

## SOY AND HEART HEALTH

---

Soy protein plays an important role in a heart healthy diet. Rich in polyunsaturated fats and low in saturated fats, soyfoods also contain dietary fibre, deliver high-quality lean protein and contribute key vitamins and minerals, such as calcium and potassium. Soyfoods are a delicious and nutritious part of a healthy, balanced diet and can replace less healthy foods that are high in saturated fat and cholesterol.

A strong body of research into soy protein and heart disease prevention has prompted many health experts to endorse the value of soy protein within a low fat, low cholesterol diet. In 1999, The Food and Drug Administration (FDA) approved an unqualified health claim in support of soy's heart health benefits, which came in response to a body of scientific evidence compiled, reviewed and presented by The Solae Company. The approved health claim is based on scientific evidence from more than 50 independent studies.

Since that time, other six health authorities around the world including, Korea, Japan, Brazil, Philippines, Indonesia, and UK have approved claims in support of FDA's conclusion that soy protein consumption benefits heart health.

[What is a good source of soy protein?](#)

[Why is heart health such a major concern?](#)

[How can soy protein contribute to heart health?](#)

[How does soy protein lower cholesterol?](#)

[Is cholesterol-lowering the only way soy protects the heart?](#)

[FDA heart health claim for soy protein](#)

[References](#)

### What is a good source of soy protein?

[Back to menu](#)

The Canadian Heart and Stroke Foundation states that research shows consuming soy products may help reduce elevated levels of LDL (bad) cholesterol. Soy protein is high quality vegetable protein found in soybeans and products made from them — including tofu, tempeh and soy beverages. A glass of soy beverage contains the same amount of protein as a glass of milk, but is lactose-free. Look for soy beverages fortified with calcium and vitamin D.

There is a wide range of nutritious and great tasting soy protein rich foods available in Canadian supermarkets that can provide the recommended 25g of soy protein per day, (see table below for examples).

FOOD	SOY PROTEIN CONTENT
So Good, Regular (1 cup/250ml)	9g
So Good flavoured soymilk e.g. So Good Vanilla (1 cup)	9g
Soy protein powder (31g approx 1 heaped tbsp)	25g

Tofu (100g approx small handful)	11g
So Good non-dairy frozen dessert (approx 1 cup)	4.5g
Soybeans, cooked (1/2 cup)	11.5g
Soy nuts (roasted soy beans, 1/3 cup)	10g
Yogurt-style cultured soy (1 tub 200g)	6.5g

### **Why is heart health such a major concern?**

[Back to menu](#)

Cardiovascular disease (CVD) is a major public health concern in Canada. Eight in ten Canadians have at least one risk factor for cardiovascular disease (CVD), and 11% have three risk factors or more, according to The Growing Burden of Heart Disease and Stroke in Canada 2003, a Heart and Stroke Foundation report prepared in collaboration with Health Canada and the Canadian Cardiovascular Society.

A major risk factor for CVD is high blood cholesterol levels. Traditionally, Canadian doctors have defined total cholesterol levels greater than 5.2 mmol/L as being excessive and unhealthy. Estimates of Canadians with elevated cholesterol levels are: men: 48% and women, 43%. "High-risk" total cholesterol levels are defined as total cholesterol greater than 6.2 mmol/L. Estimates of Canadians with high risk cholesterol levels are men: 18% and women: 16%. Other risk factors for CVD include high blood pressure, overweight and tobacco smoking. (Canadian Heart and Stroke Foundation)

### **How can soy protein contribute to heart health?**

[Back to menu](#)

Clinical studies show that soy protein consumption may lower blood cholesterol.

Results from a meta-analysis of 38 clinical studies concluded that soy protein consumption resulted in a significant reduction in total blood cholesterol and LDL cholesterol compared to animal protein consumption.<sup>1</sup> Why is this important? Lowering the concentration of blood cholesterol is associated with a reduction in risk of coronary heart disease.

### **How does soy protein lower cholesterol?**

[Back to menu](#)

The evidence showing that soy protein is effective in lowering blood cholesterol levels is overwhelming. Researchers are actively examining why this is the case and recent studies suggest that isoflavones play an important role in the cholesterol-lowering properties of soy protein.

Isoflavones are a group of plant chemicals called phytoestrogens that are virtually absent from the traditional Western diet. Soy is a naturally rich source of these compounds. Recent research strongly suggests that isoflavones in their naturally occurring combination with soy protein play a critical role in the ability for soy protein to lower blood cholesterol levels.

A study by Dr. J Robin Crouse<sup>2</sup> at Wake Forest University, USA, showed a very clear relationship between the amount of isoflavones naturally present in the soy protein and the ability to lower cholesterol. Soy protein containing high levels of isoflavones elicited a significant reduction in cholesterol levels. If the isoflavones were at very low levels or virtually absent from the soy protein then no reduction in cholesterol was observed.

But isoflavones don't act alone. Australian research recently published by Dr. Leon Simons and colleagues<sup>3</sup> from St. Vincent's Hospital in Sydney, has shown that soy isoflavones cannot bring about a reduction in cholesterol when consumed alone, i.e. as a supplement or pill. The study showed that 80mg/day of soy isoflavones (two tablets containing 40mg of isoflavones) did not bring about a change in blood cholesterol level in the subjects studied.

Soy protein in combination with its naturally occurring isoflavones is required to elicit a cholesterol lowering benefit. The search for a complete understanding of the mechanism to fully explain soy protein's cholesterol-lowering properties continues.

### **Is cholesterol-lowering the only way soy protects the heart?** [Back to menu](#)

The isoflavones found naturally in soy protein may protect the heart in other ways. Isoflavones are known to act as anti-oxidants and studies have shown that an important part in the development of atherosclerotic plaques involves the oxidation of LDL cholesterol. Dr. Jonathon Hodgson and colleagues from the University of Western Australia<sup>4</sup>, plus researchers from other centres have shown that the isoflavones in soy inhibit lipoprotein oxidation.

Soy isoflavones inhibit other processes that are key in the formation of plaques inside the arteries<sup>5</sup>. Soy isoflavones may also influence the formation of blood clots<sup>6</sup> that block arteries, which are one of the factors responsible for 'heart attack'.

More recent research indicates that soy protein helps to relax blood vessels<sup>7</sup> and lower blood pressure levels<sup>8,9</sup>. In addition, soy protein with isoflavones, combined with soy fibre has been shown to reduce homocysteine levels<sup>10</sup>, a key marker of heart disease risk. Further research in these areas, however, is needed.

### **FDA heart health claim for soy protein**

[Back to menu](#)

In October of 1999 the United States Food and Drug Administration (FDA) announced that it had approved for the use of a health claim on food labels, on the relation between the consumption of soy protein and the reduced risk of coronary heart disease. Food products that contain at least 6.25g of soy protein per serving will be permitted to feature the following claim:

"25 grams of soy protein a day, as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease. A serving of fortified soy beverage supplies 6.25 grams of soy protein."

The FDA examined the evidence from 53 clinical trials and took into account comments from the public and other interested parties before making their final decision. The FDA approval is an important endorsement of the overwhelming evidence that foods high in soy protein have major heart health benefits.

The FDA ruling recommends that people who want to lower their cholesterol levels and reduce their risk of heart disease should consume 25g of soy protein per day, which can be obtained by eating three to four servings per day of foods high in soy protein.

As a result of the FDA decision, the American Heart Association (AHA) experts announced the organization's recommendation for consumers that they could lower their cholesterol and the risk of heart disease by eating more soy protein with its naturally occurring phytochemicals<sup>11</sup>.

## References

[Back to menu](#)

1. Anderson JW, Johnstone BM, Cook-Newell ME, Meta-Analysis of the effects of soy protein intake on serum lipids, N Eng J Med 1995;333:276-282.
2. Crouse JR III, Morgan T, Terry JG, et al., A randomized trial comparing the effect of casein with that of soy protein containing varying amounts of isoflavones on plasma concentrations of lipids and lipoproteins, Arch Intern Med 1999;159:2070-2076.
3. Simons LA, von Konigsmark M, Simons J, et al., Phytoestrogens do not influence lipoprotein levels or endothelial function in healthy, postmenopausal women, Am J Cardiol 2000;85:1297-301.
4. Hodgson JM, Croft KD, Puddey IB, et al., Soybean isoflavonoids and their metabolic products inhibit in vitro lipoprotein oxidation in serum, J Nutr Biochem 1996;7:664-669.
5. Anthony MS, Clarkson TB, Bullock BC, et al., Soy protein versus soy phytoestrogens in the prevention of diet-induced coronary artery atherosclerosis of male cynomolgus monkeys, Arterioscler Thromb Vasc Biol 1997;17:2524-31.
6. Williams JK, Clarkson TB, Dietary soy isoflavones inhibit in-vivo constrictor responses of coronary arteries to collagen-induced platelet activation, Coronary Artery Dis 1998;9:759-764.
7. Figtree GA, Griffiths H, Lu Y-Q et al, Plant-derived estrogens relax coronary arteries in vitro by a calcium antagonistic mechanism, J Am Coll Cardiol 2000;35:1977-1985.
8. Washburn S, Burke GL, Morgan T, et al., Effect of soy protein supplementation on serum lipoproteins, blood pressure, and menopausal symptoms in perimenopausal women, Menopause 1999;6:7-13.
9. Teede JH, Dalais FS, Kotsopoulos D, et al., Soy protein dietary supplementation improves lipid profiles and blood pressure: A double-blind, randomized, placebo-controlled study in men and postmenopausal women, (abstract p25) Third International Symposium on the Role of Soy in Preventing and Treating Chronic Disease, Oct 31-Nov 3, 1999, Washington, DC, USA.
10. Hermansen K, Sondergaard M, Hoie L et al., Beneficial effects of a soy-based dietary supplement on lipid levels and cardiovascular risk markers in type 2 diabetic subjects, Diabetes Care 2001;24(2):228-33.
11. American Heart Association, Soy Protein and Cardiovascular Disease: A statement for Healthcare Professionals From the Nutrition Committee of the AHA, Circulation 2000;102:2555-2559.