

ORIGINAL RESEARCH COMMUNICATION

Effect of soy protein from differently processed products on cardiovascular disease risk factors and vascular endothelial function in hypercholesterolemic subjects^{1, 2, 3, 4}

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Background: The magnitude of the effect of soy protein on lipoprotein concentrations is variable. This discordance is likely attributable to the various forms of soy protein used and to unrecognized shifts in dietary fatty acid, cholesterol, and fiber.

Objective: The objective was to evaluate the effect of soybean processing as well as soy consumption relative to animal protein, independent of alterations in major dietary variables, on cardiovascular disease risk factors and vascular endothelial function.

Design: Twenty-eight hypercholesterolemic subjects (LDL cholesterol ≥ 3.36 mmol/L) aged >50 y consumed each of 4 diets for 6-wk periods according to a randomized crossover design. The diets [55% of energy as carbohydrate, 30% of energy as fat, and 15% of energy as protein—7.5% of energy as experimental protein (37.5 g/d)] were designed to contain products made from either whole soybeans, soyflour, or soymilk and were compared with a diet containing an equivalent amount of animal protein (meat, chicken, and dairy products). The cholesterol, fiber, and fatty acid profiles of the diets were equalized. All food and drink were provided, and body weight was maintained throughout the study.

Results: No significant differences in blood pressure, vascular endothelial function, or total cholesterol, VLDL-cholesterol, triacylglycerol, apolipoprotein B, or C-reactive protein concentrations were observed between the diets. Consumption of the soymilk diet resulted in a modest decrease (4%) in LDL-cholesterol concentrations compared with the animal-protein and soyflour diets ($P < 0.05$) and higher HDL-cholesterol (1%) and apolipoprotein A-I (2%) concentrations compared with the soybean and soyflour diets ($P < 0.05$).

Conclusions: The results suggest that the consumption of differently processed soy-based products and different types of protein (animal and soy) has little clinical effect on cardiovascular disease risk factors, including peripheral endothelial function, when other major dietary variables are held constant.

Key Words: Soy protein • lipids • lipoproteins • apolipoproteins • cholesterol • endothelial function

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