

The Goodness of Fresh Coconut

Regular consumption of fresh coconut has no significant harmful effect on fatty acid composition and does not change lipid-related cardiovascular risk factors.

Everybody is familiar today with the term lipid profile. Lipid profile shows the total amount of triglycerides and cholesterol, as well as the distribution between 'good cholesterol' - HDL, and the 'bad cholesterol' - LDL in our blood at any given point of time. Another aspect of lipids that is now gaining popularity are the terms 'saturated' and 'unsaturated' fatty acids. Dietary fats have been rather superficially divided into bad (saturated) and good (unsaturated) fatty acid containing foods. However it is increasingly becoming clear that this simplified definition of good and bad fatty acids is wrong, and that many saturated fatty acids could actually be good fats – with coconut fat being the key sources.

Fresh coconut, though rich in Saturated Fatty Acids (SFAs) in comparison to a combination of groundnut and groundnut oil when used over a period of 90 days, recorded no significant harmful effect on erythrocyte fatty acid composition and did not

change lipid-related cardiovascular risk factors. Regular consumption of 100 g of coconut, containing SFAs, was not found to have any harmful effect on plasma lipids and erythrocyte fatty acid composition.

A study was undertaken by Swami Vivekananda Yoga Anusandhana Samsthana, Department of Yoga and Life Sciences, Bengaluru, India with the financial assistance of CDB to compare the effects of increased SFA provided by fresh coconut versus monounsaturated fatty acid (MUFA) intake (provided by a combination of groundnuts and groundnut oil) on plasma lipids and erythrocyte fatty acid (EFA) composition in healthy adults.

Fifty-eight healthy volunteers, randomized into two groups, were provided standardized diet along with 100 g fresh coconut or groundnuts and groundnut oil combination for 90 days in a Yoga University. Fasting blood samples were collected before and after the intervention period for the measurement of plasma lipids and EFA profile.



Consumption of saturated fat is believed to increase the risk of coronary artery disease mainly because of its effects on increasing plasma total cholesterol levels. As early as the 1950s, Keys *et al.* and later Dietschy and Hegsted *et al.* worked out equations that showed how dietary fatty acids influenced plasma cholesterol levels. These equations suggested that saturated fatty acids increased total cholesterol levels, whereas polyunsaturated fatty acids (PUFAs) decreased it and monounsaturated fats (MUFAs) were largely considered as neutral. These studies were the basis of dietary recommendations that advised reduced consumption of all types of SFAs.

Nearly one third of the world's population depends on coconut to some degree for their food. Indian diets are relatively low in fat; however, inclusion of fresh/dry coconut in the daily diet is a common practice in many parts of the country. Studies on the effect of coconut oil consumption on plasma lipids are contradictory, with some studies showing deleterious effects and others showing neutral effects. However, there are almost no studies conducted on the health effects of fresh coconut consumption. Fresh coconuts contain 40%–50% moisture and, in addition to SFAs, they are rich in fiber and protein and a number of vitamins, minerals, and electrolytes. Furthermore, the coconut SFA composition is unique in that it consists of over 50% of medium-chain SFAs (MCSFAs), whose properties and metabolism appear to differ from longer chain SFAs commonly found in animal products. MCSFAs are rapidly oxidized in the liver to Acetyl coenzyme A (acetyl CoA) and do not enter or alter the lipid pool in the liver, thus remaining neutral with respect to regulation of total cholesterol or low-density lipoprotein (LDL) levels.

This study was therefore undertaken to study the effects of daily consumption of fresh coconut on plasma lipids and erythrocyte fatty acid composition in healthy young men and women.

The study was carried out on 58 healthy adults who were recruited following advertisement of the study at Swami Vivekananda Yoga Anusandhana Samstha University. The subjects were randomized into coconut group and groundnut group. All subjects received a balanced diet based on yogic principles of food (sativic, rajasic, and tamasic) blended with modern medical nutrition (calorie requirements, composition of a balanced meal) and consumed this standard meal plus intervention for a period of 90 days. In addition to the standard meal, coconut

group consumed 100 g (444 kcal) of fresh coconut per day and the other group consumed 45 g (256 kcal) of groundnuts and 22 g (198 kcal) of groundnut oil per day. A combination of groundnut and oil was used to make the two study interventions isocaloric and to ensure similar macronutrient compositions. Subjects were trained and requested to abstain from consuming anything other than the food and snacks provided by the project kitchen, set up exclusively for the study.

In this carefully controlled diet study, impact of SFAs from fresh coconut in comparison to MUFAs from a groundnut and groundnut oil combination on some well-accepted indices of cardiovascular disease (CVD) risk was analysed. The most important finding of the present study was that despite much higher intakes of SFAs in the coconut group, the effects on plasma TC and triglycerides were minimal. There was a significant increase in LDL levels in the coconut group, which is in line with a number of studies with coconut oil supplementation. This has been generally attributed to either increased LDL synthesis or reduced LDL clearance. On the other hand, a number of studies have reported beneficial effects of virgin coconut oil on LDL and have attributed it to the presence of high levels of polyphenols such as caffeic acid, which play a key role in scavenging free radicals. In the current study, despite the use of fresh coconut rich in polyphenols, an increase in LDL levels was observed. However, it was also seen that there was no significant increase in TC levels, suggesting that this increase in LDL was well within physiologic variability in the current study population of normal men and women. Groundnut was used as the control in this study because it is a rich source of MUFA and is more commonly consumed than olive oil in India. We have enough evidence from several epidemiologic studies that dietary MUFAs have a positive impact on CVD risk factors by promoting a healthy blood lipid profile, improving blood pressure, and decreasing inflammation and oxidative stress. MUFAs are reported to improve insulin sensitivity. In the present study, there was a significant decrease in total cholesterol levels in the groundnut group; however, this appeared to be mainly due to a decrease in HDL levels. In contrast, the coconut group showed a significant increase in HDL levels, which could be attributed to the high MCSFA content of the diet.

Decrease in body weight, decrease in blood sugar levels in coconut group and increase in haemoglobin levels in both the groups were observed. Blood

pressure did not change in coconut group and diastolic blood pressure increased in ground nut group.

Thus the study proves the general perception of coconuts being bad for heart as wrong. Consumption of saturated fatty acid rich fresh coconut had no significant deleterious effect on any cardiovascular parameters in normal adults. On the contrary, there were many beneficial effects not only to the heart but more. There was an increase in the HDL levels (anti-atherogenic) and anti-inflammatory precursor DGLA (Dihomo gamma linolenic acid). Added to this was a decrease in body weight, decrease in blood sugar levels and increase in haemoglobin levels. This suggests that coconut consumption may not have any deleterious effects on cardiovascular risk in normal adults but can have multiple benefits.

The Journal of American college of nutrition has published a research article on this study and responded saying “that intended objective of the authors to study the effects of daily consumption fresh coconut on plasma lipids and erythrocyte fatty acid composition is very interesting and the emerging conclusion is equally important for the

role of nutrition in lifestyle management. The vein of re-positioning the negative publicity that coconut saturated fats have endured is timely”.

Recent advances in nutritional science now allow assessment of critical questions about the health effects of SFAs. The findings of the study contradict the perspective that dietary saturated fat *per se* is harmful and emphasize the importance of considering the source of dietary SFAs. This is one of the first studies on fresh coconut that supports the beneficial effects of coconut.

The study on Effect of a Diet enriched with fresh Coconut Saturated Fats on Plasma Lipids and Erythrocyte Fatty Acid Composition in normal adults is sponsored by CDB under the scheme Technology Mission on Coconut.

Courtesy: CDB Study Report and Journal of the American College of Nutrition. Effect of a Diet Enriched with Fresh Coconut Saturated Fats on Plasma Lipids and Erythrocyte Fatty Acid Composition in Normal Adults: Rokkam Shankar Nagashree, MScA, N. K. Manjunatha, M. Indub, M. Ramesha, V. Venugopala, P. Sreedhara, N. Pavithrab, and Hongasandra R. Nagendraa ■

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