

**Evidence of hypolipemiant and antioxidant properties
of Argan oil derived from the Argan tree (*Argania spinosa*)**

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Introduction. Seaton's Argan oil is extracted using traditional methods from the kernels of the nuts of the fruit of the Argan tree (*Argania spinosa*). It has been used for centuries for skin, hair and nail care, where it helps to soften, strengthen, moisturise and protect. It is also said to have a regenerating effect, helping stretch marks and accelerating skin healing. Virgin Argan oil is of interest in cardiovascular risk prevention due to its fat composition and antioxidant compounds.

Argan oil is primarily comprised of fatty acids and a variety of phenolic compounds. The majority of the fat content of Argan oil comes from oleic and linoleic acid. Approximately 29–36% of the fatty acid content of Argan oil comes from linoleic acid, or omega-6, making it a good source of this essential nutrient.

Oleic acid, though not essential, makes up 43–49% of the fatty acid composition of Argan oil and is also a very healthy fat. Found in olive oil as well, oleic acid is renowned for its positive impact on heart health.

Additionally, Argan oil is a rich source of vitamin E, which is required for healthy skin, hair and eyes. This vitamin also has powerful antioxidant properties.

A crucial step in the pathogenesis of atherosclerosis is believed to be the oxidative modification of low density lipoprotein (LDL). The oxidation of LDL is a free radical driven lipid peroxidation process and the aldehyde products of lipid hydroperoxide breakdown are responsible for the modification of the LDL apoprotein.

Oxidation of LDL is proposed to accelerate atherogenesis by the following sequence of events. LDL accumulates in atherosclerotic plaques, presumably due to interaction with intimal proteoglycans. The LDL then undergoes oxidation, and aldehydic products of lipid peroxidation such as HNE or other aldehyde products derived from lipid peroxidation, induce blocking of lysine residues on apo B. This

results in its recognition by the scavenger receptor on tissue macrophages at sites in which LDL concentrations are low. At sites in which the LDL concentration is high, modification with such products induces intermolecular cross-linking and particle aggregation. The aggregated, oxidized LDL particles are then phagocytosed by tissue macrophages to induce lipid loading of these cells and the formation of foam cells, a characteristic of the earliest atherosclerotic lesion. By these mechanisms oxidation of LDL accelerates atherogenesis.

Aim. We investigated with Moroccan subjects the effect of regular virgin Argan oil consumption on lipid profile and antioxidant status and the *in vitro* effect of Argan oil minor compounds (tocopherols, sterols and polyphenols) on LDL peroxidation.

Materials and Methods. Healthy subjects (20 men, 76 women) were studied. Sixty-two were regular consumers of Argan oil and 34 were non-consumers. Fasting plasma lipids, antioxidant vitamins and LDL oxidation susceptibility were analyzed. *In vitro* LDL oxidation by phenolic and apolar compounds of virgin Argan oil were performed.

Results and Discussion. Diet composition of Argan oil consumers has a higher significant content of polyunsaturated fatty acids than that of non-consumers (8.8 ± 1.0 vs. 6.6 ± 0.9 g, $p < 0.05$). Subjects consuming Argan oil have lower levels of plasma LDL cholesterol (12.7%, $p < 0.05$) and Lp(a) (25.3%, $p < 0.05$) compared with the non-consumers. In Argan oil consumers, plasma lipoperoxides were lower (58.3%, $p < 0.01$) and molar ratio alpha-tocopherol/total cholesterol (21.6%, $p < 0.05$) and alpha-tocopherol concentration (13.4%, $p < 0.05$) were higher compared with the non-consumers group. In spite of higher levels of plasma antioxidant and lower levels of lipoperoxides in Argan oil consumers, LDL oxidation susceptibility remained fairly similar. A strong positive correlation was observed between increasing phenolic extract, sterol and tocopherol concentrations and the LDL-Lag phase ($p < 0.05$).

Conclusions. The findings suggest for the first time that regular consumption of virgin Argan oil induces a lowering of LDL cholesterol and has antioxidant properties. This oil offers an additional natural food to reducing cardiovascular risk.