PALM OIL technical bulletin

Vol. 4 No. 4
July - August 1998

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ASSESSING CHINA'S OILS & FATS MARKET

ISSN 0127-3329

A Publication of the Palm Oil Research Institute of Malaysia (PORIM) P.O. Box 10620, 50720 Kuala Lumpur, Malaysia.

Assessing China's Oils and Fats Market

China's demand for oils and fats has risen rapidly and exceeds its domestic supply. To meet the shortfall, palm oil is imported in large quantities. The production, consumption and import of oils and fats in China, and the use of palm oil, the soap market, and research activities on oils and fats are analysed.

OILS AND FATS SITUATION IN CHINA

China's size and geographical diversity offers a vast range of agricultural activities. Regional imbalances, a general characteristic of its agricultural production, also applies to oilseeds. The major oilseeds grown and widely consumed on a regional basis are soyabean in the north, north-east and north-west, and rapeseed and groundnut in the south and central region (*Table 1*).

Lard and animal fats are consumed in the rural inland and north-western region. Minor quantities of sunflower, cotton, sesame and tea seed oils are also produced. As the domestic production does not meet demand, palm oil, soyabean oil and rapeseed oil are imported to meet the shortfall. Soyabean oil and rapeseed are also produced locally while palm oil is produced in negligible amounts in Hainan province in the southern part of China.

Liquid vegetable oils are mainly used for the household. Unlike other vegetable oils whether locally produced or imported, palm oil is widely accepted by the food as well as non-food industries in China. Most of the palm oil products imported are used as ingredients for food production. To some extent these products, especially palm stearin, are used in the soap and oleochemical industries. Palm oil is not in direct competition with liquid vegetable oils which are predominantly used for household consumption.

Four grades of vegetable oil are commonly consumed: second grade oil, first grade oil, high class cooking oil and salad oil. Rural consumption is still based on second grade oil (degummed and neutralised) while urban consumption is moving towards fully refined oil. The exception is palm oil and palm oil products which are imported in fully-refined forms. Its major use is in deep-frying of instant noodles and snacks. Solid fats such as margarine and shortening are beginning to gain popularity with hotels, as well as the catering and food industries.

PRODUCTION

Mountains dominate China's landscape, taking up two-thirds of the country's total land area. Only about 15 percent of its land can be cultivated and this area is still rapidly diminishing. The planting area of the main oil-bearing crops was estimated at about 13 million hectares (ha).

Oilseed production in China can be divided into three categories:

- The principal oil-bearing crops such as rapeseed, groundnut, sunflower and sesame.
- Soyabean and cottonseed. According to data in China, soyabean is not regarded as an oil crop. However, in practice a substantial part of its production is crushed for oil. In addition, the cottonseed, derived as a by-product of cotton processing, is also used for oil production.

Table 1. **Growth and Consumption of Specific Oilseeds by Region**

Oil or fat	Region
Soyabean, sunflower, linseed, lard, tallow	North, north-east and north-west
Peanut	Southern region of Guangdong, Hebei, Shandong, Sichuan, Guangxi, Tianjin and Central region
Cottonseed	Shandong, Henan and Shanxi
Rapeseed, groundnut, palm oil	Southern China

By Teah Yau Kun, Zhou Li Feng and Kurt G. Berger. Teah Yau Kun and Zhou Li Feng are at the Palm Oil Research Institute of Malaysia's regional office for the Far East which is based in Hong Kong. Kurt G. Berger is a technical counsultant based in England. The paper appeared in January 1998 issue of Lipid Technology.

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- Perennial oil crops, mainly teaseed and walnut.

In China, the principal oilseeds are important as the main source of vegetable oils. Some 80 percent of edible oil production comes from these principal oilseeds. The cultivated area and production will be the main factors affecting China's oil market. The minimum cultivated area since 1985 has been 10.5 million ha. The yield of oilseeds showed an increase from 1,300 to the current 1,600 kg per ha. *Table 2* and *Table 3* show the sown area and the production of different oilseeds over the past few years.

Oilseed production in China can be divided into six main geographical regions.

- Yangtze rapeseed zone, including nine provinces and one city, namely Shanghai, Jiangsu, Zhejiang, Hubei, Anhui, Hunan, Jiangxi, Quixhou, Sichuan and Qinghai. Rapeseed is the main oilseed crop in this region and constitutes about 85 percent of the national rapeseed production.

Table 2. **Total Sown Area of Oilseeds in China, excluding Soyabean**

Year	Sown area ('000 ha.)	Production (million tonnes)
1990	10,900.1	16.13
1991	11,529.7	16.38
1992	11,489.4	16.41
1993	11,142.3	18.04
1994	12,080.9	19.90
1995	13,101.4	22.50

- South-east coastal groundnut zone including Fujian, Guangxi, Guangdong and Hainan. These four provinces have a deficiency of oil, and high-yielding crops are the only solution to increase production because of the shortage of cultivable land.

- North and north-east linseed zone including Shanxi, Inner Mongolia, Ganzu, Ningxia Hui Autonomous region, Xinjiang and Hebei. This region produces 97 percent of China's linseed.

- North, north-east and north-west sunflower zone including Jilin, Liaoning, Heilongjiang, Xinjiang, Ningxia Hui Autonomous region, Ganzu, Hebei and Shanxi, which are the main centres for sunflowerseed production.

- Bohai groundnut zone. The zone includes provinces along the coastal region of Shandong, Liaoning, Hebei, Henan, Anhui and Jiangsu. It is the most important groundnut production region in China.

- Sesame zone. The zone includes Henan, Hebei and Anhui which account for more than 70 percent of national sesame production.

Agricultural reforms have given an important boost to oil-bearing crops. The Chinese Government is fully committed to agricultural self-sufficiency and is taking measures to boost agricultural production including oilseeds. The distribution of oil-bearing crops planted in China varies as a result of diverse geographical and climatic conditions. As the production and yield in various regions are uneven, oil has to be re-distributed from regions of abundance to deficient regions (*Figure 1*).

Edible oil production increased by 80 percent in the period 1985 to 1996 as shown in *Table 4*. Despite the increase in production, increasing demand has created a shortfall since the 1980s.

Table 4. **Output of Vegetable Oil in China, 1985-96 (million tonnes)**

Year	Output	Year	Output
1985	4.01	1991	6.44
1986	4.41	1992	6.61
1987	4.78	1993	9.65
1988	4.80	1994	7.23
1989	4.96	1995	7.40
1990	5.44	1996	7.30

DEMAND AND CONSUMPTION

While China has had a tradition of producing and using vegetable oils for a long time, the industry really only developed after introduction of reforms in 1979.

For a population of 1.2 billion, the consumption level is still low. The current consumption for vegetable oils is about 9 kg per person per year with a marked disparity between rural and urban consumption. Rural consumption is about 5-6 kg while urban consumption is about 15-16 kg. In addition, rural consumption is still based on second-grade (degummed and neutralised) oil while urban consumption is moving towards fully-refined oil.

Table 3. **Production of Several Oilseeds in China**

Year	Groundnut		Rapeseed		Sesame		Soyabean	
	Area ('000 ha.)	Production (million tonnes)	Area ('000 ha.)	Production (million tonnes)	Area ('000 ha.)	Production (million tonnes)	Area ('000 ha.)	Production (million tonnes)
1990	2907.1	6.34	5503.5	6.96	668.9	0.47	7559.6	11.00
1991	2879.8	6.30	6133.3	7.44	679.5	0.44	7041.0	9.71
1992	2975.9	5.95	5975.8	7.65	746.3	0.52	7220.9	10.30
1993	3379.0	8.42	5300.5	6.94	753.5	0.56	9454.1	15.31
1994	3775.7	9.68	5783.2	7.49	689.9	0.55	9221.8	15.99
1995	3809.4	10.25	6907.2	9.78	641.9	0.58	8126.7	13.50

Table 5. **Imports of Vegetable Oils into China from 1993 to 1996 (thousand tonnes)**

Oils	1993	1994	1995	1996
Palm	1059.0	1863.0	1595.0	1370.0
Soyabean	75.7	1063.5	1481.8	1384.7
Rapeseed	150.1	544.9	630.7	316.0
Total	1284.8	3471.4	3707.5	3070.7

Sources: China Customs Statistics, and Oil World.

The present consumption of oils and fats per person in China is still low compared to a world average of about 15-16 kg, or the level of 20 kg recommended by the World Health Organization (WHO).

With increasing economic prosperity and rising purchasing power, China is expected to consume more oils and fats. The demand for quality products is also increasing, as shown by the availability and demand for cooking oils in small pack sizes. The current consumption of these cooking oils is estimated to be 300,000 to 400,000 tonnes a year under different brands and varieties.

One prominent change as a result of open reforms is the progressive demand for industrially-used oil and fats. Palm oil features prominently as the raw material for both the food and non food industries. Palm oil is the preferred choice because of its inherent stability and technical qualities.

IMPORTS

Prior to 1986, China imported only limited quantities of vegetable oils. The imported volume was about 100,000 tonnes, while the export volume was 200,000 tonnes. Since 1986, China has become a net importer of oils and fats with the import volume increasing progressively over the years. The three main vegetable oils imported are palm, soyabean and rapeseed (*Table 5*).

Over the 1994/95 period, there was a tremendous increase in the import of oils and fats with the net result being a downturn in domestic prices. In order to exert control on imports, quotas and tariff structures were revised and imposed on oils and fats. *Table 6* shows the latest tariff structure for the main vegetable oils and fats.

Table 6. **The Latest Import Tariff Structure for the Main Vegetable Oils and Fats in China**

Tax code	Product	Outside quota		Within quota
		Preferential	Regular	
15071000	Soyabean oil	121.6	190	13*
15079000		121.6	190	13*
15081000	Groundnut oil	75	100	9.7
15089000		75	100	9.7
15111000	Crude palm oil	30	60	9
15119000	Other palm oil	30	60	12
15121100	Sunflower oil	91.2	120	40
15121900		91.2	120	40
15141000	Rapeseed oil	100	170	20
15149000		100	170	20
15152100	Corn oil	91.2	120	18
15152900		91.2	120	18

** Tentatively revised upwards to 20% for the period of October 1997 to March 1998.*

Concurrent with the reduction in the duty for palm oil, the tariff for crude palm oil was reduced too. The tariff for crude palm oil was 9 percent as compared to 12 percent for refined palm oil. The crude palm oil tariff reduction was to encourage processing in China, and some crude (in negligible quantities) was imported and processed in joint-venture refineries.

Since April 1996, the six national companies given the right to import oil are:

- China National Cereals Oils & Foodstuffs Import and Export Corporation.
- China National Native Produce & Animal By-Product Import & Export Corporation.
- China Resources National Corporation.
- China Grains & Oils Group Corporation.
- China Nam Kwong National Import & Export Corporation.

PALM OIL IN CHINA

Palm oil is not new to the Chinese market. Palm oil has successfully penetrated both the food and non food sectors. Most applications are for industrial use, although some palm olein is blended into other vegetable oils and distributed for household use. Since the mid-1980s, China's import of palm oil has increased dramatically to a peak in 1994 (*Table 7*).

Table 7. **Total Palm Oil Imports by China (tonnes)**

Year	Imports	Year	Imports
1985	69,000	1991	1,205,000
1986	206,000	1992	871,000
1987	290,000	1993	1,120,000
1988	398,000	1994	1,863,000
1989	734,000	1995	1,595,000
1990	1,133,000	1996	1,370,000

Imports of palm oil by China declined slightly in 1995 and 1996. The main factors contributing to this decline were improved stocks of domestic oils and the good harvest. Uncertainties due to the new regulations in quota and import licences control during the period were also contributing factors.

The other development related to the Chinese market was the increase in imports by Hong Kong. Palm oil imports by Hong Kong expanded by almost two-fold from 130,325 tonnes in 1995 to 336, 178 tonnes in 1996. However, most of these were re-exported to China. Most of the processing in Hong Kong was shifted to southern China due to the high cost of production in Hong Kong.

Palm oil in China is mainly consumed in the food-service and industrial sectors. Frying of instant noodles is the main use for palm oil. Its technical advantages make it the preferred frying fat. Consumption of instant noodles in China is still low (about 14 packs per person per year) compared to other countries that have similar eating preferences. Consumption in Japan and South Korea is about 42 to 80 packs per person per year.

Palm oil is also widely used in the confectionery and other snack food industries. The use of palm oil in local pastries and confectioneries is well accepted. The use of palm oil products in solid fat products such as margarine, shortening, baking fats and specialty fats is also increasing. Specialised applications demanded by different industries will lead to greater demand for palm oil.

Although palm olein is blended with other vegetable oils for household use, the practice is carried out only when the palm olein price is lower than the price of other oils. The market situation suggests that palm olein has not captured a major share of the household cooking oil market. Palm olein's natural tendency to cloud during cold weather has restricted its acceptance.

INEDIBLE OILS SECTOR

The soap and oleochemical industries have undergone rapid changes in recent years. In the early 1960s and 1970s, laundry soaps were the main cleaning agent used in China. Estimates of soap production in China in the years 1960 to 1990 are shown in *Table 8*. However, with development of the detergent industry in China, soap production has declined (*Table 9*).

The growth of compound detergent has been quite substantial. Between 1985 and 1990 it grew 28 percent. Meanwhile, soap production has seen a continuous decline since 1989. Estimates are that the 1996 and 1997 soap production levels will be maintained at about 0.8 million tonnes. The reasons for the rapid increase in demand for detergent products are:

- A sharp rise in the average ownership of washing machines. In 1980, a quarter of a million Chinese households had washing machines. By 1985, this had increased to six million. China is now one of the largest producers of washing machines with an output of about 11 million in 1996.
- A detergent is suitable for different water qualities. In addition, it has the merits of saving time and being easy to use. In recent years, more new products have been developed such as formulations containing enzymes and with less foaming, all of which have helped boost sales.
- Fabric types, colour and fashion have changed in China. These changes also stimulated the growth in detergent products.

Despite the declining growth in the soap industry, the rapid growth of the detergent industry has sustained the growth in consumption of detergent from 2.0 kg in 1985 to 2.4 kg in 1995. There is still a potential for growth in the detergent industry as China's economy continues to develop.

Table 8. **Estimates of Soap Production in China, 1960 to 1990 (tonnes; NA, not available)**

Year	All soap	Toilet soap
1960	360,700	NA
1970	476,900	NA
1978	596,000	NA
1980	850,000	NA
1983	864,700	70,700
1985	980,000	98,000
1990	1,100,000	350,000

OILS AND FATS RESEARCH

In the early 1960s, oil production from oilseeds was based on simple mechanical crushing. In the 1970s, solvent extraction was promoted and supported by the Chinese government. In the 1980s, the original solvent extraction techniques were improved. The present state of these processes achieves oil extraction rates of up to 98 percent.

Prior to the 1980s, simple or primary refining, the common refining technology, resulted in inferior quality products. Reforms since 1982, coupled with the rapid economic development, no longer enabled primary oil products to satisfy market demands. By the mid-1980s, China started to import foreign refining technologies and processing equipment which stimulated indigenous research and development in the relevant institutions. Today, the majority of refineries have switched to fully-refined oil instead of degummed and neutralised oil. This

Table 9. **Growth in the Production of Detergent Products in China and Decline in Soaps (million tonnes)**

Product	1993	1994	1995	1996
Total compound detergents	1.45	1.51	1.88	2.10
Detergent powder only	0.85	1.20	1.52	1.70
Total soaps	0.98	1.10	0.84	0.80
Toilet soaps only	0.10	0.14	0.15	0.15

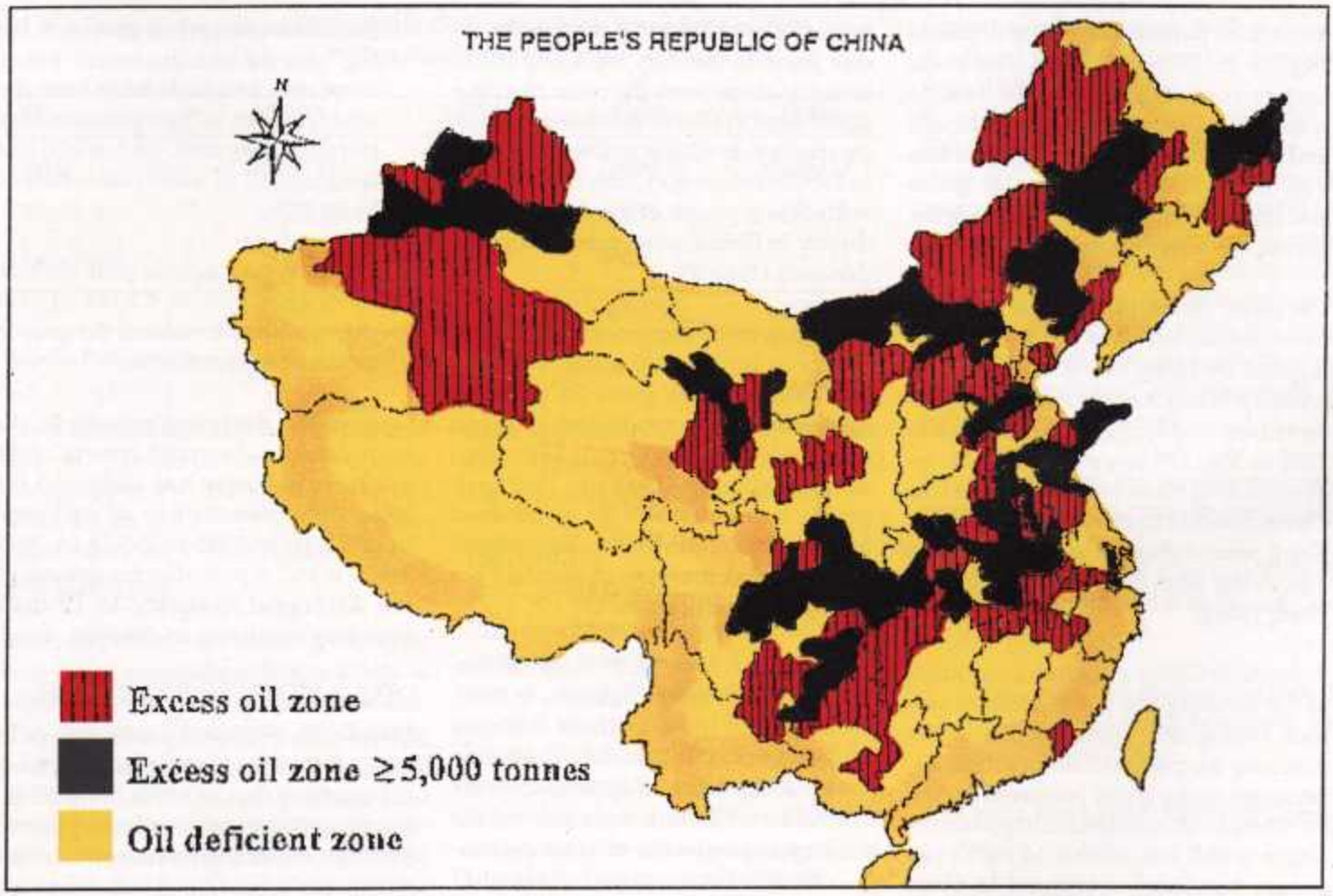

Figure 1. **The distribution of oils and fats production in the People's Republic of China**

will be the trend in the future when second grade oil production is phased out completely.

The development of the oils and fats sector owes a great deal to the various research institutions in China. There are currently 15 independent science and research institutes in sub-provincial administrative regions, six directly under the Party Central Committee and six in universities and colleges. There are about 10,000 technical personnel related to oils and fats with 500 senior researchers. They are mainly distributed in:

- Xian National Oils and Fats Research Institute;
- Chenzhou Food and Grain College;
- Wuxi Design Institute;
- Wuhan Scientific Design Institute;
- Beijing Grain and Oil Research Institute;
- Wuxi Light Industrial University;
- Gansu Grain and Oil Research Institute;
- Hunan Food Industrial College; and
- Anhui Grain and Oil Research Institute.

The present scope of research includes finding new oils such as sea buckthorn oil; extraction from herbaceous plants; concentration and extraction of vitamin E from oil distillate; extraction of teaseed polyphenols; and antioxidant effects on the stability of oils and fats. Other research include the extraction of erucic acid for chemical industries, exploring vegetable protein resources for animal feedstuff, and detoxification of protein meal from rapeseed and cottonseed.

The development of the oils and fats sector owes a great deal to the various research institutions in China.

SPECIALISED PUBLICATIONS

Various specialised journals are published. The most reputed journal on the national level is *China Oils and Fats* which is edited and printed in Xian National Oils and Fats Research Institute. Others, such as *China Grain and Oil Magazine, Technical Magazine on Grain, Oil and Foodstuffs, Food, Grain and Lipids* and *Grain and Oil in West China*, are devoted to grains, foodstuffs and oils.

Recent years have witnessed more technical exchanges in the oils and fats sector. Exposure and experience gained through exchange programmes with foreign countries have benefited the technical personnel in China. Most research establishments however are undergoing changes and there is a shortage of funds. These appear to be the main obstacles hindering the future progressive development of the oils and fats industry.

Research Highlights

Deep Frying – Assessment of Palm Oil Against Rapeseed Oil/Soyabean Oil Blend

Palm oil performed very favourably when its frying performance was compared against a vegetable oil blend. Its frying life was almost two times that of the blend.

A paper with very favorable results on palm oil's frying performance has been published in *Fd. Tech. Biotech*, the official journal of the Croatian Society for Biotechnology.

The paper was authored by Desanka Rade, Zelijko Mokrovcak and Dubravka Strucelj of the Faculty of Food Technology and Biotechnology, Zagreb, Croatia.

The main liquid oils used in the retail and catering sectors in Croatia are sunflower oil (SFO), soyabean oil (SBO) and rapeseed oil (RSO). Sunflower oil, while excellent for many applications, has a poor performance at high frying temperatures. Soyabean and rapeseed oils are prone to developing unpleasant room odours under frying conditions.

The authors therefore decided to test the performance of palm oil (PO) which is not well known in the retail and catering sectors in Croatia. The application chosen was deep frying of potatoes (making French fries).

Contributed by T.P. Pantzaris and Md. Jaafar Ahmad

Materials & Methods

The potatoes and vegetable oil (a blend of 80:20 RSO/SBO) were bought from local shops while the plam oil was obtained from the local refinery in Zvijezda. The good quality of the two oils was indicated by their initial peroxide value (1.4 and 1.2 mmole/kg) and free fatty acids (0.13 percent and 0.07 percent as oleic) respectively. The potatoes were peeled, cut into slices, blanched at 160°C and then fried at 180°C for three to four minutes.

Palm oil proved superior in nearly all the tests throughout the frying period.

Eighteen batches of sliced potatoes were fried per day for a total time of 80 hours in a 1.3 litre-capacity fryer. It was topped up with fresh oil at the beginning of each day.

While the potatoes were being fried, oil samples were periodically taken and tested for free fatty acids (FFA), peroxide value (PV), Anisidine value (AV), iodine value (IV) and polar compounds (PC). The oils were also visually assessed for foam formation and darkening.

Results

After 52 hours of frying the VO had deteriorated to the extent that further frying with it was stopped. Palm oil however could be used for 80 hours. Palm oil proved superior in all the tests throughout the frying period except for FFA, where the two oils were very similar, and PV, where the VO showed lower values (see *Table 1*). The researchers however pointed out that PV is not an appropriate test for deciding the rejection point of frying oils.

The critical test was taken to be that for polar compounds where a limit of 25-27 percent was set. This limit is legally enforced on commercial establishments in several European countries. It was reached after 44 hours in the case of VO and at 80 hours for PO. These were taken as the frying lives of the two oils. Palm oil performed better by a ratio of nearly two to one.

Table 1. **Test Values of the Two Oils at the Point of Rejection**

Text Criteria	VO* 44 hours	PO 80 hours
FFA (oleic) %	0.33	0.46
PV (mmole/kg)	2.1	2.2
AV	145	89
IV drop	5.6	3.3
Polar compounds (%)	26	26
Time to foaming (hours)	30	>80
Colour	Darker	Lighter

** Vegetable oil = Blend of 80:20 rapeseed oil/soyabean oil blend*

West Asia

Having only a 36.5 percent level of self-sufficiency in oils and fats, West Asia imported 4.25 million tonnes of oils and fats in 1996. Palm oil was the single major oil imported. With its attributes, palm oil has a potential role to play in West Asia's edible oils' industry.

PORIM's West Asia region comprises 15 countries spreading from Pakistan to Iran, Turkey and the countries of the Arabian Peninsula. The region is inhabited by 367 million people with an average population growth rate of about 3 percent.

Oils and Fats Market

Table 1 shows that the region is largely deficient in its requirements of oils and fats. In 1996, the region indigenously produced 2.45 million tonnes of oils and fats against a total disappearance of 6.70 million tonnes. This amounted to 36.5 percent of the total region's requirements of oils and fats. The gap of oils and fats' needs of the region was met through the importation of 4.25 million tonnes of oils and fats.

Palm products are the major oils imported and consumed by countries of the region. With total volume of 2.4 million tonnes, it constituted a 56.7 percent share of the total regional imports of oils and fats. The major palm products imported are RBD palm oil and RBD palm olein, followed by palm stearin and palm kernel oil and its derivative products. Important edible oil products produced by the regional vegetable oils industry are vegetable ghee (vanaspati), cooking and frying oils and margarines, etc.

Table 1.
Oils and Fats: Production, Imports and Exports, 1996

Indigenous production	2.45 million tonnes
Imports	4.25 million tonnes
Imports of palm products	2.40 million tonnes
Total disappearance	6.70 million tonnes
Level of self-sufficiency	36.5 percent
Exports & Re-exports (Edible oil products)	0.75 million tonnes

The vegetable oils industry in the West Asia region emerged and rapidly expanded in the 1980s and 1990s. There are 190 vegetable oil refineries of all sizes in the regional countries with a collective daily production capacity exceeding 215,000 tonnes. The West Asia region has surplus production capacity well exceeding the needs of the region. This has made the West Asia region a net exporter or re-exporter of edible oils and fats and their products. Although the region is deficient in the indigenous production of oils and fats, it has an industrial infrastructure to produce a variety of quality edible oil products for export to countries of Central Asia, Africa as well as to Eastern Europe. The inter and intra regional exports and re-exports of edible oil products in 1997 touched the 800,000 tonnes mark.

Consumption Pattern

The regional average per capita consumption stood at 16.5 kg with consumption pattern favouring semi-solid fats in Pakistan, Iran and Turkey and liquid oils in the rest of the countries in the Arabian Peninsula. During the last two decades the consumption pattern was predominantly for semi-solid vegetable ghee. Over the years it has been transformed to the liquid oils - mostly palm olein, sunflower oil and corn oil. In 1996, the consumption pattern stood at 50 percent solid fats and 50 percent liquid oils.

With this change in the consumption pattern, the import of RBD palm oil/ palm stearin has been substituted by palm olein. The import of corn oil has increased and sunflower and canola oils are making some inroads into the market. Other phenomena associated with this change are a consumer preference for liquid oils due to health awareness, growth in the fast food industry and a rising trend in eating out.

Increasing Competition

With the region importing and exporting oils and fats for the region, subsidies on imported oils and fats have been withdrawn. In some countries import tariffs have been imposed or increased. Traditional products like vegetable ghee and cooking oil have become commodities. The vegetable oils

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Based on a report by Iftikhar Ahmad of PORIM

In Brief

USDA Reports Growth of Daily Fats Consumption in Diet

The daily fat consumption of Americans increased steadily between 1990 and 1995. This has reversed a 25-year trend of consuming less fat, states a report by the US Department of Agriculture's (USDA) Center for Nutrition Policy and Promotion. Because the total caloric intake has increased more, the average diet looks like it is closer to achieving a major government health goal.

The Dietary Guidelines for Americans, issued jointly by USDA and the Department of Health and Human Services, has, since 1990, recommended that fat consumption be limited to 30 percent or less of total caloric intake. Expressed in terms of relative fat consumption, the American diet is approaching the recommended percentage.

Adult Americans dramatically lowered the average percentage of caloric intake from total fat, from about 45 percent in 1965 to about 34 percent in 1995, stated a report in the April issue of *Nutrition Insights*, a publication of the Department's Center for Nutrition Policy and Promotion. Although the percentage would seem to indicate that diets are growing steadily more healthy, the researchers found that Americans actually increased total fat intake for each of the last five years studied.

The researchers' explanation for the apparent paradox is that while daily fat consumption was increasing or remaining unchanged, the total caloric intake was increasing at a relatively faster pace.

For example, there was a 13 percent increase in fat consumption among men 19 to 50 years old between 1990 and 1995, but a 21 percent increase in total caloric intake over the same period. A higher percentage of calories consumed will reduce the calculated percentage of calories from fat even when there is no decrease in total fat consumption.

The largest increase in fat consumption of 33 percent was found in 31 to 40-year-old men. They consumed a daily average of 109 grams of fat in 1995, compared to 82 g in 1990.

The report stated that women of 19 to 50 years of age decreased their fat intake from 83 g/day in 1965 to 62 g/day in 1989, and have maintained their fat consumption at close to the same level since then.

The national increase in caloric intake comes largely from increased carbohydrate consumption and, to a lesser extent, increased alcohol consumption, the report said.

A USDA analysis of food consumption data revealed that increased consumption of grain products, soft drinks and alcoholic beverages has contributed to the overall reported caloric increase.

Contributed by T. Thiagarajan

FDA and USDA Urged to Ban Downer Cattle from US Food Supply

All "downed" cattle from the US food supply should be banned to protect consumers from the potential spread of bovine spongiform encephalopathy (BSE). This call to the Food and Drug Administration (FDA) and the USDA was made by petitioners.

The Farm Sanctuary, a non-profit organisation, and Michael Baur, a consumer concerned about the safety of beef produced in the US, petitioned FDA and USDA on March 4 to label all downer cattle as adulterated or condemned.

"Downed" is an industry term describing cattle which collapse for unknown reasons and are too sick to get up. There are a host of problems affiliated with these downer cattle. The illness that may cause cattle to collapse and lose their ability to move may pose a health danger to humans who consume these sick animals, the petitioners said. One such disease is BSE for which the human equivalent is Creutzfeldt-Jakob disease.

There is at present no rule explicitly prohibiting the slaughter of downer cattle for human consumption, the petitioners said. USDA's Animal and Plant Health Inspection Service reported in 1991 that tens of thousands of downer cattle were slaughtered for human food in the US every year, the petitioners noted.

However, the Federal Food, Drug and Cosmetic Act (FFDCA) prohibits the introduction of adulterated foods into interstate commerce. The petitioners claimed that downer cows fit the FFDCA's definition of "adulterated". The act stipulates that food will be deemed to be adulterated "if it bears or contains any poisonous or deleterious substance which may render it injurious to health; ... if it is, in whole or in part, the product of a diseased animal or of an animal which has died otherwise than by slaughter," the petitioners noted.

Under existing USDA regulations, a downed cow is already considered a "diseased animal," the petitioners said. The Code of Federal Regulations de-

fines diseased livestock as animals displaying any of the following symptoms: "1) central nervous system disorder; 2) abnormal temperature (high or low); 3) difficult breathing; 4) abnormal temperature (high or low); 5) lack of muscular coordination; 6) inability to walk normally or stand, and 7) any of the conditions for which livestock is required to be condemned on antemortem inspection ...," they noted.

Therefore, downer or non-ambulatory cattle are properly classified as "diseased" by the USDA, the petitioners said. "In turn, beef produced from 'diseased animals' should fall under the statutory definition of adulterated."

In light of the statutory language prohibiting the introduction of any food containing substances derived in whole or in part from a diseased animal, all products and by-products from downed cattle should be labeled adulterated or condemned and thus prohibited from entering the nation's food supply.

Contributed by T. Thiagarajan

Pilot Plant for Physical Refining of Oils and Fats

The International Food Science Centre in Denmark has developed a pilot plant deodoriser for the physical refining of fats and oils in batch sizes of 15 to 50 kg, reports *Oil and Fats International*.

Located in Lystrup, the plant can be operated at temperatures of 120° to 270°C under nitrogen protection, and vacuum of 1 to 10 m bar. All parts in contact with oil are made of stainless steel.

Following the success of physical refining on palm oil, plant constructors are now promoting this process as suitable for other oils including the soyabean-sunflower-rapeseed complex.

This newly designed pilot plant in Lystrup will enable companies to verify this assertion.

Contributed by T.P. Pantzaris and B.A. Elias

Four New Palm Oil Fractionation Plants for Europe

De Smet Engineering has ordered four new palm oil fractionation plants in Europe for this year. The company has made this decision based on increasing demand in Europe for no *trans* margarine, high quality frying oils and cocoa butter equivalents (CBE).

The new fractionation plants will go into production this year and will produce palm olein, super-olein, palm mid-fraction (PMF) for CBE and palm stearin for cocoa-butter subsitute (CBS).

The company informs that two of the plants will be in Sweden and Italy. While the locations for the remaining two plants have not been announced, PORIM's Technical Advisory Service (TAS), during a visit to Greece, was informed that one plant would be located there.

The European Union is expected to standardise chocolate, in line with the United Kingdom's practice of 5 percent CBE inclusion. This should increase the demand for CBE and PMF by a significant factor.

Contributed by T.P. Pantzaris and B.A. Elias

Recommending Beta-carotene

In response to requests by scientists working on the health benefits of antioxidants, the American National Academy of Sciences (NAS) Panel on Dietary Antioxidants is considering a wide range of possible compounds for inclusion in the next NAS recommendations for daily intake of nutrients.

At a recent meeting, a NAS panelist acknowledged that the health benefits of many antioxidants have emerged in the past 10 years since NAS last reviewed the category. Currently, only three antioxidants have RDAs: vitamin C, vitamin E and selenium.

It is reported that beta-carotene is almost certain to join the other three antioxidants in receiving an RDA during current review.

Support by the NAS would further boost the marketability of this compound.

Contributed by T. Thiagarajan

Japanese Food Labelling Changes

Japan's Ministry of Agriculture, Forestry and Fisheries (MAFF) has announced that it will introduce legislation to become internationally compatible.

The changes, mentioned in *Washington Correspondence*, include increasing the types of food products covered amending Japan's Agricultural Standards to attain equivalency with international standards, reviewing its standards every five years, using private-sector companies to provide certification, and establishing appropriate regulations to cover "regional foods."

MAFF will also accept foreign inspection, and promote the Hazard Analysis Critical Control Point (HACCP) food sanitation method and the International Standard Organisation 9000 series certification.

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Amaizing Oil

Researchers at the United States Department of Agriculture have discovered an oil derived from corn oil hulls that has been shown to significantly lower total serum cholesterol and LDL cholesterol. A patent has been applied for the oil which is aptly termed "Amaizing Oil". A large corporation is reported to be planning to develop a variety of foods and food ingredients aimed at lowering cholesterol by using the oil.

Contributed by T. Thiagarajan, PORIM, Washington DC

.....Market Update *continued*

business has become more competitive and profit margins have shrunk due to increasing competition from within and outside the regional industry. In the West Asia region the major vegetable oils of the world market both compete against each other for market share and complement each other in terms of substitution and replacement based on factors like availability, price and processing costs, etc.

Palm Oil's Potential

With its price competitiveness, increasing availability index and the lowest cost of conversion into downstream products, palm oil has a potential role to play in the future activities of West Asia's edible oils industry.

Techno-Economic Advantage

The region's edible oil industry enjoys some techno-economic advantages now that it has come of age and possesses regional experiences in the processing of oils and fats. It has cheap energy inputs and access to local markets with a growing population and purchasing power for value-added food products. West Asia's most important feature is its geographical location in the middle of the palm oil producing East Asian region and consuming regions such as Europe, Africa and Central Asia.

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We invite readers to send in their comments, suggestions and technical news for publishing in this newsletter.

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1999 PIPOC

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