



Vegetarian Nutrition

a dietetic practice group of the
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RD Resources for Consumers:

Health Effects of Soy

Soyfoods are the only commonly consumed foods that provide significant amounts of isoflavones.

Isoflavones, plant chemicals that are also called phytochemicals, have biological activity but are not nutrients. These compounds are referred to as plant estrogens or phytoestrogens. Foods that are rich in isoflavones include Asian soyfoods like tofu, soymilk, miso, and tempeh.

Most of these soyfoods contain about 3½ milligrams of isoflavones for every gram of protein. For example, ½ cup of regular tofu has about 8 grams of protein and about 28 milligrams of isoflavones. Certain types of food processing reduce the amount of isoflavones in foods. Products such as soy-based meat analogs often have much lower amounts of isoflavones.

In Japan and urban areas of China, people consume about one to two servings of soyfoods per day. Older people whose diets are more traditional often have much higher intakes than younger people. Since people in the U.S. eat few soyfoods, their isoflavone intake is very low.

Both isoflavones and the hormone estrogen bind to estrogen receptors in the breast and other tissues. There are two types of estrogen receptors in the body. These are estrogen receptor-alpha and estrogen-receptor-beta. Estrogen binds equally to both types, but isoflavones prefer estrogen receptor-beta. In tissues that have mostly estrogen-receptor alpha, estrogen has biological effects, but isoflavones may not. This means that isoflavones don't always act like estrogen. The effect of isoflavones likely depends in part on the type of estrogen receptors in different tissues.

Soyfoods and Cancer

In Asia, women who eat the most soy have a lower risk of breast cancer compared to women who eat little soy. But, evidence suggests that this is true only if they also ate soy early in life. Eating soyfoods during childhood and the teen years may protect breast tissue from cancer. Beginning soy consumption later in life doesn't appear to have any effect on risk of getting breast cancer.

However, women with breast cancer who eat soyfoods are less likely to see their cancer return and are less likely to die from their cancer. The American Cancer Society states that women with breast cancer can safely consume soyfoods.

Men may also benefit from eating soyfoods. In Asia, men who eat the most soy have about one-half the risk of getting prostate cancer compared to men who eat little soy. For men who have prostate cancer, soy may be helpful as well. One small study found that soy isoflavones reduced some of the side effects of treatment for prostate cancer.

Soyfoods and Heart Health

Adding soy protein to diets can lower blood cholesterol by as much as four percent. When soy is consumed in place of meat and other foods high in saturated fat, it reduces cholesterol even more. In older women, the isoflavones in soyfoods may improve the health of the arteries, making them more flexible.



Isoflavone Content of Selected Foods

Food	Total Isoflavone Content (mg)
Soybeans, mature, ½ cup, cooked	47
Tofu, silken, ½ cup	31.2*
Tofu, regular, ½ cup	29.7*
Edamame (green soybeans), ½ cup, cooked	28
Soy milk, 8 oz	23*
Soy imitation chicken, 3 oz	13.2*
Soy hotdog, 2 oz	9.7*
Soy cheese, 1 oz	8.8*
Soy veggie burger, 3 oz	8.4*
Soy oil, 1 tbsp	0

** isoflavone content varies according to brand*

Soyfoods and Bone Health

In older Asian women, eating more soy is linked to lower rates of bone fracture. The same results have not been seen in studies among western women where researchers fed large amounts of isoflavones to postmenopausal women. This may be another case where lifelong soyfood intake is helpful but taking supplements or eating soyfoods as an adult is not.



Menopause Symptoms

The hot flashes that plague many women after menopause are rare in Japan. Isoflavones may be part of the reason for this. Results of more than 50 studies conducted mostly in Western countries show that isoflavone supplements can reduce both the number and severity of hot flashes by about 50 percent. About two to three servings of soyfoods per day may be helpful.



Safety of Soyfoods

Human studies support the safety of both isoflavone supplements and soyfoods. Isoflavones have no effect on estrogen levels in women or testosterone levels in men. Clinical studies show they also have no effect on sperm or semen.



Soyfoods have no effect on thyroid function in people with normal thyroids. However, for those who take thyroid pills, changes in soyfood intake may require changes in the amount of medicine needed. Your doctor can make these adjustments.

Soy infant formula has been used by more than 20 million Americans over the past five decades. Evidence clearly shows that it produces normal growth and development. In recent years the high isoflavone content of soy has made soy infant formula controversial. However, the position of the American Academy of Pediatrics is that there is little concern about its safety.

Optimal Soyfood Intake

Average soyfood intake among Japanese adults ranges from about 1 to 2 servings per day. This can serve as a guide for a healthy amount of soy to consume. But some studies show that disease rates are lower with greater soyfood intake, about 2-3 servings per day. Studies have not shown any differences between the health effects of organic soyfoods versus those that are conventionally grown.

For More Information

Soy: What's the Harm by Jack Norris, RD

http://www.veganhealth.org/articles/soy_wth