The role of Soya in Men and Women’s Health

About Soya:

Also known as Glycine Max, the soya bean is a legume, first grown in China 3000 years ago.

Soya, like quinoa, is a complete plant protein containing all nine essential amino acids that our body cannot make.

Soya is also rich in fibre, high in polyunsaturated fats and low in saturated fat. Soya is also high in B vitamins and minerals (molybdenum, copper, potassium, iron).

Phyto or Plant oestrogens:

Much of the controversy on soya is because it is a uniquely rich source of isoflavones as well as the majority (as much as 70-90%) of the soya crop being genetically modified for animal feeds

The isoflavones in soybeans are just one of several classes of phytoestrogens (plant oestrogens). Daidzein and genistein are the two main types of isoflavones found in soya beans.

Other than timing and duration of exposure to soya (childhood), gut bacteria may play an important clue as to the reason for varied results in the 20,000 or more studies on soya

EQUOL producers: 25% of non-Asians and 50% of Asians and vegetarians host the intestinal bacteria that convert daidzein into the isoflavonoid equol which has more estrogenic activity. Hence one may see differing beneficial effects depending on the amount of conversion to equol.

Soya isoflavones:

Isoflavones are classified as both phytoestrogens (oestrogen-like compounds found in plants) and selective oestrogen receptor modulators (SERMs).

Isoflavones should not be equated with the hormone oestrogen and neither should soya foods be equated with just isoflavones. Isoflavones do not stimulate the vaginal maturation index or increase C-reactive protein whereas oestrogen does. Isoflavones may exert potentially relevant hormone independent physiological effects

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Isoflavones have a chemical structure similar to the hormone oestrogen which allows them to bind to both oestrogen receptors (ER)—ERα and Erβ. Mammalian oestrogen binds to and transactivates ERα and ERβ equally, whilst isoflavones preferentially bind to and transactivate ERβ.

The preference of isoflavones for ERβ is the primary reason that isoflavones are seen as capable of having tissue-selective effects and the reason they are classified as selective oestrogen receptor modulators (SERMs), thus having dual effects.

Soya and its effects on the body:

Soya isoflavones appear to have a complicated role in the human body, mimicking oestrogen in some and blocking its effect in others (SERM effect). As a result, soya can also help reduce menopausal hot flushes, a pro-oestrogenic effect but in the breast, soya isoflavones appear to have an anti-oestrogenic effect (SERM), blocking the growth promoting effects of oestrogen on the breast. Hence, the likely reduction of breast cancer risk shown in several epidemiologic studies.

Soya also mimics oestrogen and occupies oestrogen receptors in the bone, albeit with a weaker effect, promoting bone strength

Depending on how much oestrogen is present in the body to start with, soya may exhibit anti or pro oestrogenic properties and have differing effects in women, making it quite complex to study. Isoflavones may also suppress oestrogen levels by inhibiting enzymes involved in the hormone’s production.

Studies have also suggested that soya intake in childhood and early adult life may be a modifying factor for breast cancer and as little as one portion of soya (10 mg of isoflavones or 80 g of tofu) a day can reduce future risk.

Effect of Soya on Menopausal Symptoms:

South East Asian women report a lower prevalence of hot flushes compared to their western counterparts (15% vs up to 85%). This has been attributed to the higher consumption of soya

Almost all studies have used isolated soy isoflavones which is why there is a wide variation in results in animal, in vitro vs epidemiologic studies. (more than 50 hot flush trials alone have been conducted without reaching definite conclusion)

Despite these inconsistent results, it can be argued that results are good enough to recommend the regular intake of soya as a food (not as a tablet), not least because a number of other benefits and the absence of side effects from formal hormone replacement therapy, such as cancer, heart disease and stroke

Further, the overall benefit (including placebo response) is most studies is at least 50% reduction in the severity and/or frequency of hot flushes. This degree of improvement is similar to that wanted by women seeking nonhormonal alternatives to oestrogen for menopausal symptom relief.

Whole or minimally processed soya foods should be recommended over isolated soy isoflavones where possible, as these natural soya foods are a composite of intricate biologically active molecules rather than containing just isoflavones

Soya products can be safely eaten several times a week throughout as part of a varied whole food plant based diet, unless one is allergic to soya.

Iodine intake and thyroid medication may need to be watched in those with thyroid problems but is not a contraindication.

Minimally processed products are to be preferred such as young beans (edamame), mature soya beans, natto, tempeh, tofu and organic soya milk over processed soya foods. These are excellent substitutes for animal sources of protein.

Miso, tempeh and natto are healthy fermented sources of soya.

Aim for two portions of minimally processed soya as part of a varied whole food plant based diet a day as an adult (for e.g. a cup of soya milk and 80g of tofu, miso, tempeh or edamame)

Avoid isoflavone supplements and soya protein isolates, the latter may increase IGF1 similar to animal protein. The benefits of soya products appear to relate to traditional soya products, not to concentrated soya proteins.

Reproductive Health in men and women eating soya:

Studies in both men and women have shown that soya did not hinder reproduction.

Adults who had been fed soya infant formula as infants were found to have no difference in their reproductive health when compared with adults who had been fed cow's milk formula

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Soya products have no adverse effects on men and may help prevent cancer in men. A meta-analysis published in Fertility and Sterility, based on more than 50 treatment groups, showed that neither soya products nor isoflavone supplements from soya affect testosterone levels in men.

Cancer Risk reduction:

An analysis of 14 studies published in the American Journal of Clinical Nutrition showed that increased intake of soya resulted in a 26 percent reduction in prostate cancer risk. Researchers also found a 30 percent risk reduction with nonfermented soya products such as soya milk and tofu.

Evidence to date indicates that soya products may reduce the risk of breast cancer and breast cancer recurrence. Studies have also suggested that soya intake in childhood and early adult life may be a modifying factor for breast cancer and as little as one portion of soya (10 mg of isoflavones or 80 g of tofu) a day can reduce future risk.

In a recent study, post-menopausal breast cancer survivors on Tamoxifen who ate the most soya had the lowest rates of breast cancer recurrence. This was also true of lignan intake (found in especially high levels in flax seeds)

Postmenopausal women with breast cancer were found to have higher mammalian oestrogen levels in the blood than women without breast cancer. However, women on a vegetarian diet had the lowest levels. This may help explain why breast cancer risk may be reduced by a vegetarian diet

Soya by inhibiting the growth of blood vessels that can supply cancer maybe the reason for the reduction in colon, lung, prostate and ovarian cancer seen in case control studies.

Tumours in post-menopausal women do not have easy access to oestrogen, which appears to feed tumours. These tumours may then turn to creating oestrogen themselves; mushrooms have been found to disrupt this process.

Effects of soya on the thyroid gland:

Soya does not appear to have adverse effects on the thyroid gland but may reduce the absorption of thyroid medications. Soya products should still be enjoyed as part of a varied whole food plant based diet.

Timing of medication: It is advisable not to take thyroid medication at the same time as eating soya products

It is recommended to watch iodine intake and have regular checks whilst on thyroid medication.

The role of soya in Polycystic Ovarian syndrome (PCOS):

Soya has been shown to improve PCOS symptoms and metabolic markers seen in the condition.

A randomised controlled trial (RCT) published in 2018 looked at the effect of dietary soya intake on weight loss, glycaemic control, lipid profiles and biomarkers of inflammation and oxidative stress in women with PCOS.

The soya diet led to significant decreases in body weight, waist circumference, insulin, insulin resistance, blood sugar, and triglycerides; it also helped counteract hormone disruption. A 2016 study found similar results.

The role of soya in fibroids:

Fibroids may shrink in women eating soya foods although flaxseeds, whole grains and green tea are better at shrinking overall size.

The role of soya in Endometriosis:

Soya is a common food in Japan and in Southwestern Asia that contains phytoestrogens which interact with oestrogen receptors, either with an oestrogenic or an anti-oestrogenic effect. Soya food consumption and perhaps, flax seed powder through the same phytoestrogen mechanism can minimise the risk of endometriosis, with studies to show that Japanese women had a lower risk of severe endometriosis.

Conclusion:

Soya is a complete plant protein containing all nine essential amino acids, similar to animal protein.

Daidzein and genistein are the two main types of isoflavones in soya beans.

The role of Soya in Men and Women’s Health

Soya isoflavones appear to have a complicated role in the human body, mimicking oestrogen in some and blocking its effect in others (SERM effect). It plays an important and beneficial role in men and women’s health.

Soya can also help reduce menopausal hot flushes and prevent osteoporosis, a pro oestrogenic effect.

Soya mimics oestrogen and occupies oestrogen receptors in the bone, promoting bone strength

In the breast, soya isoflavones appear to have an anti-oestrogenic effect and is safe and recommended for women with breast cancer to reduce recurrence.

Aim for two portions a day (for e.g. a cup of soya milk and 80g of tofu, miso, tempeh or edamame).

Childhood exposure of as little as one portion a day is thought to be protective for reducing future breast cancer risk.

Men can see a reduction of prostate cancer with regular intake of minimally processed soya, especially as part of a whole food plant based diet.

Avoid isoflavone supplements and soya protein isolates, the latter may increase IGF1 similar to animal protein

Thyroid dysfunction is not a contraindication to consume soya as part of a varied whole food plant based diet.

Reproductive health is not affected adversely by soya in men or women.

It has a beneficial role in PCOS, Fibroids, Endometriosis and bone health.

No recommendation can be made with regards to cognition and intake of soya foods due to lack of significant studies.

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