



Palm Oil: The Story behind The Story – A Balanced Perspective

In recent months several articles criticizing palm oil have been published in the Belgian and international press. In SIPEF's opinion most of these articles are rather one-sided and have not incorporated the full story of palm oil.

Palm oil is high in Saturated Fats (SAFA), which should of course be consumed in limited doses, but these are balanced by an equal proportion of unsaturated fats and include also traces of minor components (vitamin A and vitamin E as well as natural antioxidants). As palm oil is currently a key, often irreplaceable ingredient in a large number of food products, their consumption must respect the advice for diet variety.

As population growth increases while agricultural land becomes scarce, a major asset of palm oil is its high yield per hectare provided it is produced sustainably. Moreover, the socio-economic benefit is immense for the millions of smallholder farmers and employees in the palm oil industry in mostly developing countries.

Key Notes:

- # *Palm oil has specific functional properties that make it a key ingredient in the food supply chain.***
- # *The body needs a certain amount of fat every day; it provides energy, and it contains and enables the absorption of vitamins.***
- # *Alternatives for palm oil are often no better solutions.***
- # *Sustainable palm oil production can make an important contribution towards the sustainability of the food supply chain.***
- # *Palm oil cultivation provides an income to millions of smallholder farmers and employees.***

Palm oil has specific functional properties that make it a key ingredient in the food supply chain.

Palm oil is an edible vegetable oil, solid at room temperature, produced from the fruit of palms. Palm oil is a key ingredient for the food industry due to its superior sensory characteristics and technical attributes. According to their fatty acid composition, fats have different nutritional and functional properties. Fats and oils, which are rich in SAFA (saturated fats), tend to be solid at room temperature and have a higher melting point. Such properties determine the consistency, the texture, the melt-in-the-mouth-feel, “spread ability” and oxidative stability of a fat. No other alternative edible vegetable oil, naturally solid at room temperature and providing the same functional properties, exists in sufficient quantity.

Palm oil is rich in atherogenic saturated fat (> 40%). Since its consumption has greatly increased in EU countries in recent years, its contribution to the intake of atherogenic SAFA now equals that of dairy fats. Therefore, the Belgian Health Council recommends limiting or lowering the consumption of products with a high palm oil content (amongst others: pastries and cakes, ready-made dishes, pizzas, quiches, sweet biscuits and bars, some sweet spreads, margarine, etc), as well as certain dairy fats, such as cream and butter.

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Exceeding recommended intake for saturated fats from any source is undesirable. It is the fatty acid composition of the food consumed that should be considered, rather than where the oil or fat or fatty acid comes from.

Figure 1: Fat content vegetable oils

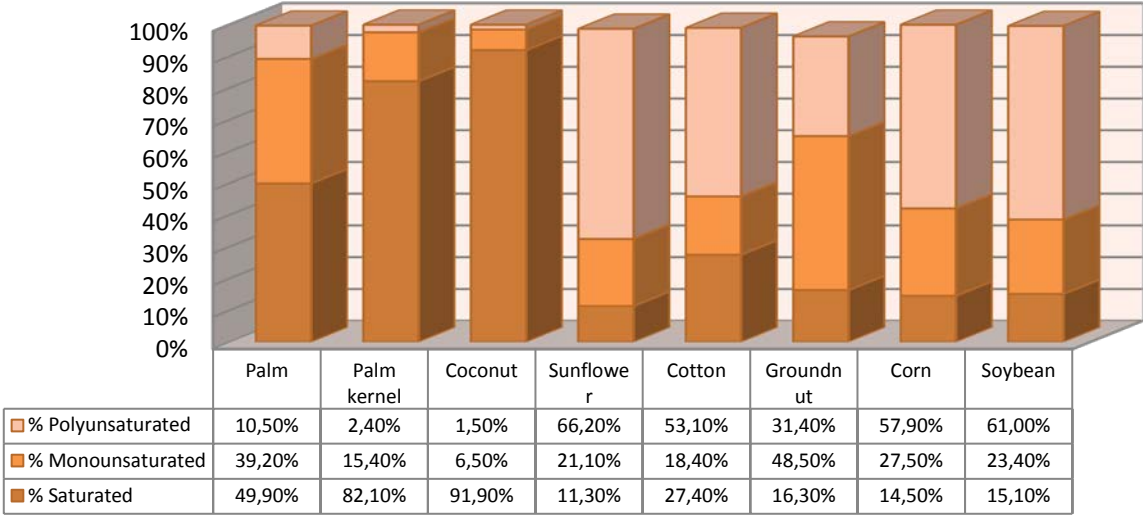


Table 1 shows the typical fatty acid composition of palm oil in more detail. In palm oil the saturated fatty acids are palmitic acid (44%), stearic acid (5%) and myristic acid (1%). These saturated fats are balanced by an equal proportion of unsaturated fatty acids, consisting of roughly 39% monounsaturated oleic acid and 10.5% polyunsaturated linoleic acid. Furthermore, palm oil’s minor components, which amount to less than 1% altogether but still contribute to the stability and nutritional value of palm oil, are tocopherols, tocotrienols, carotenoids, sterols, squalene, co-enzyme Q10 and phospholipids (Mukherjee & Mitra, 2009).

Table 1: Composition palm oil; Source: Mukherjee and Mitra (2009) and Nesaretnam (2009)

Palm oil		
Chemical composition		
Saturated acid Palmitic (C16:0)	44.3%	Saturated fat: 49.9%
Saturated acid Stearic (C18:0)	4.6%	
Saturated acid Myristic (C14:0)	1%	
Monounsaturated acid Oleic (C18:1)	38.7%	Unsaturated fat: 50.1%
Polyunsaturated acid Linoleic (C18:2)	10.5%	
Other	0.9%	
Minor components		
Phytonutrients	Concentration ppm (1µg/g)	
Tocopherols and tocotrienols	600-1000 ppm	
Carotenoids	500-1000 ppm	
Phytosterols	300-620 ppm	
Squalene	250-800 ppm	
Phospholipids	20-100 ppm	
Co-enzyme Q10	10-80 ppm	
Polyphenols	40-70 ppm	

The main components, tocopherols and tocotrienols, are active as vitamin E and natural antioxidants. They not only delay the oxidation time in the oil, but they also have anti-cancer and cholesterol lowering effects. All vegetable oils contain tocopherols, but palm oil is the only vegetable oil rich in tocotrienols. In fact, tocotrienols only occur at low levels in nature, while the highest concentration has been found in palm oil (European Food Safety Authority [EFSA], 2008). Refining palm oil decreases the levels of tocopherols and tocotrienols, therefore the refining process of palm oil should be optimized to prevent this decrease.

Furthermore, as stated by Mukherjee and Mitra (2009), palm oil is the richest plant source of carotenoids, which create the oil's red-orange colour. The Malaysian Palm Oil Council (MPOC, 2007) compares the vitamin A content of palm oil with other important sources of this vitamin (See Table 2). These carotenoids primarily act as a source of vitamin A. In addition, carotenoids are also known for many other functions, such as their antioxidant activity, immune system improvements and the prevention of cancer and cardiovascular diseases (Sundram, 2005; Zeb & Mehmood, 2004).

Table 2: Comparison of Vitamin A content; Source: Malaysian Palm Oil Council (MPOC, 2007)

Food	µg Retinol Equivalent / 100g E.P.
Oranges	21
Bananas	50
Tomatoes	130
Carrots	400
Red Palm Oil (refined)	5,000
Crude Palm Oil	6,700



The European food industry is and has been committed for several years to optimizing the nutrient composition of its products on a voluntary basis and to proposing a wider choice to consumers.

Alternatives for palm oil are often no better solutions.

Searching for alternative oils and fats that have a similar functionality and consistency, soon leads to animal fats and dairy fats. Dairy butter (68%), tallow (54%) and lard (51%) show slightly higher amounts of SAFA than palm oil. All other oils, mainly liquid oils, such as soybean oil, rapeseed oil and sunflower oil, need to be partially hydrogenated to offer similar characteristics. In brief, hydrogenation can be defined as the process by which liquid oils are converted into solid or semi-solid fats. The downside of this hydrogenation process is that in the case of partial hardening, trans fatty acids are created. In humans, consumption of trans fats increases the risk of coronary heart disease by raising levels of "bad" low-density lipoprotein (LDL) cholesterol and lowering levels of "good" high-density lipoprotein (HDL) cholesterol. Several years ago, the main health focus was on trans fats. As a result, given its naturally present semi-solid texture, palm oil plays an increasingly crucial role in providing a trans-free alternative.

The new EU food labeling legislation, which will apply from December 2014, aims at increasing transparency about the origin of food sold on the EU market. Under the new legislation the types of vegetable oil must be stated explicitly on the label. For palm oil, in particular, this implies that producers can only state ‘This product contains Sustainable Palm Oil’ once it has been processed with Segregated Roundtable on Sustainable Palm Oil (RSPO) certified palm oil. SIPEF supports this form of transparency to better inform the end-customer.

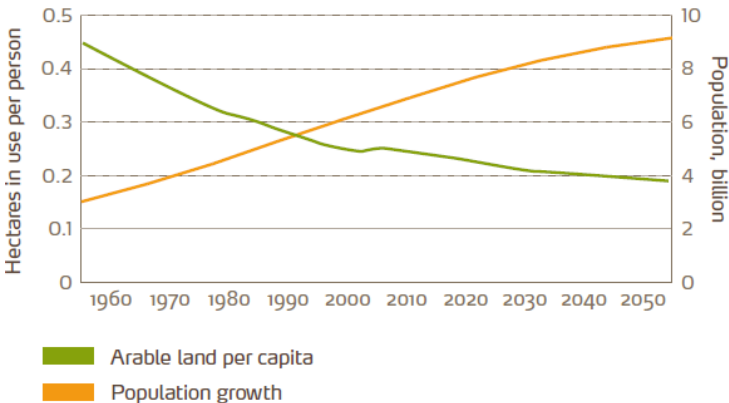
Sustainable palm oil production can make an important contribution towards the sustainability of the food supply chain.

The palm oil industry has taken concrete steps to address the environmental and social challenges posed by oil palm cultivation. In cooperation with other stakeholders, it has created a system to certify palm oil produced sustainably. The RSPO unites stakeholders from seven sectors of the palm oil industry: oil palm producers, palm oil processors or traders, consumer goods manufacturers, retailers, banks and investors, environmental or nature conservation NGOs and social or developmental NGOs. The RSPO aims to ensure that no primary forests or other high conservation value areas are cleared for new oil palm plantations, that oil palm plantations control and reduce their environmental footprint and that the rights of local communities and of our workers are fully respected.

All SIPEF’s palm oil mills are RSPO certified and most of SIPEF’s oils are sold through one of the physical certified supply chain models.

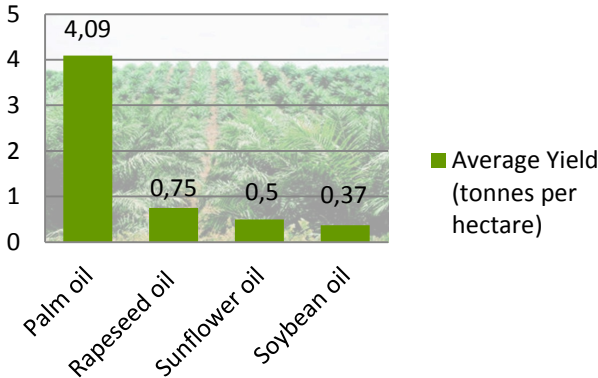
However, looking beyond growing palm oil in a sustainable way, what needs to be considered is the natural resources of our globe versus the strong growth of the world’s population and the continuous reduction of arable land.

Figure 2: Population growth and challenges to arable land resources Source: FAO as cited in Yara International (2011)



This requires optimizing our food supply chains. From that perspective we believe palm oil, as a provider of vegetable oils and fats, is superior to any other oils that can be grown large scale. Palm oil trees have particularly high yields. They already provide 39% of global vegetable oil production while only occupying only 7% of the agricultural land devoted to oilseed production.

Figure 3: Yield comparison tonnes/hectare



Another benefit of palm oil as compared to soy, sun and rapeseed oil is that being a perennial tree crop in the ground for 28 years, it has many beneficial effects to biodiversity and local environment for animal and insect habitat unlike the other three annual crops that get ploughed up and replanted each year.

Moreover, palm oil is the most efficient, most affordable edible oil on the market. Certified against sustainability standards, it has a major role to play for the future food supply of the world population.

Palm oil cultivation provides an income to millions of smallholder farmers and employees.

In Indonesia and Malaysia alone it is estimated that the livelihood of more than 25 million people is directly or indirectly impacted by the palm oil industry. The governments of these two countries have promoted the smallholder palm oil industry as a strategy for poverty alleviation. These numbers can be extended to Papua New Guinea, Thailand, and many countries in Africa and South and Central America. Furthermore, operating a palm plantation includes a commitment to developing entire communities with regard to education, health care and infrastructure.

Palm oil cultivation provides a higher income to farmers than other crops or subsistence farming. The World Bank estimated in 2006 that the annual returns to farmers from palm oil were around US\$980 per hectare. (World Bank, 2011, *The World Bank Group Framework and IFC Strategy for Engagement in the Palm Oil Sector*)

Key message

The role of palm oil needs to be assessed in all its aspects.

Critics often focus on the isolated impact of palm oil's saturated fat content, while not taking into account the natural balance with unsaturated fatty acids. In order to consume particular food products, a source of solid and therefore saturated fatty acids is required. In comparison to other sources of saturated fats, there is no significant different impact on cholesterol levels. There is currently no viable alternative to palm oil on a macroeconomic scale that is available in such high quantities and at these competitive prices, while still bringing solidity to food products without requiring hydrogenation.

However, since palm oil is the global leader of the oil and fats market, palm oil's high presence in industrially processed food products might encourage an excess intake of this oil. Everything should be eaten in moderation and palm oil is certainly no exception to this rule. Moderation and variation in the dietary intake is ultimately the responsibility of the consumer. In order to increase transparency, SIPEF supports the new labeling law from December 2014 that requires vegetable oils to be typified on food labels.

Finally, we should not underestimate the growth of the world's population and the impact it will have on our natural resources. We have to use our arable land wisely, and palm oil cultivation undoubtedly provides the highest yields per hectare. Moreover, the socio-economic benefit is immense for the millions of smallholder farmers and employees in the palm oil industry in mostly developing countries.