The Malaysian palm oil industry has experienced significant growth since the crop was first introduced into the country from West Africa in the late 1870s. The oil palm species *(Elaeis guineensis)* was originally planted as an ornamental plant. Since its introduction as an ornamental plant into Malaysia, the oil palm has proven to be one of the greatest success stories of the Malaysian economy. From its humble beginnings, the crop exponentially expanded from 54,700 hectares in 1960, to reach 1.023 million hectares in the 1980s and 2.030 million hectares in 1990s. This planted area further expanded to 3.376 million hectares in 2000 and increased to 5.64 million hectares in 2015. By 2020, it is estimated that total planted area will be around 5.8 million hectares.
PROVIDED BY NATURE

The oil palm tree grows in regions around the equator. The tree is originally found in West Africa and currently cultivated in Indonesia and Malaysia, the world’s top palm oil-producing nations.

FROM A TROPICAL CLIMATE

Nature plays a big part in the palm oil story. What the tree loves above all, is sun. It thrives on plenty of sunshine, temperatures ranging between 24 and 32 degrees centigrade and rainfall evenly distributed throughout the year. Therefore, the most suitable areas for cultivation are located between ten degrees north and south from the equator. Apart from Indonesia and Malaysia, other producers include South and Central America, Thailand and Western Africa.

OIL PALM CULTIVATION

*Germinated oil palm seeds (3 months)
*Pre-nursery young palm seedling (3-4 months)
*Planting materials at the main nursery (10-12 months)

Double-stage nursery

Young oil palm plantation

New variety of palm oil tree

ANATOMY OF OIL PALM FRUIT

Shell: Tenera or (D x P), the oil palm species commonly planted in Malaysia, produces fruit with a medium-thick shell

Kernel: The seed of the fruit that produces palm kernel oil

Mesocarp: The fleshy outer portion of the fruit that produces palm oil

Bunch weight: 10-15 kg
Fruitlets/bunch: 1000-3000
Oil/bunch: 22-25%
Kernel/bunch: 4%
Kernel production/year: 8 kg
Oil production/year: 42.5 kg

Species: Elaeis guineensis
Type: Tenera (DXP)
Planting density: 148 palm/ha
Nursery period: 24 months
Economic Life: 25 years
Palm Height: 2.3 meters
Harvesting interval: 15 days
No. of bunches/yr: 19

The oil palm is able to produce 4.03 tonnes of oil per hectare, making it the highest productive crop compared to output of 0.40, 0.60 and 0.80 oil per hectare for soybean, sunflower and rapeseed respectively. That means 7 to 11 times less land area is needed to obtain the same amount of vegetable oil if palm oil substitutes the other oils completely.

Source: Oil World December 2015
In Malaysia, the oil palm planted is mainly Dura x Pisifera (Tenera) hybrid which yields about 4.0 tonnes of palm oil per hectare together with 0.5 tonne palm kernel oil (PKO).

**OIL PALM PLANTATION: TOTAL PLANTED AREA IN MALAYSIA**

![Graph showing total planted area in Malaysia from 1960 to 2015](source)

**MALAYSIA PALM OIL PRODUCTION 2005-2015**

![Graph showing palm oil production from 2005 to 2015](source)

Palm oil production in Malaysia has increased over the years, from 7.81 million tonnes in 1995 to 14.96 million tonnes in 2005 and to 19.96 million tonnes in 2015.
Since 1985, palm oil became the second most consumed oil in the world, after soybean oil.

**GLOBAL PRODUCTION OF VEGETABLE OILS 2015 (Mn T)**

![Diagram of vegetable oil production](chart.png)

**GLOBAL PALM OIL PRODUCTION (Mn T)**

![Diagram of palm oil production](chart.png)

Global palm oil production has increased from 15.2 million tonnes in 1995 to 62.8 million tonnes in 2015. Malaysia produced 32% of the total global palm oil production.

*Source: Oil World*
**EXPORT AND PRICE TRENDS**

**MAJOR VEGETABLE OILS EXPORT**

Source: Oil World

**Palm Oil is the most traded vegetable oil in the world!**

**PRICE TREND FOR 4 MAJOR VEGETABLE OIL OVER 10 YEARS (US-$/TONNE)**

Source: Oil World
Palm Oil is the most consumed vegetable oil in the world!

The nutritional values and the versatility of palm oil are renowned worldwide, especially in the edible sector. Its unique characteristic of being semi-solid at ambient temperature allows for its diverse applications in food and non-food products. In fact, all products using oils and fats as ingredients can count on palm oil as a reliable raw material. The main traditional uses of palm oil in food products are for cooking/frying, shortenings, margarines and confectionery fats. In the frying industry, for example, palm oil is reputed as among the best and most suitable frying oil. It offers several technical characteristics desirable in food applications, such as resistance to oxidation, which contributes towards longer shelf life of end products. To the manufacturers of solid fat products, palm oil is an excellent raw material because of its solid fat contents. It does not have to undergo hydrogenation; hence does not contain undesirable trans-fatty acids.

Palm oil also offers great potential for use in non-food applications, particularly in the production of oleochemicals products such as in soaps, surfactants and detergents, cosmetics and personal care, as well as in agro and industrial products. Oil palm biomass is another excellent potential for palm oil which will enhance the Malaysian palm oil industry’s growth, competitiveness and sustainability.

Source: Oil World
From fresh palm fruits, we obtain crude palm oil which contains tri-, di-, monoglycerides and free fatty acid which make up 99% of the composition. The other 1% is minor components consisting of a bouquet of health beneficial phytonutrients.
FOOD USES OF PALM OIL AND PALM KERNEL OIL

INTRODUCTION
Palm oil and its products are very versatile edible oil. They have a range of distinctive properties, which enables to meet most of the quality and technological requirements. The main uses of palm oil and its products in food applications are for cooking/frying, shortening, margarines, cocoa butter substitutes, dairy fat replacers and animal fat replacers.

<table>
<thead>
<tr>
<th>Cooking Oil</th>
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| • Palm Olein is an excellent frying oil which is obtained from Malaysia’s golden crop, the palm fruit.  
• It’s neutral flavor enable easy expectance and incorporation in various food segments. Palm olein is an excellent oil for deep, shallow and stir frying as well as for general cooking.  
• The oil has neutral odour and flavour, high oxidation stability and provides extended shelf life for frying oil. |

<table>
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<tr>
<th>Shortenings</th>
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| • Shortenings are made from 100% conditioned/textured solid fats which are composed from either animal or plant based fats or in combination.  
• Shortening imparts many functional properties in baked products such as structure, texture, taste and stability. Palm based shortening offers a broad spectrum of applications in the bakery industry such as breads, buns, pastries, cookies, pies, flat breads, topping creams and filling creams. |

<table>
<thead>
<tr>
<th>Margarines</th>
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| • Margarines are the substitute for dairy butter and are widely used in biscuits, cakes, pastries, puff pastries, creams and spreads.  
• Normally, margarine contains about 84% oils and fats phase, 16% of water phase with permitted emulsifiers, flavours and colours.  
• Palm oil is fractionated to obtain liquid oils and solid fractions. This provides the extensive flexibility to blend palm based liquid oil and solid fats at various ratios to meet the specific requirements of the diverse types of margarine. |

<table>
<thead>
<tr>
<th>Cocoa Butter Substitutes</th>
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<tbody>
<tr>
<td>• Cocoa butter substitutes are used as an alternatives for chocolate coatings. They are usually manufactured mainly from lauric oils or lauric stearins, particularly palm kernel stearin.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Dairy Fat Replacers</th>
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<tbody>
<tr>
<td>• Dairy oils and fats are widely used in food preparation of such as special rice, pastries, biscuits and desserts. The main concern by user of dairy oils and fats is the level of cholesterol presence and the high price. Palm oil and its fraction serve as an excellent solution to these setbacks.</td>
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<table>
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<tr>
<th>Animal Fat Replacers</th>
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</table>
| • The major animal fats found in the food chain are lard, tallow and chicken fat. Animals fat are the main and important components in patties, sausages, nuggets and pepperoni.  
• Palm oil based animal fat replacers are able to imitate the functional properties of animal fats such as tallow, lard and chicken in a wide range of applications.  
• Animal fat replacers from palm oil and its fractions provide a healthier food ingredient option as it is free of trans-fatty acids and cholesterol. |
NON-EDIBLE USES OF PALM OIL AND PALM KERNEL OIL

OLEOCHEMICALS INDUSTRY
Palm oil offers great potential for use in non-food applications, particularly in the production of intermediate and final oleochemicals products such as soap, surfactants and detergents, cosmetic and personal care, agro and industrial products. Currently, less than 20% of palm oil produced is used in non-food applications.

Soap production is one of the most important applications of oils and fats. The traditional raw materials used for soap making were tallow and coconut oil. Due to the similarity in their fatty acid compositions, palm and palm kernel oils offer good and competitive alternatives to tallow and coconut oil respectively, as raw material for soap making.

BIOMASS INDUSTRY
Another new growth area of great potential is oil palm biomass which will enhance the industry’s growth, competitiveness and sustainability. There are now industrial plants manufacturing particle board, medium density fibreboard (MDF) and plywood from oil palm biomass. Biomass from the oil palm can also be used in fibre composites. Technologies are available to enable car body components to be made of fibre composites.
ADVANTAGES OF PALM OIL

GENETICALLY MODIFIED ORGANISM (GMO) FREE
Oil palm is a non-genetically modified crop. Oil palm is bred through a natural process of breeding and is not genetically modified.

CHOLESTEROL FREE
Like all other vegetable oils, palm oil is cholesterol-free. Palm oil contains a balanced proportion of unsaturated and saturated fatty acids at about 50% each. However, in the body, it behaves more like a monounsaturated fat and has no adverse impact on cholesterol levels. Both palm olein and olive oil exert similar effects on cholesterol level in healthy volunteers.

FREE OF TRANS-FATTY ACID
Having a unique and balanced composition of saturation and unsaturation, palm oil does not require hydrogenation for use as a fat component in foods, thus avoiding the formation of trans-fatty acids. Trans-fatty acids have been proven to have detrimental effects on health. Therefore, palm oil and palm stearin are good alternatives to replace trans-fat and formulate trans-free food products.

<table>
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<tr>
<th>High Nutritional Value</th>
<th>Genetically Modified Organism (GMO) Free</th>
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<tr>
<td>Free of Trans-Fatty Acid</td>
<td>Cholesterol Free</td>
</tr>
<tr>
<td>Competitive Price</td>
<td>High Stability</td>
</tr>
<tr>
<td>Anti-Oxidant Property</td>
<td></td>
</tr>
</tbody>
</table>
Palm oil contains almost equal amounts of unsaturated and saturated fats. In the body, it behaves more like a monounsaturated oil and has no adverse impact on cholesterol level.

Source: MPOB

SAFA: Saturated Fatty Acid
MUFA: Monounsaturated Fatty Acid
PUFA: Polyunsaturated Fatty Acid
Palm oil contains approximately 1% of minor components, including carotenoids, tocotrienols, phytosterol, coenzyme Q10, lecithin and squalene. These components have beneficial health properties including antioxidant, cancer prevention and cholesterol lowering effects. Palm oil is the richest source of natural tocotrienols, an anti-oxidant that is several times more powerful than the tocopherols. Studies have shown that palm tocotrienols have anti-inflammatory, cholesterol lowering, anti-oxidant, cancer preventive, radioprotective and neuroprotective properties.
SUSTAINABILITY OF THE MALAYSIAN OIL PALM INDUSTRY

One of the most challenging issues confronting the oil palm industry is proving its commitment to the sustainable development of the oil palm industry. Contrary to the allegations from non-governmental organizations that oil palm cultivation is one of the major causes of deforestation and declining biodiversity, the development of the Malaysian oil palm industry is very well regulated and current practices remain committed towards the three components of sustainability, namely social development, economic progress & conservation and management of the environment and biodiversity.

SOCIAL DEVELOPMENT
The oil palm industry meeting the needs of the poor by:
• Eradicated poverty and narrowed income gap between town and rural folk
• Created rural townships where workers reside and enjoy good quality of life
• Contributed to social security and peace
• Reduced migration of labour force from rural areas

ENSURING ECONOMIC PROGRESS
Sustainability is also stressed in Malaysia’s Economic Transformation Programme (ETP). This programme aims to transform Malaysia from a middle-income to a high income nation by 2020 by focusing on a few key growth sectors identified under the National Key Economic Areas or NKEAs. The palm oil sector is one of the 12 NKEAs. Notwithstanding the aim of achieving the status of a high income nation, the ETP adopts a holistic approach and also incorporates the social and environmental aspects as integral parts of the programme. The ETP takes cognisance of the disparity in incomes of the multi-ethnic communities and features the important social element of inclusiveness. From the environmental aspect, growth in the ETP must be sustainable with preservation of environment and natural resources being priced into the cost of development.

CONSERVATION AND MANAGEMENT OF THE ENVIRONMENT AND BIODIVERSITY
The Malaysian oil palm industry’s high commitment to conservation and management is evidenced in the voluntary participation in sustainable practices including sustainability certification, good agricultural practices, trapping of biogas from palm oil mill effluent, use of milling residues as renewable energy and the results of the life cycle assessment of palm oil for improving environmental performance. Efforts in sustainability include a concerted effort by the industry to shift from pollution control to that of pollution prevention, minimization of pollution from palm oil production and all environmental impacts associated with the full life cycle of oil palm as well as the adoption of new environmentally sustainable technologies. Malaysia’s efforts on sustainability are a continuous improvement process because palm oil is a ubiquitous source of feedstock for the global industries as well as an important source of employment and economic resource for Malaysia.
What is MSPO?

- A National standard on sustainability – applicable to all categories of oil palm industry covering small, medium and large plantations
- It is a standard that complies with Malaysian laws and ratified international agreements/conventions to ensure that all oil palm premises in Malaysia are sustainably certified
- A Standard that is based on a balanced three pillars of sustainability - people, planet and profit.

The MSPO document consists of 4 parts:

- MSPO Part 1: General Principles for Malaysian Sustainable Palm Oil
- MSPO Part 2: General Principles for Independent Small holders
- MSPO Part 3: General Principles for Oil Palm Plantations an Organized Smallholders
- MSPO Part 4: General Principles for Palm Oil Mills

- MSPO was launched in 2013 which was an initiative of MPOB following the request from stakeholders of the Malaysian oil palm industry. Its standard is dynamic and will be continually improved to ensure current issues on sustainability are well addressed.
- It is a governmental initiative to ensure palm oil producers in Malaysia comply with Malaysian Laws and ratified international laws related to sustainability.
- In 2015, Malaysian Palm Oil Certification Council (MPOCC) was established to manage and implement an impartial and credible certification scheme for the Malaysian oil palm industry.
- As of December 2015, 304,273.87 tonnes of crude palm oil was certified under MSPO.
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