

Soy and Health



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Soy foods have recently enjoyed increasing popularity. Soy foods include soybeans (also called edamame) and any other foods made from soybeans, including soymilk, tofu, tempeh, miso, and vegetarian meat and dairy substitutes, like soy meats and soy cheeses. Like most other plant foods, the most healthful choices in soy foods are those that are minimally processed so they retain all of their original nutrients. But because soy products are so widely consumed, some people have raised the question as to whether they are safe. Let's take a look at what medical studies show:

Cancer Prevention and Survival

Epidemiological studies have found that soy protein may reduce the risk for cancers including breast, colon, and prostate.¹

Studies show that women who include soy products in their routine are less likely to develop breast cancer, compared with other women. In January 2008, researchers at the University of Southern California found that women averaging one cup of soymilk or about one-half cup of tofu daily have about a 30 percent less risk of developing breast cancer, compared with women who have little or no soy products in their diets.² However, to be effective, the soy consumption may have to occur early in life, as breast tissue is forming during adolescence.^{3,4}

What about women who have been previously diagnosed with breast cancer? A study in the *Journal of the American Medical Association* reported results based on 5,042 women previously diagnosed with breast cancer who were participating in the Shanghai Breast Cancer Survival Study over a four-year period. The study showed that women who regularly consumed soy products, such as soymilk, tofu, or edamame, had a 32 percent lower risk of recurrence and a 29 percent decreased risk of death, compared with women who consumed little or no soy.⁵ An accompanying editorial suggested that inconsistencies in prior research may be attributable to the comparatively low soy consumption in the United States, making beneficial effects harder to identify.⁶ In China, soy intake is higher and diets tend to include traditional food sources of soy, rather than soy supplements. Other studies have found that there was no effect or a favorable effect on breast tissue density in women consuming soy.⁷

Why should soy products reduce cancer risk? Most research has zeroed in on *phytoestrogens* found in soybeans. (*Phyto*

means "plant.") These compounds are in some ways similar to the estrogens (female sex hormones) in a woman's bloodstream, but are much weaker. Some have suggested that they may keep estrogen levels under control as they can act both like a weak estrogen when body estrogen levels are low and can inhibit estrogen's effects when body estrogen levels are high.⁸

By analogy, the estrogens in a woman's body are like jumbo jets that have landed at an airport. Phytoestrogens are like small private planes that are occupying the Jetways, blocking the jumbo jets from attaching. This explanation is probably overly simplistic, but it may serve to illustrate how soy's weak hormonal compounds can have beneficial effects.

Fertility

Other concerns include whether soy has a negative effect on reproductive health. However, studies in both men and women have shown that soy did not hinder reproduction.^{9,10}

Also, adults who had been fed soy infant formula as infants were found to have no difference in their reproductive health when compared with adults who had been fed cow's milk formula.¹¹

Male Hormones

Although compounds in soy products have been likened to very weak female hormones, they have no adverse effects on men and may help prevent cancer in men. A meta-analysis to be published in *Fertility and Sterility*, based on more than 50 treatment groups, showed that neither soy foods nor isoflavone supplements from soy affect testosterone levels in men.¹² An analysis of 14 studies, published in the *American Journal of Clinical Nutrition* showed that increased intake of soy resulted in a 26 percent reduction in prostate cancer risk.¹³ Researchers found a 30 percent risk reduction with nonfermented soy products such as soy milk and tofu.

Fibroids

Soy products may reduce the risk of fibroids, knots of muscle tissue that form within the thin muscle layer that lies beneath the uterine lining. A study of Japanese women found that the more soy women ate, the less likely they were to need a hysterectomy, suggesting that fibroids were less frequent.¹⁴ In a study of women in Washington State, soy did not seem to help or hurt,

perhaps because American women eat very little soy, compared with their Japanese counterparts.¹⁵ What did have a big effect in this study were lignans, a type of phytoestrogens found in flaxseed and whole grains. The women consuming the highest amounts of these foods had less than half the risk of fibroids, compared with the women who generally skipped these foods. So, again, phytoestrogens seem beneficial, countering the effects of a woman's natural estrogens, although in this case the benefit comes from foods other than soy.

Thyroid Health

Clinical studies show that soy products do not cause hypothyroidism.¹⁶ However, soy isoflavones may take up some of the iodine that the body would normally use to make thyroid hormone.¹⁷ The same is true of fiber supplements and some medications. In theory, then, people who consume soy might need slightly more iodine in their diets. (Iodine is found in many plant foods, especially in seaweed and iodized salt.) Soy products can also reduce the absorption of medicines used to treat hypothyroidism.¹⁶ People who use these medicines should check with their health care providers to see if their doses need to be adjusted.

Other Health Effects

Soy products appear to reduce low density lipoprotein ("bad") cholesterol.¹⁸ They may also reduce the risk of osteoporosis-related hip fractures. In a study published in the *American Journal of Epidemiology*, women who consumed at least one-fourth cup of tofu per day, averaged a 30 percent reduction in fracture risk.¹⁹

Overnutrition

Soy products are typically high in protein. Some manufacturers have exploited this fact, packing isolated soy protein into shakes and turning it into meat substitutes. However, it may be prudent to avoid highly concentrated proteins from any source, including soy. It has long been known that cow's milk increases the amount of insulin-like growth factor in the bloodstream,²⁰ and this compound is linked to higher cancer risk. Some evidence suggests that highly concentrated soy proteins (indicated as "soy protein isolate" on food labels) can do the same.²¹ Simple soy products, such as tempeh, edamame, or soynuts, are probably best choices.

Summary

Evidence to date indicates that soy products may reduce the risk of breast cancer and breast cancer recurrence. They do not appear to have adverse effects on the thyroid gland, but may reduce the absorption of thyroid medications. The benefits of soy products appear to relate to traditional soy products, not to concentrated soy proteins.

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