as follows:

$$|Z|=\frac{1}{\sqrt{(1/R)^2+(2\pi fC)^2}}=\frac{1}{\sqrt{(1/R)^2+(2\pi x50x0.02x10^{-6})^2}}=267.99\Omega$$

The impedance was observed to be equal to resistance value. It was observed that the resistance of the sample played a major role in overall impedance of the material and capacitance had negligible impact on the impedance characteristics. The flow of current was largely controlled by the resistance offered by the hydrated rice bran. The initial resistance offered by rice bran in the electrical circuit was taken as approx. 270Ω. As the heating takes place, the electrical conductivity increases, indicating that the resistance offered by the bran layer will reduce and the current through the system will increase.

The electrical conductivity at 100 oC temp was approximated using the equation, EC = 0.0169+1.28E-03(T) (Dhingra et al. 2012). It works out to be 0.1449 S/m. The corresponding resistance value will be approx. 34.5Ω (1/EC x depth of sample).

Fabrication of the ohmic heating system

The schematic of the ohmic heating system is shown in Fig.2. The system is presented in Fig.3. The electrical wiring and accessories are not shown in the figure. The bottom electrode was fixed and the upper electrode was placed on top of the material after filling the cylindrical chamber. The electrodes were made of stainless steel. A step-up isolation transformer having a rating of 10 kW and output of 450 V, 50 Hz AC was used to supply electrical power to the system. The complete system was enclosed in a wooden frame and mounted on a MS stand.

Testing of the ohmic heating system

The hydrated rice bran (having a moisture content of 30% w. b.) was filled in the ohmic heating system. The upper electrode was placed on the top of free surface of rice bran. Then the system was connected to electricity. The electrical field strength of 45 V/cm was applied. Initially the current flow was observed to be very small (around 1 – 2 A), because the temperature of the hydrated rice bran was low. As the temperature increased, the electrical conductivity increased, and the current flow increased to around 16A. The current flow was continued till steam started emanating. It took around 5 minutes to heat 10 kg rice bran from 20°C to 100°C. At this point electrical current was switched off. The heated rice bran was taken out from the system and dried in a tray drier at 60°C temperature.

Changes in FFA of raw and ohmically heated (treated) rice bran during storage

The FFA of treated and raw rice bran was measured at regular intervals. The % FFA in treated (ohmically heated) bran was observed to be 4.77 % after 75 days of storage whereas it was 41.84 % in case of raw bran. The free fatty acid concentration of the ohmically heated samples increased very slowly in comparison to raw rice bran samples during 75 days of storage. The variation in % FFA is presented in Fig. 4. Ohmic heating effectively checked the development of FFA in rice bran. The peroxide value and acid value of ohmically heated samples after 75 days of storage were 4.7 meq/kg and 9.34 % respectively. The peroxide value and acid value of ohmically heated samples after 75 days of storage were 4.7 meq/kg and 9.34% respectively. Ohmic heating was observed to be an effective method for rice bran stabilization.

Conclusions

The developed ohmic heating system was observed to be successful for faster heating of hydrated rice bran. It has provided a new technique for preparing stabilized rice bran for food and feed applications. The system is practically working in a small scale industry. The FFA of stabilized rice bran could be retained below 5%, which is desirable for its edible quality.

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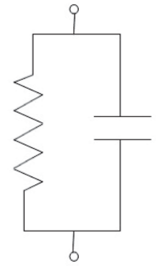


Fig. 1 Hydrated rice bran held between two parallel plates behaves like a resistor and capacitance in parallel

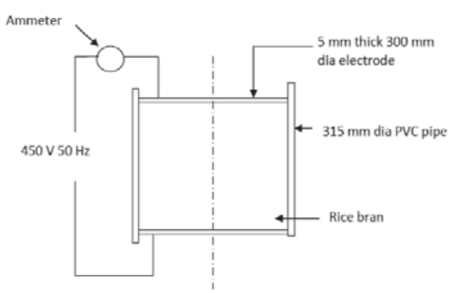


Fig. 2 Schematic of the ohmic heating system

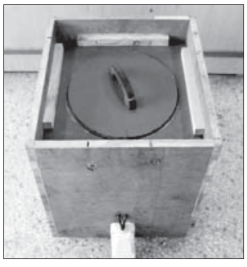
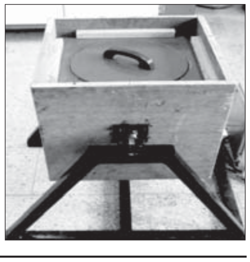


Fig. 3 Ohmic heating system enclosed in wooden frame (left) and mounted on a stand (right)



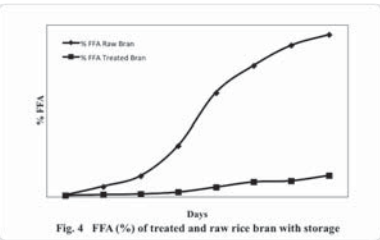


Fig. 4 FFA (%) of treated and raw rice bran with storage

Trade News

Edible oils' demand to rise 5% this year despite price fall

In spite of the steep fall in edible oil prices, local demand has not increased due to the surge in prices of other commodities of daily use. According to sector sources, demand growth is likely to be five per cent this year.

"For six months, prices have been under pressure due to higher production of seeds in India. But despite this, demand growth was a bit slow, as other commodities were trading higher owing to the rise in inflation during the past year," said Angshu Mallick, chief operating officer, Adani Wilmar Ltd.

Mallick said the demand was likely to increase five per cent this year. "Oils have almost bottomed out and the pressure may reduce." Experts said this year prices of most oils had gone down 10-40% against a year ago. While prices of imports like soya oil and RBD palm oil have decreased 11% and 7.5%, respectively, sunflower oil saw a dip of 5.5% and grape seed oil declined 16%.

Wholesale prices of oils have come down 10-12%, while retail ones are down six-seven per cent. "Good climatic conditions in South America, Canada, Russia and Ukraine, the main producers, and even in India resulted in higher productivity. Malaysia and Indonesia have also seen favorable conditions," an official of an oil company said. "The prices will continue to be lower for six months." Palmolein and palm oils have not declined as much as others because the demand for biodiesel was good.

Govindbhai Patel, managing director of Deepak Enterprises, said, "Prices may continue to decrease further for some time as crushing is still higher. Crushing will gradually decline and pressure will reduce on prices. The palm oil price will not decline much as the crop size is small." According to the data compiled by The Solvent Extractors' Association of India (SEA), imports of oils during December 2013 (second highest since 1994) were one million tonnes compared to 908,587 tonnes a year ago, up 18%.

B V Mehta, executive director, said, "This year all prices are reeling under pressure due to expectations of a higher production of seeds not only in India but across the world." Groundnut oil has been trading at a four-year low. Also, poor export demand has resulted in a further fall.

In January 2013, the price was Rs 2,250 for a 15-kg tin, an all-time high, but now is Rs 1,340-1,350, down 40%. This was seen in January 2010. Suresh Kaneria, managing director of Kaneria Oil Industries, said, "The main reason for the fall is the higher availability of groundnut. Most has been diverted to mills as exports have been nominal this year."

According to the ministry of agriculture the estimated seed area as on October 17, 2013, was 19.5 million hectares against 17.8 million a year ago, up 1.7 million. The summer crop is estimated at 17 million tonnes for 2013-14 against a year ago's 15 million. The yield increased to 867 kg a hectare during the current summer crop from 855 kg a hectare a year ago. According to the second advance estimates of production, nine seeds' production is likely to be 33 million tonnes in 2013-14 against 31 million a year ago. The report said groundnut production was estimated at nine million tonnes for the summer and winter crops this year against five million a year ago. Rape seed and mustard are estimated at eight million tonnes.

Cannabis Plants could be the source of future biodiesel and cooking oils :

Scientists have successfully boosted the energy output of the cannabis plant to create a viable alternative to rapeseed and olive oil. A team of researchers at the University of York have reported the breakthrough by dramatically increasing the content of oleic acid in hemp.

The new oil profile results in an attractive cooking oil that is similar to olive oil in terms of fatty acid content having a much longer shelf life as well as greater heat tolerance and potentially more industrial applications.

Researchers in the Centre for Novel Agricultural Products (CNAP) in the Department of Biology at York say that high oleic acid varieties are a major step towards developing hemp as a commercially attractive break crop for cereal farmers. Using fast-track molecular plant breeding, the scientists selected hemp plants lacking the active form of an enzyme involved in making polyunsaturated fatty acids. These plants made less poly-unsaturated fatty acids and instead accumulated higher levels of the mono-unsaturated oleic acid.

The research team used conventional plant breeding techniques to develop the plants into a "High Oleic Hemp" line and higher oleic acid content was demonstrated in a Yorkshire field trial. Oil from the new line was almost 80% oleic acid, compared with typical values of less than 10 per cent in the standard hemp line. This high mono- unsaturated/ low poly-unsaturated fatty acid profile increases the oil's thermal stability and oil from the new line was shown to have around five times the stability of standard hemp oil.

This not only makes the oil more valuable as cooking oil but also increases its usefulness for high temperature industrial processes. As oilseed rape faces declining yields and increasing attacks from pest and disease, UK farming needs another break crop to ensure the sustainability of its agriculture & maintain cereal yields. An improved hemp crop, yielding high quality oil would provide an excellent alternative.

Hemp is a low-input crop and is also dual-purpose, with the straw being used as a fibre (for bedding, composites and textiles), for biomass and as a source of high value waxes and secondary metabolites.

Professor Ian Graham, from CNAP, said: "The new line represents a major improvement in hemp as an oil crop. Similar developments in soybean and oilseed rape have opened up new markets for these crops, due to the perceived healthiness and increased stability of their oil."

In 2014 field trials of the new High Oleic Hemp are being rolled out across Europe in order to establish agronomic performance and yield under a range of environmental conditions in advance of launching a commercial crop.

Groundnut exports to be hit on strict Malaysia, EU norms:

Groundnut exports are likely to take a hit due to the stringent norms of the European Union (EU) and Malaysia to control aflatoxins level.

The two largest importers that account for 40 per cent of exports have asked Indian traders to procure a health certificate for every consignment. The Export Inspection Council of India (EIC), under the commerce ministry, is issuing certificates. This is required in addition to other certificates, including hazard analysis and critical control points (HACCP). "We have been appointed as the only agency for issuing health certificates for groundnut exporters to Malaysia and the EU," said an official.

After getting complaints from the two regions, Agricultural and Processed Food Products Export Development Authority (Apeda) had told the commerce ministry repeatedly about exporters not adhering to global norms. The official said importers had warned the Apeda a suspension of shipments could kick in.

Between April and December 2013, exports fell 14 per cent in volumes to 361,642 tonnes against 420,640 a year ago. Falling global prices of oilseeds have also lowered realisations 13 per cent. The groundnut realisation fell to Rs 66,000 a tonne in the first nine months of the current financial year from Rs 76,000 a tonne a year ago.

APEDA on December 31, last year, had asked recognized exporters including processing and milling units to obtain a provisional HACCP certificate for groundnut shipment after showing documentary evidences for their capability.

Groundnut Export

Particular	April-December 2012	2013	Change in %
Quantity (tonnes)	420460	361642	-14
In INR crore	3178	2381	-25
In $ million	583	395	-32
Realisaion (INR/tonnne)	76000	66000	-13

For determining aflatoxins levels in groundnut and its derivatives it would be mandatory that all public private partnership (PPP) consignments meant for export to the EU will compulsorily be vacuum packed only and no other type of packing will be used. The sampling will be done in gunny bags and after clearance from the laboratory, the consignment will be vacuum packed under the supervision of the authorized laboratory, APEDA said.

"The entire trade gets affected because of a couple of errant exporters as importers set stringent norms, difficult to adhere to. Hence, exporters should always maintain global quality specification for not to spoil entire exports fraternity from India," said Kishore Tanna, chairman of Indian Oilseeds and Produce Export Promotion Council (IOPEPC) under Ministry of Commerce. India's output is estimated at six million tonnes this year, a rise of 10% on a year ago.

Linseed Prices Seen Lower by Oil World on Output at 7-Year High:

Linseed or flaxseed prices may extend a decline in the next few months as bigger crops in Canada and Kazakhstan lift world production of the oilseed to the highest in seven years, industry researcher Oil World said.

The global linseed harvest is estimated to climb to 2.33 million metric tons in 2013-14 from 2.01 million tons a year earlier, the Hamburg-based researcher wrote in an e-mailed report today. Prices for linseed have started falling as the oilseed lost attractiveness compared to rapeseed, the researcher said. Northwest Europe prices for Russian linseed for January or February delivery dropped to $625 a ton as of Jan. 2 from $645 a week earlier and $665 on Dec. 19, according to Oil World.

"There are high chances that the market will transition to a more ample situation in January-July 2014," Oil World wrote."We hardly believe that the current linseed price levels will be maintained."

Canada's linseed crop is estimated at 712,000 tons from 489,000 tons in 2012-13, while Kazakhstan's is expected to be 250,000 tons from 158,000 tons a year earlier. Russia's harvest is estimated to have climbed to 380,000 tons from 362,000 tons, while Chinese output fell to 330,000 tons from 350,000 tons, according to Oil World.

Linseed use is expected to advance at a slower pace than production, with crush climbing to 1.89 million tons from 1.84 million tons, the researcher said. Ending stocks of linseed are forecast to climb to 330,000 tons from 190,000 tons at the end of 2012-13, Oil World said.

"The potential for an even stronger buildup of global linseed and flaxseed stocks at the end of this season should support a negative bearing on prices," the researcher said

Linseed oil traded at $1155 a ton at Rotterdam last week, compared with $990 for rapeseed oil & $960 for sunflower seed oil, Oil World data show. "To prevent significant demand losses linseed oil needs to regain competitiveness in the remainder of 2013-14, thus exerting additional pressure on linseed quotations," the industry researcher said.

World Oilseed Crushing Forecast Raised by Oil World on Rapeseed :

Global oilseed crushing is forecast to climb to a record in 2013-14 as more soybeans and sunflower seeds are processed, with the outlook raised from September on increased expectations for rapeseed crush, Oil World said.

Crush of 10 major oilseeds may jump to 405.1 million metric tons in the year through September from 387.7 million tons a year earlier, the Hamburg-based researcher said in an e-mailed report today. The group in September had forecast crushing of 401.1 million tons.

Oilseeds including soybeans and rapeseed are crushed to produce vegetable oils & meal used to feed livestock. Soybean futures dropped 6.4% this year on the Chicago Board of Trade as the Department of Agriculture forecast a record global soybean crop of 284.9 million metric tons in 2013-14. "A record oilseed crop is shaping up this season," Oil World wrote. "Soybeans will be the growth leader with an additional 12 million tons to be processed, followed by sunflower seed & rapeseed."

World production of seed oils probably will rise to 105.7 million tons from 101 million tons, while meal output is predicted to rise to 279 million tons from 266.5 million tons.

Processing of soybeans will rise to 237.6 million tons from 225.7 million tons, similar to a September outlook for 237.3 million tons. Oil World raised its estimate for rapeseed crushing to 62.8 million tons from an earlier outlook of 60.4 million tons, and up from 61.7 million tons in 2012-13.

Sunflower seed crush is predicted to climb to 36.2 million from 32.1 million tons. That's up from the September outlook for 35.8 million tons.

China's Soybeans

Oilseed processing in China, the world's biggest soybean consumer, will rise to 92.2 million tons from 90.7 million tons, Oil World estimates. Crushing in the U.S. is seen slipping to 50.1 million tons from 50.5 million tons.

"In the U.S., soybean crushing is on track to increase by about 0.2 million ton in the first quarter, but in the full 2013-14 season stagnation appears likely in view of the rapid depletion of soybean stocks by the record export commitments, "the researcher said.

World Palm Oil Exports Seen Falling for First Time in 16 Years :

Global exports of palm oil may decline this season for the first time in 16 years as makers of biofuel and cooking oil substitute sunflower and soybean oil, Oil World said.

Palm oil exports will total 43.75 million metric tons in the 2013-14 season that began Oct. 1, down 1.1 percent from a year earlier, the Hamburg-based researcher said in an e-mailed report. Shipments from top-producer Indonesia will decline 0.8% to 21 million tons, while exports from Malaysia, which ranks second, will fall 2.2% to 18.1 million tons.

"Palm oil has lost attractiveness in the energy markets of Europe and other countries, which resulted in a considerable slowing-down of purchases," Oil World said. "Also, in the food markets palm oil has lost market share to sunflower oil and partly to soya oil. This demand shift was also triggered by the deteriorated price attractiveness of palm oil."

Prices for palm oil climbed 10 percent since Oct. 1 on Bursa Malaysia Derivatives amid declining stockpiles in Malaysia and Indonesia and prospects for slower production growth. Soybean oil futures were little changed on the Chicago Board of Trade in the same timeframe.

Global palm oil output will increase 4.8 percent to 58.5 million tons in the 2013-14 seasons, compared with a 6.6 percent increase the previous year, Oil World said. Production of soybean oil will rise 5.5 percent from a year earlier to a record 44.2 million tons. World output of sunflower oil will rise as much as 9.7 percent to 8.5 million tons, according to the report. Rapeseed oil output will increase 2 percent to a record 25.4 million tons.

World production of 12 major oilseed meals, used in livestock feed, may climb 4.6 percent to a record 303.71 million tons, Oil World said. Soybean meal and sunflower seed meal will account for "the bulk of the year-on-year increase," with production totaling 187.82 million tons and 16.8 million tons, respectively.

Rabobank Sees Lower Crop Prices in 2014 amid Ample World Supply:

Agricultural commodities including soybeans and corn, the worst-performing commodity this year, probably will extend declines in 2014 as world supplies remain ample, Rabobank International said in its annual outlook report.

The world is entering a period of "more balanced" supply and demand fundamentals after a decade of increasing volatility that drove prices for many farm goods to records, Rabobank analysts led by Luke Chandler in Sydney, said in the e-mailed report today. Increased planting of grains and oilseeds and a potential slowdown in crop use for biofuels mean prices for corn and soybeans will trend lower next year, he wrote.

"Global inventory levels have been rebuilding throughout 2013, and the rapid demand growth of recent seasons has slowed," Chandler wrote. "We expect prices to continue to ease for most markets in the grain and oilseeds complex in 2014."

Corn, the biggest loser this year among the Standard & Poor's GSCI gauge of 24 raw materials, tumbled 38 percent since Jan. 1 as the U.S. harvest, the world's biggest, rebounded from drought in 2012. Wheat slid 19 percent on the Chicago Board of Trade, while soybeans dropped 6.9 percent. The U.S. Department of Agriculture expects global production of all three crops will rise to records in the 2013-14 seasons.

Corn may average as low as $4.10 a bushel in the fourth quarter of next year, while soybeans slide to $10.70 a bushel, Rabobank said. That compares with prices today at $4.315 a bushel and $13.125 a bushel, respectively.

Algae the wonder crop for sustenance of man kind

Professor R. K. Trivedi
Harcourt Technological Institute, Kanpur, India 208002

Introduction

Scientists and technologist see great promise in algae as a new source of oil — a sustainable, environmentally sound way to produce lipids for food and fuels. Algae are being explored as a sustainable energy feedstock, having potential to reduce dependence on petro-fuels and offset greenhouse gas emissions. Economic considerations and principles of green design suggest that if algae-to-fuel technology is to be successful, biofuels must be produced simultaneously with value-added co-products. At present, the algae industry is centered on a limited number of products, such as low-volume/high-value specialty nutrients. New products for medium- and high-volume markets will be needed as biomass production increases in scale. This Perspective highlights few non-fuel, food and bioactive nutritional applications of algal biomass that have received relatively little attention to date but are promising for future development. The article is aimed to draw attention to some of the unique opportunities that algae present with respect to biochemical composition as compared to lignocellulosic energy crops.

Microalgae are microscopic single cell plants, typically found in water systems such as oceans, lakes, rivers, and streams. Algae are the first link in the oceanic food chain and use photosynthesis to convert water and carbon dioxide to nutrient-rich biomass and oxygen in the presence of sunlight. In fact, microalgae produce approximately half of the atmospheric oxygen.

Algae have a long history of use as foods and for the production of food ingredients. There is also increasing interest in their exploitation as sources of bioactive compounds for use in functional foods and nutraceuticals. A range of microalgae species are cultivated at large scale around the world and commercially used in a variety of applications such as aquaculture, cosmetics, and food supplements. Important for human health, algae are primary producers and an important source for nutrients, such as Omega-3 fatty acids (EPA and DHA) and anti-oxidants. In fact, other marine sources of Omega-3 oil such as fish and krill, do not produce Omega-3 fatty acids, but rather accumulate it from the algae they and their prey consume in their natural environment. Algal lipids from microalgae are one of the best sources for biofuels as well edible and non edible lipid oils. Algae grow quickly, tolerate extreme weather conditions, and do not pose the same issues as biofuel crops that are grown both for fuel and food.

Structure and Occurrence of the Major algal Components :

The chemical structures of algal polysaccharides, algal lipids, fatty acids and sterols, algal proteins, phlorotannins, and pigments and minor compounds are of interest to scientist and technologists.

Algae are photosynthetic organisms that occur in most habitats, ranging from marine and freshwater to desert sands and from hot boiling springs to snow and ice. They vary from small, single-celled forms to complex multicellular forms, such as the giant kelps of the eastern Pacific that grow to more than 60 meters in length and form dense marine forests. Algae are found in the fossil record dating back to approximately 3 billion years in the Precambrian. They exhibit a wide range of reproductive strategies, from simple, asexual cell division to complex forms of sexual reproduction.

Algae are important as primary producers of organic matter at the base of the food chain. They also provide oxygen for other aquatic life. Algae may contribute to mass mortality of other organisms, in cases of algal blooms, but they also contribute to economic well- being in the form of food, medicine and other products. In tropical regions, coralline algae can be as important as corals in the formation of reefs.

Seaweeds are larger algae that live in the marine (salt or brackish water) environment. Kelps are large brown seaweeds in the genera Pelagophycus, Laminaria, Macrocystis, etc. In the Pacific, individual kelp plants may reach 65 meters in length.

Biological Properties of Algae and Algal Components : The properties of interest are the antioxidant properties of algal components, anticancer agents derived from marine algae, anti-obesity and anti-diabetic activities of algae, and algae and cardiovascular health.

As proper nourishment is a growing concern with increasing world populations, easy to produce and cost-effective sources that can rapidly produce large amounts of nutritional value are needed. Algae can provide a significant source of a diverse number of critical nutrients to support human health. Algae are ubiquitous throughout the world and have persisted and thrived in numerous types of environments. The adaptations they have developed and propagated are accompanied by benefits to organisms up the food chain. Many of these unique characteristics (carotenoids, micronutrient accumulation, amino acids etc.) have led to an extensive base of compounds that are critical in human health. Discovering of these algae and contained compounds is in its infancy, though numerous beneficial products are currently present.

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Extraction of compounds and fractions from algae :

There are conventional and alternative technologies for the production of algal polysaccharides. Enzymatic extraction, subcritical water extraction and supercritical CO_2 extraction of bioactives from algae, and ultrasonic- and microwave - assisted extraction and modification of algal components are the practiced commercial technologies for extraction and recovery of valuable components from algae.

It is believed that the majority of oil and natural gas originates from algae in ancient oceans. Oil (petroleum) consists of liquid hydrocarbons which arc compounds composed of carbon and hydrogen. At least 80% w/w of oil is carbon. The remainder is principally hydrogen, but sulfur and oxygen may each account for up to 5% of the weight of oil. The burning heating volume of oil is relatively high owing to its liquid state, and is comparable to that of coal.

Total proven oil reserves worldwide are estimated to be worth the equivalent of 40 years of consumable oil, based on a 1988 worldwide oil production rate of 64.2 million barrels per day. The Organization of Petroleum Exporting Countries (OPEC) is in control of approximately 60% of the world's oil, and exercises a strong influence on oil prices worldwide. The lack of stability of future energy supplies has motivated the development of alternative energy sources in order to eliminate the possibility of a future energy shortage. Few facts are listed here related to developments in microalgae oil production. Microalgae posses several attractive characteristics:

1) Costs associated with the harvesting and transportation or microalgae are relatively low, in comparison with those of other biomass materials such as trees, crops, etc.
2) By virtue of their relatively small sizes, microalgae can be easily chemically treated.
3) Algae can be grown under conditions which are unsuitable for conventional crop production.
4) Microalgae are capable of fixing CO_2 in the atmosphere, thus facilitating the reduction of increasing atmospheric CO_2 levels, which are now considered a global problem.

Microalgal oils are produced through either biological conversion to lipids or hydrocarbons or thermochemical liquefaction of algal cells.

Applications of Algae and Algal Components :

Foods, functional foods and nutraceuticals :

The current estimated global market size for nutraceutical products is 30 to 60 billion dollars, primarily in the United States, Japan, and Europe, with a potential short-term growth market demand of over 197 billion dollars [1]. With the increase in demand for nutraceuticals and food supplements, organisms that can rapidly produce nutritional compounds are desired.

As proper nourishment is a growing concern with increasing world populations, sustainable sources of nutritional value are needed. Due to the diverse nutritional components algae can produce and concentrate, along with their simple and rapid growth characteristics, these autotrophic organisms are exceedingly desired for use in nutraceuticals and nutritional supplements. Many types of algae have documented health benefits from strengthening the immune system to fighting cancer and heart disease. Currently the design of healthier foods and beverages containing whole algae, prebiotic properties of algae and algae-supplemented products, algal hydrocolloids for the production and delivery of probiotic bacteria, and cosmeceuticals from algae are the industrial applications.

Microalgae as biological sources of lipids & hydrocarbons

Microalgae contain lipids and fatty acids as membrane components, storage products, metabolites and sources of energy. Algal fatty acids and oils have a range of potential applications. Algal oils posses characteristics similar to those of fish and vegetable oils, and can thus be considered as potential substitutes for the products of fossil oil (2).

The lipid and fatty acid contents of microalgae vary in accordance with culture conditions In some cases, lipid content can be enhanced by the imposition of nitrogen starvation or other stress factors. Lipid fractions as high as 70 to 85% on a dry weight basis were reported in microalgae. Such high lipid contents, exceed that of most terrestrial plants.

According to these reports, during early stages of growth, green algae produced relatively large amounts of polar lipids and polyunsaturated C16 and C18 fatty acids. On approaching the stationary phase of growth, however, the dominant lipids produced by these algae were neutral, and consisted primarily of saturated 18:1 and 16:0 fatty acids. In the case of blue-green algae, the lipid and fatty acid composition showed relatively little change during the growth cycle.

Liquid fuels from microalgal biomass

It is well known that microalgae can assimilate CO_2 gas as a carbon source for growth. However, if the resulting cell mass is not suitably treated, CO_2 will be evolved and diluted into the environment by decomposition, thus preventing CO_2 fixation from contributing to a reduction in atmospheric CO_2.

Petroleum is widely believed to have its origins in kerogen, which is easily converted to an oily substance under conditions of high pressure and temperature (3-5). Kerogen is formed from algae, biodegraded organic compounds, plankton, bacteria, plant material, etc., by biochemical and/or chemical reactions such as diagenesis and catagenesis. On the basis of these findings, it is assumed that algae grown in CO_2 - enriched air can be converted to oily substances, and that such an approach can contribute to solving two major problems: air pollution resulting from CO_2 evolution, and future crises due to a shortage of energy sources. Use of thermochemical liquefaction of organisms in the production of alternative fuels, would reduce CO_2 evolution into the atmosphere since such fuels would indeed be produced from CO_2.

Researchers have (6) reported that diesel fuel and gasoline were produced through the transesterification and catalytic cracking of lipids accumulated in algal cells. This liquefaction is carried out in an aqueous solution of either alkali or NaCl at a temperature of about 300 C and pressure of 10 MPa in the absence of reducing gases such as hydrogen and/or carbon monoxide. Since drying is not required, energy consumption for water vaporization is avoided. Microalgal cell precipitates derived from centrifugation, which are of a high moisture content, are thus good raw materials for liquefaction. Liquefaction was performed using a conventional stainless steel autoclave of 100-ml capacity with mechanical mixing.

A heavy oil yield of 35.6% was obtained. This heavy oil consisted of carbon (73%), hydrogen (9%), nitrogen (5%), and oxygen (13%). The heating volume of the heavy oil was 34.7 kJ/g, which is almost the same as that of C heavy oil. This heavy oil had a viscosity of 860 cps, which was similar to that of castor oil.

Future prospects

Petroleum supplies will be exhausted in the future, and the development of technologies for mass production of petroleum alternatives is desired. Several studies relevant to the production of oil using microalgae have been reported. These include hydrocarbon production by Botryococcus, thermochemical liquefaction of microalgae, and algal hydrocarbon processes. Petroleum is not only used as fuel, but is also a raw material for the production of a variety of chemicals. Petroleum alternatives should be developed prior to the exhaustion of petroleum supplies. The majority of petroleum has its origins in algae, which were grown using CO; as a sole carbon source. Research into the production of petroleum alternatives using microalgae is important to the future of mankind.

Production of lipids from algal sources, which can be source for edible as well as non edible substitutes for vegetable crop oils, is the most exciting area for industrial exploitation.

Many research teams in academia and private industry are struggling, however, with one vexing problem with algae as a fuel source: The conditions that promote algal growth aren’t the same as the conditions that allow the algae to create the maximum amount of oil. Researchers have shown that, if algae are deprived of nitrogen, the cells become stressed and begin to produce lipids, but their growth rate slows. And if alga is ever to become a commercially viable fuel source, scientists must ensure that not only can it produce as many lipids as possible, but also that it can grow at the fastest rate possible. Recent findings of a research described that lipid accumulation in algal cells begins just hours after they are starved of nitrogen – not days, as scientists previously believed. They also found that about 30 percent of lipids produced under nitrogen stress occurred as the membrane began to degrade inside each cell, the cell recycling the membrane lipids to oil.

The next step for the researchers is to understand that genetic network, which is important for turning on lipid accumulation, the most critical area for current research and technology development in microalgae research.

Conclusion :

As the human population continues to increase, demand for nutritive food and health products increases concomitantly. Algae have shown viability in meeting nutritive demands due to their rapid growth, health benefits, and enriched compounds they produce. The role of algae in human health and nutrition will continually increase with additional research in the areas of health benefits and culturing. The ability of algae to treat and prevent numerous types of serious diseases (especially viral infections, heart disease, and cancer) will undoubtedly continually surge interest and investigation into their value for human health and nutrition.

Usage of currently produced algae primarily includes: food, food additives, aquaculture, colorants, cosmetics, pharmaceuticals, and nutraceuticals. Only a small fraction of the total number of algal species is being cultivated for other industrial use. Therefore, the potential for algal use in the realms of fuel & energy production, lipids production, and many more is likely to intensify in the years to come.

Increased research and development is constantly being provided to greater production and use of these algae to meet the ever-growing demand and identify benefits of additional types of algae.

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Important Figures :
World Soyabean, Rapeseed & Cottonseed details

World Soybean Details (in, 000 MT)						
	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	260403.00	263924.00	239152.00	268270.00	286828.00	+18558.00 (+6.92%)
Beginning Stocks	44095.00	62199.00	71796.00	55149.00	60550.00	+5401.00 (+9.79%)
Imports	86841.00	88821.00	93426.00	95174.00	105195.00	+10021.00 (+10.53%)
Exports	91437.00	91700.00	92270.00	99849.00	109317.00	+9468.00 (+9.48%)
Domestic Consumption	237703.00	251448.00	256955.00	258194.00	270921.00	+12727.00 (+4.93%)
Ending Stocks	62199.00	71796.00	55149.00	60550.00	72335.00	+11785.00 (+19.46%)
Feed Waste Dom. Cons.	13973.00	15163.00	13747.00	13800.00	14741.00	+941.00 (+6.82%)
Food Use Dom. Cons.	14614.00	15025.00	15380.00	15452.00	15825.00	+373.00 (+2.41%)
Crush	209116.00	221260.00	227828.00	228942.00	240355.00	+11413.00 (+4.99%)
Total Supply	391339.00	414944.00	404374.00	418593.00	452573.00	+33980.00 (+8.12%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Soybean in Top Five countries (in, 000 MT)						
Country	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
USA	91417.00	90605.00	84192.00	82561.00	89507.00	+6 946.00 (+8.41%)
Brazil	69000.00	75300.00	66500.00	82000.00	89000.00	+7 000.00 (+8.54%)
Argentina	54500.00	49000.00	40100.00	49300.00	54500.00	+5 200.00 (+10.55%)
China	14980.00	15100.00	14480.00	13050.00	12200.00	-850.00 (-6.51%)
India	9700.00	9800.00	11000.00	11500.00	11800.00	+300.00 (+2.61%)
Total	260403.00	263924.00	239152.00	268270.00	286828.00	+18 558.00 (+6.92%)
Total selected	239597.00	239805.00	216272.00	238411.00	257007.00	+18 596.00 (+7.80%)
Others	20806.00	24119.00	22880.00	29859.00	29821.00	-38.00 (-0.13%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Soybean in USA (in, 000 MT)						
	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	91417.00	90605.00	84192.00	82561.00	89507.00	+6946.00 (+8.41%)
Beginning Stocks	3761.00	4106.00	5852.00	4610.00	3826.00	-784.00 (-17.01%)
Imports	397.00	393.00	439.00	984.00	680.00	-304.00 (-30.89%)
Exports	40798.00	40957.00	37150.00	35913.00	40687.00	+4774.00 (+13.29%)
Domestic Consumption	50671.00	48295.00	48723.00	48416.00	49235.00	+819.00 (+1.69%)
Ending Stocks	4106.00	5852.00	4610.00	3826.00	4091.00	+265.00 (+6.93%)
Feed Waste Dom. Cons.	2998.00	3444.00	2375.00	2449.00	2969.00	+520.00 (+21.23%)
Food Use Dom. Cons.	0.00	0.00	0.00	0.00	0.00	0.00
Crush	47673.00	44851.00	46348.00	45967.00	46266.00	+299.00 (+0.65%)
Total Supply	95575.00	95104.00	90483.00	88155.00	94013.00	+5858.00 (+6.65%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Soybean in Brazil (in, 000 MT)						
	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	69000.00	75300.00	66500.00	82000.00	89000.00	+7000.00 (+8.54%)
Beginning Stocks	13434.00	17480.00	23636.00	12916.00	15927.00	+3011.00 (+23.31%)
Imports	174.00	37.00	128.00	395.00	150.00	-245.00 (-62.03%)
Exports	28578.00	29951.00	36315.00	41904.00	44000.00	+2096.00 (+5.00%)
Domestic Consumption	36550.00	39230.00	41033.00	37480.00	40377.00	+2897.00 (+7.73%)
Ending Stocks	17480.00	23636.00	12916.00	15927.00	20700.00	+4773.00 (+29.97%)
Feed Waste Dom. Cons.	2850.00	2900.00	2950.00	3000.00	3102.00	+102.00 (+3.40%)
Crush	33700.00	36330.00	38083.00	34480.00	37275.00	+2795.00 (+8.11%)
Total Supply	82608.00	92817.00	90264.00	95311.00	105077.00	+9766.00 (+10.25%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Soybean in Argentina (in, 000 MT)						
	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	54500.00	49000.00	40100.00	49300.00	54500.00	+5 200.00 (+10.55%)
Beginning Stocks	16588.00	22277.00	22872.00	18100.00	24400.00	+6 300.00 (+34.81%)
Imports	1.00	13.00	0.00	2.00	2.00	0.00 (0.00%)
Exports	13088.00	9205.00	7368.00	7738.00	9700.00	+1 962.00 (+25.36%)
Domestic Consumption	35724.00	39213.00	37504.00	35264.00	40002.00	+4 738.00 (+13.44%)
Ending Stocks	22277.00	22872.00	18100.00	24400.00	29200.00	+4 800.00 (+19.67%)
Feed Waste Dom. Cons.	1597.00	1599.00	1618.00	1655.00	1702.00	+47.00 (+2.84%)
Crush	34127.00	37614.00	35886.00	33609.00	38300.00	+4 691.00 (+13.96%)
Total Supply	71089.00	71290.00	62972.00	67402.00	78902.00	+11 500.00 (+17.06%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Soybean in China (in, 000 MT)						
	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	14980.00	15100.00	14480.00	13050.00	12200.00	-850.00 (-6.51%)
Beginning Stocks	7555.00	13259.00	14558.00	15924.00	12393.00	-3531.00 (-22.17%)
Imports	50338.00	52339.00	59231.00	59865.00	69000.00	+9135.00 (+15.26%)
Exports	184.00	190.00	275.00	266.00	230.00	-36.00 (-13.53%)
Domestic Consumption	59430.00	65950.00	72070.00	76180.00	79650.00	+3470.00 (+4.56%)
Ending Stocks	13259.00	14558.00	15924.00	12393.00	13713.00	+1320.00 (+10.65%)
Feed Waste Dom. Cons.	1750.00	1850.00	1800.00	1780.00	1750.00	-30.00 (-1.69%)
Food Use Dom. Cons.	8850.00	9100.00	9300.00	9450.00	9550.00	+100.00 (+1.06%)
Crush	48830.00	55000.00	60970.00	64950.00	68350.00	+3400.00 (+5.23%)
Total Supply	72873.00	80698.00	88269.00	88839.00	93593.00	+4754.00 (+5.35%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Soybean in India (in, 000 MT)						
	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	9700.00	9800.00	11000.00	11500.00	11800.00	+300.00 (+2.61%)
Beginning Stocks	658.00	1573.00	505.00	316.00	391.00	+75.00 (+23.73%)
Imports	0.00	0.00	0.00	0.00	0.00	0.00
Exports	10.00	18.00	39.00	75.00	75.00	0.00 (0.00%)
Domestic Consumption	8775.00	10850.00	11150.00	11350.00	11250.00	-100.00 (-0.88%)
Ending Stocks	1573.00	505.00	316.00	391.00	866.00	+475.00 (+121.48%)
Feed Waste Dom. Cons.	900.00	950.00	1000.00	1050.00	1100.00	+50.00 (+4.76%)
Food Use Dom. Cons.	475.00	500.00	550.00	600.00	650.00	+50.00 (+8.33%)
Crush	7400.00	9400.00	9600.00	9700.00	9500.00	-200.00 (-2.06%)
Total Supply	10358.00	11373.00	11505.00	11816.00	12191.00	+375.00 (+3.17%)

(Source: Directorate of Agriculture Marketing, GOI)

World Rapeseed details (in, 000 MT)						
	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	61056.00	60575.00	61484.00	63021.00	70073.00	+7052.00 (+11.19%)
Beginning Stocks	7284.00	8859.00	7202.00	5169.00	3157.00	-2012.00 (-38.92%)
Imports	10744.00	10099.00	13182.00	12776.00	13237.00	+461.00 (+3.61%)
Exports	10815.00	10867.00	12915.00	12480.00	13561.00	+1081.00 (+8.66%)
Domestic Consumption	59410.00	61464.00	63784.00	65329.00	67352.00	+2023.00 (+3.10%)
Ending Stocks	8859.00	7202.00	5169.00	3157.00	5554.00	+2397.00 (+75.93%)
Feed Waste Dom. Cons.	2202.00	1910.00	2296.00	2151.00	2209.00	+58.00 (+2.70%)
Food Use Dom. Cons.	520.00	540.00	560.00	580.00	600.00	+20.00 (+3.45%)
Crush	56688.00	59014.00	60928.00	62598.00	64543.00	+1945.00 (+3.11%)
Total Supply	79084.00	79533.00	81868.00	80966.00	86467.00	+5501.00 (+6.79%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Rapeseed in Top Five countries (in, 000 MT)						
Country	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
European Union	21633.00	20782.00	19235.00	19210.00	20850.00	+1640.00 (+8.54%)
Canada	12898.00	12789.00	14608.00	13869.00	18000.00	+4131.00 (+29.79%)
China	13657.00	13082.00	13426.00	14007.00	14200.00	+193.00 (+1.38%)
India	6400.00	7100.00	6200.00	6800.00	7000.00	+200.00 (+2.94%)
Australia	1907.00	2359.00	3427.00	4010.00	3400.00	-610.00 (-15.21%)
Total	61056.00	60575.00	61484.00	63021.00	70073.00	+7052.00 (+11.19%)
Total selected	56495.00	56112.00	56896.00	57896.00	63450.00	+5554.00 (+9.59%)
Others	4561.00	4463.00	4588.00	5125.00	6623.00	+1498.00 (+29.23%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Rapeseed in European Union (in, 000 MT)

	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	21633.00	20782.00	19235.00	19210.00	20850.00	+1640.00 (+8.54%)
Beginning Stocks	1843.00	1809.00	1838.00	2197.00	1158.00	-1039.00 (-47.29%)
Imports	2082.00	2624.00	3752.00	3378.00	3400.00	+22.00 (+0.65%)
Exports	176.00	214.00	149.00	93.00	270.00	+177.00 (+190.32%)
Domestic Consumption	23573.00	23163.00	22479.00	23534.00	23530.00	-4.00 (-0.02%)
Ending Stocks	1809.00	1838.00	2197.00	1158.00	1608.00	+450.00 (+38.86%)
Feed Waste Dom. Cons.	1023.00	883.00	869.00	854.00	860.00	+6.00 (+0.70%)
Crush	22550.00	22280.00	21610.00	22680.00	22670.00	-10.00 (-0.04%)
Total Supply	25558.00	25215.00	24825.00	24785.00	25408.00	+623.00 (+2.51%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Rapeseed in Canada (in, 000 MT)

	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	12898.00	12789.00	14608.00	13869.00	18000.00	+4131.00 (+29.79%)
Beginning Stocks	1944.00	2788.00	2198.00	713.00	601.00	-112.00 (-15.71%)
Imports	128.00	224.00	97.00	128.00	85.00	-43.00 (-33.59%)
Exports	7172.00	7207.00	8695.00	7115.00	8100.00	+985.00 (+13.84%)
Domestic Consumption	5010.00	6396.00	7495.00	6994.00	8086.00	+1092.00 (+15.61%)
Ending Stocks	2788.00	2198.00	713.00	601.00	2500.00	+1899.00 (+315.97%)
Feed Waste Dom. Cons.	222.00	86.00	496.00	277.00	286.00	+9.00 (+3.25%)
Crush	4788.00	6310.00	6999.00	6717.00	7800.00	+1083.00 (+16.12%)
Total Supply	14970.00	15801.00	16903.00	14710.00	18686.00	+3976.00 (+27.03%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Rapeseed in China (in, 000 MT)

	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	13657.00	13082.00	13426.00	14007.00	14200.00	+193.00 (+1.38%)
Beginning Stocks	1394.00	2114.00	1406.00	804.00	632.00	-172.00 (-21.39%)
Imports	2177.00	930.00	2622.00	3421.00	3300.00	-121.00 (-3.54%)
Exports	0.00	0.00	0.00	0.00	0.00	0.00
Domestic Consumption	15114.00	14720.00	16650.00	17600.00	17800.00	+200.00 (+1.14%)
Ending Stocks	2114.00	1406.00	804.00	632.00	332.00	-300.00 (-47.47%)
Feed Waste Dom. Cons.	550.00	550.00	550.00	600.00	600.00	0.00 (0.00%)
Crush	14564.00	14170.00	16100.00	17000.00	17200.00	+200.00 (+1.18%)
Total Supply	17228.00	16126.00	17454.00	18232.00	18132.00	-100.00 (-0.55%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Rapeseed in India (in, 000 MT)						
	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	6400.00	7100.00	6200.00	6800.00	7000.00	+200.00 (+2.94%)
Beginning Stocks	1007.00	1180.00	929.00	304.00	204.00	-100.00 (-32.89%)
Exports	0.00	1.00	0.00	0.00	0.00	0.00
Domestic Consumption	6227.00	7350.00	6825.00	6900.00	6975.00	+75.00 (+1.09%)
Ending Stocks	1180.00	929.00	304.00	204.00	229.00	+25.00 (+12.25%)
Feed Waste Dom. Cons.	207.00	210.00	165.00	220.00	225.00	+5.00 (+2.27%)
Food Use Dom. Cons.	520.00	540.00	560.00	580.00	600.00	+20.00 (+3.45%)
Crush	5500.00	6600.00	6100.00	6100.00	6150.00	+50.00 (+0.82%)
Total Supply	7407.00	8280.00	7129.00	7104.00	7204.00	+100.00 (+1.41%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Rapeseed in Australia (in, 000 MT)						
	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	1907.00	2359.00	3427.00	4010.00	3400.00	-610.00 (-15.21%)
Beginning Stocks	451.00	415.00	430.00	597.00	167.00	-430.00 (-72.03%)
Imports	0.00	1.00	1.00	1.00	1.00	0.00 (0.00%)
Exports	1214.00	1615.00	2536.00	3721.00	2500.00	-1 221.00 (-32.81%)
Domestic Consumption	729.00	730.00	725.00	720.00	730.00	+10.00 (+1.39%)
Ending Stocks	415.00	430.00	597.00	167.00	338.00	+171.00 (+102.40%)
Feed Waste Dom. Cons.	29.00	30.00	25.00	20.00	20.00	0.00 (0.00%)
Crush	700.00	700.00	700.00	700.00	710.00	+10.00 (+1.43%)
Total Supply	2358.00	2775.00	3858.00	4608.00	3568.00	-1 040.00 (-22.57%)

(Source: Directorate of Agriculture Marketing, GOI)

World Cottonseed details (in, 000 MT)						
	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	39508.00	44298.00	47776.00	46063.00	44514.00	-1 549.00 (-3.36%)
Beginning Stocks	934.00	905.00	1374.00	1962.00	1429.00	-533.00 (-27.17%)
Imports	552.00	849.00	1099.00	939.00	819.00	-120.00 (-12.78%)
Exports	572.00	1012.00	1129.00	1138.00	1041.00	-97.00(-8.52%)
Domestic Consumption	39517.00	43666.00	47158.00	46397.00	44395.00	-2 002.00 (-4.31%)
Ending Stocks	905.00	1374.00	1962.00	1429.00	1326.00	-103.00 (-7.21%)
Feed Waste Dom. Cons.	9182.00	11131.00	12724.00	11742.00	10379.00	-1 363.00 (-11.61%)
Food Use Dom. Cons.	0.00	0.00	0.00	0.00	0.00	0.00
Crush	30335.00	32535.00	34434.00	34655.00	34016.00	-639.00 (-1.84%)
Total Supply	40994.00	46052.00	50249.00	48964.00	46762.00	-2 202.00 (-4.50%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Cottonseed in Top Five countries (in, 000 MT)						
Country	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
China	12540.00	11953.00	13325.00	13720.00	12920.00	-800.00 (-5.83%)
India	10402.00	11548.00	12312.00	12100.00	12300.00	+200.00 (+1.65%)
Pakistan	4024.00	3762.00	4616.00	4000.00	4200.00	+200.00 (+5.00%)
USA	3764.00	5532.00	4872.00	5140.00	3997.00	-1 143.00 (-22.24%)
Brazil	2029.00	3351.00	3019.00	2000.00	2500.00	+500.00 (+25.00%)
Total	39508.00	44298.00	47776.00	46063.00	44514.00	-1 549.00 (-3.36%)
Total selected	32759.00	36146.00	38144.00	36960.00	35917.00	-1 043.00 (-2.82%)
Others	6749.00	8152.00	9632.00	9103.00	8597.00	-506.00 (-5.56%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Cottonseed in China (in, 000 MT)						
	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	12540.00	11953.00	13325.00	13720.00	12920.00	-800.00 (-5.83%)
Imports	1.00	317.00	398.00	205.00	200.00	-5.00 (-2.44%)
Exports	0.00	0.00	1.00	0.00	0.00	0.00
Domestic Consumption	12541.00	12270.00	13722.00	13925.00	13120.00	-805.00 (-5.78%)
Feed Waste Dom. Cons.	2461.00	2563.00	3572.00	3155.00	2965.00	-190.00 (-6.02%)
Crush	10080.00	9707.00	10150.00	10770.00	10155.00	-615.00 (-5.71%)
Total Supply	12541.00	12270.00	13723.00	13925.00	13120.00	-805.00 (-5.78%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Cottonseed in India (in, 000 MT)						
	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	10402.00	11548.00	12312.00	12100.00	12300.00	+200.00 (+1.65%)
Beginning Stocks	183.00	373.00	413.00	597.00	496.00	-101.00 (-16.92%)
Exports	4.00	8.00	8.00	8.00	8.00	0.00 (0.00%)
Domestic Consumption	10208.00	11500.00	12120.00	12193.00	12300.00	+107.00 (+0.88%)
Ending Stocks	373.00	413.00	597.00	496.00	488.00	-8.00 (-1.61%)
Feed Waste Dom. Cons.	2908.00	3500.00	3720.00	3693.00	3400.00	-293.00 (-7.93%)
Food Use Dom. Cons.	0.00	0.00	0.00	0.00	0.00	0.00
Crush	7300.00	8000.00	8400.00	8500.00	8900.00	+400.00 (+4.71%)
Total Supply	10585.00	11921.00	12725.00	12697.00	12796.00	+99.00 (+0.78%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Cottonseed in Pakistan (in, 000 MT)						
	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	4024.00	3762.00	4616.00	4000.00	4200.00	+200.00 (+5.00%)
Beginning Stocks	67.00	88.00	0.00	316.00	150.00	-166.00 (-52.53%)
Exports	0.00	0.00	0.00	0.00	0.00	0.00
Domestic Consumption	4003.00	3850.00	4300.00	4166.00	4250.00	+84.00 (+2.02%)
Ending Stocks	88.00	0.00	316.00	150.00	100.00	-50.00 (-33.33%)
Feed Waste Dom. Cons.	523.00	450.00	500.00	266.00	450.00	+184.00 (+69.17%)
Crush	3480.00	3400.00	3800.00	3900.00	3800.00	-100.00 (-2.56%)
Total Supply	4091.00	3850.00	4616.00	4316.00	4350.00	+34.00 (+0.79%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Cottonseed in USA (in, 000 MT)						
	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	3764.00	5532.00	4872.00	5140.00	3997.00	-1143.00 (-22.24%)
Beginning Stocks	466.00	310.00	560.00	390.00	446.00	+56.00 (+14.36%)
Imports	22.00	0.00	65.00	91.00	91.00	0.00 (0.00%)
Exports	268.00	249.00	120.00	174.00	181.00	+7.00 (+4.02%)
Domestic Consumption	3674.00	5033.00	4987.00	4910.00	3960.00	-950.00 (-19.35%)
Ending Stocks	310.00	560.00	390.00	446.00	393.00	-53.00 (-11.88%)
Feed Waste Dom. Cons.	1950.00	2708.00	2810.00	2642.00	1964.00	-678.00 (-25.66%)
Crush	1724.00	2325.00	2177.00	2268.00	1996.00	-272.00 (-11.99%)
Total Supply	4252.00	5842.00	5497.00	5530.00	4534.00	-996.00 (-18.01%)

(Source: Directorate of Agriculture Marketing, GOI)

Production of Cottonseed in Brazil (in, 000 MT)						
	2009/10	2010/11	2011/12	2012/13	2013/14	2013/14 +/- 2012/13
Production	2029.00	3351.00	3019.00	2000.00	2500.00	+500.00 (+25.00%)
Beginning Stocks	20.00	20.00	182.00	191.00	31.00	-160.00 (-83.77%)
Imports	0.00	0.00	0.00	0.00	0.00	0.00
Exports	4.00	39.00	4.00	20.00	40.00	+20.00 (+100.00%)
Domestic Consumption	2025.00	3150.00	3006.00	2160.00	2331.00	+171.00 (+7.92%)
Ending Stocks	20.00	182.00	191.00	31.00	160.00	+129.00 (+416.13%)
Feed Waste Dom. Cons.	48.00	400.00	256.00	60.00	31.00	-29.00 (-48.33%)
Crush	1977.00	2750.00	2750.00	2100.00	2300.00	+200.00 (+9.52%)
Total Supply	2049.00	3371.00	3201.00	2191.00	2531.00	+340.00 (+15.52%)

(Source: Directorate of Agriculture Marketing, GOI)

Health Tips

Flaxseed may reduce blood pressure, early findings show :

Eating a bit of flaxseed each day might help lower high blood pressure, a new study suggests. Researchers said it's too early to swap out blood pressure medication for the fibre-filled seeds just yet. But if future studies confirm the new results, flax might be a cheap way to treat high blood pressure, they added. Flaxseed is well known as a plant source of omega-3 fatty acids, fibre and lignans, a type of antioxidants. But so far, its effect on high blood pressure, or hypertension, has been better studied among animals than humans.

"This is the first demonstration of the cardiovascular effects of dietary flaxseed in a hypertensive population," Grant Pierce told Reuters Health in an email. Pierce is the senior author on the study and executive director of research at St. Boniface Hospital in Winnipeg, Manitoba, Canada.

The trial included 110 people who had been diagnosed with peripheral artery disease, in which plaque builds up in arteries in the leg. Patients with the condition often have high blood pressure. The participants were randomly assigned to either a flaxseed or comparison group. People in the flaxseed group ate a variety of foods like bagels, muffins and pasta that contained 30 grams - about one ounce - of milled flaxseed every day for six months.

Those in the comparison group were given foods that tasted similar, but didn't contain any flaxseed. The researchers had participants increase their dose of flaxseed gradually so they could become accustomed to the fibre load.

Still, one in five participants dropped out of each group during the trial. Some of that could have been due to stomach pain from the extra fibre, Pierce said. People who had an initial systolic blood pressure - the top number in a blood pressure reading - of at least 140 mm Hg saw that figure drop by 15 mm Hg, on average, after six months of taking flaxseed.

When protein as a fat replacement :

A study reported in Food Research International suggests that micro particulated whey protein (MWP) could be used as a replacement for fat in reduced calorie sauces & dressings. The researchers from University of Massachusetts, examined the influence of solution composition (pH and salt) and processing (homogenization and heating) on the properties of MWP (0–20%) suspensions.

Amongst the findings were those high-pressure homogenisations (6000 psi, 1 pass) of MWP suspensions significantly reduced protein particle size and improved the stability to sedimentation. The lightness and viscosity of the suspensions increased with MWP concentration, which was attributed to the influence of the protein particles on light scattering and fluid flow. Thermal treatment (90 °C for 5 min) of MWP suspensions increased their viscosity, which was attributed to aggregation of the protein particles induced by thermal denaturation. Such large aggregates formed after heating proved to be highly unstable to sedimentation, and this would limit their use in low viscosity food and beverage products.

The researchers report that addition of calcium chloride (10 mM) to these heated systems did not cause significant changes in suspension rheology, and this is assumed to be due to the existing denaturation of the MWP. The electrical characteristics of the MWPs were similar to those of protein-coated fat droplets, going from positive at low pH to negative at high pH. Overall, this study highlights conditions where MWP can be used as a fat mimetic in low calorie food emulsions such as sauces, dressings, and desserts.

Krill oil shows heart health benefits in humans :

Krill are deep-water marine planktonic crustaceans that look like tiny shrimps. Oil from the little critters is an excellent source of the long-chain omega-3 fatty acids EPA and DHA, which are carried by phospholipids rather than triglycerides (as in fish oil).

Krill oil supplements appear to be answering consumer demand for an alternative to fish oil supplements, and the smaller capsules and 'improved consumer experience' appears to be resonating with some consumers. Krill oil now accounting for 12% of total omega-3 supplement sales in the mass market.

Study details

The new study adds to the body of science supporting the benefits of krill oil supplements. Scientists recruited 300 men and women with borderline high or high triglyceride levels (150–499 mg/dL) to participate in their double-blind, randomized, multi-center, placebo-controlled study.

Participants were randomly assigned to one of five groups: Four groups received supplements providing daily krill oil doses of 0.5, 1, 2 or 4 grams, and the fifth group received the placebo.

Blood lipid levels were measured after an overnight fast at the start of the study and again after six and 12 weeks. Since there was a lot of variation in the triglyceride levels in the subjects, the researchers decided to pool the data from all of the krill oil groups. Results showed that the krill oil groups experienced an average reduction in triglyceride levels of 10.2%, relative to placebo. In addition, no changes in LDL were observed, relative to placebo.

"The outcome of the pooled analysis suggests that krill oil is effective in reducing a cardiovascular risk factor," wrote Dr Berge and his co-workers. "However, owing to the individual fluctuations of TG concentrations measured, a study with more individual measurements per treatment group is needed to increase the confidence of these findings."

Humans can smell fat :

A study published in PLOS ONE concludes that humans can detect the fat content of products via their odour alone, and this might lead to odour-based formulation options that help to reduce fat intake. The study involved three behavioural experiments, involving milk samples with fat percentages of 0.125%, 1.46%, and 2.8%.

In Experiment 1, the team from Wageningen University sought to determine whether a USA-based consumer group (30 people) was able to discriminate between these three milk samples based only on their sense of smell.

Experiment 2 repeated experiment 1 using a different population (18 people from the Netherlands).

In Experiment 3, they determined whether BMI and habitual fat intake modulated an individual's ability to detect the odour of fat, using a group of 60 US participants.

Previous studies have demonstrated that humans can discriminate high concentrations of long-chain fatty acids in vapour phase both retronasally and orthonasally. This study claims to extend these findings. The research team states that its results clearly demonstrate that humans were able to detect minute differences between milk samples with varying grades of fat, even when embedded within a milk odour. Moreover, they say they found no relation between this performance and either BMI or dairy consumption, thereby suggesting that this is not a learned ability or dependent on nutritional traits. Hence the researchers argue that their findings may open up new and innovative future paths towards a general reduction in our fat intake. They say that future studies should focus on determining the components in milk responsible for this effect.

More Helpful Fatty Acids Found in Organic Milk :

Drinking whole organic milk "will certainly lessen the risk factor for cardiovascular disease," said the study's lead author, Charles M. Benbrook, a research professor at Washington State University's Center for Sustaining Agriculture and Natural Resources.

"All milk is healthy and good for people," he continued, "but organic milk is better, because it has a more favorable balance of these fatty acids" — omega-3, typically found in fish and flaxseed, versus omega-6, which is abundant in many fried foods like potato chips.

Under government requirements for organic labeling, dairy cows must spend a certain amount of the time in the pasture, eating grassy plants high in omega-3s; conventional milk comes from cows that are mostly fed corn, which is high in omega-6s. Nonorganic cows that graze in pastures also produce milk with greater amounts of omega-3s.

The research was largely funded by Organic Valley, a farm cooperative that sells organic dairy products. But experts not connected with the study said the findings were credible — though they noted that the role of milk in a healthy diet and the influence of fatty acids in preventing or causing cardiovascular disease are far from settled.

The researchers looked at 384 samples of organic and conventional whole milk taken over 18 months around the country. Although the total amount of fat was almost the same, the organic milk contained 62 percent more omega-3 fatty acids and 25 percent fewer omega-6s.

The ratio of omega-6 to omega-3 in the organic milk was 2.28, much lower than the 5.77 ratio in conventional milk. (The figures do not apply to nonfat milk, which strips away the fatty acids.)

Nutrition experts broadly agree that omega-3 acids offer numerous health benefits. That was the impetus for the United States Department of Agriculture to urge people to eat more seafood when it revised its dietary guidelines in 2010.

But experts disagree sharply whether omega-6 consumption should be reduced.

While omega-6 is essential, some health studies suggest that such a wide disparity is associated with many ills, Dr. Benbrook said. A shift to drinking organic whole milk — and raising consumption from the currently recommended three servings a day to 4.5 — would take a big step to lowering the ratio, he said, although adjustments would have to be made elsewhere in the diet to offset the added calories of the milk fat.

Donald R. Davis, another of the study's authors, said the longstanding assumption that the saturated fats in whole milk raise the risk of cardiovascular disease has been questioned in recent years.

Dr. Walter Willett, chairman of the nutrition department at the Harvard School of Public Health, did not question the underlying data in the study. But he said the conclusions and recommendations were based on the "false assumption" that omega-6 fatty acids are harmful.

Dr. Willett said omega-6s were actually associated with a lower risk of heart disease, and he called the ratio of omega-6s to omega-3s "irrelevant." People should try to eat more of both, he said.

And he noted that milk was not essential to a healthy diet; adults in many countries drink little or none. "We don't know all the long-term consequences, so I think the best strategy given current knowledge is to keep intake low to moderate (as in the Mediterranean diet) if it is consumed at all," Dr. Willet wrote in an email.

But Dr. Hibbeln of the National Institutes of Health, who has conducted research on the effects of fatty acids on heart disease, said animal studies showed that high levels of omega-6s interfered with omega-3s.

Study Questions Fat and Heart Disease Link:

Many of us have long been told that saturated fat, the type found in meat, butter and cheese, causes heart disease. But a large and exhaustive new analysis by a team of international scientists found no evidence that eating saturated fat increased heart attacks and other cardiac events.

The new findings are part of a growing body of research that has challenged the accepted wisdom that saturated fat is inherently bad for you and will continue the debate about what foods are best to eat.

But the new research, published in the journal Annals of Internal Medicine, did not find that people who ate higher levels of saturated fat had more heart disease than those who ate less. Nor did it find less disease in those eating higher amounts of unsaturated fat, including monounsaturated fat like olive oil or polyunsaturated fat like corn oil.

“My take on this would be that it’s not saturated fat that we should worry about” in our diets, said Dr. Rajiv Chowdhury, the lead author of the new study and a cardiovascular epidemiologist in the department of public health and primary care at Cambridge University.

But Dr. Frank Hu, a professor of nutrition and epidemiology at the Harvard School of Public Health, said the findings should not be taken as “a green light” to eat more steak, butter and other foods rich in saturated fat. He said that looking at individual fats and other nutrient groups in isolation could be misleading, because when people cut down on fats they tend to eat more bread, cold cereal and other refined carbohydrates that can also be bad for cardiovascular health.

“The single macronutrient approach is outdated,” said Dr. Hu, who was not involved in the study. “I think future dietary guidelines will put more and more emphasis on real food rather than giving an absolute upper limit or cutoff point for certain macronutrients.”

In the new research, Dr. Chowdhury and his colleagues sought to evaluate the best evidence to date, drawing on nearly 80 studies involving more than a half million people. They looked not only at what people reportedly ate, but at more objective measures such as the composition of fatty acids in their bloodstreams and in their fat tissue. The scientists also reviewed evidence from 27 randomized controlled trials – the gold standard in scientific research – that assessed whether taking polyunsaturated fat supplements like fish oil promoted heart health.

The researchers did find a link between trans fats, the now widely maligned partially hydrogenated oils that had long been added to processed foods, and heart disease. But they found no evidence of dangers from saturated fat, or benefits from other kinds of fats.

The primary reason saturated fat has historically had a bad reputation is that it increases low-density lipoprotein cholesterol, or LDL, the kind that raises the risk for heart attacks. But the relationship between saturated fat and LDL is complex, said Dr. Chowdhury. In addition to raising LDL cholesterol, saturated fat also increases high-density lipoprotein, or HDL, the so-called good cholesterol. And the LDL that it raises is a subtype of big, fluffy particles that are generally benign. Doctors refer to a preponderance of these particles as LDL pattern A.

The smaller, more artery-clogging particles are increased not by saturated fat, but by sugary foods and an excess of carbohydrates, Dr. Chowdhury said. “It’s the high carbohydrate or sugary diet that should be the focus of dietary guidelines,” he said. “If anything is driving your low-density lipoproteins in a more adverse way, it’s carbohydrates.”

While the new research showed no relationship overall between saturated or polyunsaturated fat intake and cardiac events, there are numerous unique fatty acids within these two groups, and there was some indication that they are not all equal.

When the researchers looked at fatty acids in the bloodstream, for example, they found that margaric acid, a saturated fat in milk and dairy products, was associated with lower cardiovascular risk. Two types of omega-3 fatty acids, the polyunsaturated fats found in fish, were also protective. But a number of the omega-6 polyunsaturated fatty acids, commonly found in vegetable oils and processed foods, may pose risks, the findings suggested.

The researchers then looked at data from the randomized trials to see if taking supplements like fish oil produced any cardiovascular benefits. It did not.

But Dr. Chowdhury said there might be a good explanation for this discrepancy. The supplement trials mostly involved people who had pre-existing heart disease or were at high risk of developing it, while the other studies involved generally healthy populations.

So it is possible that the benefits of omega-3 fatty acids lie in preventing heart disease, rather than treating or reversing it. At least two large clinical trials designed to see if this is the case are currently underway.

Baobab Tree Oil

Baobab is the common name of a genus of trees (Adansonia). There are eight species. Six species live in Madagascar, one in mainland Africa, and one in Australia. The baobab is the national tree of Madagascar.

The Baobab Tree (Adansonia digitata) from the Family Bombacaceae is a traditional African tree whose seeds make oil that is luscious and has a wonderful aroma. The baobab is probably the best known tree in Africa. Baobabs are widely distributed in belts across Africa. They also grow in Madagascar, India, Ceylon, and Australia. They grow in many areas of Zimbabwe. Its thick, grey, fibrous trunk (reaching, in some instances, over 25 meters in circumference) and large, spreading crown, seasonally devoid of foliage, are instantly recognizable. Baobabs are extremely long-lived, with some specimens believed to be as much as 3,000 years old. Botanically is known as Adansonia digitata, named after the French botanist Michel Adanson who studied these trees.

Virgin Baobab Seed Oil is highly stable and is an excellent source of essential and other fatty acids. It contains Palmitic Acid: 18-30%, Stearic Acid: 2-8%, Oleic Acid: 30-40%, Linoleic Acid: 24-34%, Linolenic Acid: 0.5-3%. It also contains a noteworthy amount of sterols and a high percentage of vitamins A and E.

The fruit has a velvety shell and is about the size of a coconut, weighing about 1.44 kilograms (3.2 lb). It has a somewhat acidic flavour, described as 'somewhere between grapefruit, pear, and vanilla'.

The baobab oil is extracted from the seeds and the oil is easily and quickly absorbed by the skin leaving no oiliness or greasiness. Baobab oil is highly moisturizing, emollient, and soothing which is partly due to the ingredients found in the oil. It contains vitamins A, D, E and F. Vitamins A and F are actively involved in the rejuvenation and renewal of cell membranes, while vitamin E is a superior antioxidant, which helps to fight aging.

Baobab oil is ideal to help treat dry and damaged skin, as well as for intensive hair care and its soothing properties is helpful for eczema and psoriasis treatments. Baobab oil does far more than just moisturize the skin and this rich, golden oil also helps to improve skin elasticity, encourages regeneration of skin cells, and does not clog the pores. It is also said to alleviate pain from burns and regenerates the epithelial tissues in a short time, thereby improving skin tone and elasticity. Baobab oil is used in small percentages in creams, lotions, body butters and other skin care formulations.

Virgin Baobab Seed Oil Properties :

- Rapid Absorption
- Highly Emollient
- Medium Viscosity
- Golden Yellow Hue (Resembles Jojoba in Appearance)
- Non-Comogenic (Does not clog pores)
- Nutty, Characteristic Aroma

Baobab oil is known for the following beauty benefits and helpful in following manner:

- Skin softening
- Skin restructuring
- Quick absorption
- Improves elasticity of the skin
- Encourages regeneration of cells
- Do no clog skin pores
- The essential fatty acids contribute towards maintaining a healthy skin
- Superb moisturizing benefits for skin and hair
- It is a non-siccative (non-drying) oil
- Moisturizers for Dry, Rough Skin
- Scar Prevention/ Skin Regeneration
- Dermatitis, Eczema, Psoriasis, Rosacea
- Anti-Aging and Wrinkle Reduction
- Acne
- Nail Care
- Hair Care
- Sun Care
- Lip Care

Baobab is extremely stable oil, and has a golden yellow color. It has a shelf life of 4-5 years. Baobab oil provides a fairly good measure of unsaturated and saturated fats. Baobab oil is filled with antioxidants that are valuable micronutrients for the cosmetic and beauty industry.

Penn state is continuing to research the properties of the baobab seed to optimize the process of oil extraction in hopes to establish industry standards for ambitious yet poor entrepreneurs who don't have the resources to make baobab oil extraction a reality. As of 2010 experts estimate the potential international market at a billion dollars ($US) a year.

Some studies indicate that Baobab products depict medical properties including antioxidant, prebiotic-like activity, anti-inflammatory, analgesic, antipyretic activity, anti-diarrhoea, anti-dysentery activity and excipient. These properties make Baobab products widely used in both traditional and modern medicine. In fact, Baobab products may be used as food, drugs, and cosmetics. According to a recent research study conducted by researcher Aberl Deule at the Tanzania Food and Drugs Authority (TFDA), the majority of Tanzanians use Baobab products as food.

The food and drug watchdog says Baobab oil contains high degree of Cyclopropenoid fatty acids (CPFA) which are dangerous to human health. Baobab oil contains CPFA at the range between 10 and 12.8 per cent, depending on the nature of a Baobab product. The level of CPFA, which cannot harm (tolerate limit) consumers of Baobab oil, is 0.4 per cent.

Recently baobab oil and other products are being marketed as "cure- all" concoction. Due to a lack of supporting research, it's too soon to recommend baobab for any health-related purpose. Consumers are advised not to consume baobab products for treatment of chronic condition.

Laugh Out Loud

Wealth, Wisdom or Beauty

An angel appears at a faculty meeting and tells the dean that in return for his unselfish and exemplary behavior, the Lord will reward him with his choice of infinite wealth, wisdom, or beauty.

Without hesitating, the dean selects infinite wisdom.

"Done!" says the angel, and disappears in a cloud of smoke and a bolt of lightning.

Now, all heads turn toward the dean, who sits surrounded by a faint halo of light. At length, one of his colleagues whispers, "Say something."

The dean sighs and says, "I should have taken the money."

Foreign language

A mother mouse and a baby mouse were walking along, when all of a sudden, a cat attacked them. The mother mouse goes, "BARK!" and the cat runs away.

"See?" says the mother mouse to her baby. "Now do you see why it's important to learn a foreign language?"

Why God never received a Ph.D?

1. He had only one major publication.
2. It was in Sanskrit.
3. It had no references.
4. It wasn't published in a refereed journal.
5. Some even doubt he wrote it by himself.
6. It may be true that he created the world, but what has he done since then?
7. His cooperative efforts have been quite limited.
8. The scientific community has had a hard time replicating his results.
9. He never applied to the ethics board for permission to use human subjects.
10. When one experiment went awry he tried to cover it by drowning his subjects.
11. When subjects didn't behave as predicted, he deleted them from the sample.
12. He rarely came to class, just told students to read the book.
13. Some say he had his son teach the class.
14. He expelled his first two students for learning.
15. Although there were only 10 requirements, most of his students failed his tests.
16. His office hours were infrequent and usually held on a mountain top.
17. No record of working well with colleagues.

Nobel Prize

A man is driving down a country road, when he spots a farmer standing in the middle of a huge field of grass. He pulls the car over to the side of the road and notices that the farmer is just standing there, doing nothing, looking at nothing.

The man gets out of the car, walks all the way out to the farmer and asks him, "Ah excuse me mister, but what are you doing?"

The farmer replies, "I'm trying to win a Nobel Prize."

"How?" asks the man, puzzled.

"Well I heard they give the Nobel Prize to people who are outstanding in their field."

Monkey Business

NASA decided to send a shuttle into space with two monkeys and an astronaut. They trained them for months. Then when they thought they were ready, they placed all three in the shuttle and got ready to send them up into space.

As the moment came closer NASA's mission control center announced, "This is mission control to Monkey One. Initiate!"

At that the first monkey started typing like mad and suddenly the shuttle's engines ignited and the shuttle took off.

Two hours later NASA's mission control center announced, "This is mission control to Monkey Two. Initiate!"

At that the second monkey started typing like mad and suddenly the shuttle separated from the empty fuel tanks.

Another two hours later mission control announced, "This is mission control to the astronaut…"

At this the astronaut responded "I know, I know. Feed the monkeys and don't touch anything."

Intelligent Life

It was a celebratory mood with the boys at NASA — they had just made the scientific achievement of a lifetime. As they were uncorking a bottle of champagne, the head scientist at NASA asked everyone to be quiet as he was receiving a congratulatory phone call from the President of the United States.

He picked up a special red phone, and spoke into it. "Mr. President," he said with a broad smile on his face, "After twelve years of hard research and billions of dollars spent, we have finally found intelligent life on Mars."

He listened for a second, and his smile gradually disappeared, replaced by a frown. He said, "But that's impossible… we could never do it… yes, Mr. President," and hung up the phone.

He addressed the crowd of scientists staring at him curiously. "I have some bad news," he said, "the President said that now that we've found intelligent life on Mars… he wants us to try to find it in the Congress."

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Member's PAGE

Egg Oil

EXTRAORDINARY USES

These days, maintaining healthy skin & hair is a challenge due to continuous exposure to heat, dust, pollution, stress & long working hours in air-conditioned surroundings. Artificial (chemical) hair & skin treatments are not the permanent solutions for everyday wear & tear. In fact, chemicals damage the hair & skin irreparably. To fight this challenge, nature has blessed us with a promising ingredient in the form of egg oil.

Egg oil also known as Egg yolk oil (Urdub : Roghan Baiza Murg) extracted from yolk of chicken eggs -- mainly contains triglycerides with cholesterol & phospholipids. Studies have shown that cholesterol is essential for the skin and hair. Egg Oil is a high quality & functional source for highly bio-available cholesterol. Cholesterol is readily absorbed into the skin and scalp. Personal care products containing cholesterol have shown great promise in healing dry and damaged skin.

Egg Oil is also rich in essential poly unsaturated fatty acids (PUFA) like Omega-3 & Omega-6. These fatty acids are essential to maintain the normal growth of cells.

Happy And Healthy Skin

Skin is an audacious organ. It protects us from environmental challenges and infection. Having a healthy skin is the most important aspect of good health. It is ironic how we use chemicals for repairing our skin and they instead damage it beyond repair. Egg oil has all the properties that replenish the skin. It is an excellent emollient and has the properties of a moisturizer because of which it is used in a variety of cosmetic preparations such as creams, ointments and lotions. It helps the texture, lubricating and anti-friction properties of these creams and lotions. It is also a penetration enhancer which makes it an important ingredient in sun-screen products. Egg oil acts as a compatible dermatological agent. With fine spreading, it reduces the scaling effect of many cosmetic formulations, thus helping to avoid heat congestion. Testing indicates that Egg Oil exhibits anti-inflammatory & anti-bacterial properties. Studies also indicate that Egg Oil may dramatically reduce scarring and reduce the appearance of aging scars.

As an occlusive agent, egg oil protects against dehydration without disturbing the pores and is easily incorporated in topical preparations since it forms stable oil in water emulsions. . In a scientific study done on human skin cells, it was found that after 24 hours Egg Oil treated cells produced less Reactive Oxygen Species (ROS). ROS is the major cause of ageing. Hence, egg oil has potent anti-ageing properties. Thus egg oil has a dramatic ability to nourish, moisturize and improve the condition of the skin while maintaining youthful glow.

Egg oil is used in products meant for the treatment of burns & wounds because of its excellent healing and anti-inflammatory properties. Whenever there is any injury or infection, inflammation ensues. Inflammation is a protective attempt by the organism to remove the injurious stimuli and to initiate the healing process. Without inflammation, wounds and infections would never heal. Inflammation involves pain. Redness, heat or fever & swelling, all these are signals for the "soldiers of the body" or the white blood cells to gear up for action. The major mediator of inflammatory response is a molecule called interleukin 8 or IL 8. Egg oil was found to stimulate the release of IL 8. Thus Egg Oil stimulates the inflammatory processes and inhibits bacterial growth at the site of injury and also reduces pain.

Egg oil aids re-epithelisation and it was found that the wound closes earlier in burn patients treated with egg oil than those treated with silver sulfadiazine ointment, the later being commonly used. The biological effectiveness of egg oil was tested in patients with scars. Egg oil improved blood circulation in the scar tissue and also in the adjacent healthy tissue. It minimized the formation of scars.

Oil For Naturally Beautiful Hair

Beautiful hair is a much coveted accessory. Egg oil helps the hair to recreate itself and maintains the texture of hair with the presence of the important elements. Egg oil is an excellent natural hair nutrient for dry scalp which nourishes hair and promotes growth of healthy hair giving natural softness. It is ideal for use in hair care since it acts as a humectants. Egg oil averts falling of hair, prevents premature greying and strengthens hair with regular use. It has superior nourishing and conditioning property which help in reducing the onset of premature hair loss. Egg oil also promotes the growth of new hair by nourishing the hair roots.

Tried And Tested Since Millennia!

Egg oil is a completely natural product. It finds its reference in texts that date back to thousands of years. Egg oil also has its reference in Alchemy (originated circa 400 BC) in regard to its effectiveness in regeneration of skin and cell membranes. Ambroise Paré used a solution of egg yolk, oil of roses, and turpentine for war wounds, an old method that the Romans had discovered 1000 years before him. He published his first book 'The method of curing wounds caused by arquebus and firearms' in 1545. It aids faster healing by re-epithelisation, keeping the wound sterile due to its anti-bacterial action and minimizes scars. In Indian, Japanese, Chinese and the 2000 year old Unani-tibb or Greek system of medicine (Roghan Baiza Murgh), egg oil was traditionally used as a treatment for hair care. For treatment of Scabies in Spain, Oil of Egg Yolk was used along with oil of castor and roses in ancient Andalusia.

*(Sneha Mishra, Senior Manager-Lab Operations
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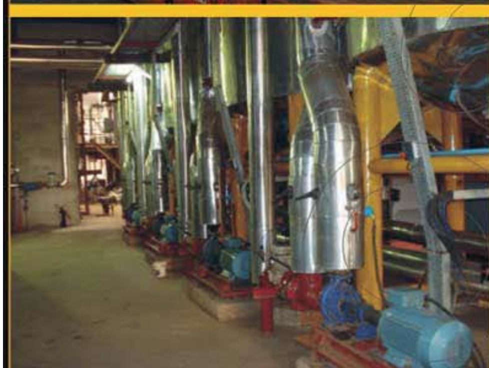
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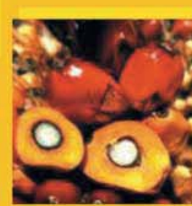

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