Palm Oil decreases Cholesterol Levels

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Palm oil is a vegetable oil, not an animal or dairy product, and therefore does not contain cholesterol. It is produced from the fruit of the Elaeis guineensis. Palm oil sometimes is confused with palm kernel oil, but is in fact different, being derived from the mesocarp of the palm fruit rather than the centre kernel.

Palm oil contains much less saturated fat than palm kernel oil or coconut oil. Palm oil has been used in food preparation for over 5,000 years. Today it is consumed worldwide as a cooking oil, in margarines and shortening, and as an ingredient in fat blends and a vast array of food products.

Food manufacturers choose palm oil because it has a distinctive quality, requires little or no hydrogenation, and lengthens the shelf life of products. These advantages are difficult to duplicate at the same cost with polyunsaturated oils, which often have higher market prices and require additional processing for the same characteristics.

Even though palm oil consists of about 45% - 50% saturated fatty acid, the saturated fatty acid is made up of palmitic saturated fatty acid. Palm oil should be classified as both a “saturated fat” and an “unsaturated fat”. It contains equal proportions of saturated fatty acids and unsaturated fatty acids. The saturated fatty acids are made up of 44% palmitic acid and 5% stearic acid. The unsaturated fatty acids consist of 39% oleic acid (monounsaturates) and 10% linoleic acid (polyunsaturates). The fatty acid composition in palm oil is entirely different from the so-called “saturated fats” such as coconut oil and palm kernel oil.

The saturated fatty acids that have been shown through various epidemiological studies, to increase bad LDL cholesterol level are the C12 Lauric and C14 Myristic saturated fatty acid. These two saturated fatty acid are abundantly found in coconut oil and palm kernel oil. Unfortunately, more often than not, palm oil has been confused with palm kernel oil.

Palm oil is derived from the fleshy part of the palm fruits while palm kernel oil is derived from the seed or the kernel. Palm kernel oil and palm oil are two different oils with very distinct fatty acid composition.

Palm kernel oil is used mainly in oleochemical (detergent/surfactant) industry and not as an edible or cooking oil. Palm oil, on the other hand, is used worldwide (more than 100 countries) for cooking and other food preparations. Palm oil is currently the number two edible oil in the world.

Trans-Fatty Acid – The “Stealth” Fat
In addition, palm oil is non-genetically modified and trans-fat free. It does not need to go through the hydrogenation process. In comparison, most vegetable oils (corn oil, soy oil, cottonseed oil, canola oil, etc) require hydrogenation – “hardening of oils”. The “hardening” of oils through hydrogenation creates trans-fatty acid. Trans-fatty acid has been shown to lower good cholesterol and raise the bad cholesterol. In fact, the cholesterol-raising effect of trans-fatty acid is significantly higher than saturated fatty acid. Because of this fact, it has prompted the FDA to require food manufacturers to list trans-fatty acid content on food labels soon.

In May 1994, Prof. Walter C. Willett and Dr. Albert Ascherio (1994), members of the Harvard University Department of Nutrition and Epidemiology, reviewed the growing science on trans fatty acids and heart disease, and concluded:

“Although the percentage of coronary heart disease deaths in the United States attributable to intake of trans fatty acids is uncertain, even the lower estimates from the effects on blood lipids would suggest that more than 30,000 deaths per year may be due to consumption of partially hydrogenated vegetable fat. Further, the number of attributable cases of non-fatal coronary heart disease will be even larger”.

Other studies also confirmed that trans fatty acids are worse than butter by raising the ‘bad’ LDL-cholesterol, lowering the ‘good’ HDL-cholesterol and increasing the Lp(a), a very powerful risk factor for ischaemic heart disease (Mensink and Katan, 1990; Nestle et al., 1992; Zock and Katan, 1992; Mensink et al., 1992; Wood et al., 1993; Judd, et al., 1994; Aro et al., 1997).

There are findings showing that trans fatty acids may be related with human fetal development. Two European studies showed significant associations between low birth weights and the content of trans-fatty acids in the blood (Koletzko, 1992a; 1992b; Jendryczko et al., 1993). The uptake of essential fatty acids (EFA) by the fetus may be impaired by trans-fatty acids. Trans-fatty acids may also affect the metabolism of EFA of the fetus which could result in poor development of the fetal organs and tissues.

A recent five-center Euramic study (Sylvester, 1986; Kohlmejer et al., 1997) suggested that trans-fatty acids were associated with increasing breast cancer risk in post-menopausal women. A high trans fatty acid content was found to be associated with a 40% increase in breast cancer risk.

What Do Epidemiological Studies Say?
A number of human feeding studies reported that palm oil diets showed a reduction of blood cholesterol values ranging from 7% to 38% (Ahrens et al., 1957; Anderson et al., 1976; Baudet et al., 1984; Mattson and Grundy, 1985; Bonanome and Grundy, 1988)

Recent studies, specifically designed to evaluate palm oil, confirm that palm oil’s impact on blood cholesterol and lipoprotein profiles are beneficial. The following are the salient studies:

• A comparative study in young Australian adults showed that the total blood cholesterol, triglycerides and HDL-cholesterol levels of those fed on palm oil (palm olein) and olive oil were lower than those fed on the usual Australian diet (Choudhury, Tan and Truswell, 1995). They showed that young Australian adults fed on palm oil diets had the same total blood cholesterol, triglycerides and ‘good’ HDL-cholesterol levels as those fed on olive oil.

• A double-blind cross-over study (Sundram 1997) showed that palm olein-rich diet is identical to oleic-acid rich diet. Trans fatty acid rich diet performed the worst by elevated total cholesterol, ‘bad’ LDL-cholesterol, lipoprotein (a) and depressed ‘good’ HDL-cholesterol relative to oleic acid, stearic acid, lauric and myristic acids rich diets.

• A study on fifty-one Pakistani adults showed that those given palm oil rich diets performed better than sunflower oil. Palm oil increased HDL-cholesterol and Apo A-1 levels. Hydrogenated cottonseed oil behaved the worst by raising serum triglycerides and lipoprotein levels. (Farooq et al., 1996).

• A study by a group of researchers from the Institute of Nutrition and Food Hygiene, Beijing, China compared the effects of palm oil, soybean oil, peanut oil and lard (Zhang et al., 1997a; Zhang et al., 1997b; Zhang et al., 1995). They showed that palm oil has the effect of decreasing total blood cholesterol and ‘bad’ LDL-cholesterol and increasing the level of ‘good’ HDL-cholesterol. Soya bean oil and peanut oil had no effect on the blood cholesterol but lard increased the cholesterol levels. Among those hypercholesterolemic subjects, palm oil diets lower the cholesterol levels.

• Study conducted on healthy Indian subjects (Ghafoorunissa et al., 1995) showed that palm olein and groundnut oil have comparable effects. Both of the oil do not induce hypercholesterolemia.

• Sundram et al., (1992) performed a dietary intervention study on a free-living Dutch population which normally consumes diets high in fats. Using a double blind cross-over study design consisting of two periods of six weeks of feeding, the normal fat intake of a group of 40 male volunteers was replaced with 70% of palm oil. The palm oil diet did not raise serum total cholesterol and ‘bad’ LDL-cholesterol, and caused a significant increase in the ‘good’ HDL-cholesterol and a significant reduction in ‘bad’ LDL-triglycerides.

• The effect of palm olein and of canola oil on plasma lipids was examined in double blind experiments in healthy Australian adults. Palm oil performed better than canola oil in raising the ‘good’ HDL-cholesterol (Truswell et al., 1992).

• A cross-over feeding study showed that the blood cholesterol, triglycerides, HDL-cholesterol and LDL-cholesterol levels of palm olein and olive oil diets were comparable (Ng et al., 1992).

• A Malaysian study (Ng et al., 1991) was conducted to compare the effects of diets containing palm oil (olein), corn oil and coconut oil on serum cholesterol. Coconut oil raised serum total cholesterol by > 10% whereas both corn and palm oil diet reduced the total cholesterol; corn oil diet reduced the total cholesterol by 36% and palm oil diet by 19%.

• A similar cholesterol-lowering effect of palm oil was observed in 110 students in a study conducted in Malaysia (Marzuki et al., 1991). The study compared the effect of palm oil with that of soybean oil. Volunteers fed on palm oil (olein) and soy oil for five weeks, with a six-week wash-out period, had comparable blood cholesterol levels. However, the blood triglycerides were increased by 28% on the soybean oil diet.

Thus the impact of palm oil on serum lipids is more like that of a monounsaturated rather than saturated oil.

There appear to be several explanations:

1. Palm oil is made up of 50% unsaturated fats. It is not totally saturated and the saturated fatty acids present are palmitic (90%) and stearic (10%). Stearic acid does not elevate blood cholesterol, and palmitic acid does not raise blood cholesterol level in people whose blood cholesterol level is in normal range (Hayes, 1993; Hayes et al., 1995; Hayes et al., 1991; Khosla and Hayes, 1994; Khosla and Hayes, 1992).

2. The vitamin E, particularly the tocotrienols present in palm oil can suppress the synthesis of cholesterol in the liver (Qureshi et al., 1986). As a consequence, tocotrienols lower blood cholesterol levels (Qureshi et al., 1995; Qureshi et al., 1991a; Qureshi et al., 1991b; Qureshi et al., 1980; McIntosh et al., 1991).

3. The position of the saturated and unsaturated fatty acid chains in a triglyceride backbone of the fat molecule determines whether the fat will elevate cholesterol level in the blood (Kritchevsky, 1996; Kritchevsky, 1995; Kritchevsky, 1988 and Innis et al.,

1993). In palm oil, 75% of the unsaturated fatty acid chains are found in position 2 of the carbon atom of the triglyceride backbone molecule (Padley et al., 1986; Ng, 1985; Berger, 1983). This could explain why palm oil is not cholesterol-elevating.

4. It has an anti-clotting effect and prevents the formation of thrombus in the blood vessels. Blood clotting can be induced by injury to the blood vessel wall and the alteration in the aggregating properties of blood platelets. Hornstra (1988) in the Netherlands first demonstrated the palm oil has anti-clotting effect, and is as anti-thrombotic as the highly unsaturated sunflowerseed oil. A human study (Kooyenga et al., 1997 and Tomeo et al., 1995) showed that tocotrienols (from palm oil) supplementation can reduce restenosis of patients with carotid atherosclerosis.

Holub et al. (1989) reported that the vitamin E in palm oil inhibits human platelets from “sticking” to each other. Other supporting evidence showed that a palm oil diet either increases the production of a hormone that prevents blood-clotting (prostacyclin) or decreases the formation of a blood-clotting hormone (thromboxane) (Sugano and Imaizumi, 1991; Sundram et al., 1990; Rand et al. 1988; Abeywardena et al., 1989; Charnock et al. 1989; Ng et al., 1992). Thus scientific evidence indicates that the palm oil diet is as
anti-thrombotic as one based on polyunsaturated oil.

It does not promote the formation of plaques in the arteries. Atherosclerosis is the thickening and hardening of the walls of the arteries. Fatty deposits or plaques are made up of mainly fats and cholesterol. Atherosclerosis results in the narrowing of the lumen of the arteries, thus inhibiting the flow of blood. By feeding diets high in cholesterol along with certain saturated fats such milk fat, tallow and coconut oil, atherosclerosis can be produced in animals such as rabbits, quail, pigs and monkeys.

A Netherlands study was conducted on rabbits to test the effect of palm oil on atherosclerosis (Hornstra,
1988). After feeding the rabbits for 11/2 years, palm oil and sunflower oil diets caused the lowest degree of atherosclerosis in comparison with fish oil, linseed oil and olive oil. Similarly Kurfeld et al. (1990) in the United States, also using the rabbit model, compared the effects of palm oil with hydrogenated coconut oil, cottonseed oil, hydrogenated cottonseed oil, and an American fat blend containing a mixture of butterfat,
tallow, lard, shortening, salad oil, peanut oil and corn oil. At the end of the 14-month feeding period, coconut oil fed rabbits had the most atherosclerotic lesions, while in palm oil-fed rabbits the number of lesions was no different from that with the other oils.

Conclusion:

Palm oil has been used in food preparation since the last 5,000 years. Today, it is consumed worldwide as a cooking oil, margarines, shortening and as an ingredient in fat blends and a vast array of food products. Food manufacturers choose palm oil because it has a distinctive quality, nutrition attributes (tocotrienols and carotenoids), requires no hydrogenation (trans-fatty acid free) and non-GMO status.

Contrary to popular believe and misconception, based on scientific studies and publications, palm oil has been proven to have no effect at all on serum cholesterol level. Its saturated fat – C16 Palmitic fatty acid does not increase total serum cholesterol level. THE END.

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