

To bean or not to bean, that is the question?

In October 1999 the US's FDA (Food & Drug Administration) released statement that announced 'Foods containing soy protein in a diet low in saturated fat and cholesterol can reduce risk of coronary heart disease by lowering blood cholesterol levels.' The decision came about after the FDA reviewed, in the region of 167 scientific studies, on the effects of soya in the diet. Allowing manufacturers to extol the health virtues of the soy contained within on their packages.

Even before, and consequently afterwards, the announcement articles have appeared with or without case studies either debunking the bean as hype, at times ignoring and/or questioning its qualities, brandishing the study, studies as bad science, or, on the contrary, extolling its virtues, overlooking its shortcomings and challenging the anti-soy claims. All in all leaving most of us at a total loss and frustrated at what to believe.

According to many scientists, doctors and nutritionist soy is a food with properties that may help prevent osteoporosis, various cancers, decrease cardiovascular disease and reduce the affects of menopause, the lists goes on. As convincingly on the other hand as many scientists, doctors and nutritionists, soy contains agents that may leave you anaemic, promote cancer, upset your or your child's thyroid, contribute to osteoporosis and a whole ream of other conditions.

The interest in soy in the first place for health and medical circles stems from the possibility of it being an anti-carcinogen due to phytoestrogens (plant estrogens) and its effectiveness in lowering levels of bad (LDL) cholesterol in individuals with levels (250mg per decilitre blood sample) and raising the good (HDL) cholesterol levels but not those with normal levels.

Confusion Abounds

On numerous occasions we have been contacted by concerned people here and friends living overseas, who believe somehow we are more in the know being in Japan the land of miso and other beanie foods, to shed some light on this most mind boggling confusion! The truth is that we are fairly confused ourselves by all the contradictions surrounding soy and the phytoestrogens, phytates, and enzyme inhibitors contain within it. Nevertheless, we have looked at the possible pros and cons, but by no means all, surrounding soy and with so much veneration or denigration going on, has made us question if anything can really be substantiated? However, what is presented has been done without pitching this study against that study or going into any real detail too excessively, we leave that to you as have included a host of websites for you to browse if you so wish.

We have chosen what we feel to be the middle path of including soybeans and soy products in ones diet from the perspective of how soy has been traditional used here in Japan and by the Macrobiotic community and what can be determined as just simple common sense in soy's use.

Brief History: From Humble Beginnings to Food for a Brave New World

The plant was first described in Chinese manuscripts in 2800BC, and has been cultivated for several thousand years with its wild and early beginnings in China and later on introduced to 7th century Japan and to Indonesia.

There are estimated to be 1000 or more varieties of soybeans in a full spectrum of colours from white to black and sizes from that of a pea to that of a cherry. 'Glycine Soja' is the long forgotten and hardly recognisable wild ancestor where the modern hybrid we have today 'Glycine Max' started its humble beginnings. The modern counter part has been manipulated to bring about a higher protein content and better resistance to disease to the very latest biotech offering and by far most disturbing, genetic modification/manipulation of the bean, 'GM', or 'GMO' technology as it is known and hailed to feed the world?

Nutritionally, soy is a nutritional powerplant with a protein content of 38%, concentrated essential fatty acids, including large amounts of omega-3, with a higher protein content than milk, minus the saturated fat and cholesterol and is often referred to as 'The Meat of the East', 'The Meat of the Fields' or 'The Beef of China.'

Soy in the West

Soybeans apparently first reached the shores of Europe some 300 years ago but it's really only over the last 30 years or so soy has been consumed in any real quantity in the West. A good deal of today's promotion for soy is coming from agrochemical corporations with a vested interest in increased human consumption of soy, already multi-billion dollar business, with the industry taking full advantage of the FDA ruling.

The US soybean crop alone now accounts for over half of the world's harvest, with 72 million acres or more of American farmland under soybean production. Colossal growth when you consider it was a minor crop of only 1.8 million in 1924. Though the majority of soy still goes to animal feed.

Isoflavones

Soy contains the isoflavones; daidzein, genistein and glycitein that studies have shown are unique substances that have similar structures to estrogen in the body so can exert a weak estrogenic effect in the body especially genistein. Research has indicated that isoflavones help the body whether it is low or high in estrogen. If the body levels of natural estrogen are high, isoflavones will occupy estrogen receptor sites cells, thus preventing its potentially tumour producing effects, and when estrogen levels are low isoflavones can provide additional weak estrogen support. Research has demonstrated that they may offer limited protection against breast, bowel, prostate cancers, and help to reduce the effects of menopause, osteoporosis and cardiovascular disease due the estrogenic influence of the isoflavones in the bean.

This same isoflavones have also been targeted as the purveyors and antagonists of the very cancers research has indicted they may prevent! With some research showing isoflavones had no positive benefits whatsoever on health and other research showing they actually interfere with menopause and fertility.

Phytates & Trypsin Enzyme Inhibitors

We all know beans are notoriously and at times embarrassingly difficult to digest and soybeans are no exception. Soy contains enzyme inhibitors that interfere with digestion, especially the enzyme trypsin that breaks down protein, making soy difficult to digest. Soy also contains phytic acid also known as phytates, (found in all seeds and legumes) which block assimilation of essential minerals like calcium, magnesium, iron and especially zinc. The trypsin inhibitors and phytates are reduced but not totally removed by soaking and long slow cooking.

Paul Pitchford (Healing with Wholefoods) recommends that soaking the beans for 12 hours or more begins the sprouting process and to change the water once or twice before cooking help to eliminate the phytates. Adding kombu during cooking adds essential vitamin and minerals and a pinch of salt added when the beans are almost cooked assists the digestion of the beans salt being a digestive aid to high protein foods.

In the production of tofu and soymilk the phytates and enzyme inhibitors are greatly reduced making the nutrients available. It seems only the traditional fermentation process used by some in the East (not modern methods) in the production of miso, shoyu and tempeh eliminates the trypsin inhibitor and the phytates.

Modern Soy Foods: Use & Abuse from the Field to the Burger

If you don't think you consume soy, think again. Soy oil is one of the most commonly used oils in processed foods and soy in one guise or another is used in over 60 percent of convenience foods found at your local natural food shop or at the local supermarket; in margarine, shortening, soy cheese, baby formula, milk, burgers, hotdogs, ice cream, yoghurt, flour, energy bars, supplements and in almost every bar of chocolate as lecithin.

Modern soy production does not employ the natural methods traditional used in the East to remove the enzyme inhibitors or phytic acid from soy. Dependence is upon industrial machinery, chemicals, high heat and extreme pressures as outlined by William Shurtleff & Aikiko Aoyagi in their book '**The Book of Tofu**', shedding some light on modern day industrial soy processing not organic soy processing.

Defatted soy flour is made by cleaning, cracking the soybeans to make soy flakes. The flakes are processed with hexane solvent (a type of paraffin) to remove the soy oil. The hexane solvent is vaporised with heat. Flakes are ground to produce the least expensive and most widely used soy protein in the West, defatted soy flour. Defatted soy flour is used in breads, diet foods, breakfast cereals, processed and meat alternatives.

Soy protein isolates are made by removing all non-protein constituents from defatted soy flakes processing the flakes through alkaline and acid baths to remove fibre. Isolates are widely used in high protein health food supplements, dairy products alternatives and meat sausages.

Textured soy protein also known as textured vegetable protein (TVP) is made from defatted soy flour thermoplastically extruded under great pressure and heat to form small chunks.

Soy oil is extracted from soybeans using hexane solvent and heat. Often to make the soy derivatives more palatable artificial flavouring, colouring, and MSG are added.

Modern processors have worked hard to remove the phytates and enzymes inhibitors from their soy products and have succeeded but at what cost to the bean and to health? The products manufactured and the processes themselves are questionable and no doubt more injurious to health than the phytates or enzyme inhibitors found in the whole unadulterated bean itself.

Baby Soy-Based Formula

Soy-based formulas have been lifesavers for thousands of babies when unable to tolerate breast milk or dairy milk formula, or the mother has been unable to breastfeed. A very big concern is whether soy-based formulas, being high in phytoestrogens, are safe and the effects later on in life? The US, the largest user of soy-based formula, with 25 percent of infants fed soy-based formula every year. Fears have been raised that soy-based formula may accelerate puberty, cause developmental and reproductive abnormalities due to the presence of phytoestrogens and

thyroid disorders because of the goitrogens found in soy that may deplete iodine.

Several research papers have come out but none seem conclusive on the long-term effects if any. In August 2001 study results from the University of Pennsylvania's Center for Clinical Epidemiology & Biostatistics found no apparent long term positive or negative effects after surveying 811 participants who were soy-based formula fed. The participants were aged between 20-34 years old, and more than 30 medical conditions were looked at, including types of cancer, thyroid conditions, reproductive development as well as general physical development and education levels. A further study that appeared in The British medical magazine Lancet in 1997 found isoflavones levels to be 2-5 times higher in soy-based formula fed infants than found in adults who consume soy foods. The authors are not sure if the isoflavones are fully bioavailable to the infants and even if the high levels have health implications. Long term studies are required to allay growing concerns of the use of soy based infant formulas. Such studies would be able to identify not only the negative if any, but positive effects of phytoestrogens on such young and developing bodies then and later on in life.

In The Orient

The Chinese were well aware of the trypsin inhibitors and mineral obstructing phytates in soy and developed natural methods remove these. Soy was first fermented: shoyu, miso, natto and tempeh, or precipitated like tofu and soymilk, eliminating or greatly reducing the inhibitors and phytic acid content before being consumed.

Traditionally in Japan soybeans were cultivated only around the edges of rice paddies. This basically set the percentage of soy to rice consumed, at no more than 1-2 percent. The majority of the beans would be made into the following year's miso and shoyu. A small percentage of the beans were made in to tofu at times of celebration: New Year celebrations or Obon festival, though tofu never was the daily food it has become today. Further south, Okinawa, tofu has been eaten more traditionally and perhaps part of the reason for this is that tofu cools the body and the further south you go the warmer it gets.

From a Macrobiotic perspective soy is a yin, cooling, food, best eaten in the form of fermented products that use salt, creates a yang, warming and more alkalised, food. Soy when made in to tofu becomes more yin and acid forming, soymilk even more so. George Osawa advised to keep unfermented soy and soy products use to very limited amounts or not at all due to the formented and the exaggerated potassium (yin) to sodium (yang) ratio of 1677mg to 3mg in soybeans, (brown rice considered a central and balanced food with a ratio of 5 to 1). Over consumption of such high potassium foods can weaken the system overall, bring on vomiting, an inability to absorb nutrients, and cause loss of equilibrium and to become off centred due to potassium's ascending properties.

Back to the Original Question

Is soy just one more food that the spin-doctors have spun into another fad in a long series in health and nutrition? Certainly the health claims for soy have deified it. Marketed as the new miracle food, even though some of the health claims have been validated, there is very little discernment in the kind and amount of soy consumed. This supported with the FDA statement that as little as 25 grams reduces cholesterol levels, no doubt leads people to think, the more the merry.

Common sense tells us if we continue to consume soy at the levels we are finding in processed foods today we are going to see further increases in allergies and negative health where total elimination from the diet is will end up being the only answer. Is it any wonder that so many dissenting voices have been raised against soy? To be moderate and selective is paramount to getting the best from soy in our diets. Soy and processed soy products need to be kept to a balanced minimum. Tofu burgers or energy bars, etc, on occasion, soymilk, certainly, but not in litres, tofu, not daily, but a couple of times a week, traditionally hand crafted fermented foods wholefoods (not the pseudo products found in supermarkets), miso and shoyu, daily, in moderation because of the high salt content. Without a doubt soy is very powerful food with very special properties that the West's manufacturers and consumers need to understand. Especially in it's preparation and use and how it affects the body in the long and short term. Moreover, soy needs to be treated with the respect it receives in the East. Eaten in small quantities in fermented products or precipitated as in tofu and soymilk and then the soybean can be, as it is for millions already, a healthy and essential part of our diets.

References: Healing with Wholefoods, P. Pitchford ~/~ The Book of Tofu, W. Shurtleff, A. Aoyagi. ~/~ Essential Osawa, G. Osawa ~/~ Soy Bean of the Future, S. Marie ~/~ Yin & Yang-Acid & Alkaline, H. Aihara ~ /~ The Lancet, 1997, Vol350, 23-27, Exposure of infants to phytoestrogens from soy-based formula, K.D.R. Setchell, L. Zimmer-Nechemias, J. Cai, J.E.Heubi ~/~ New Scientist, 14 March 1998, Genistein, Cancer Killer, A. Lee, Y. Zhou.

Websites: www.starbulletin.com/1999/11/19/news/story4.html ~/~ www.tldp.com/issue/11_00/joysoy.htm ~/~ www.cnn.com/2000/HEALTH/diet.fitness/06/26/soy.danger.wmd/index.html ~/~ www.Soybean.org/FAQs.html ~/~ www.mercola.com/2000/feb/13 ~/~ www.abcnes.go.com/sections/living/DailyNews/soy010814.html ~/~ www.aap.org/policy/re9806.html ~/~ www.soyonlineservice.co.nz/