

The Role of Dietary Olive Oil from the Islamic and Scientific Perspectives

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DOI: <http://dx.doi.org/10.5915/22-2-13551>

Abstract

Health authorities have advised Americans to modify their diet in order to reduce the risk of heart disease and cancer. The dietary goals for the U.S. suggest reducing average dietary fat to 30% of total energy, reducing cholesterol to 300 mg per day, and replacement of saturated fatty acids by polyunsaturated or monounsaturated fatty acids.

Monounsaturated fats have been the object of considerable nutritional interest, as epidemiological studies have determined that people in Mediterranean countries, where the predominant oil consumed is olive oil (a highly monounsaturated oil), suffer a very low incidence of cardiovascular disease.

A methodology is urgently needed for assessment of adherence to fat-controlled diets in free-living subjects, both long term and daily or even from meal to meal. In this respect, the Holy Qur'an and the Sunnah of the Prophet Muhammad (PBUH) offer great promise. The aim of this undertaking is to present a survey of literature on the role of dietary olive oil from an Islamic perspective.

Key words: Olive oil, monounsaturated fatty acids, lipoprotein, cholesterol, Islamic teachings.

Oils have held a unique, universal appeal that is well entrenched in the history of culinary science, and have yet to be matched by any other food component. Oil confers a host of properties including flavor and a rich, smooth texture that improves the palatability of foods. Because of these properties, some cultures historically have regarded various oils as luxuries. Butter oil, for example, was one of these foods and was banned during Lent during the Middle Ages.

Oils also have been hallowed for other than strictly culinary purposes. In mythologies, butter is associated with virility and procreation. Medicinal qualities were ascribed to oils by the ancient Greek philosopher Democritus, whose prescription for good health was "honey on the inside, olive (oil) on the outside." Recognizing the lubricant and

"healthful" properties of oil, the ancient Greeks and Romans rubbed it on their skin after bathing and before wrestling to make their muscles supple.

Today, oils are recognized for their nutritional, functional, and organoleptic properties. As the most concentrated source of energy, they supply 9 kcal/g, which is more than twice that provided by proteins and carbohydrates. Oils act as carriers of fat-soluble vitamins. They also aid in the transfer of heat to foods which are fried, and they contribute to a feeling of satiety after eating.

Oils belong to the chemical class of compounds called lipids. Lipids constitute one of the three major components of foods and are recognized as essential nutrients in the human diet. Olive oil, which until recently was considered a specialty item, is one of the most ancient oils. It is obtained from the fruit of the evergreen tree, *olea europa*, by a crushing and pressing process. It takes 1300-2000 olives to make one quart of olive oil.¹

The Holy Qur'an, the sacred text of Islam, contains revelation made by Allāh (God) to Muḥammad (PBUH). The Qur'an mentions olives and olive oil in the following surahs (verses):

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“Also a tree springing out of Mount Sinai which produces oil, and relish for those who use it for food.”²

“Allāh is the light of the heavens and the earth. The parable of His light is as if there were a Niche and within it a lamp; the lamp enclosed in glass; the glass as it were a brilliant star lit from a blessed tree, an olive, neither of the East nor of the West whose oil is well - nigh luminous, though fire scarce touched it; light upon light. Allāh does guide whom He will to His light. Allāh does set forth parables for men, And Allāh does know all things.”³

“By the fig and the olive and the Mount of Sina, and this city of Security we have indeed created man in the best of molds.”⁴

According to the Ḥadīth, the sayings and practices of Prophet Muḥammad (PBUH), 'Abū 'Usaid al-Anṣārī reported Allāh's messenger as saying, “Eat olive oil and anoint yourselves with it, for it comes from a blessed tree”⁵

In our technology-based modern society, which attempts to rationalize every fact of life, it is quite pertinent that the knowledge contained in the holy scriptures is having moral bearing on scientific thought for direction and development. In view of the current interest in olive oil, it is absolutely essential that the Holy Qur'ān and the traditions of the Prophet (PBUH) be given due credit. Also, it is important to extend our knowledge about the essentiality of olive oil in humans. After all, science and religion seek values to make human life meaningful and purposeful.

Scientific studies are emerging on the effects of olive oil as a natural source of oleic acid on lipid metabolism.^{6,7} In Mediterranean countries, in spite of high average fat intake (40% of total calories), coronary heart disease (CHD) rates and plasma cholesterol levels are relatively low.⁸⁻¹⁰ In these countries, the usual diet is high in olive oil, which is rich in monounsaturated fatty acids (oleic acid).

For the same total cholesterol levels, death rate from CHD is lower in Mediterranean countries than in other countries such as Finland and the United States,¹¹ suggesting that the influence of diet may simply be related to plasma and low-density lipoprotein (LDL) cholesterol levels, but also to different atherosclerosis risk factors.¹² For the first time, health authorities such as the American Heart Association¹³ have recommended olive oil in the treatment of hyperlipidemia in adults.

Recent studies^{14,15} have shown that diets rich in monounsaturated fatty acids, especially oleic acid, produce favorable changes in the concentrations of

Figure 1. Comparison of Dietary Fats

Dietary Fat	Cholesterol mg/Tbsp	%Monounsaturated Fat Content
Canola Oil	0	58%
Safflower Oil	0	13%
Sunflower Oil	0	20%
Corn Oil	0	25%
Olive Oil	0	77%
Soybean Oil	0	24%
Peanut Oil	0	48%
Cottonseed Oil	0	19%
Lard	12	47%
Palm Oil	0	39%
Beef Tallow	14	44%
Butterfat	33	30%
Coconut Oil	0	6%

Taken from Agricultural Handbook No. 8-4 and Human Nutrition Information Service, United States Department of Agriculture, Washington, DC, 1979.

serum lipoproteins. Other studies^{16,17} have suggested that increased consumption of oleic acid in the form of olive oil, at the expense of either saturated fatty acids or carbohydrates, is a proper approach to lowering coronary heart disease risk.

Figure 1 shows the cholesterol and monounsaturated fatty acid composition of olive oil compared to other representative oils. It is worth noting that of all the oils, only olive oil contains 77% monounsaturated fat.

Recent studies also suggest that diets rich in the monounsaturated fatty acid, oleic acid, are worthy of extensive investigation. Such diets might serve as an alternative to the more classical diets designed to reduce coronary heart disease. There is scientific evidence that dietary oleic acid does not lower high density lipoprotein (HDL) cholesterol when compared to the polyunsaturated fatty acid, linoleic acid.^{16,17} The replacement of saturated fatty acids by carbohydrates and monounsaturated fatty acids effectively decreases LDL cholesterol. However, carbohydrates lower HDL cholesterol whereas monounsaturated fatty acids leave HDL levels unchanged.^{18,19} Thus, substitution of monounsaturated for saturated fatty acids could be more advantageous than replacement of saturated fatty acids by either polyunsaturated fatty acids or carbohydrates.

A study by the Department of Human Nutrition,

Agricultural University and the Department of General Internal Medicine, University of Nijmegen in the Netherlands compared the benefits of a diet rich in olive oil to one high in carbohydrate and fiber.²⁰

Forty-eight healthy men and women consumed a baseline diet high in saturated fat for 17 days. For the next 36 days half the subjects consumed a diet rich in olive oil (41% total fat and 24% monounsaturated fat), and half consumed a diet high in complex carbohydrates and fiber (22% total fat and 65% carbohydrate).

Total cholesterol, LDL cholesterol, and HDL₂ cholesterol levels decreased in subjects on both diets. Levels of HDL₃ cholesterol decreased among the carbohydrate group but increased among the olive oil group. VLDL cholesterol decreased in the olive oil group but increased in the carbohydrate group.

In addition, levels of apolipoproteins changed favorably in the olive oil group (apolipoprotein A1, apo A1, increased and apolipoprotein B, Apo B, decreased). In the carbohydrate group, the reverse occurred (apo A1 decreased and apo B increased). The latter changes resulted in a 10% decrease in the ratio of apo A1 to apo B in the carbohydrate group, but a 16% increase in the ratio in the olive oil group. These results are significant, since some studies suggest that concentrations of apolipoproteins and HDL₂ cholesterol are better indicators for risk of atherosclerosis than total cholesterol and HDL cholesterol.

The researchers conclude that an olive oil rich diet more favorable affects the lipoprotein risk profile for coronary heart disease than diet high in complex carbohydrates.

In another study at the Institute of Internal Medicine and the Clinical Medica I, University of Padua, the Military Hospital of Padua, and the Institute of Chemical and Clinical Microscopy and the Patologia Medica, University of Verona, Italy, the effects on serum lipids and lipoproteins of an olive oil-enriched diet were compared with a low fat diet.²¹

Eleven young male subjects were studied in a metabolic ward at the Military Hospital of Padua, Italy. All but three had plasma total cholesterol levels 5.2 mmol/L at the time of admission; two had plasma cholesterol levels 6.5 mmol/L without xanthomas, atherosclerotic lesions, or family history of familial hypercholesterolemia. The mean cholesterol level value was 5.90 ± 0.80 mmol/L (\pm SD). Levels of plasma triglycerides were within the normal range for Italy. No subjects had history or clinical evidence of atherosclerotic, liver, kidney, gastrointestinal, or endocrine disease.

All subjects were studied at the end of two 3-week dietary periods. Throughout the study, the participants had three meals per day: breakfast, lunch, and dinner at 0800 hours, 1230 hours, and 1930

hours, respectively. For the first three weeks, subjects received diet I (low-fat diet); for the second 3 weeks, they received diet II (olive oil-rich diet). During the whole trial the daily caloric intake was evaluated so that each subject maintained a constant body weight. Diet II was obtained by eliminating all separable (seasoning and cooking) fats from diet I and by adding 100 g of olive oil. Average fat removed from diet I was 60 g; 70 g of carbohydrates also were removed to maintain the same caloric intake. Total caloric intake and body weight remained constant in each subject during the trial. The subjects were permitted to walk around the hospital premises but not to engage in any form of strenuous physical activity.

At the end of each 3-week dietary period, blood samples were collected after a 12-hour fast, and serum was separated by low-speed centrifugation (100 x g, 10 min) after one hour of clotting. Each sample was analyzed for total cholesterol, triglycerides, apoproteins A1 and B, HDL cholesterol, and HDL₃ cholesterol. A significant decrease (12.2%) was noted in the LDL cholesterol. HDL, HDL₂ and HDL₃ cholesterol and serum apo A1 mean levels remained unchanged after the olive oil diet. The mean LDL:HDL cholesterol ratio decreased by 9.4%. Olive oil administration for 21 days did not affect the cholesterol saturation index of bile, which was 0.804 ± 0.17 after diet I and 0.796 ± 0.11 after diet II. Similarly, gall bladder volume and motility were not influenced. In fact, fasting volumes were 19.56 ± 7.08 ml ($x \pm$ SD) before and 19.88 ± 9.6 ml after diet II. Residual volumes after meal were 9.93 ± 5.05 ml before and 9.22 ± 7.03 ml after diet II, corresponding to 51 and 50% reduction, respectively (difference was not significant).

Two conclusions can be drawn from this study. First, olive oil represents a good source of natural fat for the dietary control mild hypercholesterolemia. In fact, it is as effective as polyunsaturated fatty acid-enriched vegetable oils in reducing serum cholesterol levels without interfering with HDL metabolism. Second, raising the fat content (percent of total calories) of the diet by using olive oil represents a good strategic approach for the dietary lowering of cholesterol levels.

Elevation of blood cholesterol levels is a major cause of coronary artery disease. It has been established beyond a reasonable doubt that lowering definitely elevated blood cholesterol levels (specifically blood levels of low density lipoprotein [LDL] cholesterol) will reduce the risk of heart attacks caused by coronary heart disease. Saturated fats have been shown repeatedly to raise plasma cholesterol and LDL levels. Monounsaturated fatty acids would be a good substitute for saturated fatty acids. The former do not reduce plasma cholesterol quite as much as polyunsaturates do, but they nevertheless have certain potential advantages. The human

body synthesizes considerable quantities of monounsaturated fatty acids, and thus these fatty acids probably do not possess any inherent "toxicity". Large amounts of monounsaturates are ingested as olive oil in the Mediterranean region without evidence of adverse effects. Indeed, the prevalence of CHD in this region of the world is relatively low compared to countries where ingestion of saturated fat is high.^{22,8}

At present, no inexpensive sources of natural monounsaturated fats similar to olive oil are readily available in the U.S., but there are several potential sources of monounsaturates which could be explored were they deemed a useful substitute for saturated fat. With regard to the safety of various dietary fats, it must be stressed that olive oil has been used without any adverse effect for thousands of years as the major fat component in the diets of Mediterranean populations.

Conclusion

Olive oil represents a good source of natural fat for the dietary control of mild hypercholesterolemia. Raising the fat content (percent of total calories) of the diet by using olive oil represents a good strategic approach for the dietary lowering of cholesterol level. In any event, it is reassuring that the various regions of Mediterranean countries, high intakes of fat in the form of olive oil do not appear to affect health negatively. On the contrary, the liberal use of olive oil might be, in part, responsible for the low rates of coronary heart disease in these countries.

In biblical times, "holy" oils usually included a base of olive oil with myrrh, frankincense, sweet calamus, and cassia (cinnamon) added. When used in anointing, the precious olive oil and the sweet-smelling liquid contributed to the religious effect.²³ The Bible, the Talmud and the Qur'an all speak of the olive and olive oil in various terms, as a good oil, and for anointing for the body. Now science has given full praise about the curative properties of olive oil. A learned scholar and scientist of our time has said this in a very beautiful way: "... Mankind has only begun to unravel the mysteries of substances the Holy Qur'an described."²⁴

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