



SOY – MYTHS AND TRUTHS

Clinical Protocol

Soy Myths

For references and additional information, send \$12 to Soy Alert! 4200 Wisconsin Avenue #106-336; Washington, DC 20007.

- **Myth:** Use of soy as a food dates back many thousands of years.
- **Truth:** Soy was first used as a food during the late Chou dynasty (1134-246 BC), only after the Chinese learned to ferment soybeans to make foods like tempeh, natto and tamari.
- **Myth:** Asians consume large amounts of soy foods.
- **Truth:** Average consumption of soy foods in Japan and China is 10 grams (about 2 teaspoons) per day. Asians consume soy foods in small amounts as a condiment, and not as a replacement for animal foods.
- **Myth:** Modern soy foods confer the same health benefits as traditionally fermented soy foods.
- **Truth:** Most modern soy foods are not fermented to neutralize toxins in soybeans, and are processed in a way that denatures proteins and increases levels of carcinogens.
- **Myth:** Soy foods provide complete protein.
- **Truth:** Like all legumes, soybeans are deficient in sulfur-containing amino acids methionine and cysteine. In addition, modern processing denatures fragile lysine.
- **Myth:** Fermented soy foods can provide vitamin B12 in vegetarian diets.
- **Truth:** The human body cannot use the compound that resembles vitamin B12 in soy; in fact, soy foods cause the body to require more B12.
- **Myth:** Soy formula is safe for infants.
- **Truth:** Soy foods contain trypsin inhibitors that inhibit protein digestion and affect pancreatic function. In test animals, diets high in trypsin inhibitors led to stunted growth and pancreatic disorders. Soy foods increase the body's requirement for vitamin D, needed for strong bones and normal growth. Phytic acid in soy foods results in reduced bioavailability of iron and zinc, which are required for the health, and development of the brain and nervous system. Soy also lacks cholesterol, likewise essential for the development of the brain and nervous system. Mega doses of phytoestrogens in soy formula have been implicated in the current trend toward increasingly premature sexual development in girls and delayed or retarded sexual development in boys.
- **Myth:** Soy foods can prevent osteoporosis.
- **Truth:** Soy foods can cause deficiencies in calcium and vitamin D, both needed for healthy bones. Calcium from bone broths and vitamin D from seafood, lard and organ meats prevent osteoporosis in Asian countries - not soy foods.

- **Myth:** Modern soy foods protect against many types of cancer.
- **Truth:** A British government report concluded that there is little evidence that soy foods protect against breast cancer or any other forms of cancer. In fact, soy foods may result in an increased risk of cancer.
- **Myth:** Soy foods protect against heart disease.
- **Truth:** In some people, consumption of soy foods will lower cholesterol, but there is no evidence that lowering cholesterol improves one's risk of having heart disease.
- **Myth:** Soy estrogens (isoflavones) are good for you.
- **Truth:** Soy isoflavones are phyto-endocrine disrupters. At dietary levels, they can prevent ovulation and stimulate the growth of cancer cells. Eating as little as 30 grams (about 4 tablespoons) of soy per day can result in hypothyroidism with symptoms of lethargy, constipation, weight gain and fatigue.
- **Myth:** Soy foods are safe and beneficial for women to use in their postmenopausal years.
- **Truth:** Soy foods can stimulate the growth of estrogen-dependent tumors and cause thyroid problems. Low thyroid function is associated with difficulties in menopause.
- **Myth:** Phytoestrogens in soy foods can enhance mental ability.
- **Truth:** A recent study found that women with the highest levels of estrogen in their blood had the lowest levels of cognitive function. In Japanese Americans, tofu consumption in mid-life is associated with the occurrence of Alzheimer's disease in later life.
- **Myth:** Soy isoflavones and soy protein isolate have GRAS (Generally Recognized as Safe) status.
- **Truth:** Archer Daniels Midland (ADM) recently withdrew its application to the FDA for GRAS status for soy isoflavones following an outpouring of protest from the scientific community. The FDA never approved GRAS status for soy protein isolate because of concern regarding the presence of toxins and carcinogens in processed soy.
- **Myth:** Soy foods are good for your sex life.
- **Truth:** Numerous animal studies show that soy foods cause infertility in animals. Soy consumption enhances hair growth in middle-aged men, indicating lowered testosterone levels. Japanese homemakers feed tofu to their husbands frequently when they want to reduce his virility.
- **Myth:** Soybeans are good for the environment.
- **Truth:** Most soybeans grown in the US are genetically engineered to allow farmers to use large amounts of herbicides.
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- **Truth:** Most soybeans grown in the US are genetically engineered to allow farmers to use large amounts of herbicides.
- **Myth:** Soybeans are good for developing nations.
- **Truth:** In third world countries, soybeans replace traditional crops and transfer the value added of processing from the local population to multinational corporations.

Soy Dangers Summarized

- High levels of phytic acid in soy reduce assimilation of calcium, magnesium, copper, iron and zinc.
- Phytic acid in soy is not neutralized by ordinary preparation methods such as soaking, sprouting and long, slow cooking. High phytate diets have caused growth problems in children.
- Trypsin inhibitors in soy interfere with protein digestion and may cause pancreatic disorders. In test animals soy containing trypsin inhibitors caused stunted growth.
- Soy phytoestrogens disrupt endocrine function and have the potential to cause infertility and to promote breast cancer in adult women.
- Soy phytoestrogens are potent anti-thyroid agents that cause hypothyroidism and may cause thyroid cancer. In infants, consumption of soy formula has been linked to autoimmune thyroid disease.
- Vitamin B12 analogs in soy are not absorbed and actually increase the body's requirement for B 12.
- Soy foods increase the body's requirement for vitamin D.
- Fragile proteins are denatured during high temperature processing to make soy protein isolate and textured vegetable protein.
- Processing of soy protein results in the formation of toxic lysinoalanine and highly carcinogenic nitrosamines.
- Free glutamic acid or MSG, a potent neurotoxin, is formed during soy food processing and added to many soy foods.
- Soy foods contain high levels of aluminum, which is toxic to the nervous system and the kidneys.

Soy Infant Formula Birth Control Pills for Babies

- Babies fed soy-based formula have 13,000 to 22,000 times more estrogen compounds in their blood than babies fed milk-based formula.
- Infants exclusively fed soy formula receive the estrogenic equivalent of at least five birth control pills per day.
- Male infants undergo a "testosterone surge" during the first few months of life, when testosterone levels may be as high as those of an adult male. During this period, baby boys are programmed to express male characteristics after puberty, not only in the development of their sexual organs and other masculine physical traits, but also in setting patterns in the brain characteristic of male behavior.
- Pediatricians are noticing greater numbers of boys whose physical maturation is delayed, or does not occur at all, including lack of development of the sexual organs. Learning disabilities, especially in male children, have reached epidemic proportions.
- Soy infant feeding, that floods the bloodstream with female hormones that inhibit testosterone, cannot be ignored as a possible cause for these tragic developments. In

animals, soy feeding indicates that phytoestrogens in soy are powerful endocrine disrupters.

- Almost 15 percent of white girls and 50 percent of African-American girls show signs of puberty such as breast development and pubic hair, before the age of eight. Some girls are showing sexual development before the age of three.
- Premature development of girls has been linked to the use of soy formula and exposure to environmental estrogens such as PCBs and DDE.

Soy Facts

- US Food and Drug Administration (FDA) decision, announced on October 25, 1999, allowed a health claim for products "low in saturated fat and cholesterol" that contain 6.25 grams of soy protein per serving.
- Breakfast cereals, baked goods, convenience food, smoothie mixes and meat substitutes could now be sold with labels touting benefits to cardiovascular health, as long as these products contained one heaping teaspoon of soy protein per 100-gram serving.
- All soybean producers pay a mandatory assessment of one-half to one per cent of the net market price of soybeans. The total something like US \$80 million annually.
- Possibly, in the 2nd century BC, Chinese scientists discovered that a purée of cooked soybeans could be precipitated with calcium sulfate or magnesium sulfate (plaster of Paris or Epsom salts) to make a smooth, pale curd tofu or bean curd.
- The Chinese did not eat unfermented soybeans as they did other legumes such as lentils because the soybean contains large quantities of natural toxins or "anti-nutrients".
- First among them are potent enzyme inhibitors that block the action of trypsin and other enzymes needed for protein digestion. They can produce serious gastric distress, reduced protein digestion and chronic deficiencies in amino acid uptake.
- In test animals, diets high in trypsin inhibitors cause enlargement and pathological conditions of the pancreas, including cancer.
- Soybeans also contain hemagglutinin, a clot-promoting substance that causes red blood cells to clump together.
- In fermented products, enzyme inhibitors concentrate in the soaking liquid rather than in the curd. Thus, in tofu and bean curd, growth depressants are reduced in quantity but not completely eliminated.
- Soy also contains goitrogens - substances that depress thyroid function.
- Soybeans are high in phytic acid, present in the bran or hulls of all seeds. It's a substance that can block the uptake of essential minerals - calcium, magnesium, copper, iron and especially zinc - in the intestinal tract.
- The soybean has one of the highest phytate levels of any grain or legume that has been studied, and the phytates in soy are highly resistant to normal phytate reducing techniques such as long, slow cooking.
- Vegetarians who consume tofu and bean curd as a substitute for meat and dairy products risk severe mineral deficiencies. The results of calcium, magnesium and iron deficiency are well known; those of zinc are less so.

- Zinc is called the intelligence mineral because it is needed for optimal development and functioning of the brain and nervous system. It plays a role in protein synthesis and collagen formation; it is involved in the blood-sugar control mechanism and thus protects against diabetes; and it is needed for a healthy reproductive system.
- Zinc is a key component in numerous vital enzymes and plays a role in the immune system.
- Phytates found in soy products interfere with zinc absorption more completely than with other minerals.
- Zinc deficiency can cause a "spacey" feeling that some vegetarians may mistake for the "high" of spiritual enlightenment.
- Acid washing in aluminum tanks leaches high levels of aluminum into the final product.
- High-temperature processing has the unfortunate side-effect of so denaturing the other proteins in soy that they are rendered largely ineffective.
- In feeding experiments, the use of Soy Protein Isolate (SPI) increased requirements for Vitamins E, K, D and B¹² and created deficiency symptoms of calcium, magnesium, manganese, molybdenum, copper, iron and zinc.
- Phytic acid remaining in these soy products greatly inhibits zinc and iron absorption; test animals fed SPI develop enlarged organs, particularly the pancreas and thyroid gland, and increased deposition of fatty acids in the liver.
- The "long and demanding" road to FDA approval actually took a few unexpected turns. The original petition, submitted by Protein Technology International, requested a health claim for isoflavones, the estrogen-like compounds found plentifully in soybeans, based on assertions that "only soy protein that has been processed in a manner in which isoflavones are retained will result in cholesterol lowering".
- In 1998, the FDA made the unprecedented move of rewriting PTI's petition, removing any reference to the phyto-estrogens and substituting a claim for soy protein - a move that was in direct contradiction to the agency's regulations. The FDA is authorized to make rulings only on substances presented by petition.
- The abrupt change in direction was no doubt due to the fact that a number of researchers, including scientists employed by the US Government, submitted documents indicating that isoflavones are toxic.
- The published report suggested that individuals with cholesterol levels over 250 mg/dl would experience a "significant" reduction of 7 to 20 per cent in levels of serum cholesterol if they substituted soy protein for animal protein. Cholesterol reduction was insignificant for individuals whose cholesterol was lower than 250 mg/dl.
- In other words, for most of us, giving up steak and eating veggie-burgers instead will not bring down blood cholesterol levels. The health claim that the FDA approved "after detailed review of human clinical data" fails to inform the consumer about these important details.
- The famous Cornell China Study, conducted by Colin T. Campbell, found that legume consumption in China varied from 0 to 58 grams per day, with a mean of about twelve. Assuming that two-thirds of legume consumption is soy, and then the maximum consumption is about 40 grams, or less than three tablespoons per day, with an average consumption of about nine grams, or less than two teaspoons.

- A survey conducted in the 1930's found that soy foods accounted for only 1.5 per cent of calories in the Chinese diet, compared with 65 per cent of calories from pork.
- Celibate monks living in monasteries and leading a vegetarian lifestyle find soy foods quite helpful because they dampen libido.
- Thousands of women are now consuming soy in the belief that it protects them against breast cancer. Yet, in 1996, researchers found that women consuming soy protein isolate had an increased incidence of epithelial hyperplasia, a condition that presages malignancies.
- A year later, dietary genistein was found to stimulate breast cells to enter the cell cycle - a discovery that led the study authors to conclude that women should not consume soy products to prevent breast cancer.
- In 1997, researchers from the FDA's National Center for Toxicological Research made the embarrassing discovery that the goitrogenic components of soy were the very same isoflavones touted to lower cholesterol.
- Twenty-five grams of soy protein isolate, the minimum amount PTI claimed to have cholesterol-lowering effects, contains from 50 to 70 mg of isoflavones. It took only 45 mg of isoflavones in premenopausal women to exert significant biological effects, including a reduction in hormones needed for adequate thyroid function. These effects lingered for three months after soy consumption was discontinued.
- One hundred grams of soy protein - the maximum suggested cholesterol-lowering dose, and the amount recommended by Protein Technologies International - can contain almost 600 mg of isoflavones, an amount that is undeniably toxic.
- In 1992, the Swiss health service estimated that 100 grams of soy protein provided the estrogenic equivalent of the Pill.
- In 1998, investigators reported that the daily exposure of infants to isoflavones in soy infant formula is 6 toll 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 fed soy-based formula were 13,000 to 22,000 times higher than plasma estradiol concentrations in infants on cow's milk formula.
- Approximately 25 per cent of bottle-fed children in the U.S. receive soy-based formula - a much higher percentage than in other parts of the Western world. Fitzpatrick estimated that an infant exclusively fed soy formula receives the estrogenic equivalent (based on body weight) of at least five birth control pills per day!
- Dr. Lon White reported on a study of Japanese Americans living in Hawaii that showed a significant statistical relationship between two or more servings of tofu a week and accelerated brain aging.
- Genistein in soy foods causes irreversible damage to enzymes that synthesize thyroid hormones.
- Mothers who ate a vegetarian diet during pregnancy had a fivefold greater risk of delivering a boy with hypospadias, a birth defect of the gonads.
- Problems with female offspring of vegetarian mothers are more likely to show up later in life. While soy's estrogenic effect is less than that of diethylstilbestrol (DES), the dose is likely to be higher because it's consumed as a food, not taken as a drug.

Daughters of women who took DES during pregnancy suffered from infertility and cancer when they reached their twenties.

- Soy protein was introduced into infant formula in the early 1960's. It was a new product with no history of any use at all.
- As soy protein did not have GRAS status, premarket approval was required. This was not and still has not been granted.
- The key ingredient of soy infant formula is not recognized as safe.
- According to Crinella and Tran, the discovery of potential harm from soy infant formula began in 1980 when a federal agency then called the Food and Nutrition Board established safe and acceptable values for manganese in adults, toddlers and infants.
- Permissible levels for the three age groups ranged from 2.5 to 3 mg per day for adults, 1 to 1.5 mg per day for toddlers and 0.5 to 1 mg per day for infants under 6 months. This job now is handled by the Food and Drug Administration (FDA), which today permits 0.6 mg per day for infants, 120 times the amount found in mother's milk.

References

- Fallon, S. and Enig, M.G. Ph.D., **Myths and Truths About Soy Foods**
- Tennant, Jerry, M.D., **Soy is Poisonous**