

# Miracles of Coconut oil

Dr. D.M. Vasudevan

Principal (Retd), Amrita Institute of Medical Sciences, Kochi

Various clinical studies, including the study undertaken by Amrita Institute of Medical Sciences, Kochi have shown that coconut oil does not increase serum cholesterol level. The plaques in the diseased coronary arteries contain mainly long chain fatty acids (seen in 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 indicate that coconut oil is neutral with respect to plaque formation and eventual heart attack. Other beneficial effects include that coconut oil increases serum HDL (good cholesterol); it produces very little free radicals, as opposed to other oils; it is rapidly metabolized and so does not get deposited.

## Coconut oil does not contain harmful fatty acids

The health and nutritional benefits of coconut oil have been recognized for centuries. However, in recent decades, the reputation of coconut oil has been clouded by misinformation about its relation with atherosclerosis. Many health organizations advise against the consumption of high amounts of coconut oil due to its high levels of saturated fat, including US Department of Health and Human Services and World Health Organization. Successful campaigns were undertaken to state that coconut oil is harmful to heart. In this review, the negative propaganda against coconut oil has been refuted with the help of experimental data.

Increased risk for heart attack is attributed to elevated levels of serum cholesterol, which in turn is due to increased intake of saturated fats. 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. 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. Medium chain fatty acids are more available for oxidation and they provide a rapid source of energy and are

considered to be less implicated in the accumulation of body fat.

## Animal experiments: Coconut oil does not increase cholesterol level

Coconut oil feeding did not produce any statistically significant alteration in the serum levels of total cholesterol, HDL cholesterol or LDL cholesterol from the baseline values. Instead, there was a beneficial effect of adding coconut kernel to the diet. Virgin coconut oil was found to be capable of preventing LDL oxidation, thus preventing the atheroma formation. The feeding of coconut oil did not alter the blood lipid composition in pigs. In rat experiments, coconut oil feeding produced significantly high HDL ("good" cholesterol), relative to sunflower oil feeding. HDL cholesterol is considered to be the "good cholesterol" in the blood.

**Table 1. 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

**Table 2. Lipid profile in Serum samples of patients having Coronary Artery Disease**

	Cholesterol mg/dl	HDL mg/dl	LDL mg/dl	Triglyceride mg/dl
Coconut oil group(41 patient)	152	42	95	116
Sunflower group(35 patient)	141	41	84	108

Studies on animals at Amrita Institute of Medical Sciences, Kochi, showed that coconut oil intake did not cause hypercholesterolemia.

### Clinical studies: Coconut oil and lipid profile in human beings

A large scale study is conducted at Amrita Institute of Medical Sciences, Kochi, India. 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 two 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 1). Further, lipid profile in serum was analysed in 76 coronary artery disease patients, out of which 41 used to take coconut oil and 35 used to take sunflower oil atleast for the past two years. There were no differences in cholesterol levels in these two groups (Table 2). From these figures it can be seen that there was no statistically significant difference in the cholesterol, HDL or LDL levels in coconut oil consuming population versus sunflower oil consuming population. In other words, plasma fatty acid composition reflected no changes with dietary fat source and that coconut oil does not increase the

risk of atherosclerosis and heart disease. There is not even one paper in the whole literature, directly showing that coconut oil increases cardiac diseases.

### Clinical studies: Coconut oil and LDL particles in circulation

It is known that LDL particles are more atherogenic; hence LDL is otherwise called bad cholesterol. Amrita Institute of Medical Sciences, Kochi, conducted a study to assess LDL particles among normal subjects consuming either coconut oil or sunflower oil. Group one and two consisted of 31 control subjects each group, consuming coconut oil and sunflower oil respectively, each person consuming about 24 g of the oil. The proportion of healthy coconut oil consumers, with low LDL-cholesterol was high compared to the sunflower oil users (48% vs.

38%). The studies showed no superiority of sunflower oil over coconut oil in reducing the LDL (bad) cholesterol in blood.

### Clinical studies: Coconut oil is not deposited in heart vessels

There are a few studies on chemical analysis of the atheromatous plaques (blood clogging substance inside the artery). Studies have 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, the fatty acid composition of the plaques taken from diseased arteries were analyzed. 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. (See Table 3). 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 an effect to produce plaque or heart disease (Table 3).

**Table 3. Fatty acid composition from plaques obtained from diseased coronary artery**

	Plaque from Coconut oil consumers	Plaque from Sunflower oil consumers
C10, Capric acid	0.32 %	0.19 %
C12, Lauric acid	3 %	3.9 %
C14, Myristic acid	5 %	5 %
C16, Palmitic acid	46 %	46 %
C18:0, Stearic acid	34 %	33 %
C18:1, Oleic acid	6 %	6 %
C18:2, Linoleic acid	6 %	5 %

**Table 4: Mean values and standard deviations of antioxidant enzyme levels of subjects**

	Group 1Control Coconut oil	Group 2Control Sunflower oil	Group 3Diabetic Coconut oil	Group 4Diabetic Sunflower oil
Glutathione (GSH)	7±0.7	7±0.73	6±0.87	5±0.95
Glutathione peroxidase (GPx)	18±1.8	19±2.1	17±2.2	17±1.6
Superoxide (SOD)	6±1.14	5±1.22	5±0.98	5±1.1

No significant changes were observed between subgroups (Groups 1& 2 and groups 3& 4).

### Clinical studies: Antioxidant status in coconut oil consumers

In a parallel study, comparison was made on the lipid profile and antioxidant enzymes of normal and diabetic subjects consuming coconut oil and sunflower oil. 70 normal healthy persons and 70 patients with diabetes were studied. Each group was further subdivided into two subgroups of 35 subjects each, consuming coconut oil and sunflower oil respectively as cooking medium. Total glutathione and glutathione peroxidase were measured in erythrocytes and superoxide dismutase in serum. (See Table 4). Though oxidative stress parameters were high in diabetic subjects compared to controls, no pronounced changes for these parameters were observed between the subgroups (coconut oil vs. sunflower oil). Most importantly, lipid profile or oxidative stress parameters did not show significant changes between coconut oil and sunflower oil groups. Although scanty, available previous studies on the effect of coconut oil on oxidative stress confirms the findings. Other studies have also showed excellent antioxidant properties of coconut oil.

### Randomized prospective clinical studies on risk factors of heart attack

A large scale randomized single blind case control study comparing the impact of coconut oil versus sunflower oil as a cooking medium

on the cardiovascular events and risk factors was done at Amrita Institute of Medical Sciences, Kochi. Two hundred patients with heart diseases were enrolled for a two years follow up. All of them were getting their usual drugs. One group (100 patients) was using only coconut oil, while the other 100 patients were using only sunflower oil. At the end of the two year study, all conventional atherosclerotic risk factors such as total cholesterol, LDL cholesterol, triglycerides etc were remained the same in both groups. Antioxidant markers (lipid peroxidase, glutathione reductase, glutathione-S-transferase, superoxide dismutase, catalase) were again shown to be the same in both groups. High sensitive CRP (hsCRP) (an important inflammatory marker for future heart attack) was also found to be the same level in both coconut oil users and sunflower oil users.

### PUFA, in excess, may be harmful

Poly unsaturated fatty acids (PUFA), in appropriate dose, 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. There is a general feeling 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.

### Clinical studies; Coconut oil and body weight

Overweight increases the risk for osteoarthritis, diabetes, heart disease, stroke and early death. The usual advice given to overweight individual is to reduce food intake, particularly fat intake. However, on such a diet, the person will feel hungry and feel depressed. In such circumstances, they stop the dieting and end up in rebound weight gaining. Coconut oil has an advantage in these types of settings. Overweight person taking coconut oil, containing medium chain fatty acids, gradually over the months lose weight effortlessly. Long chain fats will almost always go into fat stores; this will eventually make the person overweight and will cause dyslipidemia. However, as explained previously, the medium chain fatty acids will be immediately utilised for energy purposes and will not be deposited in the body. This will help to reduce weight. Obesity being a great problem, particularly among growing children, this feature of coconut oil may be of immense help in curbing the onset of obesity at a very early age.