

Role of soy isoflavones in human health

*Mohita Kushwaha
 School of Biotechnology,
 Gautam Buddha University,
 Greater Noida, India.
 Email: mohita.kushwaha@yahoo.com

Abstract: There is a great arrangement of disagreement adjacent of soy foods, mostly due to their isoflavones which can bind to estrogen receptor and effect thyroid hormone .Isoflavones moderate the threat of prostate cancer and lower the LDL cholesterol. Soy Isoflavones compel the thyroid peroxidase. When we take high amount of soy isoflavones decrease the threat of endometrium cancer and ovarian cancer. It effect on neuroendocrine development in newborns. Soy isoflavones have no important assumption on thyroid hormones. Soy isoflavones may prevent postmenopausal osteoporosis and improve bone strength thus decreasing risk of fracture in menopausal women by increasing lumbar spine BMD and decreasing bone resorption marker urine deoxyypyridinoline.

Keywords: Soy isoflavones, Soy milk.

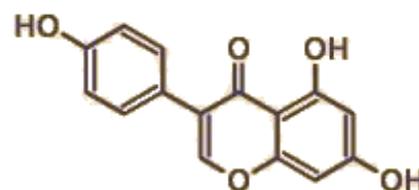
Introduction

Soymilk is a beverages made from soybeans. It is produced by soaking dry soybeans and grinding them with water. Glycinemax is common name of soybean seeds is the rich source protein and isoflavones. Soy milk contains about the same proportion of protein as cow's milk: around 3.5%; also 2% fat, 2.9% carbohydrate, and 0.5% ash. Plain, unfortified soymilk is an excellent source of high-quality protein, B-vitamins and iron. Some brands of soymilk are fortified with vitamins and minerals and are good sources of calcium, vitamin D and vitamin B-12. one cup soy milk contains 125 mg of Isoflavones. The oil is used in many industrial applications Isoflavones are a class of phytoestrogen plant resulting compound with estrogen activity. In the soymilk high content of soy protein which is the source of isoflavones in human health. Soymilk contains the prebiotic sugars stachyose and raffinose. These prebiotic sugars boost immunity and help decrease toxic substances in the body.

Isoflavones

Soybeans are the most abundant source of isoflavones.

Structure of Isoflavones

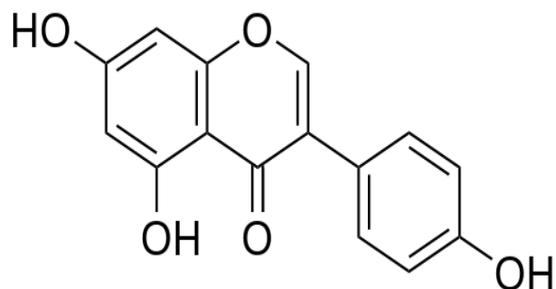


ISOFLAVONES is the compound which largely present in the high amount of protein and it also prevent cancer, being produced in plant legume from phenylpropanoids and simple phenols (Kenneth DR Setchell, 2005).

Depending on the type of estrogen receptor on the cells, isoflavones may reduce or activate the activity of estrogen. The best way to consume isoflavones is in the form soy or soyfoods, so you can benefit from other healthy components of soy. Soy contains many types of isoflavones, but the most beneficial are genistein and daidzein. It is the similar structure of mammalian estrogen. It consists of phenolic ring and bind to estrogen receptor (Leclerq and Heuson 1979). Compound which largely present in the high amount of protein and it also prevent cancer, being produced in plant legume from phenylpropanoids and simple phenols (Kenneth DR Setchell)

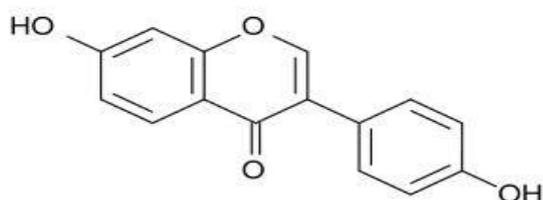
Genistein

Genistein is one of several known isoflavones. Isoflavones, such as genistein. Genistein, were found in the leaves of Psoralea corylifolia (Indian bread root. It is anticancerous metabolite. It helps in inhibition of several tyrosine kinases, inhibition of topoisomerase, direct antioxidation with some prooxidative features activation of Nrf2 antioxidative response, stimulation of autophagy,



Activation of estrogen receptor beta

Diadzein were found in the stems of the fava bean (*Vicia faba*) and roots of kudzu vine (*Pueraria lobata*), respectively. Miso, a fermented soybean product, is also a rich source of both isoflavones. It's an isoflavone found mostly in soybeans, legumes, and peas. Soy isoflavones are free radical scavengers (potent antioxidants) and are antiangiogenic (they interfere with unwanted blood vessel growth in disease states). They have been shown to have a beneficial effect on some types of cancer and bone health.



Role of soy isoflavones for human health

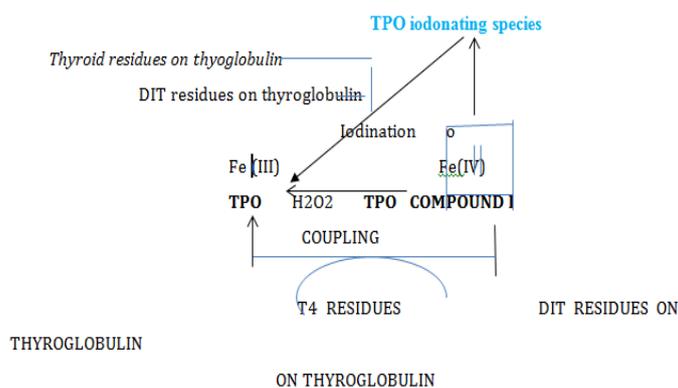
All soybean proteins and foods presently existing for human feeding contain significant amounts of the isoflavones consumption contain significant amounts of the isoflavones daidzein and genistein, either as the aglycone (unconjugated) Or as different types of conjugated form. Soy isoflavones is a

great effect on human health positively and negatively as following:

1. Inhibition the TPO (Thyroid peroxidases) (TPO) an enzyme involved in the synthesis of the thyroid hormones.

The majority of evidence from clinical trials involving healthy adult man and women indicate that neither soy protein nor isoflavones adversely affect thyroid function (Messina and Redmond, 2006).iodine deficiency is energy of concern in Americans. Elderly women need to be aware of and monitored the thyroid gland produces hormone T3 and T4 that regulate metabolism. Thyroid gland stimulating the TSH hormone. In soymilk isoflavones inhibit thyroid peroxidases for possible thyroid problems resulting from consumption of soy isoflavones .the post-menopausal women who consume large amount of Soy isoflavones product may be at high risk.

Synthesis of thyroid hormones thyroid peroxidase (TPO) is found in the apical membrane of thyroid follicular cells. TPO, a heme-containing enzyme, catalyzes both reactions required for thyroid hormone synthesis



Endometrium cancer

Effect of soy isoflavones against endometrium cancer

A 2009 meta- analysis of five retrospective and prospective studies found that participants with a higher soy isoflavones intake and a reduced risk for endometrium cancer and ovarian cancer. Two other studies of there years in duration found that soy isoflavones in the

amount of 70, 80 and 120 mg/day did not have a negative effect on the endometrium.

Women at risk for endometrial cancer might be attention in eating more than one serving per day of soy isoflavones. Lead author Ollberding wrote in Journal of the National Cancer Institute that intake of isoflavone-containing foods may be associated with a reduced risk of endometrial cancer. When cancer cells were also treated with estradiol, the isoflavones replaced gently by decreasing the estrogenic activity of estradiol.

One study found that daidzein and genistein prevented estrogen-induced endometrial cancer in mice. It should be noted that results of animal studies using such experimental models cannot reliably be applied to humans. Phytoestrogens may have anti-estrogenic effects. We evaluated the associations between dietary consumption of seven specific compounds representing three classes of phytoestrogens (isoflavones, coumestans, and lignans) and the risk of endometrial cancer.

Isoflavones is the protective against osteoporosis

In osteoporosis bone become a "porous" and degeneration of bone mineral density and bone strength. Osteoporosis occurs anywhere in human skeleton like spine, hips and ribs. In 5 years menopause women have loss 20% of their bone mass. That's why women require more amount of calcium for their bone development. Studies show that, in spite of their suggestively weaker estrogen action, isoflavones have bone building effects. Genistein is responsible for the reduction of bone cancer and menopausal symptoms in women. Daidzein isoflavones is protective against osteoporosis.

Chen et al (2004) demonstrated that soy isoflavones have a beneficial effect on bone mineral content, especially in women who were over 4 years in menopause, had a lower body weight or a lower calcium intake. Many studies have already illustrated that the soy isoflavones (genistein and daidzein) have an effect on bone turnover and can improve bone health in animals.

Soy is flavones decrease the amount of bone resorption

Soy isoflavones may prevent osteoporosis and improve bone strength in postmenopausal women. Soy foods contain several components (isoflavones and amino acid) that possibly affect bone. Soy as a means of improving bone mineral density (BMD) in late postmenopausal women have been accompanied. (Anne M Kenny *et al*, 2009). Doses of 60 mg isoflavones/day sufficient to the prevention of osteoporosis

Many studies have already illustrated that the soy isoflavones (genistein and daidzein) have an effect on bone turnover and can improve bone health in animals. Soy isoflavones is the diphenolic compound, it is a weak estrogens binds to estrogens receptor promote the bone health. Ipriflavone is the synthetic drug similar to the isoflavone. In addition to a possible direct effect of isoflavones on bone tissue, soy protein when replaced for animal protein may indirectly improve bone strength. (Messina M, *et al* 2000)

Soy isoflavones prevent type II diabetes

Genistein is a natural occurring soy isoflavones. Genistein has anti-diabetic effects, in particular, direct effects on β -cell increase, glucose-stimulated insulin secretion and protection against apoptosis, independent of its functions as an estrogen receptor agonist, antioxidant, or tyrosine kinase inhibitor (Elizabeth Gilbert *et al*, 2012).

Legumes have a very low glycemic index so it is responsible to reduce the risk of TYPE II diabetes. Soymilk is the important food for diabetes patient. It contains many factors like Tannin, fiber, phytic acid. When a human include this soybean in our normal daily diet i.e. 25 gm. that is significantly reduced the level of glucose. Soy isoflavones increase the level of insulin concentration.

Soy isoflavones contain antidiabetic property in daidzein compound, it reduces the blood glucose level and decrease the risk of cardiovascular disease and improve glucose level in human body. Soy foods are lowers the cholesterol and

improve glucose tolerance in people with diabetes.

Diabetes mellitus is a condition that afflicts people of all ages, genders, and parts of the world.¹ According to the most recent statistics, some 17 million Americans have diabetes, up more than 8 percent than previously estimated. The millions of Americans with diabetes ~ 5 percent have Type 1 diabetes and 90-95 percent has Type 2 diabetes; about 2-5 percent of pregnant women develop gestational diabetes. (Tammy J. Stephenson et al 1917). In 1917, John Harvey Kellogg reported that soybean is treating blood sugar level in diabetes.

Soy isoflavones decreases the cardiovascular risk

In type 2 diabetes lower the HDL - cholesterol level urine albumin excretion by the ingestion of high amount of soy isoflavones. Cardiovascular disease (CVD) mortality rates are lower in Asian countries where dietary patterns are very different from Western diet. A number of studies have linked these lower rates to the inclusion of soy products as a staple food in those countries. Isoflavone-containing soy protein consumption has been linked to reduced levels of LDL cholesterol in hypercholesterolemic patients. (Gil-Izquierdo A et al, 2012).

Soy based products, reduces the blood pressure in human

Before initiation of the study, urinary isoflavonoids (measured by HPLC) were undetectable in most case (for genistein, they were always <100 mol/L). After soy milk consumption, systolic blood pressure decreased by 18.4 ± 10.7 mmHg compared with 1.4 ± 7.2 mmHg in the cow's milk group ($P < 0.0001$), diastolic blood pressure decreased by 15.9 ± 9.8 mmHg vs. 3.7 ± 5.0 mmHg in the cow's milk group ($P < 0.0001$) and

Mean blood pressure decreased by 16.7 ± 9.0 mmHg compared with 3.0 ± 4.6 mmHg in the cow's milk group ($P < 0.0001$). Isoflavonoid contents were measured in commercially available preparations, including three different soy milks, soy lecithin and soy germ. Of these, daidzein and genistein contents in the selected

soy milk were 2 times higher than in soy lecithin and 10 times higher than in soy germ. Soy milk is the higher content of low saturated fatty acid than cow milk that's why it's more superior to cow's milk

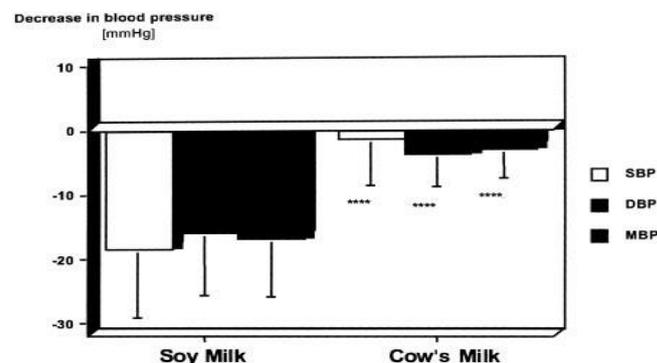


Figure: change in blood pressure in men and women consumed soy milk or cow's milk-based diet for 3 mo. Values are means +SD, n20. SBP, systolic blood pressure; DBP, diastolic blood pressure; MBP, mean blood pressure. Different from soy milk, $P < 0.0001$.

Soy isoflavones are helpful in alleviating postmenopausal symptoms

After Intake of soy isoflavones it was observed that post-menopausal symptoms were improved in women. A highly significant improvement was seen in serum lipid profile and Apolipoprotein. Women taking soy isoflavones demonstrated significant improvement in serum triglycerides. Soy proteins offer a greater health advantage due to their beneficial effect on serum lipid profile. (H K Jassi et al, 2010)

Beneficial role of soy isoflavones on obesity

Isoflavones is a group of compound; contain a high amount of dietary protein, it reduces the body weight and fat mass in addition to lowering plasma cholesterol and triglycerides. Soy protein may recover insulin resistance and lower body fat and blood lipids are discussed and include a wide spectrum of biochemical and molecular activities that favorably affect fatty acid metabolism and cholesterol homeostasis. Polypeptides isoflavones (genistein and daidzein) have free actions on fatty acid and cholesterol metabolism, which may give to the overall beneficial effects of soy protein in obesity. (Manuel T. Velasquez et al, 2007)

Negative aspects of soy isoflavones in human body

Soy protein may be associated with an increased risk of developing estrogen-dependent breast cancer in women. Soy isoflavones will increase natural estrogen cycles in women and therefore stimulate the proliferation of existing breast tumors. The most commonly observed side effects were bloating, abdominal pain and constipation after intake of soy proteins and soy isoflavones.

Conclusion

In January 2006, a review by the American Heart Association (AHA) of 22 studies on the effects of soy protein with isoflavones confirmed minimal or no benefit on cholesterol, which led the AHA to state that they could not mention the use of isoflavone supplements in pills or food for the anticipation of heart disease. Whole (dry) soy contains about 200 milligrams of isoflavones per 100 gram serving. If we take high protein content and minimal fat rich compounds are taken in our daily life definitely we reduce the many chronic diseases. Soy isoflavonoids are the high group of chemicals known as "flavonoids". It would be difficult to consume too much isoflavone from natural soy products, but there might be a risk associated with the consumption of dietary estrogens in the form of concentrated isoflavone pills or supplements. Soy isoflavones are inhibiting the action of TPO (thyroid peroxidases) on thyroid gland. It lowers the concentration of LDL and cholesterol level in humans by taking soy rich foods. It reduces the blood glucose level also prevent type II diabetes.

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