

Health effects of coconut oil

V. N. Ortiz¹ and M.K.Q. Go²

Due to its unique properties, coconut oil has applications as ingredient of food in the form of cooking oil, shortening, margarine, and filled milk. It was also tapped for nutritional and medical applications. MCFAs are now found in the market as a component of infant food and nutritional supplements for the sick and the convalescent, especially persons who have difficulty digesting fat.

Coconut oil, the primary product from the "tree of life", has been widely used ever since the time of our ancestors. Since the Americans took over in the Philippines in the early 1900s, it did not take long for them to recognize the exceptional uses of coconut oil- its cooking qualities, its food value, and its industrial use. They began to capitalize on refinery plants set up in the country to produce coconut oil for American foods and industrial companies. Coconut oil export started to the US without tax.

But the situation turned bad in the early 1930s when the US Department of Agriculture introduced the soybean agriculture and a Republic Act was passed in the US Congress imposing a 3-cent-per-pound excise tax on coconut oil making the coconut oil uncompetitive. Circumstances were worsened by the smear campaign spearheaded by the American Soybean Association (ASA) against tropical oils particularly the coconut oil. And their motive was to protect their domestic market for soybean oil.

A health issue on coconut oil as a threat to US consumers health was waged which resulted in expelling the oil in the American diet. Doctors have even advised their patients

against the use of coconut oil due to its role in raising serum cholesterol levels which in turn cause heart disease. The health claims were based on experiments in the 1950s implicating coconut oil as hypercholesterolemic (high blood cholesterol) or atherogenic (induces hardening of arteries) which were flawed in that they lacked the benefits of sophisticated statistical analysis and tightly controlled study design. For instance, the experimental purified coconut oil diet contained abnormally excessive proportion of fats and oils and lacked essential fatty acids. In these experiments where the foundation of labeling coconut oil as "bad fat" were based, the essential fatty acid was usually missing which must constitute 2-3% of fat intake to satisfy essential fatty acid requirement.

The success of anti-tropical campaign was felt not only in the US and other parts of the world, but also in the Philippines. It is unfortunate that until now, the misinformation and misconception still lag the people's perception on coconut oil.

PCRDF's role in the anti-tropical oils campaign

At the height of the anti-tropical oils campaign in the US launched by

¹Paper presented by Ms. Ortiz in the Coconut Summit on October 25, 2006 in PMA Auditorium, Philippines.

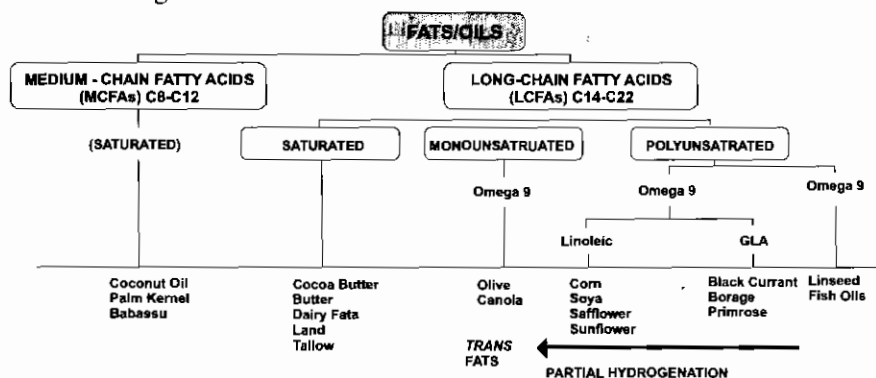
²Philippine Coconut Research and Development Foundation, Inc. (PCRDF), PCRDF Bldg., Pearl Drive, Ortigas Center, Pasig City, 1605 Philippines



medium chain fatty acids follow the portal venous system directly to the liver where they are rapidly oxidized to energy. In this respect, they do act more like carbohydrates than they do as fats. Medium chain fatty acids do not require carnitine to enter the mitochondria. Since medium chain fatty acids are oxidized much faster than long chain fatty acids, fat accumulation is reduced, thus it is non-fattening.

transport vessel for dietary cholesterol. The chylomicrons are transported to peripheral tissues (heart, muscle, adipose) and are hydrolyzed at the inner surface of the capillaries either as source of energy or recombined into triglycerides for storage. Unlike MCTs, LCTs provide a large saturate pool for very low density lipoproteins (VLDLs) incorporation in the liver.

circulation in complex with a protein to form the VLDLs. Through their passage to peripheral tissues (heart, arteries, liver) the triglycerides are slowly used up. The VLDLs become the intermediate density lipoproteins (LDLs,) and finally the low density lipoproteins (IDLs), as the triglycerides are hydrolyzed by endothelial lipases till only the cholesterol remains in the LDLs. The cholesterol is taken up from the extracellular environment by body cells and the cholesterol is used for synthesis of various steroid hormones and as component in plasma membranes of cells and organelles.



**PCRDF's Coconut Health Studies
PCRDF-NEDH (A Harvard Medical
School Affiliate) Study on the health
effects of dietary coconut oil**

Long chain triglycerides that make up most of the vegetable oils in the market, on the other hand, follow the lipoprotein transport of lipids. Generally, they are digested and absorbed more slowly. LCTs being hydrophobic, require bile acids to allow the digestive attack by pancreatic lipases and facilitate the absorption through the intestinal mucosal cells. Ingested LCTs are hydrolyzed in the lumen of the small intestine. Hydrolysis products absorbed by the intestinal mucosa are recombined into triglycerides which combine with apoprotein to form the lipoprotein called the chylomicron. The process solubilizes the lipids and permits the transport through the blood and lymph.

From the liver, triglycerides and cholesterol enter the systemic

A study funded by PCRDF at the New England Deaconess Hospital,

Annex 2. Characteristics of oils

Characteristics	Coconut oil	Corn oil	Palm oil	Olive oil	Rapeseed oil	Soybean oil	Tallow	Lard	Butter
Refractive index	1.448-1.450 (at 40°C)	1.470-1.474 (at 25°C)	1.453-1.456 (at 40°C)	1.4689-1.4700 (at 20°C)	1.470-1.474 (at 25°C)	1.470-1.476 (at 25°C)	46-49 (at 40°C)	45-52 (at 40°C)	1.453-1.458 (at 40°C)
Iodine number	7.5-10.5	103-128	44-58	80-88	97-108	120-141	35-48	46-70	35-40
Saponification value	250-264	187-193	195-205	188-196	170-180	189-195	193-202	195-202	190-200
Titer, °C	20-24	14-20	40-47	17-26	11.5-15.0	-	40.46	36-42	45.50
Unsaponifiable matter, %	Not over 0.5	Not over 2.0	Not over 0.8	Not over 1.8	Not over 1.5	Not over 1.5	Not over 0.8	Not over 1.0	Not over 1.0
Fatty Acid Composition (wt. %)									
Caproic	Trace	-	-	-	-	-	-	-	-
Caprylic	7.9	-	-	-	-	-	-	-	-
Capric	7.2	-	-	-	-	-	-	-	-
Lauric	48.0	-	-	-	-	-	0.2	-	-
Myristic	17.5	0.1-1.2	0.5-6	Tr.1.7	-	0.4	3.1	1.3	-
Palmitic	9.0	7-16	32-45	8-12	1-3	10.6	24.9	28.3	24.4
Stearic	2.1	1-3	2-7	2-5	0.4-3.5	2.4	24.1	11.9	35.4
Oleic	5.7	65-85	38-52	19-49	12-24	23.5	41.8	47.5	38.1
Linoleic	2.6	4-15	5-11	34-62	12.16	51.2	-	6.0	2.1

*Cost/nut = Rs. 4



a Harvard Medical School affiliate, on the use of coconut oil in human nutrition and diet and its effects on the cholesterol level disproved the allegation that coconut oil raises blood cholesterol.

The 7 month study was designed to determine the effect of fats of varying carbon chain length on lipid metabolism. In the study, a crossover design was implemented comprising of a three 6-week test period with a minimum of 4-week washout phase between each test diets. Twenty-eight healthy American men between ages 22 and 47 were randomly assigned to one of six groups with differing orders of the three diets.

The participants answered series of questionnaires to determine relevant information that may affect serum lipids. They were also asked to maintain stable weight, their exercise level, alcohol consumption, and smoking habits over the duration of the study to determine the possible effects of these variables in lipid profile.

The test diets used were 1) high coconut oil (92% saturated fats), 2) soybean oil (60% polyunsaturated fats) and 3) hydrogenated soybean oil (hydrogenated fat and 19% trans fatty acid). These oils were supplied through specially prepared muffins. The test diets were formulated to provide adequate calories to maintain body weight and standardize total fat intake of 37%, carbohydrate of 45% and protein of 18% of the total calories.

The study showed the following conclusions:

- Consumption of up to 50% of dietary fat as coconut oil in the American diet does not significantly alter either total cholesterol or LDL cholesterol.

Coconut oil at intake levels of 50% of total fat in the diet was found to have no effect on serum total cholesterol.

- HDL levels seem to increase significantly with coconut oil consumption. Among the three dietary fats taken, coconut oil was the only oil which raises HDL.

Although the mechanism by which coconut oil increases HDL is unclear, this observation is very significant since it raises the possibility of beneficial effects from coconut oil in subjects with increased cardiovascular risk due to low HDL levels. When combined with a low-fat diet (30% of calories), coconut oil may significantly improve blood lipid profiles in at risk patients.

Coconut oil study on HIV/AIDS

Also in an effort by PCRDF to expand the medical applications of coconut oil, the Foundation had embarked in the world's first human clinical test of coconut oil and monolaurin in the treatment of the dreaded HIV and AIDS.

In the 6-month study conducted at the San Lazaro Hospital, fifteen HIV patients aged 22-38 had been given coconut oil and monolaurin, a coconut oil derivative, as

monotherapy. The first phase of the study gave very encouraging results. The study showed that the viral load or the number of HIV viruses in the bloodstream of the patients was significantly reduced. It strongly suggested the possible antiretroviral property of coconut oil or monolaurin in persons living with HIV infections. The finding is encouraging in view of the fact that coconut oil and monolaurin are safe and are widely available. Therefore, the next step is to conduct a randomized controlled trial with more patients.

Conclusion

The two studies proved the beneficial effect of coconut oil. Another proof of coconut oil's effectiveness is the phenomenal craze over the virgin coconut oil. Many people used and are still using the VCO even if there are no clinical studies yet to prove its significance. Coconut oil is undoubtedly very beneficial and important to our health. The studies have not yet come to an end; succeeding studies are still needed and many other breakthroughs are yet to be discovered.

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