

## Soy-diet has beneficial effects on cardiovascular parameters that are independent of its lipid effect in male hypercholesterolemic rats

Fatehi, M.<sup>a</sup>, Farrokhfall, K.<sup>a</sup>, Davoudi, S.<sup>a</sup>, Collins, T.M.<sup>b</sup>, Fatehi-Hassanabad, Z.<sup>abc</sup>

<sup>a</sup> Department of Physiology and Pharmacology, Faculty of Medicine, **Mashhad University of Medical Sciences, Mashhad, Iran**

<sup>b</sup> Department of Biomedical **Sciences**, Atlantic Veterinary College, **University of Prince Edward Island**, Charlottetown, PE C1A 4P3, Canada

<sup>c</sup> Department of Biomedical **Sciences**, **University of Prince Edward Island**, Charlottetown, PE C1A 4P3, Canada

[View references \(27\)](#)

### Abstract

Diet-induced atherosclerosis is lower in animals fed soy protein. The effects of various soy components have been extensively studied; however, little is known about the effect of crude soybean feeding on hypercholesterolemia-induced cardiovascular changes. This study investigated the effect of soy feeding on cardiovascular parameters in hypercholesterolemic male rats. Total cholesterol (TC), low density lipoprotein (LDL) and high density lipoprotein cholesterol (HDL), and triglyceride (TG) were measured. Rats were randomly assigned to control, high cholesterol (HC, 2% cholesterol) or HC + soy (HC+S) diets. In the HC+S group, rats received HC diet for 10 weeks followed by 7 weeks of soybean feeding. Arterial blood pressure, TC, TG, LDL and HDL were measured. TC, TG and LDL were higher in HC rats and were not significantly reduced by soybean feeding. Soy feeding reversed the HC-induced increase in arterial blood pressure and also restored the impaired vascular responses to acetylcholine in isolated aortic rings. Pre-incubation of HC+S aortic rings with L-NAME ( $10^{-5}$  M for 10 min) partially reduced the effects of soy on acetylcholine responses, indicating that the beneficial vascular effects of dietary soy are partially mediated via nitric oxide pathway. Copyright © 2009 John Wiley & Sons, Ltd.

### Author keywords

Acetylcholine; Cholesterol; L-NAME; Rat; Soybean

### Indexed Keywords

**ENTREE drug terms:** acetylcholine; high density lipoprotein cholesterol; lipid; low density lipoprotein cholesterol; n(g) nitroarginine methyl ester; nitric oxide; soybean protein; triacylglycerol; cardiovascular agent

**ENTREE medical terms:** animal experiment; animal model; arterial pressure; article; blood vessel reactivity; cardiovascular parameters; cholesterol blood level; controlled study; diet; hypercholesterolemia; incubation time; male; nonhuman; rat; soybean; triacylglycerol blood level; vascular ring; animal; aorta; blood; blood pressure; cholesterol intake; diet therapy; drug effect; metabolism; randomization; Sprague Dawley rat

**Species Index:** Animalia; Glycine max; Rattus

**MeSH:** Animals; Aorta; Blood Pressure; Cardiovascular Agents; Cholesterol, Dietary; Cholesterol, HDL; Cholesterol, LDL; Diet; Hypercholesterolemia; Male; NG-Nitroarginine Methyl Ester; Nitric Oxide; Random Allocation; Rats; Rats, Sprague-Dawley; Soybeans; Triglycerides

*Medline is the source for the MeSH terms of this document.*

**Chemicals and CAS Registry Numbers:** acetylcholine, 51-84-3, 70-31-1, 77-23-9; lipid, 66400-18-3; n(g) nitroarginine methyl ester, 5903-99-7; nitric oxide, 10102-43-9; soybean protein, 910-10-0; Cardiovascular Agents; Cholesterol, Dietary; Cholesterol, HDL; Cholesterol, LDL; NG-Nitroarginine Methyl Ester, 5903-99-7; Nitric Oxide, 10102-43-9; Triglycerides