



Soy Yoghurt : An Emerging Nutraceutical

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Soybean, (*Glycine max* L.) is economically the most important oilseeds in the world, providing vegetable protein for millions of people and ingredients for hundreds of chemical products and a potential source of bioactive peptides. They are high in protein and a typical analysis on dry weight basis might be 20% lipid, 40% protein, 35% carbohydrate and 5% ash. Soy protein has been investigated for benefit in terms of other cardiovascular disease risk factors, reducing menopausal symptoms, weight loss, arthritis, brain function, and exercise performance enhancement. Soymilk is considered as a suitable economical substitute for cow's milk and an ideal nutritional supplement for lactose-intolerant population.

The concept of a "nutraceutical" originated in Japan during the 1980s with the development of "physiologically functional foods" that are considered, by definition, to be "any food or ingredient that has a positive impact on an individual's health, physical performance, or state of mind, in addition to its nutritive value".

Soy fortified yoghurt is a nutraceutical food. Soy yoghurt is fermented with a mixed starter culture of *Streptococcus thermophilus* and *Lactobacillus delbrueckii* ssp. *bulgaricus*. Yoghurts with 5% added soy protein concentrate qualify for the Food and Drug Administration (FDA) -approved soy health claim of "cholesterol reducing" and also contain sufficient fiber to provide 1 g of dietary fiber per serving. Fermentation is considered to be an efficient way to produce bioactive peptides. Many bioactive peptides have also been identified in fermented soymilk. For example, Angiotensin Converting Enzyme (ACE)-inhibitory peptides containing Ala, Phe and His have been isolated from soy yoghurt.

During the bacterial fermentation, major constituents including lactose and milk proteins, soy proteins, raffinose, stachyose and other soy carbohydrates are utilized for the bacterial growth, which results in the conversion of fermentable materials into a range of products such as lactic acid, acetic acid, peptides, amino acids and different vitamins. The health benefits provided by soy yoghurt are discussed as follows-

1. Antihypertensive property: Hypertension is reported to affect 25% of the world population. One of the most important intermediary factors for controlling hypertension is the action of the ACE. The development of soy yoghurt containing higher concentration of released bioactive ACE inhibitors and viable probiotics may provide health benefits from these functional compounds more efficiently.

2. Anticancer activity : It is reported that consumption of soy proteins in soy yoghurt reduced the incidence of azoxymethane induced colon tumors in rats. Soy foods are rich in isoflavones, a major group of phytoestrogens that have been hypothesized to reduce the risk of breast cancer. Among women with breast cancer, soy food consumption was significantly associated with decreased risk of death and recurrence.

3. Antidiabetic property : It has been suggested that soy yoghurt may be beneficial for diabetic subjects because of their estrogenic activity and their ability to prevent glucose induced lipid peroxidation and inhibit intestinal glucose uptake by decreasing sodium-dependent glucose transporter, which results in a reduction in postprandial hyperglycemia.

4. Antiobesity property : It has been found that the soy yoghurt have potential to reduce obesity. Genistein and soy protein supplementation in soy yoghurt can decrease triglyceride, total cholesterol, and low density lipoproteins (LDL) cholesterol levels in the serum and liver of mice. Furthermore, isoflavone supplementation has also been shown to effectively lower the serum cholesterol level in rats.

5. Hypocholesterolemic effect : Consumption of soy protein rather than animal protein significantly decreased serum concentrations of total cholesterol, LDL cholesterol and triglycerides without significantly affecting serum high density lipoproteins (HDL) cholesterol concentrations. Because of hypocholesterolemic effects shown by soy protein, Food and Drug Administration approved a health claim linking foods that are naturally rich in soy protein reduce coronary heart disease.

6. Antioxidative property : Soy yoghurt contains isoflavones (daidzein and genistein) which is having natural antioxidative property. It has also been observed that radical scavenging ability of soy peptides plays an important role in the suppression of lipid oxidation.

In future technological prospects that should be considered in view of the functionality of soy yoghurt that industries should work closely not only with the regulatory authorities but also with the medical profession in order to substantiate the health claims associated with these beneficial micro-organisms. More research work is needed to develop a large scale fractionation of protein hydrolysates to obtain products enriched with biologically active peptides of specific function that could be used as nutraceutical additives in functional foods.

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