Changing Market Trends in the Oils and Fats Sector

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ABSTRACT

The contribution of the oil palm industry to Malaysia's economic development has indeed been impressive. Changing market trends and rapid developments in competing oils has, nevertheless, continued to pose challenges to palm oil in terms of market opportunities. This article provides an overview of the developments that the oils and fats industry has undergone in terms of world balance, with special reference to palm oil price and market performance.

INTRODUCTION

The world's vegetable oils market stands enthused by the rising per capita consumption of edible oils in developing countries in Asia-Pacific and Latin America. Driven by P R China and India, Asia-Pacific is expected to offer lucrative growth opportunities, particularly for palm oil intake. In the developed countries, per capita consumption of vegetable oils has reached a point of saturation, and unlike the developing countries, low fat content is the crucial deciding factor influencing their purchasing patterns.

The on-going concerns over *trans*-fatty acids (TFA), and genetically-modified (GM) oils are expected to have a considerable impact on soyabean oil consumption across North America and Europe. GMO-free and organic oils are, therefore, expected to witness increased demand in these markets. *Trans* fat-free crude palm oil is expected to witness consumption growth at the expense of soyabean oil. Meanwhile, the lower prices of palm oil in comparison to soyabean oil are expected to stimulate its demand even in developing countries, although they are not bogged down by TFA labelling requirements. Public concerns over health and food safety issues will continue to dot the industry's landscape, especially in the developed markets. Several food companies have already embarked on the transition towards *trans* fat-free food processing. The issue is expected to witness a realignment in consumption patterns across product segments, while overall market growth momentum will continue to remain strong.

Non-edible applications of vegetable oils are expected to gain momentum in the future, and this is evident in the rising market demand for biodiesel. In the developed markets, a medley of factors such as environmental concerns, stringent greenhouse gas emission regulations, high energy prices and government incentives are leading to increased interest in biodiesel.

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GENERAL OILS/FATS MARKET TRENDS

Production

The world's oils and fats complex has indeed undergone major changes in the last four decades. Vegetable oils have displaced animal fats as the major source of cooking oils and fats, and palm oil has witnessed a significant rise in ranking. The share of animal fats has declined from 20% in 1998 to 16% in 2007, while that of vegetable oils has risen from 80% to 84% during the same period.

The increasing role played by vegetable oils is clearly evident during the last 10 years (*Table 1*). During this period (1998-2007), world vegetable oil production grew by 5.2% per annum (p.a.) vis-à-vis only 1.9% p.a. for animal oils and fats.

There has also been a shift in production areas. The most important change over the past 10 years was the fact that the US lost its position as the second largest producer of oils and fats in 2007 (from 15% in 1998 to 11% in 2007), while P R China and Indonesia specifically have gained market shares (from 11.3% to 13% and from 6% to 13% respectively).

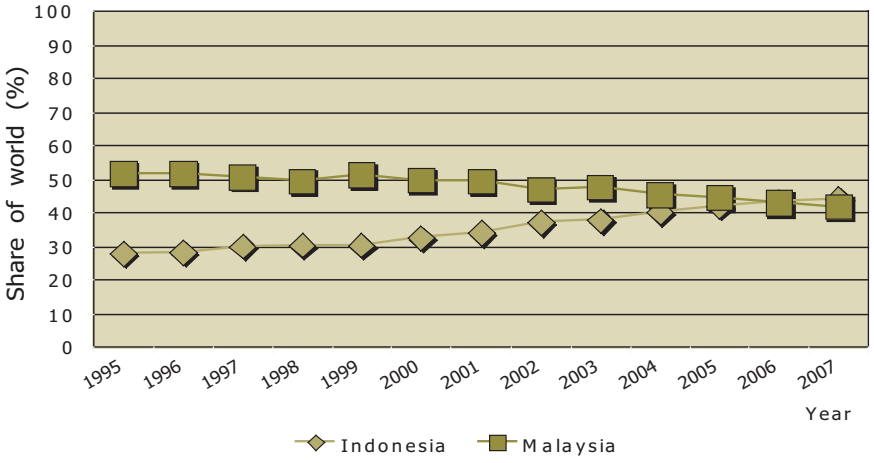
TABLE 1. WORLD'S MAJOR OILS AND FATS PRODUCERS: 1998-2007 ('000 t)

Country	1998	2002	2008
P R China	11 653	16 130	19 726
EU	15 614	16 916	19 561
Indonesia	6 505	11 143	19 438
Malaysia	9 527	13 533	17 754
USA	15 309	15 760	16 898
India	7 260	7 097	9 074
Argentina	5 146	5 592	8 637
Brazil	5 152	6 356	7 578

This in fact consolidated Asia's position as the major producer of vegetable oils in the world, and it would seem that trade in these commodities will continue to increase dramatically in the future. It is important to point out here that Indonesia overtook Malaysia as the largest palm oil producer from 2006 onwards (*Figure 1*).

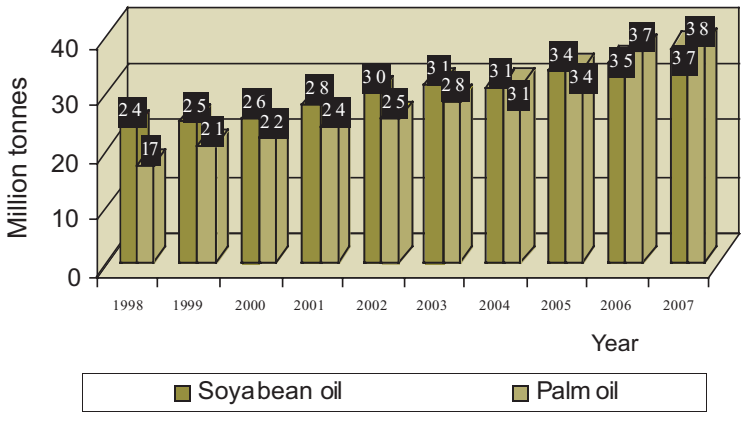
From 1998 to 2007, world palm oil production increased by 126% from 16.92 million tonnes to 38.25 million tonnes, growing at an average rate of 9.6% p.a or more than double the rate of the world's total oils and fats production growth of 4.6% p.a. In fact, the significant expansion in palm oil production surpassed the growth of soyabean oil production, which registered an annual growth of 5.1% p.a. Production of soyabean oil increased by 56.1% from 24.01 million tonnes to 37.48 million tonnes during this period (*Figure 2*). Production increase of 15 other major oils/fats only ranged between 0.6% and 8.1% p.a.

The share of palm oil production in the world's oils and fats complex has also increased from 16.5% in 1998 to 24.8% in 2007, whilst that of soyabean oil increased only slightly from 23.4% to 24.3%. The increase in palm oil production was attributed to high yield performance in the key producing countries other than Malaysia, such as Indonesia, Thailand, Colombia and Nigeria, as well as more mature oil palm areas coming into production in Indonesia.



Source: Oil World & MPOB.

Figure 1. Production of palm oil: Malaysia vs. *Indonesia (1995-2007).*



Source: Oil World.

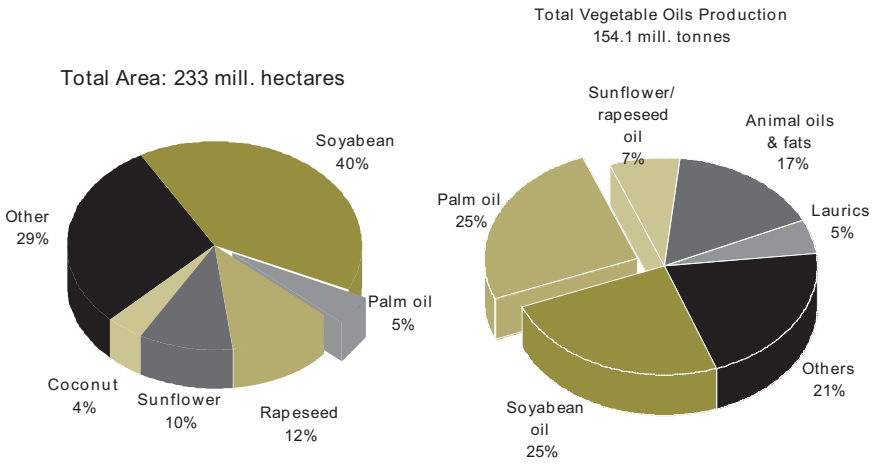
Figure 2. Production of soyabean oil and palm oil (1998-2007).

Part of the growth of palm oil is the result of a bias towards oilseeds with higher oil content. Oil palm has the highest oil yield at 3.43 t/ha as compared to 0.36 t/ha for soyabean oil and 0.60 t/ha for rapeseed (*Figure 3*). There is also a historical price discount of palm oil in relation to the other oils.

In 2007, world production of oils and fats increased moderately by 2.7% to 154.1 million tonnes as compared to 150.2 million tonnes in the previous year. Of this volume, vegetable oils increased by 2.7% from 126.0 million tonnes to 129.4 million tonnes, mainly as the result of an increase in the production of palm oil, soyabean oil and rapeseed oil, while the production of animal fats increased only marginally by 2.5% from 24.1 million tonnes to 24.7 million tonnes. *Figure 4* shows the share of major oils and fats in world production in 2007.

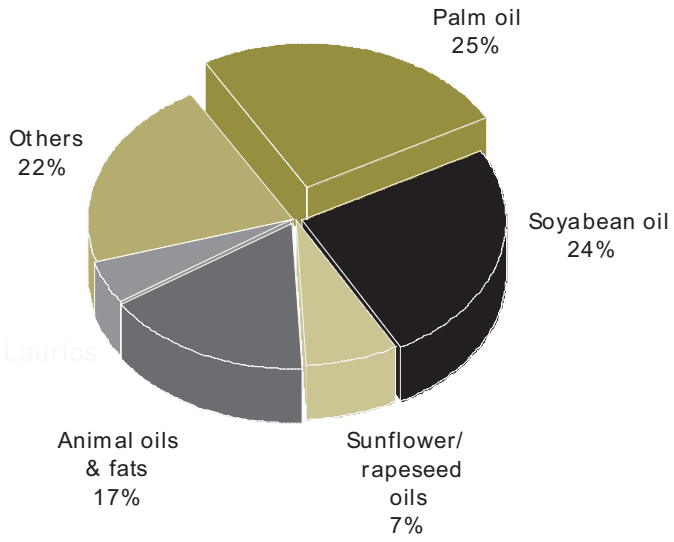
Although palm oil maintained its position as the largest oils/fats produced in 2007, its growth was lower vis-à-vis soyabean oil. Soyabean oil production grew by 6.2% to 37.5 million tonnes from 35.3 million tonnes, while palm oil only increased marginally by 3.0% from 37.1 million tonnes to 38.2 million tonnes.

World oils/fats output in 2008 is forecast to increase moderately by 4.4% to 160.9 million tonnes, following another expected production increase, led by the three major oils/fats, *i.e.* palm oil, soyabean oil and rapeseed oil, up by 7.6%, 7.3% and 3.4%, respectively.



Source: Oil World.

Figure 3. High oil production with less land utilization (2007).



Source: Oil World.

Figure 4. Share of major oils and fats in world production of 154.1 million tonnes (2007).

Consumption

The world's consumption of oils/fats has continued its upward trend, rising by 4.6% p.a. from 103.1 million tonnes in 1998 to 154.8 million tonnes in 2007. The increase in demand, especially in 2006 onwards, was primarily due to the rising use of vegetable oils/fats in the non-food sector. In fact, demand in the non-food sector, especially for biofuel production, is fast expanding and is estimated to account for nearly 40% of the total demand growth. As for the food sector, the rise in consumption was mainly due to the increasing global population and rising per capita income, thus reflecting a higher demand for vegetable oils. Coupled with this is the fact that consumers are increasingly changing their dietary habits, switching from consuming animal oils/fats to vegetable oils.

Among 17 oils and fats, the consumption of palm oil recorded the highest growth rate of 9.0% p.a. during the period 1998-2007, followed by soyabean oil by 5.3% p.a. and rapeseed oil by 5.2% p.a.

As the most consumed oils/fats in the world, palm oil recorded a sharp increase by two-fold, up from 17.7 million tonnes in 1998 to 38.3 million tonnes in 2007. Its consumption surpassed that of soyabean oil as the most

consumed oils and fats since 2005. Its market share in world consumption of oils/fats also increased from 17.1% to 24.8% during this period. Meanwhile, soyabean oil consumption in 2007 amounted to 37.5 million tonnes, an increase by 6.7% from 23.6 million tonnes in 1998 (*Figure 5*). Its market share registered only a moderate expansion, up from 22.9% to 24.2% during this period.

World per capita consumption of oils and fats increased by 32.5% from 17.48 kg in 1998 to 23.16 kg in 2007. Changes in lifestyle arising from an expanding household income, which eventually leads to higher purchasing power and higher health consciousness, coupled with an expanding demand from the biofuel industry, have been attributed to the increase in per capita consumption of oils and fats.

Among the five largest oils/fats consumers, European Union (EU) recorded the highest per capita consumption in 2007 with 57.4 kg, increasing from 44.9 kg in 1998. The EU is followed by the US at 54.1 kg, up from 46.8 kg. P R China, the largest oils/fats importer and consumer, recorded a per capita consumption of 22.0 kg in 2007, an increase of 76% from 12.5 kg in 1998. Meanwhile, Brazil and India recorded moderate increases in their per capita consumption, *i.e.*, from 24.3 kg to 29.0 kg and from 11.8 kg to 12.3 kg, respectively.

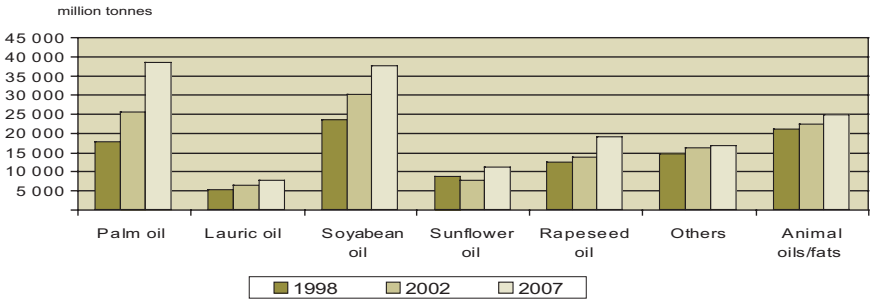
Exports

In tandem with the significant growth in global production, world oils and fats exports also rose by 77% from 32.7 million tonnes in 1998 to 57.9 million tonnes in 2007. Vegetable oil exports grew by a sharp 85.4% (from 29.1 million tonnes to 54.0 million tonnes), while that of animal fats grew slowly by 9.9% (from 3.6 million tonnes to 4.0 million tonnes).

Palm oil's performance in the global oils and fats trade during this period was equally impressive. Palm oil exports again recorded significant growth, rising by 12.0% p.a., exceeding the world's oils and fats exports' average growth of a moderate 6.6% p.a. over the 10-year period (1998-2007). Palm oil's growth is matched only by that of palm kernel oil, a close second at 10.8%, albeit with a smaller export volume. The growth of other major oils, namely soyabean oil, sunflower oil, coconut oil and rapeseed oil, hovered around 4.2% p.a., 5.5% p.a., 5.5% p.a and 3.0% p.a., respectively, while the growth of animal oils and fats was even smaller, increasing only slightly by 1.2% p.a.

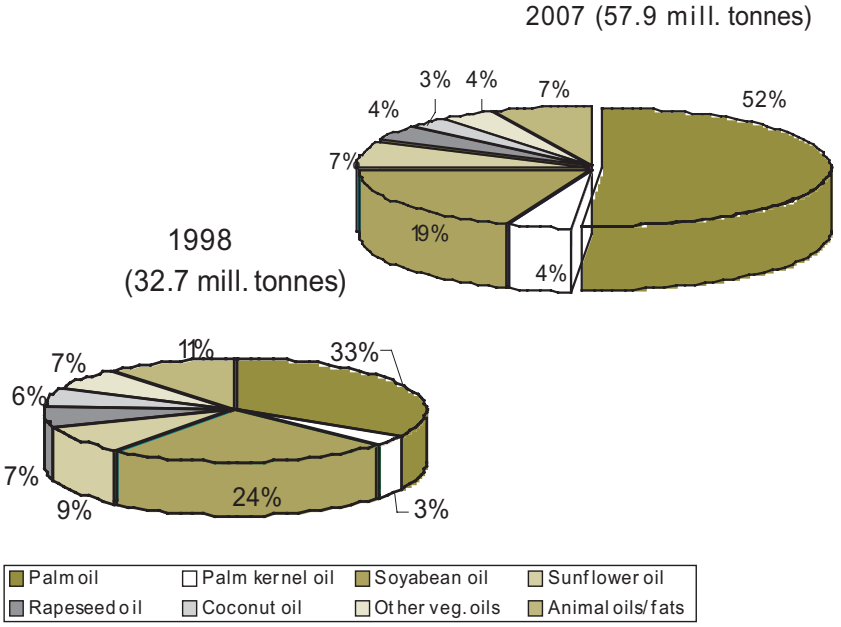
During the 10-year period, palm oil maintained its position as the highest oils/fats exports. Palm oil exports increased by a hefty 2.7-fold, jumping from 10.9 million tonnes in 1998 to 29.7 million tonnes in 2007. Meanwhile, exports of soyabean oil and sunflower oil during the same period increased by 41.1% from 7.9 million tonnes to 11.2 million tonnes, and by 43.3% from 2.9 million tonnes to 4.2 million tonnes, respectively. That of rapeseed oil was down by 3.5% to 2.16 million tonnes from 2.24 million tonnes.

From *Figure 6,* it may be seen that palm oil also took the largest



Source: Oil World.

Figure 5. World consumption of 17 oils and fats from 1998-2007 ('000 t).



Source: Oil World.

Figure 6. Export share of various oils/fats (1998 vs. 2007).

share of the world's oils/fats exports during the 10-year period, expanding from 33.3% in 1998 to a commendable 51.3% in 2007 compared to soyabean oil, which was down slightly from 24.3% to 19.3% for the same period. Both Malaysia and Indonesia combined accounted for the lion's share of the world's palm oil exports during the period, at almost 88.5 % of the total share in 2007 alone. Sunflower oil and rapeseed oil's shares in world exports decreased from 8.9% and 6.9% in 1998 to 7.2% and 3.7%, respectively, in 2007. The share of animal oils and fats was down by almost half, from 11.0% to 6.8% during the same period. As such, vegetable oils maintained their position as the leading category in global oils and fats exports.

Major Importers of Palm Oil

The EU, India, Pakistan and P R China are the traditional buyers of palm oil. The EU has been quite consistent with its purchasing pattern. Higher demand for palm oil in the region is also supported by higher demand for the biofuel industry. P R China, India and Pakistan share the advantage of closer proximity to Malaysia and Indonesia in procuring their supply on a regular and consistent basis. One country that has emerged as one of the major palm oil buyers recently is the US. Its imports surged significantly to 629 000 t in 2006 and to 720 000 t in 2007. The surging demand for palm oil mainly from Malaysia can be attributed to the TFA labelling regulations that have encouraged the US user to use palm oil to replace the more harmful TFA contained in food products. TFA result from hydrogenating soft oils to improve their stability

Prices

Palm oil is priced competitively vis-à-vis other major oils and fats in the world market. It is traded at a price discount (to other competing oils/fats), which may widen or narrow, based on the dynamics of the supply-demand situation.

During the past 10 years (1998-2007), crude palm oil (CPO) has been at a price discount to soyabean oil (SBO) for a period of eight years, with the discount ranging from a low of USD 28 to an extreme of USD 145/t (*Table 2*). Nevertheless, there have also been occasions during this period when CPO was traded at a price premium to that of SBO, albeit the premiums being relatively small, between USD 9 (1999) and USD 45 (1998) per tonne. This situation arose as a result of the demand for palm oil increasing much faster than that of supply.

Meanwhile, the price competitiveness of palm oil vis-à-vis other vegetable oils had contributed positively to the expanding demand for palm oil exports in many developing countries, especially in price-sensitive markets like Pakistan.

An interesting development in 2007 was the firming up of the prices of oils and fats in the world market, supported by tight supplies of oils and fats and higher crude oil price sentiments. SBO oil prices soared to at an all-time high as US farmers switched their plantings from soyabean to corn to produce ethanol for fuel rather than for food and feed applications. As a result, the price of SBO also surged, thus causing CPO prices to follow in tandem. CPO prices increased by 63.2%, or from USD 302 to USD 780 in 2007.

Against CPO, soyabean oil price increased only by 47.1%, or from USD 282 to USD 881, while rapeseed oil price increased by 22%, or from USD 175 to USD 969, influenced by the boost in demand from the European biodiesel industry. Meanwhile, the price of sunflower oil rose by 55.3%, or from USD 364 to USD 1022/t, as a result of lower production (down by 1.7%) and increasing demand.

TABLE 2. AVERAGE PRICES OF FOUR MAJOR OILS IN THE NORTH-WESTERN EUROPEAN MARKET (from 1998 – June 2008) (USD/t)

Year	Sunflower oil	Rapeseed oil	Soyabean oil	Crude palm oil
1998	728	628	626	671
1999	507	423	427	436
2000	392	347	338	310
2001	484	402	354	286
2002	594	485	454	390
2003	593	600	554	443
2004	684	685	616	471
2005	677	669	545	422
2006	658	794	599	478
2007	1 022	969	881	780
2008 (Jan-June)	1 876	1 491	1 429	1 180

Source: Oil World Annual (from 1998 – 2007).

Price Increase and Effects on Trade

In spite of the rapid rise in price, world palm oil exports reached nearly 30 million tonnes compared to SBO exports in second place at 11 million tonnes in 2007. Exports from Malaysia and Indonesia to the world market were accentuated by increased economic prosperity in key consuming countries such as P R China and India, the two new economic power-houses. In fact, through their increased prosperity, these countries were able to import more oil for their domestic consumption.

Price competitiveness of palm oil has helped the growth in trade with these countries. Palm oil has been a relatively cheap source of edible oils/fats compared to SBO. Traditionally at a discount to SBO, palm oil has enjoyed greater inroads into populous markets like P R China, India and Pakistan. Over the last two years, the discount of palm oil to soyabean oil averaged at USD 63/t, which was far lower than in the earlier years due to the strong palm oil price rally, beginning in 2006. The highest SBO price premium was recorded at USD 178/t in the middle of 2004, and it shrunk to USD 4/t in mid 2007.

MARKET TRENDS IN MAJOR OILS/FATS CONSUMING COUNTRIES

People's Republic of China (P R China)

China's imports of palm oil experienced continuous growth, and in 2007, her imports amounted to 5.50 million tonnes, which exceeded the import volume of 2006 (5.46 million tonnes). Statistics show that imports of palm oil for the first six months of 2008 had reached 2.83 million tonnes.

P R China has been the world's largest oils and fats consumer since 2003, with palm oil and SBO being the major oils consumed. Consumption of vegetable oils in 2007 amounted to 29 million tonnes, and palm oil made up about 19% of this amount. With the rapid increase in China's palm oil consumption, her consumption of the oil in 2008 is expected to exceed that of 2007. Oils and fats also play an indispensable role in China's oleochemical industry, with the palm oil-based oleochemical industry constituting 40% of the total.

Palm oil consumption is expected to increase by 10% on average annually. In fact, the growing consumption of oils and fats in China is a key factor in the estimation that the country's palm oil imports will maintain an upward trend in the years to come.

European Union (EU)

In 1997, the EU resolved to improve the share of renewable resources in its energy consumption from 6% to 12% by 2010. However, only limited progress was achieved, and, early last year, the EU reiterated its commitment and set itself a target of 20% share of renewable energy sources in energy consumption by 2020. Concerns over the increasing demand for energy, rising fossil fuel prices and the fear of global warming have caused the EU to bind its member states to achieving a 10% minimum target for the use of biofuels in transport. Following this, the European Commission (EC) proposed further measures to boost energy production from renewable sources. On 23 January 2008, the EC unveiled the EC Directive to promote the use of energy from renewable sources for its 27 member states.

The measures stipulated in the above Directive vary from the present level of renewable energy of 8.5% and allow each member state to decide on the mix for the three sectors – electricity, heating and cooling, and transport.

On the new target of 20% by 2020, the first half of the increase will be divided equally among all member states, while the remaining half is apportioned between the states, calculated on the basis of GDP per capita. This means that member states with higher incomes will have a higher target, even if they have already reached the 20% target.

The concern about this Directive is related to the sustainability criteria which specify that biofuel must be able to provide a minimum reduction in 35% greenhouse gas (GHG) emissions when compared with fossil fuels to count under the new target. Besides the reduction in CO_2, biofuels sourced from feedstocks/crops planted in protected areas, 'highly biodiverse' grasslands, forests and wetlands will not count in the 10% target. Land with 'high biodiversity' value is defined as natural forests and protected areas, regarded as unsuitable for the production of raw materials for biofuels.

United States of America

The United States is a big player in the world's oils and fats market, and she will continue to dominate and influence the movement of this market. However, within the US, the oils and fats industry is also facing its own challenges, as follows:

The promulgation of food labelling regulations by the US Food and Drug Administration (FDA) to address the *trans*-fats content from 1 January 2006 has stimulated the reformulation of many pre-packaged food products so that the amount of *trans*-fats in

these new products is reduced to less than 0.5 g per serving. This can thus be rounded up to 'zero grams *trans*-fats per serving'.

Apart from this, the Health Code passed by New York City, effective from 1 July 2007, has also had a significant effect on the *trans*-fats content of foods served in restaurants, both in and outside New York City. New York City-based restaurant chains have also altered their food product compositions in other cities of the US due to the need to have consistency in product formulations wherever their facilities operate. The New York City code has also set a precedent for other cities and states. At least 20 states have proposed similar regulations, and at least 25 municipalities have proposed ordinances or codes restricting the content of *trans*-fats in food ingredients.

Meanwhile, a vast majority of food manufacturers and restaurants have adopted policies to reformulate products having no or preferably less *trans*-fat as well as saturated fat compared with the original substituted products. Palm oil can be blended with other vegetable oils (such as canola, soyabean or cottonseed oils) to result in frying or baking shortenings that contain no *trans*-fat.

India

The use of palm oil has grown steadily in India over the last 25 years, and it is today the single largest vegetable oil consumed in the country. The general public's perception of palm oil in India is still influenced by its availability and pricing. Palm olein's main attraction is its price competitiveness vis-à-vis other vegetable oils. From a previous negative tag of 'a poor man's oil', palm oil's fortunes in India have since changed and consumers have become progressively more aware that they are consuming a product not only competitively priced, but also techno-economically advantageous based on its myriad uses.

The oils imported used to be channelled through the government's buying agency, the State Trading Company (STC). However, with the adoption of more liberal import policies from the early 1990s, vegetable oil imports were in 1994 put under the Open General Licence (OGL) regime. The private sector was allowed to import oils and the role of STC gradually diminished. This has also resulted in the gradual withdrawal of palm olein from the Public Distribution System (PDS). Imports gradually rose from 2 million tonnes in 1996 to 5.30 million tonnes in 2007. In fact, the Indian Government at present has further facilitated the country's palm oil intake amidst rising domestic inflation by reducing import duties significantly to 0% on CPO and 7.5% on refined palm oil .

Furthermore, in the food-processing sector, institutional users of cooking oils, such as the snack food industry, are turning out to be true friends of palm oil. Greater awareness of the characteristics of all oils, including palm oil, has convinced this industry that palm oil offers excellent frying properties, leading to longer shelf-life and better taste of the products, besides there being no compromise on quality assurance.

Pakistan

Pakistan is a deficit producer of edible oils, able to meet only 30%-40% of its consumption requirements despite efforts by her government to increase production and thereby save foreign exchange earnings. In spite of the government's efforts, the production of indigenous oilseeds declined from 5.66 million tonnes during 2004/2005 to 4.72 million tonnes in 2007/2008. Cottonseed, which remained the major contributor to indigenous production, registered only marginal growth up until 2006/2007 (however, declining in 2007/2008), while other oilseed crops, including sunflower, rapeseed and canola, either remained stagnant or showed negative growth. Thus, increases in edible oil imports appear likely to be the case even in the foreseeable future despite a slight decrease in 2007 imports (down to 1.88 million tonnes compared to 1.91 million tonnes in 2006, but still up compared to 1.78 million tonnes in 2006).

What is important here is that Pakistan is still a price-sensitive market, wherein the relative prices of oils will decide the final import mix. Palm oil, being the most price competitive, is thus the principal oil imported, taking up the lion's share of almost 95% of the edible oils brought in, with palm olein being the major commodity. In addition, robust consumer spending has also been supporting the on-going growth momentum in imports.

OTHER RELATED CHANGING TRENDS

Emergence of Mega Business Corporations

A new related phenomenon is the emergence of mega business entities. This is already evident in most sectors, including the commodities sector. The challenge to major vegetable oil producing nations like Malaysia and Brazil is to ensure that their businessmen are quick to realize this and enter into synergistic partnerships with appropriate partners in both the producing and importing countries in order to have a share of the action.

These megatrends are already taking place in South America, where American SBO companies, such as Bunge & ADM, are already moving their operations from the US into the South American countries, especially Brazil and Argentina.

Not to be outdone in this regard, the oil palm sector has also seen its fair share of mega corporations being formed, *e.g.*, Sime Darby Bhd and Willmar International as well as IOI and Loders Crocklands have merged with significant stakes in oil palm plantations and palm oil processing.

Impediments to Market Access

There are some countries which use the import tariff mechanism to protect their local industries, for example, in North Africa, Algeria has the following import tariffs: crude vegetable oils = 5%, semi-finished products = 15% and finished products = 30%, while in Morocco the tariffs are: crude vegetable oils = 2.5% and processed oils = 25%. Yet in other cases, there is a tendency for these countries to raise import duties whenever international prices of vegetable oils decline so that domestic prices are kept high to protect their farmers. In addition, self-sufficiency programmes espoused by these countries are supported by prohibitive import tariffs on vegetable oils.

However, the concern of competitive vegetable oil producing countries is the tendency by some nations to use non-tariff barriers to restrict market accessibility. There are several cases where commercial restrictions in the form of technical barriers are put in place under the guise of protecting health concerns of consumers, but without sufficient backing by facts or results based on scientific findings. One example is the case where RBD palm stearin is not permitted to be imported and consumed in the food sector in some developing countries when in actual fact that same vegetable oil product has been accepted and widely consumed even in developed countries.

A looming threat is the legislation regarding dedicated vessels for the shipment of vegetable oils to the EU. Such legislation is certainly unnecessary as there are already adequate measures in place for the safe transportation of vegetable oils. Furthermore, such legislation will not only increase the freight rate charged by ship owners, but also lead to problems of availability of vessels.

Another area of concern for vegetable oil exporting nations will be to ensure that efforts at multilateral levels such as CODEX are not used to introduce stringent technical barriers. Whilst it is acknowledged that importing countries need to have food standards/regulations and the harmonization of quality standards under CODEX is aimed at protecting consumer health and ensuring fair trading practice, it is also pertinent that such standards/ regulations should not be trade restrictive and discriminatory in nature. They should be based on the principle of sound scientific analysis and evidence.

Growing Health Concerns of Consumers

Most consumer perception of fats and oils reflects the image of an unhealthy component of food that should be consumed with utmost choice and care. The commonly ascribed adverse health perceptions of fats and oils include cholesterol content. However, in reality, only fats and oils of animal origin are high in cholesterol. Vegetable oils and fats are essentially free of cholesterol. In most vegetable fats or oils, cholesterol content hardly exceeds 20 mg/kg of oil or fat whereas a single egg yolk contributes 200 mg of dietary cholesterol.

Palm oil in current diet/dietary habits. There is abundant evidence including that from a number of well-controlled human studies that palm oil and palm olein can behave as neutral fats towards blood cholesterol modulation. Researchers at the Malaysian Palm Oil Board or MPOB (Dr Kalyana Sundram) and Brandeis University, USA (Prof K C Hayes) produced a blend of natural, cholesterol-free fats that readily met this ideal fat balance as recommended by the American Heart Association. This was evaluated in human clinical and animal trials for its effects on blood cholesterol. This balanced fat was found not to cause an increase in LDL blood cholesterol levels and instead increased the beneficial HDL-cholesterol. This was a major achievement because in humans it is indeed difficult to increase the protective HDL-cholesterol. The net effect was a significant improvement in the LDL/HDL cholesterol ratio. These findings were so useful that the researchers patented their findings as a major observation benefiting the fight against blood cholesterol and heart disease.

Trans *fat-free*. Since their introduction into the human diet and until the early 1990s, partially hydrogenated fats containing TFA were advocated as the preferred fatty acid base for solid fats, especially margarines. They were initially designed to replace butterfat, and with advances in our knowledge on the adverse impacts of saturated fatty acids (SFA) on cardiovascular disease (CVD) risk at that time, TFA were made prominent as a safe alternative.

The study of Mensink and Katan suggested that *trans*-fats

increased total (TC) and low-density lipoprotein cholesterol (LDL-C) while decreasing the beneficial high-density lipoprotein cholesterol (HDL-C) resulting in a less desirable TC/HDL-C ratio. Nearly a dozen other studies quickly supported this finding, almost all reflecting increases in the atherogenic LDL-C and decreases in the beneficial HDL-C following the consumption of a TFA diet.

Vitamin E. Vitamin E is an important health-giving minor nutrient. There is a strong relationship between vitamin E intake and protection against degenerative diseases. It is known that LDL enhances CVD, but vitamin E protects the human body against such oxidation. Vitamin E does inhibit oxidation processes and it is shown to protect against atherosclerosis. Vitamin E functions primarily as a chain-breaking antioxidant and prevents the accumulation of lipid peroxidation products. In nature, vitamin E occurs in eight isomeric forms, the four tocopherol and four tocotrienol isomers.

Tocotrienols have been shown to be far superior chain-breaking antioxidants than tocopherols. It is proven that tocotrienols have blood cholesterol-lowering properties through a mechanism that is akin to the family of statin drugs currently prescribed by cardiologists to control high blood cholesterol levels. The advantage of tocotrienols is primarily that they are natural food components with no adverse effects unlike the statin drugs.

Palm carotenes. Carotenes are fat-soluble pro-vitamin A molecules that have a long historical association with good health for humans. Most carotenes in the plant kingdom are packaged within the protoplast of the fruit or vegetable in which they occur. Recognizing the nutritional potential of a carotene-rich palm oil, MPOB developed and commercialized red palm oil that retains its carotene content (800 mg/kg) and profile so that the consumers can benefit from this nutrient. This is now readily available in Malaysian supermarkets. The red palm oil is increasingly becoming available in international health food stores as well. Apart from the red palm oil, carotene concentrates are also processed from palm oil and these are now regular constituents in many mixed vitamin supplements.

The Emergence of the Third Sector

It is now acknowledged that non-governmental organizations (NGOs) constitute the 'Third Sector', besides the government and private sectors, in formulating strategies for the balanced development of nations. The growing pressure exerted by NGOs is being felt across all sectors of the economy, including the oils and fats sector. Everyday more and more of these NGO representatives are having their voice heard at various domestic and international fora on how best to use planting materials, to plant, to produce and to market oilseeds, and oils and fats to meet the growing demand of consumers. For example, the prominent involvement by Green Peace in food legislations and policies in Europe has a significant bearing on the marketing of oils and fats throughout the world.

Whilst it is acknowledged that NGOs have a significant role to play in protecting consumers' health and interests, it is important that they advocate standards which are based on sound scientific analysis and evidence that can be reasonably attained by both developed and developing countries. Coupled with this, their views expressed must fully take into consideration the long-term interests and development needs of the oilseeds, oils and fats sector.

Sustainability Issues

On the issue of sustainability, environmental and consumer advocacy groups in Europe and the US have increasingly claimed that the oil palm sector is reportedly destroying large tracts of forests and encroaching on the habitats of endangered species. Some NGOs and European countries have accused palm oil as being an environmentally damaging oil, citing 'rainforest destruction' and the loss of the 'orang utan's natural habitat', and this has caused an uproar among consumers of edible oils in these countries. The smear campaigns against palm oil are likely to be linked to the fear of its expansion in planted area, production as well as price competitiveness.

The Netherlands is a major proponent for more sustainable development and use of tropical forests. Many Dutch manufacturers have been pressured to source palm oil from sustainable production. The issue on sustainability has taken a new dimension when the EU set out key compulsory targets for renewable energy and biofuel in March 2007. There is a heated debate about whether the EU can deliver on the 10% target for biofuel, without putting a huge strain on the food markets. The Netherlands being the key re-export centre for both cereals and major oilseeds in the EU is very concerned about any negative publicity arising from this debate.

In addition, the Dutch Government is reported to be concerned that the biofuel used in Europe should not have undesirable environmental consequences in terms of net greenhouse gas emissions and loss of biodiversity. To this effect, many

legislators in the EU are currently defining a mechanism to ensure this is possible. This mechanism must not load extra burden onto European farmers and must also be compatible with WTO rules and existing EU rules.

Discriminatory Internal Policies

There are 50 independent state legislatures in the US, any of which could adopt discriminatory legislation. In 2006, the state of Washington enacted renewable fuel standards requiring fuel suppliers and distributors in the state of Washington to meet minimum biofuel sale requirements and obligating state agencies to minimum biofuel requirements. The state law provides certain tax exemptions to businesses that use biofuel and meet requirements of the Motor Fuel Quality Act (MFQA). In Bill 1055, it addresses the definition of biodiesel and places strict use of biodiesel from palm oil for purposes of state minimum renewable fuel standards and tax exemptions. Only palm oil was singled out in this version which prevents a business from using palm oil-based biodiesel to qualify for state biofuel use requirements and tax exemptions, unless the business can demonstrate that there is not enough feedstock grown in the US, or that palm oil was purchased from a company that provides sustainable palm oil only.

The state of Oregon has already passed Bill HR 2210 which provides for production tax credit for Oregon growers to produce locally grown biofuel feedstocks such as canola, camelina, wheat and flax. The Bill also provides for tax credit to Oregonians who use higher blends of biodiesel and ethanol in their vehicles produced from the same biomass, except palm oil (incentive for both production and use of renewable energy). The Bill does not state any particular reasons as to why palm oil is excluded.

The state of Minnesota also passed a legislation to increase the biodiesel content of diesel fuel sold in the state from the current 2% to 20%, which is the highest in the US, by 2015. In particular the legislation included:

- a first-in-the-country palm oil ban: virgin palm oil cannot be used to produce biodiesel to meet the Mandate;
- focus on Minnesota and Mid-West production: The increasing levels of biodiesel content can only go into effect if Minnesota produces at least 50% of the mandated production level in state from feedstocks produced in the US and Canada;
- opening the door for the next generation biofuel: 5% of the Mandate needs to be met with biodiesel produced from alternative feedstocks (waste oil, algae, *etc.*), which will help diversify raw materials used in biodiesel production and shift away from food and feed crops; and
- asessing the costs and benefits: reports to the legislature are required annually on the price and supply of biodiesel, as well as the impact of the Mandate on the Minnesota biodiesel industry and the use of Minnesota crops and materials used for biodiesel production.

Nevertheless, there is also a positive side to these internal policies/legislations, in that the demand for palm oil is likely to grow even faster. If there are further US State legislations crafted tactfully against the use of palm oil for biodiesel, then other vegetable oils will be diverted for biodiesel manufacturing. In this case, the likely scenario to happen is that palm oil will most likely fill the gap left behind by these oils for edible purposes, and invariably this will increase its (palm oil) market share in the US. As a result, in the long-run, users in the US will get used to the superior quality of palm oil for certain applications, and at the same time, manufacturers will also benefit from its lower prices. All in all, the volume of palm oil shipped to the US will eventually grow significantly faster.

CONCLUSION

The demand for oils/fats will continue to grow in line with world population expansion, and the focus will be on the four major vegetable oils. What is clear is that the oils and fats industry will definitely face numerous changing trends and challenges/issues that need to be addressed fully and in an effective manner. The oils/fats sector in both Malaysia and the world at large will, however, remain resilient throughout this endeavour and successfully surmount all these changing trends and challenges. In all these undertakings, close co-operation is paramount, not only between vegetable oil producers, but also between them and other related industries. In fact, there is enough room for every player in the oils and fats sector.

Furthermore, palm oil is not only the most traded oil, but it is also able to satisfy the growing needs of the world's oils/fats market. The increase in world consumption of edible oils, including that of palm oil, has been the result of the economic growth of major trading partners, albeit slowly in recent times, coupled with higher per capita income of consumers.

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REFERENCE

KALYANA, S (2005). Meeting the rising health awareness: the palm oil formula. *Palm Oil Developments No. 43*.

RECOMMENDED READING

FAO (2007a). *Food Outlook – Global Market Analysis*.

FAO (2007b). *Food Outlook No. 1 June 2007*.

LMC INTERNATIONAL (1996). Competitive strategies for oilseed producers and processors during the next decade (multi-client report). *Production Costs*. Part IV, Chap. 2, Vol. 1. p. 26-34.

MPOB (2007). *Malaysian Oil Palm Statistics 2007*. MPOB, Bangi.

OIL WORLD (2007). *Oil World Annual 2007* and *Oil World Weekly* (various issues).

STEENBLINK, R (2007). *Biofuels – At What Cost*? GSI Publications.

THONES, P (2006). *Biofuels and Commodity Markets – Palm Oil Focus*. FAO Publications

YUSOF, B; CHANDRAMOHAN, N and BALU, N (2003). Palm oil: the powerhouse of oils and fats. Paper presented at the MPOB International Palm Oil Congress 2003.