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Soy – Food, Wonder Drug, or Poison?

Soy-food consuming populations of people, like the Chinese and Japanese, have a much lower incidence of heart disease, osteoporosis, and cancer of the breast and prostate. From this observation, many researchers have come to the conclusion that ingredients in the soybean have anticancer, antihypertensive, and anti-cholesterol benefits, and also act as a natural alternative to hormone replacement therapy. Soy foods have become synonymous with health food and vegetarianism. Their popularity is tied to the belief that soy has “wonder-drug” benefits – so powerful that many people suppose they can safely eat their bacon and eggs for breakfast as long as they finish off their morning meal with a cup of soy yogurt.

We recommend that you use traditional soy foods, like soy milk and tofu, only as a small part of your diet, at most 5% of your daily calories. “Synthetic soy foods,” like meats, cheeses, and soy bars, should rarely, if ever, be consumed.

Examples of sensible uses might be:

Soy milk to moisten cereal, not glassfuls as a beverage

Tofu pieces in a “stir-fry” rice dish, not as a soy burger entrée

An occasional tofu-based dessert, not daily soy “candy” bars



However, there is a dark side to the soy story that warns that these foods may increase your risk for cancer, impair your thyroid, immune, and brain function, and cause you bone loss and reproductive problems. Fortunately, these worries are relevant mostly for people lured into consuming “fake foods” synthesized from man-made components of soy and other foods, and high potency soy supplements – not for those who consume traditional soy foods as a small portion of their diet.

Soy's Effects Are Usually

Inconsequential

In Asian countries, soy is consumed as boiled soybeans (edamame), tofu (soybean curd), natto (fermented soybeans), miso (fermented soybean paste), okara (a by-product of tofu), soybean sprouts, soymilk, yuba (by-product of soy milk), kinako (soy flour), and soy sauce. These foods are made from simple processes like grinding, precipitation, and fermentation – thus, most of soy's ingredients remain little altered. Less than 5% of daily calories in the typical diet of Japanese or Chinese people comes from soybeans.¹ This amounts to about 2 ounces (55 to 64 grams) derived from soy foods daily, which means only 7 to 8 grams of protein and 15 to 45 milligrams of the estrogen-like phytochemical known as *isoflavone*. How could this tiny amount of soy food make a measurable difference – positive or negative – to the health of Asians?

The primary reason these people are so hardy is that the Asian diet is based on a starch – **rice** – with generous amounts of vegetables and fruits. Starches are ideal foods for human nutrition and have many desirable nutritional qualities – they are low in fat, moderate in protein, high in carbohydrates, and contain no cholesterol. The Asian diet also contains few animal products. Any unique pharmacologic benefits from eating soy are unnoticeable compared to the impact of these people's overall diet. (For a discussion of the benefits of starches, see my April 2004 newsletter article: People – Not Their Words – Tell “The Carbohydrate Story.”)



Soy – Detrimental or Beneficial

The truth behind soy is clouded by emotional reactions from the anti-soy movement of hard-core meat-eaters and soy-loving vegetarians – and as usual, money from big businesses, the soy manufacturers. Most of the rhetoric on both sides of the argument is of no real importance – the real issue is whether you are consuming small amounts traditional soy foods or making yourself a diet of synthetic foods.

The Seven Main Arguments:

Argument 1: Anti-nutrients

Detrimental: Soy contains “anti-nutrients,” which interfere with the digestion of proteins (trypsin inhibitors) and the absorption of minerals (phytic acid).

Beneficial: These “anti-nutrient” substances are deactivated by cooking and fermentation. Cooking before consumption is not unique to soybeans – no other beans, peas, or lentils are eaten “raw.” Although adverse effects on experimental animals have been demonstrated, there is no direct evidence as to the physiological effects of the trypsin inhibitors on humans.² Interestingly, Phytic acid has anticancer effects in animal models for both colon and breast cancer.³

Argument 2: Cancer

Detrimental: Soy has estrogen-like activity that may promote the growth of estrogen-sensitive cancers (breast and prostate), especially for those people who already have cancer.⁴⁻⁵

Beneficial: Breast and prostate cancer rates are four to six times lower in Japan and China than Western countries. In laboratory studies, isoflavone from soy can inhibit the growth of breast cancer and prostate cancer tissues.⁶

Argument 3: Heart Disease

Detrimental: Benefits on heart disease are largely unproven and are really due to the low-fat, low-cholesterol qualities of the Asian diet.

Beneficial: People living in countries with more soy in their diet, for example Japan, have a much lower risk of heart attacks. Experimental research consistently shows soy foods cause a decrease in total and “bad” LDL cholesterol, and an increase in “good” HDL-cholesterol.⁷⁻⁸ Products containing at least 6.25 grams of soy protein per serving are now allowed to carry a FDA-approved claim on their label; stating a low-fat, low-cholesterol diet containing at least 25 grams (about one ounce) of soy protein a day may reduce one’s risk of heart disease.

Argument 4: Sex Hormones

Detrimental: Twelve ounces of soy milk drunk three times a day for one month will decrease a woman’s estradiol and progesterone levels, and her menstrual cycle length will be increased by about four days.⁹ These effects may cause infertility and contribute to bone loss.

Beneficial: Chinese and Japanese are among the most prolific baby-makers in the world. Phytoestrogens have both a weak estrogen-stimulating (estrogenic) and paradoxically, an estrogen-inhibiting (anti-estrogenic) activity. The estrogen-like activities may strengthen bones and prevent menopausal symptoms like hot flashes. Hot flashes are reported by 70% to 80% of US menopausal women compared to 10 to 14% of women in Japan and Singapore.¹⁰ The anti-estrogen activity reduces the risk of breast and uterine cancer.

Argument 5: Thyroid

Detrimental: Goiter and hypothyroidism have been reported in infants receiving soy formula. Autoimmune diseases of the thyroid and thyroid cancer may also be caused by exposure to soy.¹¹⁻¹²

Beneficial: The addition of adequate iodine to the diet reverses any goiter-causing effects of soy. Population studies suggest soy protects against thyroid cancer.¹³

Argument 6: Immune System

Detrimental: In experimental studies, soy isoflavone suppresses the immune system, and reduces the size of the thymus gland. There are reports of a decrease in antibodies, white blood cells, and other indications of immune system malfunction with soy consumption.¹⁴⁻¹⁹

Beneficial: Soy isoflavone enhances the immune response and provides a possible explanation for lower incidence of certain cancers in soy-eating parts of the world.^{20,21} The pain of arthritis has been helped by soy through modulating the immune system.²²

Argument 7: Brain Health

Detrimental: A recent study of middle-aged Japanese-Americans living in Hawaii found adults consuming tofu had reduced brain function, accelerated brain aging and some structural changes in their brains that might be related to Alzheimer’s disease.²³

Beneficial: Alzheimer’s disease and other forms of dementia are less common in Asian compared to Western populations.²⁴ Recent studies have actually shown improvement in brain functions with the use of soy supplements.^{25,26}

In summary, population studies fail to support real-life soy-caused diseases, experimental data is inconsistent, and the larger components of the diet (starches, vegetables, and fruits) are most likely the reason for the superior health of soy consuming peoples.

The Whole Is Healthier Than the Parts

Over the past two decades there has been an explosion on the supermarket shelves of soy products

that resemble our favorite meat and dairy products. I often refer to these as “fake foods.” Manufacturing processes remove the dietary fibers, carbohydrates, fats, vitamins, minerals, and hundreds of other helpful plant chemicals – leaving behind almost pure soy protein.

These protein concentrates are mixed with extracts of wheat protein, vegetable oils, and sometimes, starch, sugar, salt, artificial sweeteners, and dairy and egg proteins – then the magic of modern technology turns these mixtures into products that look and taste like real cheese, hot dogs, sausages, burgers, luncheon meats, chicken, and turkey. Soy protein is used to replace dairy protein in candy bars, yogurt, ice cream, breads, pastries and cookies. You can identify the synthesized concentrated proteins on the ingredient list of your foods by these words: defatted soy flour, organic textured soy flour, textured vegetable protein, isolated soy protein, soy protein concentrates, and soy concentrates. These new “foods” in no way resemble nature’s creations and the effects on your health make that clear.

Calcium Loss and Cancer Growth from Protein Concentrates

Concentrated dairy (cow-milk) protein, when consumed by people, causes large and important losses of calcium contributing to osteoporosis and kidney stones. You would hope that replacement with soy protein concentrates would eliminate this health hazard. Unfortunately, recent research on people has demonstrated that the addition of 40 grams of concentrated soy protein to a diet, already low in protein (40 to 50 grams daily) and high in calcium (1100 mg daily), causes significant net losses of calcium from the body.²⁷ Other research shows isolated soy protein is just as damaging as meat protein to the bones.²⁸



Another recent study showed how 40 grams of soy or cow-milk protein concentrate added to the diet significantly increases levels of a powerful cancer-promoting growth hormone, called *Insulin-like Growth Factor 1* – IGF-1.²⁹ However, soy protein was almost twice as powerful as the milk protein concentrate – doubling the levels of IGF-1 with 40 grams of soy protein isolate. This growth promoter has been strongly linked to the development of cancer of the breast, prostate, lung, and colon.³⁰ Excess IGF-1 stimulates cell proliferation and inhibits cell death – two activities you definitely don't want when cancer cells are involved.³⁰

What does 40 grams of isolated soy protein mean to you? In real life, a person seeking excellent health by following a low-protein version of the McDougall diet with 1100 mg of calcium (which would have to be added with a calcium supplement) becomes at risk for osteoporosis, kidney stones, and cancer with the daily addition of a soy “candy bar” and a soy shake. One soy “chicken” patty for lunch and 2 soy burgers for dinner will also add that 40 grams of isolated protein daily – and so will just four soy breakfast patties. Now soy has real meaning in your life.

The effects of adding soy protein concentrates on people already consuming the bone-losing, high-animal-protein Western diet (100 to 160 grams of protein daily), or worse yet, the Atkins diet (up to 300 grams daily) have yet to be determined.³¹ Because of the very low incidence of osteoporosis, and breast and prostate cancer, among people who consume traditional soybean foods, there is every reason to believe that only the synthetic soy foods need to be of concern. (Studies have yet to be done to specifically test the effects of traditional foods in laboratory settings – in the meantime, we will keep these as a small part of our diet.)

Examples of Common Foods with Protein Isolates

Eating "fake foods" adds 40 grams of protein concentrate effortlessly to your diet:

Item:	Serving:	Grams of Protein
<i>Desserts and Snacks:</i>		
Cliff® Builder's Bar	1 bar	20
Cliff® Bar (Oatmeal, Raisin Walnut)	1 bar	10
Revival Soy Bars®	1 bar	17
Atkins Nutrition Bars®	1 bar	21
ZonePerfect Nutrition Bars®	1 bar	15
Revival Soy Shakes® Splenda®	1 shake	20
<i>Meats:</i>		
Morningstar Farms® Sausage Patties	1 patty	10
Boca® Breakfast Links	1 link	8
Gardenburger® Chik'n Grill	1 patty	13
Boca Burger® Original	1 burger	13
Boca® Ground Burger	2 ounces	13
Boca® Chicken Patties	1 patty	11
Smart Dogs®	1 dog	9
Boca® Chili	1 serving	20
<i>Cheeses:</i>		
Veggie Shreds® (Cheese)	2 ounces	6
Boca® Pizza	1 slice	13
<i>Tofu with Added Isolates:</i>		
Lite Tofu®	3 ounces	5
<i>Flour:</i>		
Benesoy® High Protein Soy Flour	1 ounce	15

Many of these foods also contain an isolated wheat protein (gluten) which has similar effects on calcium loss.³²

Pharmaceutical-grade Soy Hormones

Phytochemicals found in plants are important ingredients for radiant health, but must be consumed in their natural packages – like the traditional soy foods – to reap the most benefits with the least risks. After isolation from their natural environment – the soybean – these chemicals unquestionably become pharmaceuticals.

Manufacturing processes concentrate the pharmacologic ingredients of soy into powerful drugs sold to women to treat menopausal symptoms and osteoporosis. Unfortunately, drugs have side effects. A concentrated preparations of isoflavone, sold as Novasoy®, and mixtures of the active chemicals (isoflavone and/or genistin), have been shown to be strong promoters of breast cancer growth in animals.³³ Long-term treatment (up to 5 years) with soy isoflavone preparations was associated with an increased occurrence of endometrial hyperplasia in women – a precancerous condition of the female uterus.³⁴

Soy Infant Formula

Soy baby formula is synthesized from pure sugar (corn syrup), oil (safflower), and protein (soy protein isolate) – this is the epitome of "fake food" – especially when considering the potential consequences. Approximately 1.4 million (36%) infants per year in the United States receive soy formula. Because 100% of the dietary protein and isoflavone that the baby gets is from soy, the chemical compounds reach levels many times higher than the levels found in adults who consume soy foods – and even exceed concentrations shown to be toxic in laboratory experiments. For example,

daily exposure to estrogen-like compounds from soy formula results in levels 6 to 11 times higher in infants than the level that will cause changes in the menstrual cycle of women.³⁵⁻³⁶

The reason so little is known about the harmful effects of feeding soy formula to babies is that these effects in real life situations have not been adequately studied. However, some indication of the sensitivity of a baby to soy's estrogen-like effects might be learned from a recent study finding birth defects of the genitalia of male infants (hypospadias) born to mothers who consumed large amounts of soy products.³⁷

Reserve Traditional Soy foods for Special

Despite concerns, there is no definite evidence that traditional soy foods are harmful at levels customarily consumed. Consider the hundreds of millions of people living in Japan, consuming soy products throughout their life – and they enjoy the longest life expectancy in the world (Japanese women are expected to live 84.93 years, compared to US women to 79.5 years; and Japanese men to 78.07 years, compared to 74.1 years for US men).

However, soybeans and their by-products should be thought of as rich foods – naturally high in fat and protein. In their traditional forms consider them as delicacies – and you should consume them as you might other plant food delicacies – nuts, seeds, avocados, and olives – in small amounts on special occasions.

Soybeans Are Nutritionally between a Bean and a Nut

These soy items are rich plant foods (look at the fat and protein contents)

Food	% Fat	% Protein	% Carbohydrate
Pinto Bean	4	24	75
Soybeans	41	35	31
Tofu	57	40	12
Miso	27	23	54
Tempeh	35	38	34
Peanuts	61	17	2

*These do not add to 100% because of the original data used

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