

In western countries and those countries influenced by western eating habits, coconut oil has recently risen to superfood status. Coconut oil has invaded our supermarkets, with barely a food or drink category untouched. Various claims have been made for different coconut products, such as coconut milk, virgin coconut oil, and coconut cream. In particular, coconut oil has been lauded as a cure for Alzheimer's Disease, a body fat burner, a cure for arthritis, diabetes and infections (both viral and bacterial), as well as an immune booster and an oil useful for weight management and the prevention of heart disease (1).

Indigenous populations who continue to live their traditional lifestyle are not at risk when eating the whole coconut as part of their traditional diet. As Western foods are introduced into the diet, new risks emerge for these indigenous populations for the typical Western chronic diseases.

Liquid Coconut Products

Coconut water is the clear liquid inside the immature coconut. Contains about 45-50 calories per cup. It contains mostly sugars and fiber with a small amount of many vitamins and minerals, especially potassium.

Coconut milk is made by adding water to the shredded white flesh of a coconut. Typically, the milk is almost 70% water by weight, with over 50% of the calories coming from fat, largely saturated fat. Canned coconut milk is typically imported from the Philippines or Thailand. A number of companies make coconut milk in USA and add vitamins and minerals to the coconut milk and it is sold in cartons as a non-dairy beverage.

Coconut cream is essentially a thicker version of coconut milk, with a much lower water content.

Virgin Coconut oil (VCO) can be extracted by grating the fresh white coconut flesh and then using a manual press to extract the oil. About 7 liters of coconut oil can be produced from 100 mature coconuts. The calories from VCO are largely from fat, and the oil is rich in polyphenolics. Much of the commercial virgin coconut oil imported into the USA comes from Philippines, Thailand, and Sri Lanka.

Low Medium Chain Content

Coconut oil has been called the healthiest oil on earth, perfect for healthy cooking. However, the FDA does not allow a product to be labeled as healthy if a serving contains more than 1 gram of saturated fat or more than 15% of the calories from saturated fat. Coconut oil contains 12 grams of saturated fat per tablespoon*, and has about 85-90% of its calories from saturated fat. Coconut milk has 4 to 5 grams/serving of saturated fat.

Many of the claims about coconut oil's health benefits come from the belief that coconut oil is rich in medium chain triglycerides (MCT). Triglycerides containing short to medium chain fatty

acids are water soluble and more readily absorbed and metabolized quicker than long-chain fatty acids. While promoters of coconut oil claim lauric acid (12 carbon chain length) is a medium chain fatty acid it actually behaves chemically like a long-chain fatty acid. Lauric acid makes up 45% of the composition of coconut oil. Coconut oil contains 3-4% MCT and only about 15% medium chain fatty acids (2).

Uses of Coconut Oil

Regular coconut oil comes from extraction of the dried coconut meat (copra) and is typically bleached, deodorized and refined. Virgin coconut oil comes from a wet extraction process without the use of chemicals or heat. Coconut oil has a mild, nutty, vanilla flavor. Pastries made with coconut oil have a nice, flaky crust. It is a very stable oil for cooking, but not recommended for continuous deep frying due to its low smoke point (about 175°C or 350°F) and potential production of harmful substances when overheating.

Weight Reduction

Claim: Proponents claim that because coconut oil has unique medium-chain triglycerides (MCT), it is more readily burned in the body and not stored as fat. Proponents claim that coconut oil can decrease visceral fat and waist size, increase energy expenditure, have a greater satiating effect and does not produce body weight gain (3). Some even claim that the MCT in coconut boosts your metabolism and that coconut has fewer calories than other fats and that the ketones produced increase satiety and reduces your appetite. In short, coconut oil supports weight loss (1).

Evidence: The experiments that are quoted to show that MCT are digested, absorbed, and metabolized faster than other fats were performed with specially prepared 100% MCT. One cannot extrapolate the findings on 100% MCT to coconut oil since only a small percentage of coconut oil is comprised of MCT (4, 5). In addition, coconut oil contains about the same caloric value as all other vegetable oils.

Cardiovascular Disease

Claim: Proponents of coconut oil believe that the saturated fat in coconut behaves differently to other foods high in saturated fat. While coconut oil is high in saturated fat, it is claimed that its use does not increase the risk of blood clots or of heart disease but actually helps to promote normal platelet function, and lowers LDL and total cholesterol levels, triglyceride levels, and raises HDL levels (1). Its proponents claim it actually reduces the risk of heart disease and that populations who eat large amounts of coconut have very little heart disease.

Evidence: The majority of the saturated fat in coconut is comprised of myristic, palmitic and lauric fatty acids, all of which increase LDL and total cholesterol levels (6). The true medium chain fatty acids comprise only 15% of the coconut oil fat. Virgin coconut oil (due to its lauric acid content) does raise HDL levels (6). The rich content of flavonoids and other antioxidants enable virgin coconut oil to be regarded as being more heart-friendly and to possess anti-inflammatory properties. But coconut oil also elevates triglycerides, which is undesirable. Since most of the saturated fat in coconut oil increases serum cholesterol, overall the accumulating evidence suggests that coconut oil raises risk of cardiovascular disease. Studies with primates

have shown that coconut oil increases the risk of blood clots similar to other fats rich in saturated fat (7).

Indigenous populations which include coconut in their traditional cuisine, consume a lot of vegetables, fruits and fish, and are more active than Westerners. They tend to eat relatively little coconut oil and instead use the high-fiber coconut flesh or use coconut milk. Historically these populations have had low rates of heart disease.

Antiviral and antibacterial properties

Claim: Lauric acid in coconut is claimed to be a powerful destroyer of viruses (such as HIV, herpes, measles, and the Influenza virus), protozoans (such as giardia lamblia), and gram-negative bacteria (8, 9). Capric acid, another fatty acid present in smaller amounts in coconut, is reported to have antimicrobial properties.

Evidence: Further research is needed to verify preliminary data. Three novel antimicrobial peptides from been isolated from green coconut water (10). A recent study found no antimicrobial activity of coconut water. (11).

Improved brain function; a miracle cure for dementia or Alzheimer's disease

Claim: Proponents of coconut oil believe its MCT content helps with memory loss, memory disorders, and mild cognitive impairment. They claim that coconut oil cures or reverses the effects of dementia, delays aging of the brain, and is very effective for treating depression. It is claimed that MCT are turned into ketone bodies, which can have therapeutic effects on brain disorders like epilepsy and Alzheimer's. Some claim that coconut oil reduces the beta-amyloid plaque that cause Alzheimer's (1, 12).

Evidence: Much research is needed to test these hypotheses.

Protection against diabetes and other problems

Claim: It is claimed that coconut oil helps stabilize your blood sugar, lowers insulin resistance, and hence lowers the risk of type 2 diabetes (13). Coconut oil has been used to treat irritable bowel syndrome, chronic fatigue, psoriasis, thyroid problems, arthritis, immune dysfunctions, and hemorrhoids. It is also claimed to prevent osteoporosis by increasing the absorption of calcium and magnesium (1).

Evidence: Clinical evidence for these curative properties is generally lacking. Some data suggests that MCT may preserve insulin sensitivity in some animals, but human research is needed.

Are there ways to use coconut oil and coconut products safely?

Small amounts of coconut oil, used occasionally as part of a plant-based diet, is appropriate. But generally it's best to replace coconut oil with unsaturated plant oils such as olive or canola oils as your usual oil for cooking. The use of other coconut products, such as lite coconut cream or milk, can be used in traditional recipes in place of full cream coconut milk. This will provide flavor and texture, but with less saturated fat and calories. Desiccated coconut can be sprinkled

on wholegrain cereal, adding extra fiber and flavor. Coconut water contains no fat, is very low in calories and makes a refreshing drink.

Conclusion

While a lot of health claims have been made for coconut oil, insufficient scientific evidence exists to support these claims (14). In fact, evidence shows that coconut oil is similar to other sources of saturated fat, and that it's preferable to use unsaturated plant fats so as not to increase your risk of cardiovascular disease. Hence, we should exercise caution when reading claims for coconut oil. Claims about weight loss made for medium chain fats do not apply to coconut oil since it contains only about 4% MCT and 15% medium-chain fatty acids (2).

Coconut oil is not a miracle cure-all. Be wary of articles on the web that claim coconut oil has been conclusively proven to possess a myriad of health benefits. Claims made for medium chain fats cannot be applied to coconut oil due to its small content of MCT. Further evidence is needed for the benefits claimed for the use of virgin coconut oil. In the meantime, an occasional use of coconut can be part of a healthy diet, but a daily spoonful of coconut oil, as if it were a medicine, is not recommended.

Notes:

Reliable Sources of Information on web to check for coconut:

www.webmd.com
www.mayoclinic.org

*In Australia, 1 Tablespoon of coconut oil gives 16-17 g of saturated fat since there are 4 teaspoons to a tablespoon, rather than 3 tsp as in the UK and USA.

References:

1. Fife B. The Coconut Oil Miracle: Use nature's elixir to lose weight, beautify skin and hair, prevent heart disease, cancer, and diabetes, strengthen the immune system. 5th edition. Avery Publishing, 2013.
2. Marina AM, Che Man YB, Nazimah SAH, Amin I. Chemical properties of virgin coconut oil. *J Am Oil Chem Soc* 2009;86:301-7.
3. Papamandjaris AA, MacDougall DE, Jones PJ. Medium chain fatty acid metabolism and energy expenditure: obesity treatment implications. *Life Sci* 1998;62:1203-15.
4. St-Onge MP, Jones PJ. Physiological effects of medium-chain triglycerides: potential agents in the prevention of obesity. *J Nutr* 2002;132:329-32.
5. St-Onge MP, Bosarge A. Weight-loss diet that includes consumption of medium-chain triacylglycerol oil leads to a greater rate of weight and fat mass loss than does olive oil. *Am J Clin Nutr* 2008;87:621-6.
6. Eyres, L, MF Eyres, A Chisholm, RC Brown. Coconut oil consumption and cardiovascular risk factors in humans. *Nutr Rev* 2016;74(4):267-80.
7. Pronczuk A, Patton GM, Stephan ZF, Hayes KC. Species variation in the atherogenic profile of monkeys: relationship between dietary fats, lipoproteins, and platelet aggregation. *Lipids* 1991;26(3):213-22.

8. DebMandal M, Mandal S. Coconut (*Cocos nucifera* L: Arecaceae): In health promotion and disease prevention. *Asian Pac J Trop Med* (2011)241-7
9. Dua K, Sheshala R, Ling TY, Hui Ling S, Gorajana A. Anti-inflammatory, antibacterial and analgesic potential of *cocos nucifera* linn.: a review. *Antiinflamm Antiallergy Agents Med Chem* 2013;12(2):158-64.
10. Mandal SM, Dey S, Mandal M, Sarkar S, Maria-Neto S, Franco OL. Identification and structural insights of three novel antimicrobial peptides isolated from green coconut water. *Peptides* 2009;30(4): 633-7.
11. Rukmini JN, Manasa S, Rohini C, Sireesha LP, Ritu S, Umashankar GK. Antibacterial Efficacy of Tender Coconut Water (*Cocos nucifera* L) on *Streptococcus mutans*: An In-Vitro Study. *J Int Soc Prev Community Dent* 2017;7(2):130-4.
12. Fernando WM, Martins IJ, Goozee KG, et al., The role of dietary coconut for the prevention and treatment of Alzheimer's disease: potential mechanisms of action. *Br J Nutr* 2015;114:1-14.
13. Nagao K, Yanagita T. Medium-chain fatty acids: functional lipids for the prevention and treatment of the metabolic syndrome. *Pharmacol Res* 2010;61(3): 208-12
14. Cunningham E. Is there science to support claims for coconut oil. *J Am Diet Assoc* 2011;796