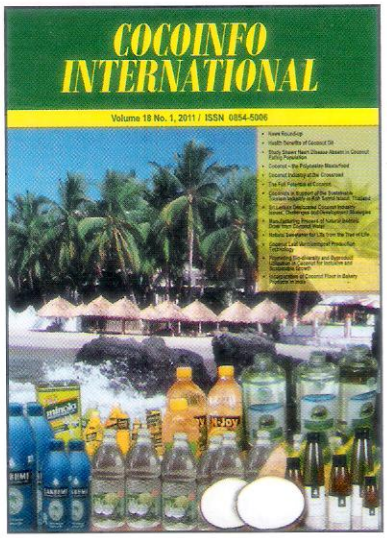
COCOINFO INTERNATIONAL

Volume 18 No. 1, 2011 / ISSN 0854-5006

VOLUME 18, No. 1, 2011/ ISSN 0854-5006

COCOINFO INTERNATIONAL



Editor-In-Chief: Romulo N. Arancon, Jr.
Managing Editor: Muhartoyo
Associate Editor: W.K.N. Shanthichandra

Advertising Manager: Amrizal Idroes
Circulation Manager: Sri Utami Widya L.

Cocoinfo International, is a polular journal on the coconut industry published twice a year by the Asian and Pacific Coconut Community (APCC),
3rd Fl. Lina Building,
Jl. H.R. Rasuna Said, Kav 7 Kuningan,
Jakarta 12920, Indonesia.
P.O. Box 1343, Jakarta 10013.
Phone 62 21 5221712 to 13, Fax 62 21 5221714,

E-mail address: apcc@indo.net.id.
Home page: http://www.apccsec.org
Queries and information regarding subscription and advertisement insertion rates should be directed to the above address.
Foreign subscription rates including airmail postage for one year (two issues) is US$25.00 (Asia & Pacific)
US$ 30.00 (USA & Elsewhere)

HEALTH BENEFITS OF COCONUT OIL

Dr. Vasudevan, MBBS, MD, FRCPath

The health and nutritional benefits from consuming coconut oil have been recognized in many parts of the world for centuries. In India, coconut tree has been considered from time immemorial as "Kalpavriksha", literally meaning "a tree that bestows all boons".

Healthy Coconut Cooking Oil

Atherosclerosis and Cholesterol

Coronary artery disease (CAD) is a condition in which the blood supply to the heart muscle is partially or completely blocked. The most deadly presentation of CAD is acute myocardial infarction (AMI), where heart muscle cells are dead. Atherosclerosis is characterized by accumulation of lipids and cholesterol within the inside covering of the vessel wall, along with a component of vascular inflammation. The earliest pathologic lesion of atherosclerosis is the fatty streak, which may progress to form a fibrous plaque. This may further progress to luminal narrowing and compromised oxygen supply to the tissues supplied by that artery. The risk factors for the development and progression of atherosclerosis include hyperlipidemia, hypertension, cigarette habit and diabetes mellitus.

Coconut oil contains medium chain fatty acids

Increased risk for CAD is attributed to elevated levels of serum cholesterol, which in turn is due to increased intake of saturated fats. However, a fear complex has been created among the general public that consumption of coconut oil results in elevated cholesterol levels. This "myth" is primarily due to equating coconut oil with saturated fat; without knowing that saturated fat in coconut oil are of the short chain and medium chain fatty acids. It is to be emphasized that the fats that cause heart disease are saturated fats with long chain fatty acids. Nearly 50 % of the fat in coconut oil is Lauric acid (medium chain fatty acid). These medium chain fatty acids directly enter into the cells and are metabolized immediately (Vasudevan et al, 2010). On the other hand, long-chain fatty acids (of other oils) require the help of lipoproteins, which are eventually deposited into various organs, including heart vessels (Table 1).

Coconut oil does not increase cholesterol level in blood

People in Kerala State in India were using coconut oil from time immemorial. The word "Kerala" literally means "land of coconut trees". However, due to the attack against coconut oil in

Table 1. Metabolic differences between medium chain and long chain fatty acids

	Medium chain fatty acid (eg, Coconut oil)	Long chain fatty acid (eg, Other oils and fats)
For absorption, pancreatic lipase	Is not necessary	Absolutely essential
For Absorption, Bile salts	Are not necessary	Absolutely essential
Absorbed as	Free fatty acid	Tri glycerides
After absorption	Immediately metabolised by peripheral tissues	Transported by LDL into adipose tissue
Pathology	Not deposited in tissues	Deposited in tissues leading to plaque formation

general press, the per capita coconut oil consumption has been reduced to 1/3 during the last 50 years. However, during the same period, the rate of heart attack has been increased to 3 times in the same population. This alone will be sufficient to show that coconut oil has nothing to do with heart attacks. By giving coconut oil, Kurup and Rajmohan (1995) found no statistically significant alteration in the serum levels of total cholesterol, HDL cholesterol or LDL cholesterol from the baseline values. They also noted a beneficial effect of adding the coconut kernel to the diet (Mini and Rajamohan, 2004). The polyphenol fraction of virgin coconut oil was found to be capable of preventing LDL oxidation (Nevin and Rajamohan, 2004).

We have conducted a large scale study at Kochi, India (Sabitha et al, 2009). Serum samples were analysed from 302 normal healthy persons, out of which 152 were consuming coconut oil and 150 were using sunflower oil for the past 2 years or more. There were no statistically significant differences in the cholesterol, HDL or LDL levels in coconut oil consuming population versus sunflower oil consuming population (Table 2). Further, lipid profile in serum was analysed in 76 coronary artery disease patients, out of which 41 were used to take coconut oil and 35 were used to take sunflower oil at least for the past 2 years. There were no differences in cholesterol levels in these two groups (Sabitha et al, 2009). Thus plasma fatty acid composition reflected no changes with dietary fat source.

Hostmark et al (1980) in experiments with rats, showed that coconut oil feeding produced significantly HDL, relative to sunflower oil feeding. HDL cholesterol is considered to be the "good cholesterol" in the blood. Awad (1981) showed that total tissue cholesterol accumulation in animals on the safflower diet was six times greater than for animals fed the coconut oil. Our own studies on animals at Kochi, India showed that coconut oil intake did not cause hypercholesterolemia or oxidative stress in rats (Sabitha et al, 2010).

Table 2. Lipid profile in Serum samples of normal persons

	Cholesterol mg/dl	HDL-C mg/dl	LDL-C mg/dl	Triglyceride mg/dl
Coconut oil group (152 patient)	203	46	124	143
Sunflower group (150 patient)	196	44	118	140

There are many animal and human studies in world literature to disprove allegations about coconut oil enhancing the risk of a CAD (Blackburn et al, 1989). At the same time, there is not even one paper in the whole literature, directly showing that coconut oil increases cardiac diseases. Studies that were wrongly interpreted as hyper-cholesterolemic effect of coconut oil feeding, in fact, have only shown that coconut oil was not as effective at lowering the serum cholesterol as compared with the unsaturated fat. Willett (1990) in an editorial summarised that "no relation between saturated fat intake and risk of CAD was observed in the most informative prospective study to date." Without any evidence, the wrong publicity is still going on to spoil the name of coconut oil.

Coconut oil is not deposited in Blood vessels

There are a few studies on chemical analysis of the atheromatous plaques (blood clogging substance inside the artery) Felton et al (1994) showed that the plaques contained cholesterol esters with 74% unsaturated (41% is polyunsaturated) and only 24% saturated fatty acids. Moreover, none of the saturated fatty acids were Lauric acid (fats seen in coconut oil).

At Amrita Institute of Medical Sciences, Kochi, India, we have analysed the fatty acid composition of the plaques taken from diseased arteries. A total of 71 samples of plaques were analysed, of which 48 persons were using coconut oil and 23 persons were using sunflower oil routinely (Sabitha et al, unpublished). Plaques did not contain significant amounts of Lauric acid or Myristic acid (fatty acids from coconut oil). Instead, palmitic acid and stearic acid (long chain saturated fatty acids) were the main ingredients of these plaques. Fatty acid content of plaques from coconut oil consuming group and sunflower consuming group were the same. This clearly shows that coconut oil does not have any action on plaque formation or heart disease.

Other health benefits of coconut oil

The Lauric acid in coconut oil is used by the body to make the anti-microbial derivative monolaurin (Enig, 1993). Coconut oil inhibits various microorganisms including bacteria, yeast, fungi, and enveloped viruses (Kabara et al, 1985). Coconut oil-treated wounds healed much faster, as indicated by a decreased time of complete epithelization (Nevin and Rajamohan, 2010).

The medium chain fatty acids in

coconut oil offer positive health benefits for patients with irritable bowel syndrome and other digestive disorders, by reducing inflammation in the intestinal tract and helping to combat unhealthy microorganisms (Gorard, 2003; Shea et al, 2003). Reddy et al (1984) showed that chemically induced adenocarcinomas in the colon appeared 10-fold less in coconut oil treated animals. Cohen et al (1986) showed that such effect of coconut oil was also seen in breast cancer.

PUFA, in excess, may be harmful

Poly unsaturated fatty acids (PUFA) can definitely reduce cholesterol level in blood. This finding led to clinicians advising patients to refrain from the use of coconut oil, and to use vegetable oils such as sunflower oil. Eventually, general public came to the conclusion that PUFA are safe. However, PUFA are notorious for lipid peroxidation and generation of toxic free radicals. The starting point of atheroma formation is the deposition of peroxide laden LDL in the arteries. High intake of omega-6 oils will cause lowering of HDL, elevation of plasma triglycerides, and will promote platelet aggregation; all of which favour heart attacks. Vegetable oils (e.g., sunflower oil), containing PUFA are rich in omega-6 variety; while coconut oil and butter are low in omega-6. Normal Indian diet (cereals, pulses and vegetables) contains about 10 g of PUFA per day; out of which about 2 g is omega-3 and the rest 8 g is omega-6. Further intake of omega-6, as sunflower oil or other vegetable oil may be harmful. The optimal ratio for omega-6 to omega-3 varieties in diet is 4:1. In an average Indian diet, this is about 30:1. In sunflower oil, this value is 160:1, and therefore, unnecessary addition of such vegetable oils will further deteriorate the condition. In coconut oil, the omega 6 to 3 ratio is 3:1, and therefore superior to sunflower oil in this respect.

Summary

The major fat in mother's milk is the same Lauric acid as in coconut oil. Baby foods all over the world do contain Lauric acid (that from coconut oil) as the prominent ingredient. If coconut oil is considered atherogenic and its use is to be prohibited, then mother's milk should also be prohibited! The plaques in the diseased coronary arteries contain mainly long chain fatty acids (of other oils) and not medium chain fatty acids (of coconut oil); and this is the same irrespective of whether one takes sunflower oil or coconut oil. All these findings show that coconut oil is neutral with respect to atherogenicity (plaque formation and eventual heart attack). The advantages of coconut oil are: It does not affect serum cholesterol level; it is not causing clogging in arterial walls; it increases serum HDL cholesterol (beneficial); it produces very little free radicals, as opposed to other oils (beneficial); it is rapidly absorbed, rapidly metabolised and so does not get deposited (beneficial) and it helps in resisting invading micro-organisms (beneficial).

Dr. Vasudevan, MBBS, MD is Principal (Rtd), Amrita Institute of Medical Sciences, Kochi, India