Lower LDL Cholesterol with Australian Almonds

As An Important Part Of A Healthy Diet

AUSTRALIAN ALMONDS

For Health Professionals

Key Findings

As a result of diet and lifestyle factors, cardiovascular disease (CVD) remains the leading cause of death in Australia. Excessive dietary saturated fat, elevating blood cholesterol levels impact the health of many. By including almonds in a balanced diet, blood lipids improve, reducing CVD risk.

Studies have revealed a linear dose response to almonds with a 1% reduction in low density lipoprotein cholesterol (LDL-C) resulting from each 7g serve of almonds and with this, a 2% reduction in CVD. From clinical trials, where the diet has been manipulated to accommodate larger serves of almonds (68-84g/day), there is up to a 10% reduction in LDL-C.

Mechanisms that may account for the reductions seen in cohort and clinical intervention studies are likely due to the unique food matrix, including favourable fatty acids, antioxidant effects, fibre, and to a lesser extent, the protein profile, minerals and folate.

Almonds & Cholesterol Lowering

In Australia, saturated fat intake is too high[1]. As a consequence, elevated blood cholesterol remains a significant health issue despite the availability of medications and manufactured functional foods aimed at cholesterol lowering. Lowering total cholesterol and the proportion of LDL-C specifically, is an important biochemical change, as decreasing the high density lipoprotein cholesterol (HDL-C) may increase the risk of CVD.

There is scientific consensus supporting a true reduction in CVD risk by targeting the key biomarkers: LDL cholesterol and blood pressure[2]. Almonds have been shown to decrease LDL-C, one of the most critical biomarkers for heart disease and there is early clinical evidence demonstrating that almonds also assist with lowering blood pressure[3].

In a review of the four large prospective epidemiological studies[4-7], Kelly and Sabate concluded that there was a 37% reduction in CVD risk for those consuming nuts more than four times per week compared to those who never, or seldom, consume nuts[8]. Overall, there was a reduction in risk of CVD death of 8.3% for each 30g serving of nuts consumed weekly[8]. In clinical trials, larger serves of almonds have achieved up to a 10% reduction in LDL-C[9] whilst as little as 7g of almonds achieves a 1% reduction in LDL-C[10] and this is supported by others[11 12]. Importantly, for every 1% reduction in LDL-C there is approximately a 2% reduction in risk of CVD[13 14].

The cholesterol reduction associated with almond consumption, has been primarily been attributed to the replacement of saturated fat with MUFA. The addition of MUFA to the diet from almonds also reduces the LDL:HDL cholesterol ratio[12]. However, almonds contain a number of positive nutritional features and bioactive substances within the food matrix. The fatty acid and amino acid profile, the Vitamin E antioxidant content, folic acid level, minerals and other phytochemicals contained in almonds work synergistically to reduce CVD risk beyond what can be measured with cholesterol testing alone[15].

Almonds: Their Unique Composition

Fat

Whilst almonds are considered high in fat, they have a favourable fatty acid profile. The polyunsaturated to saturated fat ratio is 4 but MUFA predominates, totalling 65% of the total fat, being mostly oleic acid[16]. MUFA may have an advantage over polyunsaturated fatty acids because enrichment of lipoprotein lipids with MUFA increases their resistance to oxidation[17].

Vitamin E

Almonds contain a significant amount of alpha tocopherol (28mg/100g), a recognised antioxidant with the potential to reduce the amount of LDL particles that are oxidised by free radicals[16]. Oxidised LDL may adhere to the endothelial wall and is responsible for the progression of atherosclerosis. The amount of Vitamin E in almonds is higher than other nuts[18] and may potentially contribute to the reduced risk of atherosclerosis development[19]. Studies have also documented elevated levels of Vitamin E and increased total plasma antioxidant capacity following consumption of just one handful of almonds[19 20].

Phytosterols

Almonds contain 115-199mg/100g of phytosterols: b-sitosterol, campesterol and stigmasterol[21 22]. It is known that phytosterols and in particular, sitosterol – the most abundant plant sterol in almonds - interfere with cholesterol absorption and lower blood LDL cholesterol concentrations[23]. There have been some suggestions that phytosterols work best when in a fat matrix, as is the case with almonds.

Fibre

Almonds contain between 8.8g - 10.4g/100g of fibre[16 22]. They contain soluble fibre but a larger proportion is insoluble fibre, also linked with CVD protection. For those consuming whole almonds as a snack, the fibrous coat may play a role in nutrient release, satiety and possibly also weight control[24-27]. Current recommendations are to increase dietary fibre and as nuts rank after cereals in their fibre content, they make a valuable contribution to the diet[1].

Understanding the mechanism & the dose

Almonds are high in the monounsaturated fatty acid, oleic acid, which demonstrates some similarities to omega-3 fatty acids in its ability to down regulate pro-inflammatory cytokines and reduce cellular adhesion particularly in endothelial dysfunction and atherosclerosis[17]. Furthermore, studies consistently show that saturated fatty acids impair endothelial function and the administration of the nutrients present in nuts like almonds, counteract these effects[17]. In studies using almonds, researchers have established that their effect on cholesterol lowering and, on disease reduction, is influenced by more than just the fatty acid profile, emphasising the importance of all nutrient components, fibre and other bioactives[28].

30 grams of almonds have been shown to lower LDL cholesterol.

This quantity represents 'a healthy handful' and is approximately 25 almonds which provides about 750kJ.

This amount of almonds has been shown to displace other snack foods in the diet, improving satiety and nutritional intake[27 29]. To date, studies of free-living individuals from cohort and short term intervention studies[9-12 30], do not indicate that body mass index or weight gain is a concern with more than double the amount of almonds suggested here[31 32].

For further information go to www.australianalmonds.com.au

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