

Nut Consumption Lower Cardiovascular Risk: Lights and Shadows -

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About one third of annual worldwide mortality for both man and women is attributed to cardiovascular disease (CVD), making it the main cause of global death, especially in developed countries [1,2]. Elevated serum levels of total cholesterol, low-density lipoprotein (LDL) cholesterol, triglycerides, and hypertension, diabetes, cigarette smoking, overweight or obesity, physical inactivity and atherogenic diet are the most important risk factors associated with the development and progression of CVD [3]. Numerous epidemiological studies have shown that a diet rich in fruits and vegetables and poor in saturated fat reduce risk of CVD [4,5]. Recently, it has been shown that some dietary components, as stanols/sterols, viscous fibers, mono- and polyunsaturated fatty acids, are able to reduce the serum levels of total cholesterol and LDL cholesterol [6-11]. Nuts (as almonds, walnuts, pistachios, pecan nuts, peanuts) contain all these compounds in addition to other microcomponents [12,13], and several epidemiologic studies have shown that nut consumption for 4 or more serving a week is responsible to reduce by 37% the mean coronary heart disease (CHD) risk, respect to rare or no consumption [14-16], with a mean reduction of 8.3% for each incremental serving per week [17]. In addition, numerous randomized, controlled human intervention trials have shown that nut consumption reduced blood levels of total cholesterol and LDL cholesterol [18-24]. These results have been considered a sufficient basis by the US Food and Drugs Administration, which in 2003 issued a qualified health claim stating that eating 43 g/die of nuts as part of a diet low in saturated fats and cholesterol may reduce the risk of heart disease [25].

Despite the qualified US FDA claim has pointed out the disagreement in the scientific evidence so far available, we believe that, nevertheless, it has been a strong impulse for conducting studies that, in our humble opinion, have not helped to clarify the real potential benefit of nuts.

The large epidemiological studies [26-29] conducted to verify beneficial effects of nuts suffer from several limitations associated with epidemiological studies, i.e. the necessity to generalize the final result, neglecting variables of population studied. Most of the studies based on dietary interventions were conducted on almonds and walnuts; conflicting results emerge from those studies and many reports showed only modest benefits very often lacking of statistical significance. On the other hand, the results obtained from interventional studies with other nuts (i.e. pecan nuts, pistachios, macadamia, peanuts) can not be considered significant both because of study numbers and the limited number of individuals enrolled (Table 1).

Studies on almonds and walnuts were performed following different treatment protocols (grams nuts/die; treatment time; different feature of enrolled subjects) and the pooled results lack of statistical significance.

Many studies showed that a higher dietary intake of unsaturated fat acids it is not responsible of a significant reduction of CVD risk [62,63]. In addition, other studies showed that introduction of almonds or walnuts into the diet does not give a significant effect on blood lipids [42,64].

This is the question! Is it just a change in lifestyle (balanced diet, reduced intake of alcoholic beverages, cessation of cigarette smoking,

Nut	Number of studies	Group's features	Intervention time
Walnuts	15 [19,20,30-42]	Healthy, hyperlipidaemic, hypercholesterolemic, diabetes, overweight/obese, metabolic syndrome, prostate disease	Mean: 7.69 (week) From 3 to 24 weeks
Almonds	12 [20,41,43-52]	Healthy, hypercholesterolemic, hyperlipidaemic, diabetes	Mean: 7.08 (week) From 3 to 24 weeks
Pistachios	5 [21, 53-56]	Healthy, hypercholesterolemic, overweight/obese	Mean: 5.2 (week) From 3 to 12 weeks
Macadamia	3 [24,57,58]	Healthy, hyperlipidaemic, hypercholesterolemic	Mean: 4.33 (week) From 4 to 5 weeks
Pecans	2 [23,59]	Healthy, hypercholesterolemic	Mean: 5.33 (week) From 4 to 8 weeks
Hazelnuts	1 [22]	Healthy	4 weeks
Brazil nuts	1 [60]	Healthy	2 weeks
Cashew nuts	1 [37]	metabolic syndrome	8 weeks
Peanuts	1 [61]	hypercholesterolemic	4 weeks

Table 1: Features of enrolled subjects and dietary intervention time in studies on nuts.

weight control, increased physical activity) being able to positively change the serum lipid profile as observed in the interventional studies based on the introduction of nuts into the diet?

Further investigations carried out following straight protocols more similar to the drug evaluation will be necessary to clarify the real beneficial effects produced with the introduction of nuts into the diet.

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