

Soy-based Diet: A Mesmerizing Triumph for Wellness

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There are three topics that can cause derision and division at any coffee or dinner table across the Western world: religion, politics, and soy. The humble soybean does have a noble and ingrained place in our world today and, whether you are pro or no, it's almost unavoidable. Soy is everywhere - from your soy milks and tofus to the more discreet soy lecithin used to prevent compounds from separating during the cooking process.



Asian countries have used soy-based remedies and foods dating back 5000 years to when Emperor Shennong declared the soybean a sacred plant. Henry Ford even found a use for soybeans. In 1935 he used soybean oil to paint his cars and top up his shock absorbers. He even created a soybean car created solely out of soy-based plastics in 1941. Soy is one of the most nutritious foods on the planet. Packing a whopping 22 grams of protein in a 180-gram serving, 26% of your RDI (Recommended Daily Index) of Ca (calcium), 51% of your RDI of vitamin C, and 25% of your RDI of Fe (iron), it

can easily become a dietary staple, especially for vegetarians. But there are some things you need to know that make the soybean of history very different from the soybean of today.



The soy is the famous plant beans used in many health products as well as used as raw and cooked meal. It is the seed of a plant called soy plant. The

soy has different names in different countries. It is called soya bean in UK and soybean in US. The Chinese dadou, deizu and greater bean of Japan are also referred to be the soy. East Asia is the origin of soy however it is mainly cultivated in India, Brazil, China, Argentine and United States of America.



The soy is widely used bean at the home and commercial level. It is used in medicines, dairy products, health improvers, tonics, multivitamins and other herbal products. The Soy milk and Soy vegetable oil are its main products that are used worldwide. It is the best source of protein and a fat-free meal. A lot of animal feeds are also prepared from the soy. The soy is



the main ingredient in many prepackaged industrial products. There it is used as processed oil, TVP (texture vegetable oil), soy milk and many other non-fermented foods. It is also used in fermented foods like natto, fermented bean paste, tempeh, soy sauce and a long range of other fermented food products.

A native of China, soybean has been cultivated for food well over 13,000 years. The Chinese name for soybean means 'greater bean'. Like other beans, soybeans grow in pods, containing edible seeds. While we most often think of them as being green, the seeds can also be yellow, brown or black. Today soybeans are grown all over the world. This plant was introduced in most countries as a source of oil food and protein for livestock but now it's commercially grown for many food and industrial purposes. About 70% of the total production goes for oil extraction and rest for seed purposes (10%) and direct food uses (20%). The oil so obtained is refined and used for culinary purposes. It's also used as an important ingredient for industrial products such as paints, plastics, lubricants and bio-fuels. The main by-product of the oil industry, namely lecithin (phospholipid) finds commercial application as a nutritional supplement and emulsifier. Other by-product includes hulls, which are used in animal feeds and as a source of fiber. The meal primarily used as a source of protein for poultry, piggery, livestock, aquaculture, etc. Soy meal has more than 50% edible grade protein, which can also be diverted for food uses. However the meal from the solvent extraction plants must be made edible grade and devoid of the residual solvents, which may cause various physiological disorders in humans. The ISO (International Standard Organisation) recommends 50ppm of residual hexane while BIS (Bureau of Indian Standards) allows 170ppm of such residual solvents. In an innovative process, developed by the INTSOY (International Soybean Center) at the University of Illinois, the soya bean oil is extracted

primarily through extrusion. The meal is devoid of the solvent and also contains low profile of fat. It may be used for direct food uses through either supplementation of fortification with traditional foods.

The K (potassium) has been proved to lower the high blood pressure. The hypertension can be controlled with the soy as it contains a proper amount of K. A 100 gram of raw soy bean has more than 600 mg of K. It is a reasonable amount to lower the blood pressure from a high BP stage. The soy may act as a BP controller if it is in the diet in proper amount and on constant basis. Many drug and food agencies have proved that the soy lowers down the cholesterol level in the human blood. US FDA (Food and Drug Administration) have declared it an official cholesterol controller food. So the persons with the high cholesterol level may have a great help with the soy. The regular and adequate use of soy can help lower the bad high cholesterol level. The soy contains niacin which helps protect cancer. The researches and the surveys show that the soy helps prevent cancer. The special arrangement of niacin with the proper additional helping ingredients in the soy makes it a guard against the breast cancer and prostate cancer. The Phytosterols and lycethin in the soy are great energizer in case of fatigue and mental tiredness. It acts as a refresher and activator. So we can say that the soy provides energy before work, during work and even after work when you get tired.

Soybean has exceptionally large quantities of fat. It has on an average 20% oil. The oil is hypocholesterolemic. The oil content is much higher than other pulses such as black gram, 1.64%; pigeon pea, 2.19%; cowpea, 2.05%; chick pea, 4.99%; lentil, 1.17%; lathyrus, 1.0% and green gram, 2.14%. The quality of oil is normally judged by its fatty acid composition. More the unsaturated fatty acids better the quality of oil. It contains about 78% of unsaturated fatty acids. Out of them linoleic and linolenic constitute 58%. They are called PUFs

(polyunsaturated fatty acids) . The IV (iodine value) is in the range of 125-135. The oil remains liquid over a relatively wide range. The oil can be hydrogenated selectively for blending with semi solid or liquid oils. Naturally occurring antioxidants/ tocopherols are present and are not completely removed during processing. However, soya oil has certain disadvantage like high phosphate content (2%), which must be removed by processing. The oil also contains 7-8% linolenic acid, which is responsible for flavour and odor reversion. It contains about 20-30% carbohydrates. Mostly they are galacto

oligosaccharides such as raffinose, stachyose and verbascose. It has little starch. The carbohydrate content is much lower than the other legumes where the major portion is starch such as black gram, 56.5-63.7%; chickpea, 60.1-61.7; green gram, 53.3-61.2; pigeon pea, 57.3-58.7% and lentil, 59.7-61.0%. It also has considerable amounts of calcium (226mg); phosphorus (546mg); iron (8.5mg); iron (8.5mg); magnesium (236mg); copper (2.4mg); and sodium (27.9mg)/ 100g of beans. All whole, unprocessed plant foods contain dietary fiber.

Soy or soya bean contains proteins, fat, vitamins, iron, folic acid, carbohydrates and many other basic healthy nutrients. For this reason it is used worldwide. Followings are its main benefits. Before discussing its numerous benefits, have a look at its wonderful ingredients' composition.

100 gram of raw mature soy beans contain ~

Fat.....20 g (*Polyunsaturated, Monounsaturated, Saturated*)

Carbohydrates.....30 g (*Dietary fiber, Sugars*)

Minerals.....3.0 g (*Calcium, Iron, Magnesium, Manganese, Phosphorus, Potassium, Sodium, Zinc*)

Vitamins.....175 mg (*A, B, C, E, K, Thiamin, Riboflavin, Niacin, Pantothenic Acid, Folate, choline*)

Proteins.....37 g (*Tryptophan, Glycine, Tyrosine, Threonine, Isoleucine, Lysine, Methionine, Cystine, Phenylalanine, Valine, Histidine, Alanine, Asparticacid, Glutamicacid, Proline, Serine, Leucine, Arginine*)

The soy contains about all kinds of beneficial proteins in the reasonable quantity. All necessary amino acids are present there in the soy protein. The PDCAASW (protein digestibility corrected amino acid score) is 1.0, which is equivalent to animal protein. Soybeans have a number of nutritional advantages over other food legumes. It is a cheap and easily available source found all around the world. Secondly this protein is easily soluble and digests simply without extra processes. As the protein also has the company of a large range of minerals and vitamins, so the digestion gets rapid and comparatively more beneficial. When a child is growing, a large number of amino acids are required for their rapid growth. As the soy contains all essential amino acids, so the soy is very useful to increase the growth of a child. The food experts and food researching departments have declared the so or soy bean a complete energy source, sufficient without any additional supplement. So the growing child must be supplied with the soy products to elevate his growth rate. However, keeping in mind some cares, the use of soy must be after a health care providers' recommendation. The skin is made of proteins. It requires protein for its strength as well as minerals and vitamins for its beauty and glow. The soy works as a skin care supplement. It provides the skin with the necessary proteins, vitamins and minerals in sufficient quantity. The constant use of soy may keep the skin strong, healthy, soft and glowing.

Calories.....446 kcal (*1866k j. Energy*) Soy is an excellent source of energy. They provide us a great amount of energy. This significant value may keep us energetic for a long time. So the soy should not only be included only in the breakfast for an energetic start but also a day meal with the soy helps us to keep on the way with high passion.

Source: (USDA Nutrient Database)

Soybeans have a nutrient profile for heart health and have other properties that may help lower risk for heart disease. Soy protein lowers the total and LDL cholesterol levels. Soy foods are excellent choice for a heart-healthy diet. Soy oil provides the plant-derived omega-3 fatty acid, ALA, while fish oil contains the marine-derived omega-3 fatty acids, EPA and DHA. These omega-3 fatty acids improve heart function by providing greater variability between beats, therefore reducing the risk of arrhythmia and/or sudden death. Soy in the diets will have significant reduction in both diastolic and systolic blood pressure. Not only the total blood cholesterol is significantly lowered, the level of HDL (High Density Lipoprotein) and good cholesterol are also significantly increased. Soy protein can reduce high blood cholesterol levels by 10 to 15% - enough to cut the chances of a heart attack by up to 30%. Soy protein inhibits cholesterol oxidation. Oxidised cholesterol is cholesterol that has undergone structural changes because of exposure to oxygen, damage arteries.

The original interest in soy was fueled by geographic epidemiology—the observation that populations that consume a lot of soy, particularly those in eastern Asia, have less breast cancer, prostate cancer, and cardiovascular disease, and fewer bone fractures. Additionally, women in these populations report fewer menopausal symptoms, such as hot flashes, and both men and women have a lower incidence of aging-related brain diseases. Since lifestyle can affect chronic disease development, and diet is a major lifestyle factor, traditional Asian diets drew considerable attention. Although initial research overestimated the amount of soy consumed by Asians, the cumulative evidence of numerous biomarker studies has confirmed that their diets are significantly higher in both isoflavones and lignans (another phytoestrogen) compared to the typical Western diet. Studies have further shown that when Asians emigrate to Western nations such as the United States and adopt the prevailing diet, their disease rates change.

There are some evidences that soya foods may help with sugar control in diabetics. Soy may also help lower risk of some of the complications of diabetes, such as kidney disease. Soybeans have a very low GI (glycemic index) and are valuable in a diabetic diet. Blood sugar control may also be improved by choosing carbohydrates that are high in soluble fiber. It helps in the slow absorption of the sugars. In kidney disease, a soy-based diet may be preferable to the traditional low protein diet from decreasing the renal damage. Soy provides high quality protein without stimulating hyper filtration and proteinuria. It prevents kidney damage by lowering serum LDL cholesterol levels. The soy-based diet thus lowers the incidences of obesity. Active isoflavone compounds found in soy, specifically, genistein help us stay lean by producing fewer and smaller fat cells. The two primary isoflavones in soybeans are genistein and diadzein and their

glycosides. They contribute too many protective effects. Soy foods and other soy based dairy analogues can serve as a balanced and remedial substitute of dairy milk for lactose intolerant persons. This condition arises mainly due to lack of β -galactosidase, the enzyme responsible for the hydrolysis of lactose in the intestine. The lactose is in turn degraded by the colonic bacteria into acid and carbon dioxide causing gastric discomfort such as flatulence, bloating, belching and diarrhoea. One serving of soybeans provides ~ 8 grams of dietary fiber. However, many soya foods are processed in ways that decrease their fiber content significantly.

Tofu and soya milk, 2 of the more popular soya foods, contain very little fiber. Soya foods that utilize the whole bean such as tempeh, soya flour and textured soya protein, are high in fiber. About 30% of the fiber in soya foods is

soluble fiber. It's a rich source of vitamin A (426mg); thiamine (73mg); riboflavin (39mg) and niacin (3.2mg)/ 100g beans. Soya foods are the richest source of isoflavones. These are phyto-serms (selective estrogen receptor modulators). They have some estrogen-like qualities and have non-hormonal properties as well. Since soybean has no lactose in it, the products prepared from soybean, namely, soy paneer and other soymilk analogues can serve as an ideal substitute of regular milk. The new USDA guidelines include soymilk, which is good because drinking soymilk has been associated with weight loss, reducing cancer risk (see also the video about breast cancer survival and soy), and preventing COPD. Soymilk has 75% more antioxidants than cow's milk (sample breakfast here), and contains phytoestrogens that have a number of health-promoting effects. Girls who drink soymilk as opposed to cow's milk develop at a more normal age, beginning puberty 8 months later on average.

Alas the inevitable happened. Researchers, hell-bent on creating the zombie apocalypse, went and created a strain of genetically modified soybeans. In 1997, 8% of the available soy product available in the United States was genetically modified. As of 2010, 93% of all soybeans in US circulation have been genetically modified.

Isoflavones are one of the most controversial chemical compounds on the market today due to their structure being very close to estrogen compounds. Isoflavones are phytoestrogens, plant based hormones that mimic the effects of estrogen within the human body. They naturally occur in foods, especially beans, and due to their role as phytoestrogens have been linked to decreased rates of breast cancer in women, namely within Asian countries where soy consumption is high. More specifically, genistein is a soy isoflavone that has been

shown to target and fight off estrogenic and androgen signaling pathways that have become cancerous, helping to reduce the risk of cancer. However, if you are a male, consuming half a cup of soy has been linked to low sperm count and mobility due to phytoestrogens and high isoflavone intake. Then again, isoflavones have also shown, through observational studies, to decrease the risk of prostate cancer in males due to their ability to modulate and prevent carcinogenic pathways in the body, possibly leading to preventative measures. For men, it seems as if you'll need to decide what side swings the blue light saber and which one wields the red one. But isoflavones and phytoestrogens don't only possess a risk for male virility. They can also cause significant problems to pregnant women. Consuming processed soy during a pregnancy can lead to increased levels of amniotic fluid in male and female fetuses and potentially Hydramnios in the mother, causing issues regarding the sexual development of the baby - a condition that can lead to fetal defects, facial deformities, or central nervous system issues. Not to mention that a 1992 finding by the SHSs (Swiss Health Services) found that if a woman was consuming two cups of soy milk a day, it was the equivalent to 1 birth control pill due to soy's estrogenic properties. And if you aren't a pregnant woman, or a woman trying to get pregnant, then you need to watch your soy intake as the soybean isoflavones have been shown to damage thyroid function in women consuming inadequate levels of iodine. Findings from laboratory studies have raised concerns that soy consumption may stimulate the growth of breast cancer cells. So while researchers believe soy reduces the risk of breast cancer, it might not be safe for women who have already had breast cancer. More research is needed to settle the issue.



Discussing soy is similar to discussing religious fervor at the dinner table. It's divisive, controversial, and can otherwise cause people to draw the battle lines and read the rules of engagement in preparation. Possibly the most important thing to remember is that most soy research is either (a) influenced by 3rd party funders pushing an agenda or (b) observational. Even though the humble soybean has been around for over 5,000 years and found use as everything from a dietary staple to a shock absorber oil, the research done is still largely arbitrary and biased. Nobody is telling you not to eat soy. For centuries, Asian cultures have thrived on the soybean and with its high content of fats, fiber, vitamins, and minerals; the soybean is a valuable addition to any Western diet. Keep in mind though that Western soy is processed, ground up, and genetically modified. Soon, we may even be consuming soybeans grown entirely in a lab and, just like you're fussy with the meat you eat, you should employ the same vigilance and moderation when it comes to consuming soy.

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