Coconut oil is extracted from the kernel or meat of mature coconut harvested from the coconut palm (Cocos nucifera). Throughout the tropical world it has provided the primary source of fat in the diets of millions of people for generations. When Europeans first arrived on the South Pacific in the 18th and 19th centuries one of the first commodities they brought back with them was coconut. In Europe the oil was used for food and soap making. Coconut oil provided a less expensive and cleaner alternative to animal fats. The oil made a good fuel for lamps and was especially valued in the Caribbean as it produced a rich bubbly lather in hard water and was effective in seawater, unlike other soaps.

Today coconut oil and its components (fatty acids) are used in cooking and food preparation, infant formulas, enteral (tube feeding) and parenteral (intravenous) nutritional formulas for hospital patients, as carriers for transdermal delivery of medication, antifungal, antibacterial, and antiviral medications, cosmetic creams and lotions, sunscreens, cosmetics, toothpastes, soaps and detergents, lubricants, balms, and numerous other pharmaceutical and industrial applications.

**INTRODUCTION**

Coconut oil is composed predominately of a special group of saturated fats known as medium-chain triglycerides (MCT). Although MCT are classified as saturated fats they do not contribute to cardiovascular disease. Evidence shows they may actually protect against it. Studies have shown that populations that use coconut oil as their primary source of dietary fat have very low rates of cardiovascular disease. Coconut oil is easier to digest than other fats, improves nutrient absorption, does not contribute to weight gain, stimulates metabolism, boosts energy, possesses potent antimicrobial properties, and improves essential fatty acid metabolism in the brain. All these features suggest that coconut oil is a healthy choice with important nutritional and medicinal applications.

Coconut oil is different than those of the LCTA that are more commonly found in the diet. Coconut oil contains approximately 92.1% saturated fatty acids, 6.2% monounsaturated fatty acids, 1.4% polyunsaturated fatty acids. All of the MCTA in coconut oil is saturated. For this reason, it has a relatively high melting point. Above 77°F (25°C) coconut oil is a colorless liquid. Below this temperature it solidifies into a pure white solid. Coconut oil is very heat stable so it makes an excellent cooking and frying oil. It has a smoke point of about 368°F (182°C). Because of its high degree of saturation, it is slow to oxidize and thus resistant to rancidity.

Coconut oil is unique in that it is composed predominately of a special group of saturated fats known as medium-chain triglycerides (MCT). Although MCT are classified as saturated fats they do not contribute to cardiovascular disease. Evidence shows they may actually protect against it. Studies have shown that populations that use coconut oil as their primary source of dietary fat have very low rates of cardiovascular disease. Coconut oil is easier to digest than other fats, improves nutrient absorption, does not contribute to weight gain, stimulates metabolism, boosts energy, possesses potent antimicrobial properties, and improves essential fatty acid metabolism in the brain. All these features suggest that coconut oil is a healthy choice with important nutritional and medicinal applications.

**KEYWORDS:** coconut oil, medium chain fatty acids; medium chain triglycerides.

**ABSTRACT:** Coconut oil has a long history of use throughout the world as both a food and as a medicine. Over the past 50 years research has shown that coconut oil possesses unique properties important in nutritional and medicinal applications. Coconut oil is unique in that it is composed predominately of a special group of saturated fats known as medium-chain triglycerides (MCT). Although MCT are classified as saturated fats they do not contribute to cardiovascular disease. Evidence shows they may actually protect against it. Studies have shown that populations that use coconut oil as their primary source of dietary fat have very low rates of cardiovascular disease. Coconut oil is easier to digest than other fats, improves nutrient absorption, does not contribute to weight gain, stimulates metabolism, boosts energy, possesses potent antimicrobial properties, and improves essential fatty acid metabolism in the brain. All these features suggest that coconut oil is a healthy choice with important nutritional and medicinal applications.

**HEALTH EFFECTS**

**Cardiovascular Disease**

Cardiovascular disease is caused by atherosclerosis, a condition in which the lining of the arteries becomes thickened by the accumulation of a fatty substance called plaque. This condition can cause a decrease in the flow of blood to the heart, brain, and other organs, which can lead to heart attack, stroke, and other serious health problems. Coconut oil and other saturated fats are known to increase total cholesterol levels, which is a risk factor for cardiovascular disease. coconut oil may increase total cholesterol levels slightly in some individuals. The increase in total cholesterol is due primarily to an increase in HDL (good) cholesterol. HDL cholesterol is believed to protect against heart disease and the higher the better. The HDL cholesterol level of coconut oil and other fats is not significantly different. Total cholesterol is a poor indicator of heart disease risk. The reason for this is that total cholesterol includes both HDL and LDL cholesterol and there is no indication of how much of each make up the total. This may explain why 75% of those people who experience heart attacks have fatty acid deficiency below normal total cholesterol values. A far more accurate indicator of heart disease risk is the cholesterol ratio (total cholesterol/LDL cholesterol). The cholesterol ratio can be calculated by dividing the amount of HDL cholesterol by the amount of LDL cholesterol.

Researchers at Harvard Medical School have shown that coconut oil consumption increases HDL and in so doing improves the cholesterol ratio, thus reducing risk of heart disease. They also demonstrated that coconut oil does not significantly affect total cholesterol levels even when up to half of the total daily fat consumption (up to 37% of total calories) consists of coconut oil. The researchers state, “Two conclusions are basically based. The first is that consumption of up to 50% of dietary fat as coconut oil does not significantly alter either total cholesterol or LDL cholesterol in otherwise healthy young men. More importantly, HDL levels seemed to increase significantly with coconut oil consumption. In fact, coconut oil was the only fat in the study which raised HDL.” They went so far as to state, “The study suggests that coconut oil may be an aid in preventing heart disease in high risk patients and said, “This observation is very significant since it raises the possibility of beneficial effects from large doses of MCT and coconut oil from increased cardiovascular risk due to low HDL levels…coconut oil may significantly improve blood lipid profiles in at risk patients.”

One of the reasons coconut oil has come to similar conclusions. Kurup and Rahman (3) conducted a study on 64 volunteers and found no statistically significant difference in baseline total cholesterol or LDL cholesterol from baseline values. Kauria and Dayal (4) reviewed epidemiological and experimental data regarding coconut oil consumption. They noted and called the “population studies that show dietary coconut oil does not lead to high serum cholesterol or to high coronary heart disease mortality or morbidity.”

Mendes (5) showed that coconut oil makes a far more efficient source of fuel than glucose, the body’s normal source. In skeletal muscle, coconut oil is immediately absorbed into the portal vein and channelled to the bloodstream to the same degree that other fats do. As a result, they are much less likely to be incorporated into fat cells and do not collect in artery walls or contribute to hardening of the arteries. MCTA are utilized primarily by the body to produce energy rather than body fat.

Because of the ease at which coconut oil is digested, it has proven useful in the treatment of malnutrition. Coconut oil has shown to be superior to most vegetable oils for promoting growth and improving nutritional status in malnourished children. Coconut oil is recommended over other oils for those who have digestive problems or who have trouble digesting fats. Coconut oil or MCTA are easily added to infant formulas because they are better tolerated by newborns whose digestive systems are still developing. Likewise, they are added to adult hospital feeding formulas to improve patients’ nutritional status (10). Medium-chain fatty acids also improve the absorption of many other nutrients. The absorption of minerals (particularly calcium and magnesium), B vitamins, fat soluble vitamins (A, D, E, K and beta-carotene) and also amino acids have been found to increase when infants are fed a diet containing MCT (11-12).
Functional drinks

Bioactive Lipid Fractions: Potential Use in Functional Foods

Energy and Weight Management
The fact that the fatty acids in coconut oil are used as fuel to generate energy has earned it a place in storage like other fats, provides many health benefits. The most obvious is a boost in energy. The energy boost is not like the kick you get from caffeine or sugar but longer lasting. It is most noticeable as an increase in endurance [13]. This effect is accumulative, that is, energy level increases with daily use. Some researchers have even given MCT during their training and performance and endurance improves [14]. For this reason, coconut oil or MCT oil is added to many sports drinks and energy bars. Because coconut oil produces energy, it stimulates the metabolism. This thermogenic or metabolic stimulating effect causes the body to burn more calories, thus leaving fewer calories to be converted into body fat. For this reason, coconut oil can help promote weight loss in overweight individuals. Studies have shown that replacing LCFAs with MCFAs in the diet yields meals having a lower effective caloric content [15]. In one study, the thermogenic (fat-burning) effect of a high-calorie coconut oil (containing 45 percent fat as MCFAs) was compared to one containing 40 percent fat as LCFAs. The thermogenic effect of the MCFAs was almost twice as high as its LCFAs counterpart. The researchers concluded that the excess energy provided by fats in the form of MCFAs wouldn’t be efficiently stored as fat, but rather would be burned. A follow-up study demonstrated that MCTA given over a six-day period can increase diet-induced thermogenesis by 50 percent (16-17). In another study, researchers compared single meals of 1400 calories of MCTA and LCFAs. The thermogenic effect of MCFAs over six hours was three times greater than that of LCFAs. Researchers concluded that substituting MCFAs for LCFAs would produce weight loss as long as the caloric level remained the same [18].

Antimicrobial Effects
Jon J Kabara and other researchers have reported that certain fatty acids, primarily MCTA, and their derivatives (e.g., monoglycerides, diacylglycerols, certain antibacterial, antifungal, and antiprotozoal properties) [19]. When coconut oil is consumed, the MCT are broken down into individual medium chain fatty acids and monoglycerides which can kill or inactivate disease-causing microorganisms inside the body. This is another reason why MCT are so important in weight management. A common feature found in Alzheimer’s disease and many other neurological disorders is chronic inflammation. Inflammation interferes with normal glucose metabolism. This type of disruption in energy metabolism causes the brain cells to degenerate and die. In the process, the brain rapidly ages and degenerates into dementia. Ketones bypass this defect in glucose energy metabolism. Therefore, if enough ketones are available on a continual basis, they could satisfy the brain’s energy needs. However, ketones are only produced when food, and particularly carbohydrate, consumption is very low. When coconut oil is consumed, a portion of the MCFAs is automatically converted into ketones regardless of blood glucose levels or what other foods are eaten at the same time (26). These ketones supply the Alzheimer’s brain with the energy it needs to survive, and if given on a continual basis will support processes in the brain that are involved in healing and repair. Case histories of Alzheimer’s patients receiving coconut oil have demonstrated that it is possible to not only stop the progression of the disease, but even bring about significant improvement (27). In clinical studies, MCTA have produced better results in Alzheimer’s patients than any other treatment currently in use. In one study, for instance, Alzheimer’s patients consuming MCTA for a beverage without MCT. After 90 minutes a cognitive test was administered. Those patients who received the MCTA scored significantly better on the test than the other group. [28] This study demonstrated that MCFAs do have a positive effect on Alzheimer’s patients. It also showed that improvement was almost immediate and can occur after a single dose. No Alzheimer’s drug or treatment has come close to achieving results like this. Based on studies such as this, a new medicinal food supplement containing MCTA has been approved by the FDA for the treatment of Alzheimer’s disease (29).

CONCLUSION
Coconut oil has nourished millions of people throughout the world for generations. Those populations that use it as their primary source of dietary fat are remarkably free of cardiovascular disease and other common degenerative conditions. In comparison to other fats, coconut oil is easy to digest and improves the absorption of vitamins, minerals, amino acids, and fatty acids, making it an excellent choice for the treatment of malnutrition and for those who have digestive concerns. MCTA are added to hospital infant and enteral formulations for this reason. MCT are digested quickly and are immediately utilized to provide energy rather than being stored as body fat. This increase in energy elevates metabolism making it a useful food in weight management. The antimicrobial effects of MCFAs in coconut oil are well documented. Evidence suggests that consuming coconut oil on a regular basis may provide significant protection against a wide variety of infectious illnesses. When consumed, many of the MCFAs in coconut oil are automatically converted into ketones which are used as a major energy source for the brain. Neurological disorders involving defects in glucose metabolism can be successfully treated with the regular consumption of coconut oil. All these features make coconut oil an excellent dietary choice to support good overall health.

REFERENCES AND NOTES