

Coconut Oil: A Heart Healthy Fat?¹

Wendy M. Gans and Gail P. A. Kauwell²

You have probably seen or heard claims on social media or even talk shows with health professionals about the health benefits of coconut oil. Claims such as “Coconut oil decreases cholesterol!” or “Coconut oil treats hypertension!” are enough to interest any consumer looking for a quick cure for these health problems. Plus, coconut oil is sold everywhere—from your local grocery store to the corner drug store. But what is the evidence behind these health claims? Does coconut oil have any health benefits? Read on to learn more about coconut oil and how it might affect heart health.



Credits: Magone/iStockphoto

Coconut

Coconut is a tropical fruit produced by coconut palm trees. Coconut has many uses. For example, it is frequently used for its edible flesh and cool, refreshing coconut water. In fact, a popular way to quench your thirst in areas where coconuts are plentiful is to simply cut off the top and insert a straw. The coconut water can also be used to make coco frio, a popular adult beverage. The fresh and dried forms of the coconut flesh or “coconut meat” can be eaten as is or cooked. Coconut meat is especially popular in many Southeast Asian dishes. In addition, the fat present in coconut meat can be extracted to produce coconut oil. Coconut oil can be used in cooking and in the production of shampoos, soaps, lotions, cosmetics, and fragrances.

Coconut Oil

The majority of coconut oil production occurs in Indonesia, the Philippines, and India. Coconut oil is extracted using heat, pressure, and/or chemical solvents. Depending on the extraction method(s), the final product may be labeled as virgin, refined, or hydrogenated, as outlined below.

- *Virgin* coconut oil is made using fresh, mature coconuts that are mechanically pressed in order to separate the oil from the meat. It is the least refined coconut oil available. Virgin coconut oil is made with or without the use of heat and is free from chemical solvents and bleaching or deodorizing agents (Villarino, Dy, and Lizada 2007). This process allows the coconut oil to retain high levels of antioxidants and polyphenols (Arunima and Rajamohan

1. This document is FSHN17-1, one of a series of the Food Science and Human Nutrition Department, UF/IFAS Extension. Original publication date February 2017. Visit the EDIS website at <http://edis.ifas.ufl.edu>.

2. Wendy M. Gans, dietetic intern; and Gail P. A. Kauwell, professor; Food Science and Human Nutrition Department; UF/IFAS Extension, Gainesville, FL 32611.

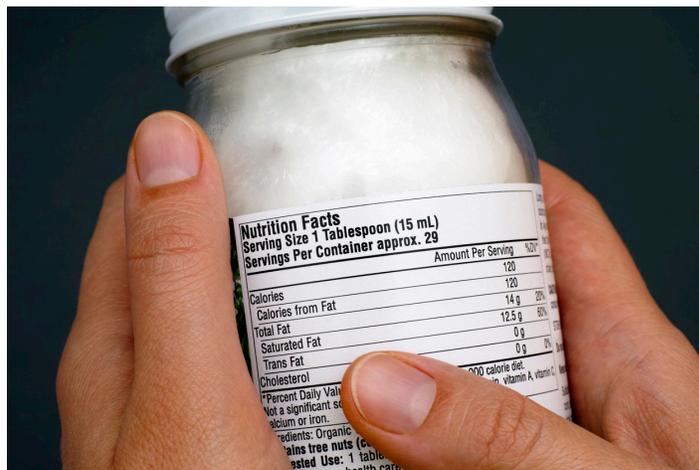
2013). Virgin coconut oil retains the scent and taste of coconut.

- *Refined* coconut oil starts with a process similar to that used to make virgin coconut oil, but is followed by additional processing methods including refining, bleaching, and deodorizing. Bleaching usually does not involve chemicals; rather it uses bleaching clay to remove impurities, after which the oil is deodorized by steam heating it 405–475 degrees F. Deodorizing removes most of the coconut aroma and flavor from the coconut oil. Refined coconut oil also has a higher smoke point, making it a good option for cooking at higher temperatures (Marina, Man, and Amin 2009).
- *Hydrogenated* coconut oil is sometimes used as an ingredient for shelf stable sweets and baked goods, but is rarely sold in supermarkets in the United States. Partial hydrogenation of the oil results in the formation of some saturated and trans fats. It is best to avoid this form of coconut oil because of the adverse health effects associated with trans and saturated fats.

When it comes to cooking, refined coconut oil has an advantage over most other oils because it can be heated to higher temperatures (up to 450 degrees F) without becoming damaged (Srivastava et al. 2010; Fullana, Carbonell-Barrachina, and Sidhu 2004). However, coconut oil should only be used for single use shallow frying. Carcinogenic substances may form if coconut oil is used multiple times for deep-frying (Srivastava et al. 2010). Virgin coconut oil can be used in recipes, such as coconut rice or baked breads, to add a mild coconut flavor. However, remember that the smoke point for virgin coconut oil is lower than the smoke point for refined coconut oil, so refined oil is the best choice when using coconut oil for fried foods.

How much and what type of fat is in coconut oil?

One tablespoon of coconut oil contains 14 grams of total fat, 12 grams of which are saturated fat (USDA 2017). This means that about 86% of the total fat content of coconut oil comes from saturated fat. For comparison, olive oil and butter contain 14% and 64% saturated fat, respectively (USDA n.d.).



Credits: Ekaterina79/iStockphoto

A Glimpse into Coconut Oil and Heart Health

With coconut oil becoming more and more popular, there is concern about the increased saturated fat intake that comes with consuming this product. The American Heart Association recommends a dietary pattern consisting of 5 to 6% of calories from saturated fat. As an example, if you eat a 2,000-calorie a day diet, then no more than 120 of these calories should come from saturated fats. This amounts to about 13 grams of saturated fat per day, or just over the amount found in one tablespoon of coconut oil (American Heart Association 2016).

But isn't the fat in coconut oil supposed to be healthy?

Before answering this question, let's review some facts about fat. Fats are made of chains of carbon molecules of varying lengths. Fats with a chain length of 6 to 12 carbons are called medium chain triglycerides (MCTs). Fats with chain lengths of 14 carbons or more are called long chain triglycerides (LCTs). MCTs are digested, absorbed, and handled by the body differently than LCTs. The proposed benefits of coconut oil are often attributed to the amount of MCTs, which is about 64% of the total fat in coconut oil.

Studies suggest favorable outcomes when using MCT oil to treat certain conditions and promote weight loss, despite its high content of saturated fat (St-Onge and Jones 2002; Lei et al. 2004; Stubbs and Harbron 1996; Fushiki et al. 1995; Afar and Mearow 2014). However, the fatty acid profile of coconut oil is different than the MCT oil used in these studies. The majority of MCTs in coconut oil come from lauric acid. Even though it is classified as an MCT, lauric acid acts more like an LCT than an MCT, and thus does not have the same effect as shorter MCTs (Denk and Grundy

1992). Because lauric acid behaves like an LCT, it can lead to increases in LDL cholesterol, similar to the results seen with eating other types of saturated fats (Cox et al. 1994).

High blood levels of total and LDL (bad) cholesterol are risk factors for heart disease. Research has shown that coconut oil raises the level of total and LDL cholesterol in the blood more than a diet with unsaturated plant oils like safflower oil (Cox et al. 1994). However, some studies have shown that consuming coconut oil is associated with an increase in HDL (good) cholesterol (Feranil et al. 2011; Voon et al. 2011). Furthermore, studies looking at dietary patterns and health outcomes among populations in the South Pacific, where coconut is primarily consumed in forms such as coconut flesh and fresh coconut cream, have suggested that eating coconut does not have an adverse effect on heart health. This does not mean you should give coconut oil the green light, because there are some important issues to consider. First, these South Pacific populations tend to eat coconut flesh or squeezed coconut cream, not coconut oil. Furthermore, the traditional diet consumed by South Pacific populations is characterized by a very low intake of sugar and processed foods, with most of their calories coming from fish, fresh fruits and vegetables, and fiber-rich foods, a dietary pattern that is more in line with what is recommended for heart health and quite different from the typical Western diet (Stanhope, Sampson, and Prior 1981; Eyres et al. 2016). Consequently, these findings cannot be directly attributed to eating coconut, but may instead be the result of their total dietary pattern and lifestyle.

There are very few human studies on coconut oil and heart disease risk factors, but the evidence available does not support the use of coconut oil to reduce heart disease risk (Eyres et al. 2016). Based on a review of the research, the National Lipid Association suggests that if coconut oil is to be used as part of the daily eating plan, it should be consumed in limited amounts that fit within the recommendations for saturated fat intake mentioned previously (Jaxobson et al. 2015). A good place to look for guidance on what makes up a healthy diet is the 2015 Dietary Guidelines for Americans (Office of Disease Prevention and Health Promotion 2015). Recommended eating patterns that promote a healthy intake include the US Healthy Eating Pattern, the Healthy Mediterranean Style Eating Pattern, and the Healthy Vegetarian Style Eating Pattern.

Click on the links below to view the different eating patterns:

Healthy US-Style Eating Pattern: <https://health.gov/dietaryguidelines/2015/guidelines/appendix-3/>

Healthy Mediterranean-Style Eating Pattern: <https://health.gov/dietaryguidelines/2015/guidelines/appendix-4/>

Healthy Vegetarian Eating Pattern: <https://health.gov/dietaryguidelines/2015/guidelines/appendix-5/>

Where do we go from here?

As coconut oil becomes more popular in the Western diet, it is important to keep the current research in mind. Most of the studies used to claim the beneficial effects of coconut oil have been conducted in populations consuming diets different from the Western diet and have been based on the consumption of coconut products other than coconut oil. Until more research is available about coconut oil's overall effect on health, it is best to get most of your fat intake from unsaturated sources. Sources of mono- and polyunsaturated fats that produce a more favorable effect on blood cholesterol levels are listed below (American Heart Association 2017). It is also important to make sure you are consuming enough omega-3 fatty acids, which are mainly found in cold-water fish and plant sources such as flaxseed, walnuts, and sunflower seeds (American Heart Association 2017; Mayo Clinic 2017).

Monounsaturated Fat Sources

- Oils (olive oil, sesame oil, peanut oil)
- Avocados
- Peanut butter
- Nuts (almonds, hazelnuts, pecans)
- Seeds (pumpkin, sesame)

Polyunsaturated Fat Sources

- Oils (soybean oil, corn oil, sunflower oil)
- Nuts (walnuts)
- Seeds (sunflower seeds, flaxseed)
- Fish (salmon, herring, trout, tuna, sardines, anchovies, scallops) (American Heart Association 2017; Mayo Clinic 2017; HSPH Harvard 2015)

If you consume coconut oil, make sure it is consumed in moderation and keep the current American Heart Association guidelines for saturated fat intake in mind. Furthermore, foods high in saturated fat, like coconut oil, should only be consumed in combination with an overall healthy eating pattern that mirrors the US Healthy Eating Pattern, the Healthy Mediterranean Style Eating Pattern, or the Healthy Vegetarian Style Eating Pattern as recommended in

the 2015 Dietary Guidelines for Americans. Otherwise, the combination of saturated fat from coconut oil along with an unhealthy diet may have an adverse effect on heart health.

References

- Afar, F., & Mearow, K. M. 2014. "Coconut oil attenuates the effects of amyloid- β on cortical neurons in vitro." *J Alzheimers Dis.* 39(2), 233–237. doi:10.3233/JAD-131436
- American Heart Association. 2015. Saturated Fats. Available at: http://www.heart.org/HEARTORG/HealthyLiving/HealthyEating/Nutrition/Saturated-Fats_UCM_301110_Article.jsp#.V969iVdU2CQ. Accessed January 05, 2017.
- American Heart Association. 2016. Polyunsaturated Fats. Available at: http://www.heart.org/HEARTORG/HealthyLiving/HealthyEating/Nutrition/Polyunsaturated-Fats_UCM_301461_Article.jsp#.WG58OVcfdM. Accessed January 5, 2017.
- Arunima, S. and T. Rajamohan. 2013. "Effect of virgin coconut oil enriched diet on the antioxidant status and paraoxonase 1 activity in ameliorating the oxidative stress in rats - a comparative study." *Food Funct.* 4(9):1402–1409.
- Cox, C., J. Mann, A. Chisholm, and W. Sutherland. 1994. "Effects of coconut oil, butter and safflower oil on lipids and lipoproteins in persons with moderately elevated cholesterol levels." *Atherosclerosis.* 109(1–2):146–147. doi:10.1016/0021-9150(94)93598-x.
- Denke, M.A. and S.M. Grundy. 1992. "Comparison of effects of lauric acid and palmitic acid on plasma lipids and lipoproteins." *Am J Clin Nutr.* 56:895–898.
- Eyres, L., M.F. Eyres, A. Chisholm, and R.C. Brown. 2016. "Coconut oil consumption and cardiovascular risk factors in humans." *Nutr Rev.* 74(4):267–280. doi:10.1093/nutrit/nuw002.
- Feranil, A.B., P.L. Duazo, C.W. Kuzawa, and L.S. Adair. 2011. "Coconut oil is associated with a beneficial lipid profile in pre-menopausal women in the Philippines." *Asia Pacific Journal of Clinical Nutrition.* 20(2):190–195.
- Fullana, A., A.A. Carbonell-Barrachina, and S. Sidhu. 2004. "Comparison of Volatile Aldehydes Present in the Cooking Fumes of Extra Virgin Olive, Olive, and Canola Oils." *J Agric Food Chem.* 52(16):5207–5214. doi:10.1021/jf035241f.
- Fushiki, T., K. Matsumoto, K. Inoue, T. Kawada, and E. Sugimoto. 1995. "Swimming endurance capacity of mice is increased by chronic consumption of medium-chain triglycerides." *J Nutr.* 125(3):531–539.
- HSPH Harvard. 2015. Types of Fat. The Nutrition Source. Available at: <https://www.hsph.harvard.edu/nutrition-source/types-of-fat/>. Accessed January 5, 2017.
- Jacobson, T.A., K.C. Maki, C.E. Orringer. 2015. "National Lipid Association Recommendations for Patient-Centered Management of Dyslipidemia: Part 2." *J Clin Lipidol.* 9(6). doi:10.1016/j.jacl.2015.09.002.
- Lei, T., W. Xie, J. Han, B.E. Corkey, J.A. Hamilton, and W. Guo. 2004. "Medium-Chain Fatty Acids Attenuate Agonist-Stimulated Lipolysis, Mimicking the Effects of Starvation." *Obes Res.* 12(4), 599–611. doi:10.1038/oby.2004.69
- Marina, A, Y.C. Man, and I. Amin. 2009. "Virgin coconut oil: emerging functional food oil." *Trends Food Sci Technol.* 20(10):481–487. doi:10.1016/j.tifs.2009.06.003.
- Mayo Clinic. n.d. Nutrition and healthy eating. Dietary fats: Know which types to choose. Available at: <http://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/fat/art-20045550>. Accessed January 5, 2017.
- Office of Disease Prevention and Health Promotion. 2015. "Appendix 4. USDA Food Patterns: Healthy Mediterranean-Style Eating Pattern." In *Dietary Guidelines for Americans, 2015–2020, Eighth Edition*. Available at: <https://health.gov/dietaryguidelines/2015/guidelines/appendix-4/>. Accessed January 5, 2017.
- St-Onge, M. and P.J.H.Jones. 2002. "Physiological Effects of Medium-Chain Triglycerides: Potential Agents in the Prevention of Obesity." *J Nutr.* 132(3):329–332.
- Srivastava, S., M. Singh, J. George, K. Bhui, A.M. Saxena, and Y. Shukla. 2010. "Genotoxic and carcinogenic risks associated with the dietary consumption of repeatedly heated coconut oil." *Br J Nutr.* 104(09):1343–1352. doi:10.1017/s0007114510002229.
- Stanhope, J.M., V.M. Sampson, and I.A. Prior. 1981. "The Tokelau island migrant study: Serum lipid concentrations in two environments." *J Chronic Dis.* 34(2-3):45–55. doi:10.1016/0021-9681(81)90050-3.
- Stubbs, R.J. and C.G. Harbron. 1996. "Covert manipulation of the ratio of medium- to long-chain triglycerides in isoenergetically dense diets: effect on food intake in

ad libitum feeding men.” *Int J Obes Relat Metab Disord*. 20(5):435–444.

United States Department of Agriculture (USDA). 2017. Organic Virgin Coconut Oil. Available at: <https://ndb.nal.usda.gov/ndb/foods/show/31783?manu=&fgcd=&ds=>. Accessed January 5, 2017.

United States Department of Agriculture (USDA). n.d. Foods List. Available at: <https://ndb.nal.usda.gov/ndb/search/list>. Accessed January 5, 2017.

Villarino, B.J., L.M. Dy, and M.C.C. Lizada. 2007. “Descriptive sensory evaluation of virgin coconut oil and refined, bleached and deodorized coconut oil.” *LWT-Food Sci Technol*. 40(2):193–199. doi:10.1016/j.lwt.2005.11.007.

Voon, P.T., T.K. Ng, V.K. Lee, and K. Nesaretnam. 2011. “Diets high in palmitic acid (16:0), lauric and myristic acids (12:0 + 14:0), or oleic acid (18:1) do not alter postprandial or fasting plasma homocysteine and inflammatory markers in healthy Malaysian adults.” *Am J Clin Nutr*. 94: 1451–1457.