

Nutrition for Your Health

Your guide to better living

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ESTROGEN WOES PART II

SOY

Before you read this: Some of you may find this hard to accept. Many people and other doctors are touting soy products as a benefit to help many health problems. In fact, we have highly recommended them in the past. But we must continually study and test which is why we no longer recommend soy products. After you read this letter, I am sure you will re-evaluate your position. Much of the cutting edge data that we use concerning health and nutrition will not become mainstream for about 15 to 20 years. Don't panic...just don't use soy as your primary protein source and don't use it more than 1-2 times per week. Avoid soy in your vitamins. If you are pregnant or lactating, severely limit or eliminate your intake of soy products. - Dr. Kelly

Are Soy Products In Our Markets Truly “Natural”?

Most soy products (tofu, isolated soy protein, texturized vegetable protein, etc) are produced in factories at high temperatures and pressures and with the help of a variety of chemicals. The soybeans themselves are grown on huge corporate farms, most of which use toxic pesticides and herbicides and a large percentage of soy foods (52% of US soy crops) come from genetically engineered plants.

Soy contains:

- **allergens**
- **mineral blockers**
- **enzyme inhibitors**
- **hormone modifiers**
- **iodine blockers that interfere with normal thyroid function**
- **potential for nitrosamine or nitrates (cancer causing agents) in isolated soy proteins and TVP (Texturized Vegetable Protein)**
- **potential cancer-causing agents**

The promotion of soy as a miracle food is right in line with the doctrine of the food industry-that imitation foods are as good as natural foods.

Soy Consumption in Asia

There are arguments that soy is the reason Asians have lower rates of breast, prostate and colon cancer (simply because Asians supposedly eat large amounts of soy). If this were true then the same logic requires us to blame high rates of esophagus, stomach, thyroid, pancreas and liver cancers in Asian countries on the high consumption of soy. Soy consumption in Asia is actually much lower than claimed-averaging 10 grams per person, less than two teaspoons. A 1998 study by Nagata and others published in the *Journal of Nutrition* gives daily consumption of tofu in Japan as less than 1 gram per day.

Asian countries have certain types of cancers and western countries have other types. Eastern types of cancers have been attributed to many factors, of which soy consumption is one, but to claim that soy consumption is associated with lower rates of certain types of cancers while neglecting to mention that soy is also associated with higher rates of certain types of cancer is illogical and unfounded.

Mineral Blockers

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. Although not a household word, phytic acid has been extensively studied; there are literally hundreds of articles on the effects of phytic acid in the current scientific literature. Scientists are in general agreement that grain- and legume-based diets high in phytates contribute to widespread mineral deficiencies in third world countries. Analysis shows that calcium, magnesium, iron and zinc are present in the plant foods eaten in these areas, but the high phytate content of soy- and grain-based diets prevents their absorption. The claim that soy prevents osteoporosis is extraordinary, given that soy foods block calcium and cause vitamin D deficiencies.

Only a long period of fermentation will significantly reduce the high phytate content of soybeans. When precipitated soy products like tofu are consumed with meat, the mineral-blocking effects of the phytates are reduced. The Japanese traditionally eat a small amount of tofu or miso as part of a mineral-rich fish broth, followed by a serving of meat or fish. Vegetarians who consume tofu or bean curd as a substitute for meat and dairy products risk severe mineral deficiencies.

Hormone Modifiers

In 1992, the Swiss health service estimated that 100 grams of soy protein provided the estrogenic equivalent of the (birth control) Pill. *Bulletin de L'Office Fédéral de la Santé Publique, no. 28, July 20, 1992.*

Soy & Menopause

A 1999 study at the Clinical Research Center at MIT, published in the *Proceedings of the Annual Meeting of the Pacific Coast Reproductive Society* found that estrogens in soy had no effect on menopausal symptoms such as hot flashes and night sweats.

For pre-menopausal women...two glasses of soy milk a day, over the course of a month, contain enough plant estrogens to change the timing of a woman's menstrual cycle.

Early Puberty

The male species of tropical birds carries the drab plumage of the female at birth and 'colors up' at maturity, somewhere between 9 and 24 months. In 1991, Richard and Valerie James, bird breeders in Whangarei, New Zealand, purchased a new kind of feed for their birds - one based largely on soy protein. When soy-based feed was used, their birds 'colored up' after just a few months. In fact, one bird-food manufacturer claimed that this early development was an advantage imparted by the feed. A 1992 ad for Roudybush feed formula showed a picture of the male crimson rosella, an Australian parrot that acquires beautiful red plumage at 18 to 24 months, already brightly colored at 11 weeks old. Unfortunately, in the ensuing years, there was decreased fertility in the birds, with precocious maturation, deformed, stunted and stillborn babies, and premature deaths, especially among females, with the result that the total population in the aviaries went into steady decline. The birds suffered beak and bone deformities, goiter, immune system disorders and pathological, aggressive behavior. Autopsy revealed digestive organs in a state of disintegration. Startled and aghast, the James' hired toxicologist Mike Fitzpatrick PhD, to investigate further. Dr Fitzpatrick's literature review uncovered evidence that soy consumption has been linked to numerous disorders, including infertility, increased cancer and infantile leukemia; and, in studies dating back to the 1950s, that genistein in soy causes endocrine disruption in animals. Dr Fitzpatrick also analyzed the bird feed and found that it contained high levels of phytoestrogens, especially genistein. When the James' discontinued using soy-based feed, the flock gradually returned to normal breeding habits and behavior.

Woodhams, D.J., "Phytoestrogens and parrots: The anatomy of an investigation", Proceedings of the Nutrition Society of New Zealand (1995) 20:22-30.

Matrone, G. et al., "Effect of Genistein on Growth and Development of the Male Mouse", Journal of Nutrition (1956) 235-240.

Soy in Pregnancy & Nursing

Increased in-utero exposure to the phytoestrogen genistein found in soy, dose-dependently increased the incidence of breast tumors, when compared with the controls. The number of estrogen receptor binding sites was significantly elevated in the mammary glands of genistein offspring. *Oncol Rep* 1999 Sep-Oct; 6(5): 108995

An April 2000 study published in *Proceedings of the National Academy of Science* found that phytoestrogens, especially genistein, can cross the placenta and induce cell changes that lead to infant leukemia.

The *British Journal of Urology*, January 2000, reported a study showing that mothers who ate a vegetarian diet high in soy during pregnancy had a five-time greater risk of delivering a boy with hypospadias, a birth defect of the penis. The researchers attributed high rates of the birth defect to phytoestrogens in soy products. Problems with female offspring of vegetarian mothers who consume high quantities of soy products are more likely to show up later in life in the forms of infertility and cancer.

Most Serious Concerns Involve The Use of Soy Infant Formula

Soy protein was introduced into infant formula in the early 1960s. It was a new product with no history of any use at all in food products. Soy protein is not legally a GRAS (generally recognized as safe) foodstuff, as the FDA has never codified it as such. In their review of soy protein isolates the FDA's Select Committee of GRAS Substances (SCOGS) noted that such products were initially developed as binders in paper coatings. Soy protein isolates were GRAS under the provisions of the Code of Federal Regulations as substances migrating from paper and paperboard products used in food packaging because it was assumed that only very small amounts would be subject to human ingestion. As soy protein did not have GRAS status by the FDA, 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.

A 1994 article by Lonnerdal published in *Acta Paediatr* summarized the reduced bioavailability of trace minerals due to high phytic acid content in soy infant formula; and high levels of manganese in soy formula compared to cows milk formula and breast milk. Excessive intake of manganese is linked to problems with the central nervous system.

It is 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. Scientists have known for years that soy-based formula can cause thyroid problems in babies. *Irvine, C. et al., "The Potential Adverse Effects of Soybean Phytoestrogens in Infant Feeding", New Zealand Medical Journal May 24, 1995, p. 318.*

Atrazine, a weed killer that can enter the water supply, causes mammary and uterine cancer in rats. The states with the highest levels of atrazine in many water supplies are Ohio, Indiana, Illinois, Iowa, Missouri, Nebraska, and Kansas. Formula-fed babies who consume reconstituted formula using tap water receive a lifetime dose of this chemical in the first four months of their lives. *Environmental Working Group, 1999*

A 1998 *Nutrition Reviews* article by K. O. Klein of DuPont Hospital for Children notes that effects of isoflavones on various animal species include hormonal changes, increased uterine weight and infertility. "It is clear from the literature," says Klein, "that different species and different tissues are affected by isoflavones in markedly different ways. It is difficult to know which tissue, if any, are affected in infants, and the variation among species makes extrapolation to infants inappropriate." Scientists may be reluctant to extrapolate but parents would certainly err on the side of caution if they knew that "isoflavones affect different tissues in markedly different ways." Klein says that medical literature provides "no evidence of endocrine effects and no changes in timing of puberty." But she makes no mention of the Puerto Rican study which found that consumption of soy formula correlated strongly with early maturation in girls. Why would Dr. Klein leave out any reference to the Puerto Rican study in her review? Is it because

DuPont, owner of Protein Technologies International, is the leading manufacturer of soy protein isolate? Or is it because her review was sponsored by the Infant Formula Council? Or because *Nutrition Reviews*, which published her findings, is funded by industry giants, including Pillsbury, Hershey Foods, Kellogg, Roche, General Mills, Kraft, Campbell Soup, Monsanto, Coca-Cola, Cargill, Heinz, Nabisco, Proctor and Gamble and Pepsi-Cola?

Infant formula is also known to be associated with:

1. A three- to four-fold risk of middle ear infection (*Acta Paediatrica Scandinavica*, 1982)
2. A similar risk of diarrheal disease (*Am. J. of Public Health*, 1986)
3. A five- to eight-fold risk of childhood lymphoma up to age 15 (*Lancet*, 1988)
4. Increased risk of pulmonary hemorrhage (*Pediatrics*, 1997)
5. Soy formula has ELEVEN times as much as aluminum as regular formula. (*J. Parenteral of Enteral Nutrition*, 1988)
6. Children with autoimmune thyroid disease were 3 times more likely to have been fed soy formula in infancy. *Lancet*, *Am. J of Disabled Children*, *Proceedings of the Society of Exp. and Biological Medicine*

Obviously, breast milk is best for your baby. If you have been told that you cannot breastfeed your baby (for any reason), please contact us. Statistically, only 1/10 of 1% of women cannot breastfeed their baby usually because of a malformation of the breast. If you have been told you are not producing enough milk, there are things you can do nutritionally as well as functionally to increase your milk output. Don't give up! There are options! – Dr. Kelly

Soy & Thyroid Function

Soy also contains goitrogens - substances that depress thyroid function. 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. *Divi, R.L. et al., "Anti-thyroid isoflavones from the soybean", Biochemical Pharmacology (1997) 54: 1087-1096.*

In 1991, Japanese researchers reported that consumption of as little as 30 grams or two tablespoons of soybeans per day for only one month resulted in a significant increase in thyroid-stimulating hormone (TSH). Diffuse goiter and hypothyroidism appeared in some of the subjects and many complained of constipation, fatigue and lethargy, even though their intake of iodine was adequate. *If thyroid function is lowered by soy then the pituitary tries to stimulate more thyroid function hence, the elevated TSH. – Dr. Kelly*

An April 2000 study published in *Carcinogenesis* found that soy feeding stimulated the growth of a rat's thyroid even with iodine deficiency. This was partly through a pituitary-dependent pathway.

Twenty-five 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 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. *Cassidy, A. et al., "Biological Effects of a Diet of Soy Protein Rich in Isoflavones on the Menstrual Cycle of Premenopausal Women", American Journal of Clinical Nutrition (1994) 60:333-340.*

High soy consumers and users of isoflavone supplements are at risk of thyroid disorders. The subtle effects of anti-thyroid agents such as soy on thyroid function would most likely be evidenced as subclinical, or even overt hypothyroidism. *New Zealand Medical Journal (Volume 113, Feb 11, 2000)*

Soy and Cancer

Soy proponents don't want the public to know that phytoestrogens can induce tumors in several different species of animals. The younger the animal, the more susceptible it is to the action of plant-based estrogens, as it frequently is to other carcinogens.

In 1996, researchers found that women consuming soy protein isolate had an increased incidence of epithelial hyperplasia, a condition that presages malignancies. *Petrakis, N.L. et al., "Stimulatory influence of soy protein isolate on breast secretion in pre- and post-menopausal women", Cancer Epid. Bio. Prev. (1996) 5: 785-794.*

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. *Dees, C. et al., "Dietary estrogens stimulate human breast cells to enter the cell cycle", Environmental Health Perspectives (1997) 105(Suppl. 3):633-636.*

Two 1997 studies published in *Nutrition and Cancer*. One found that phytoestrogens at levels close to probable levels in humans stimulate cellular changes leading to breast cancer; the other found that dietary soy suppressed enzymes protective of breast cancer in mice.

A 1998 study published in the *American Journal of Clinical Nutrition* further confirming that soy-protein supplementation stimulates cell proliferation in human breast tissue.

A 1998 study published in *Cancer Research* found that dietary genistein enhances the growth of mammary gland tumors in mice.

Soy Protein Isolate (SPI)* and Texturized Vegetable Protein (TVP)

Note: "Soy protein isolate" and "Isolated soy protein" mean the same. These phrases are used interchangeably.

Soy processors have worked hard to get the antinutrients out of the finished product, particularly soy protein isolate (SPI) which is the key ingredient in most soy foods that 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 a slurry of soy beans is 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. The resultant curds are spray-dried at high temperatures to produce a high-protein powder. The final step is a high-temperature, high-pressure extrusion processing of soy protein isolate to produce textured vegetable protein (TVP).

Trypsin is an enzyme used in the digestion of protein. Soy has an inhibitory effect on the digestion of proteins. Much of the trypsin inhibitor content of soy can be removed through high-temperature processing, but not all. Trypsin inhibitor content of soy protein isolate can vary as much as fivefold. (In rats, even low-level trypsin inhibitor SPI feeding results in reduced weight gain compared to controls.) But high-temperature processing has the unfortunate side-effect of so denaturing the other proteins in soy that they are rendered largely ineffective. That's why animals on soy feed need lysine (amino acid) supplements for normal growth. *Wallace, G.M., "Studies on the Processing and Properties of Soymilk", Journal of Science and Food Agriculture 22:526-535, October 1971.*

Nitrosamines are not naturally occurring in soybeans but form during the processing of products such as soy protein isolate. Nitrites, which are potent carcinogens, are formed during spray-drying, and a toxin called lysinoalanine is formed during alkaline processing. *Rackis, et al., ibid., p. 22; "Evaluation of the Health Aspects of Soy Protein Isolates as Food Ingredients", prepared for FDA by Life Sciences Research Office, Federation of American Societies for Experimental Biology (9650 Rockville Pike, Bethesda, MD 20014), USA, Contract No. FDA 223-75-2004, 1979.*

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. In feeding experiments, the use of SPI (soy protein isolate) increased requirements for vitamins E, K, D and B12 and created deficiency symptoms of calcium, magnesium, manganese, molybdenum, copper, iron and zinc. *Rackis, Joseph, J., "Biological and*

Physiological Factors in Soybeans", Journal of the American Oil Chemists' Society 51: 161A-170A, January 1974.

Phytic acid remaining in these soy products greatly inhibits zinc and iron absorption; test animals fed ISP (isolated soy protein) develop enlarged organs, particularly the pancreas and thyroid gland, and increased deposition of fatty acids in the liver. *Rackis, Joseph J. et al., "The USDA trypsin inhibitor study", ibid.*

Other Documentation:

A study from Cornell University, published in the *Journal of the American College of Nutrition*, 1986, which found that children who develop diabetes mellitus were twice as likely to have been fed soy.

A November 1994 warning published in *Pediatrics* in which the Nutrition Committee of the American Academy of Pediatrics advised against the use of soy formulas due to the diabetes risk. These warnings have been neglected ever since it was reported that the AAP accepted a multi-dollar donation from the Infant Formula Council for their new headquarters building outside Chicago.

A 1998 study published in *Toxicology and Industrial Health* indicating the phytoestrogens are potential endocrine disrupters in males.

A March 12, 1999 *Daily Express* article with the headline "Soy Allergy/Adverse Effect Rates Skyrocket - Monsanto's Roundup-Ready Soy Blamed"

May 1999 and June 2000 studies published in *Brain Research* indicating that phytoestrogens have adverse affects on brain chemistry.

An article published in *Nutrition and Cancer* 2000 found lower testosterone levels and higher estrogen levels in Japanese men who consumed higher levels of soy foods.

A June 2000 article in *American Journal of Cardiology* found that soy had no impact on lipid levels in healthy postmenopausal women

Evidence that disturbing results were omitted from a 1994 study presented to the FDA during the approval process for Roundup Ready Soybeans. Researchers found that raw Roundup Ready meal contained 27 percent more trypsin inhibitor (an enzyme needed for digestion) and toasted Roundup Ready meal contained 18 percent more trypsin inhibitor compared to non-genetically manipulated controls. *This is just the tip of the iceberg for genetically modified foods.*

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