

Is soy healthy?

Soy is not the health food that you think it is.

From tofu and tacos to baby formula and burgers, soy products have swept the nation as a healthy source of protein, with a reputation for being all natural and good for you. New studies have however raised questions over whether the ingredients in soy might increase the risk of breast [cancer](#) in some women, affect brain function in men and lead to hidden developmental abnormalities in infants.



The core of their concerns rests with the chemical makeup of soy: in addition to all the nutrients and protein, soy contains a natural chemical that mimics estrogen, the female hormone. Some studies in animals show that this chemical can alter sexual development. And in fact, 2 glasses of soy milk/day, over the course of one month, contain enough of the chemical to change the timing of a woman's menstrual cycle.

Isoflavones in soybeans

Soybeans contain an impressive array of phytochemicals (biologically active components derived from plants), the most interesting of which are known as isoflavones. Isoflavones are the compounds which are being studied in relation to the relief of certain menopausal symptoms, cancer prevention, slowing or reversing osteoporosis and reducing the risk of [heart disease](#).

Soy critics point to the fact that soybeans, as provided by nature, are not suitable for human consumption. Only after fermentation for some time, or extensive processing, including chemical extractions and high temperatures, are the beans, or the soy protein isolate, suitable for digestion when eaten.

Soybeans also reportedly contain an anti-nutrient called "phytic acid", which all beans do. However, soybeans have higher levels of phytic acid than any other legume. Phytic acid may block the absorption of certain minerals, including magnesium, calcium, iron and zinc. Epidemiological studies have shown that people in 3rd World Countries who have high consumption of grains and soy also commonly have deficiencies in these minerals. It must also be noted that this may be of particular concern with regard to babies who are using soy-based infant formulas.

What is the truth when it comes to soy?

So how does one get to the truth when it comes to soy? Usually, the first question I ask is... "Where is the money? Who has something to be gained from one side or the other?" With the soy issue, there does not seem to be an easy answer here either... and that's because there appear to be strong financial incentives on both sides of the argument.

Who has something to gain from the consumption of soy? Perhaps companies like Monsanto which produce the [genetically modified](#) soybean seeds. Perhaps companies like Cargill Foods or SoyLife which produce countless soy-based foods. Or soybean councils in several states which represent farmers who grow this new, emerging bumper crop. And, of course, all of the companies which are constructing factories all over the world to do the processing which is necessary to make soybeans edible.

Soy - more negatives than positives

I feel the positive aspects of the soybean are overshadowed by their potential for harm. Soybeans in fact contain a large number of dangerous substances. We already mentioned "phytic acid", also called "phytates". This organic acid is present in the bran or hulls of all seeds and legumes, but none have the high level of phytates which soybeans do. Phytic acid blocks the body's uptake of essential minerals like magnesium, calcium, iron and especially zinc. Adding to the high phytate problem, soybeans are highly resistant to phytate-reducing techniques, such as long, slow cooking.

Soybeans also contain potent enzyme-inhibitors. These inhibitors block uptake of trypsin and other [enzymes](#) which the body needs for protein digestion. Normal cooking does not de-activate these harmful antinutrients, which can cause serious gastric distress, reduced protein digestion and can lead to chronic deficiencies in amino acid uptake.

In addition, soybeans also contain hemagglutinin, a clot-promoting substance which causes red blood cells to clump together. These clustered blood cells cannot properly absorb oxygen for distribution to the body's tissues, and are unable to help in maintaining good cardiac health.

Hemagglutinin and trypsin inhibitors are both "growth depressant" substances. Although the act of fermenting soybeans does de-activate both hemagglutinin and trypsin inhibitors, cooking and precipitation do not. Although these enzyme inhibitors are found in reduced levels within precipitated soy products like tofu, they are not completely eliminated. For this reason, if you are going to consume soy, I would recommend limiting your soy use to fermented products only, like tempeh or miso.

Only after a long period of fermentation (as occurs in the creation of miso or tempeh) are the antinutrient and phytate levels of soybeans reduced, making their nourishment available to the human digestive system. The high level of harmful substances remaining in precipitated soy products leaves their nutritional value questionable at best, and potentially harmful.

Soy and hormonal balance

Just because tofu is of vegetable origin does not necessarily make it healthy.

Health-conscious Americans believe in the benefits of tofu, infant formula and other food products made from soybeans and soy extract. But their assumption is now being called

into question by Jill Schneider, associate professor of biological sciences at Lehigh University in Bethlehem, Pennsylvania.

In a study of hamsters completed under Schneider's direction, it was recently found that a component of soy beans - isoflavones - significantly accelerated the onset of puberty in the rodents.

These findings, which are similar to the results reported by labs which have experimented with rats, might be relevant to humans, Schneider says. She points out that many babies who are allergic to cow's milk are fed soy-based formulas which contain isoflavones. Isoflavones, she says, can act like estrogen, a natural hormone important in the development of both male and female humans.

It is child abuse to feed a baby soy formula. A baby fed soy will receive, through the phytoestrogens, the equivalent of approximately 5 birth control pills per day! The damage is incalculable.

There are other reasons to stay away from soy

A very large percentage of soy - over 90% - is [genetically modified](#) and it also has one of the highest percentages contamination by [pesticides](#) of any of the foods we eat.

Soy processors have worked hard to get these anti-nutrients out of the finished product, particularly soy protein isolate (SPI) which is the key ingredient in most soy foods which imitate meat and dairy products, including baby formulas and some brands of soy milk.



SPI is not something you can make in your own kitchen. Production takes place in industrial factories where soybeans are first mixed with an alkaline solution to remove fiber, then precipitated and separated using an acid wash and, finally, neutralized in an alkaline solution.

Acid washing in aluminum tanks leaches high levels of aluminum into the final product. As a result, soy-based formula also has over 1000% more aluminum than conventional milk based formulas. Breast milk is best, but if one, for whatever reason, cannot breast feed, then Carnation Good Start until six months and Carnation FollowUp after that seem to be the best commercial formula currently available. The milk protein is hydrolyzed 80% which tends to significantly decrease its allergenicity.

Finally, the resulting curds are spray-dried at high temperatures to produce a high-protein powder. A final hardship to the original soybean is high-temperature, high-

pressure extrusion processing of soy protein isolate to produce textured vegetable protein.

Nitrites, which are potent carcinogens, are formed during spray-drying, and a toxin called "lysinoalanine" is formed during alkaline processing.(1) Numerous artificial flavorings, particularly MSG, are added to soy protein isolate and textured vegetable protein products to mask their strong "beany" taste and to impart the flavor of meat.(2)

Yet soy protein isolate and textured vegetable protein are used extensively in school lunch programs, commercial baked goods, fast food products and diet beverages. They are heavily promoted in 3rd world countries and form the basis of many food giveaway programs.

Marketing and soy

All soybean producers pay a mandatory assessment of 0.5% to 1% of the net market price of soybeans. The total - something like US \$80 million annually(3) - supports United Soybean's program to "strengthen the position of soybeans in the marketplace and maintain and expand domestic and foreign markets for uses for soybeans and soybean products".

State soybean councils from Maryland, Nebraska, Delaware, Arkansas, Virginia, North Dakota and Michigan provide another \$2.5 million for "research".(4) Private companies like Archer Daniels Midland also contribute their share. ADM spent \$4.7 million for advertising on the TV show "Meet the Press" and \$4.3 million on "Face the Nation" during the course of a year.(5)

[Public relations firms](#) help convert research projects into advertising copy and newspaper articles, and law firms lobby for favorable government regulations. IMF money funds soy-processing plants in foreign countries, and free-trade policies keep soybean abundance flowing to overseas destinations.

Soy milk has posted the biggest gains, soaring from \$2 million in 1980 to \$300 million in the US in 2001.(6) Recent advances in processing have transformed the bitter, gray, beany-tasting Asian beverage into a product that Western consumers will accept - one that tastes like a milkshake, but without the guilt.

What about soy offering protection against cancer?

Some sources claim that "soy has demonstrated powerful anticancer benefits...the Japanese, who eat 30 times as much soy as North Americans, have a lower incidence of cancers of the breast, uterus and prostate."(7)

Indeed they do. But the Japanese, and Asians in general, have much higher rates of other types of [cancer](#), particularly cancer of the esophagus, stomach, liver and pancreas.(8) Asians throughout the world also have high rates of thyroid cancer.(9) The logic which links low rates of reproductive cancers to soy consumption requires attribution of high

rates of thyroid and digestive cancers to the same foods, particularly as soy causes these types of cancers in laboratory rats.

In 1991, Japanese researchers reported that consumption of as little as 30 grams or 2 tablespoons of soybeans/day for only 1 month resulted in a significant increase in thyroid-stimulating hormone.(10) Diffuse goiter and hypothyroidism appeared in some of the subjects and many complained of constipation, lethargy and fatigue, even though their intake of iodine was adequate.

25 grams of soy protein isolate, the minimum amount claimed to have cholesterol-lowering effects, contains from 50 to 70 mg of isoflavones. It took only 45 mg of isoflavones in pre-menopausal women to exert significant biological effects, including a reduction in hormones needed for adequate thyroid function. These effects lingered for 3 months after soy consumption was discontinued.(11)

In 1992, the Swiss health service estimated that 100 grams of soy protein provided the estrogenic equivalent of the Pill.(12)

Soy formula: Birth control pills for infants

But it is the isoflavones in infant formula which give the most cause for concern. In 1998, investigators reported that the daily exposure of infants to isoflavones in soy infant formula is 6 to 11 times higher on a body-weight basis than the dose that has hormonal effects in adults consuming soy foods. Circulating concentrations of isoflavones in infants who were fed soy-based formula were 13,000 to 22,000 times higher than plasma estradiol concentrations in infants on cow's milk formula.(13)



Approximately 25% of bottle-fed children in the US receive soy-based formula - a much higher percentage than in other parts of the Western world. It is estimated that an infant exclusively fed soy formula receives the estrogen equivalent (based on body weight) of at least 5 birth control pills per day.(14) By contrast, almost no phytoestrogens have been detected in dairy-based infant formula or in human milk, even when the mother consumes soy products.

References:

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(2). See [www/truthinlabeling.org](http://www.truthinlabeling.org).

(3). See [www/unitedsoybean.org](http://www.unitedsoybean.org).

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