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Walnut and Coronary Heart Disease Health Claim – LDL cholesterol
10-15-02

Submitted by Alice H. Lichtenstein, D.Sc., Stanley N. Gershoff Professor of Nutrition Science and Policy and Senior Scientist and Director, Cardiovascular Nutrition Laboratory, Gerald J. & Dorothy R. Friedman School of Nutrition Science & Policy and Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University.

In your opinion, are any of the observed LDL-cholesterol lowering effects in persons in the clinical trials who consumed diets containing walnuts most likely due to a unique characteristic(s) of walnuts, due to changes in the fatty acid profile of the diets, or due to some other factor(s) (e.g. flaws in study design, etc.)? What are the bases for your conclusions?

In my opinion there is no evidence that a unique characteristic of walnuts accounts for the differences in lipids reported. One study (Abby et al. 1994, see table) would directly argue against there being a unique characteristic because the differences in LDL-cholesterol levels reported between the reference diet and walnut or almond diets are similar and appear to be attributable to reductions in saturated fatty acid intake content of both diets.

In some studies the authors state that the predicted change in LDL-cholesterol levels exceeds that which would have been predicted using the standard equations. It should be pointed out that the equations were not intended to be used for small sample sizes and although they provide an interesting discussion point the results do not add additional supporting data. In some case it appears that the *trans* fatty acid content of the diet, in addition to the saturated fatty acid and cholesterol content of the diet, was also decreased when walnuts were used to displace fats and oils. This change may have contributed to the greater than predicted LDL-cholesterol lowering (please refer to original review submitted on this topic for more detail).

Although it is difficult to quantify the individual effect of differences in saturated fatty acids, *trans* fatty acids and cholesterol intakes relative to walnuts, per se, on changes in the LDL-cholesterol levels reported, with the exception of one study (Almario et al. 2001, see table), all the differences would favor a decrease in LDL-cholesterol levels. Regarding the Almario et al. study, reported increases in energy intake in the absence of increases in body weight suggest the possibility that food intake was not accurately assessed.

The information used to make these assessments is summarized in the table that follows. If further clarification is required please let me know and it will be provided.

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Alice H. Lichtenstein, D.Sc.

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Study	Δ LDL-C reduction	Potential mechanism for change in LDL-C			
		Unique characteristic walnuts	Δ f.a. profile diet	Δ B.W.	other
Sabate et al. 1993	16% ↓		Step 1 v walnut diet ↓ SFA - 9% v 6% ↓ chol. - 237mg v 125mg/day potential decrease <i>trans</i> f.a.		
Abby et al. 1994	9% ↓	effect walnuts and almonds indistinguishable	reference v walnut v almond diets ↓ SFA - 6% v 9% v 8%		
Chisholm et al. 1998	N.S.		low fat v walnut diets ↑ total fat - 30% v 38% ↓ SFA - 12 % v 10% ↓ chol. - 320 mg v 230 mg/day		significant decrease apo B
Zambon et al. 2000	6% ↓		control v walnut diets → SFA - 7% v 6% → chol. - 221 v 166 mg/day		No apparent dietary explanation, combined differences in SFA, chol. and PUFA content of walnut diet may have contributed.
Munoz et al. 2001 (substudy of Zambon et al. 2000)	6% ↓ N.S.		control v walnut → SFA - 6.0% v 5.5% → chol. - 222 v 167 mg/day		Sub-study of Zambon et al., 10 out of the 49 original subjects. Failed to achieve sig. dif. in LDL-C originally reported.
Iwamoto et al. 2002	9% ↓		control v walnut ↓ SFA - 6.9% v 4.8% ↓ chol. - 279 v 252 mg/day potential ↓ <i>trans</i> f.a.		
Almario et al. 2001	high fat N.S. low fat 12% ↓		high fat control (HFC) v high fat walnut (HFW) HFC v HFW ↓ SFA - 11% v 9.8% chol. ? low fat control (LFC) v low fat walnut (LFW) LFC v LFW ↓ SFA - 7.5% v 8.2% chol. ?	HFC v HFW, → in body weight LFC v LFW, ↓ in body weight	Subjects were told to add walnuts to their diet with no apparent guidance on what specific foods to displace. Authors reported an ↑ in energy intake in the absence of change or ↓ in body weight. Suggests assessment of diet during intervention phases may not have been accurate.