

Dose response of almonds on coronary heart disease risk factors: blood lipids, oxidized low-density lipoproteins, lipoprotein(a), homocysteine, and pulmonary nitric oxide a randomized, controlled, crossover trial.

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Abstract:

Background-Although recent studies have indicated that nut consumption may improve levels of blood lipids, nuts are not generally recommended as snacks for hyperlipidemic subjects because of their high fat content. Furthermore, the effective dose is still unknown. Methods and Results: The dose-response effects of whole almonds, taken as snacks, were compared with low-saturated fat (<5% energy) whole-wheat muffins (control) in the therapeutic diets of hyperlipidemic subjects. In a randomized crossover study, 27 hyperlipidemic men and women consumed 3 isoenergetic (mean 423 kcal/d) supplements each for 1 month. Supplements provided 22.2% of energy and consisted of full-dose almonds (73 ± 3 g/d), half-dose almonds plus half-dose muffins, and full-dose muffins. Fasting blood, expired air, blood pressure, and body weight measurements were obtained at weeks 0, 2, and 4. Mean body weights differed <300 g between treatments. The full-dose almonds produced the greatest reduction in levels of blood lipids. Significant reductions from baseline were seen on both half and full-dose almonds for LDL cholesterol ($4.42 \pm 1.7\%$, $P=0.018$, and $9.4 \pm 1.9\%$, $P<0.001$, respectively) and LDL: HDL cholesterol ($7.8 \pm 2.2\%$, $P=0.001$, and $12.0 \pm 2.1\%$, $P<0.001$, respectively) and on full-dose almonds alone for lipoprotein(a) ($7.8 \pm 3.5\%$, $P=0.034$) and oxidized LDL concentrations ($14.0 \pm 3.8\%$, $P<0.001$), with no significant reductions on the control diet. No difference was seen in pulmonary nitric oxide between treatments. Conclusions: Almonds used as snacks in the diets of hyperlipidemic subjects significantly reduce coronary heart disease risk factors, probably in part because of the nonfat (protein and fiber) and monounsaturated fatty acid components of the nut. (*Circulation*. 2002;106:1327-1332.)