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SOYBEAN: A PROTEIN BOOSTER FOR HUMAN BEING

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Abstract

The soybean, soy bean, or soybean (Glycine max) is a species of legume native to East Asia, widely grown for its edible bean, which has numerous uses. Traditional unfermented food uses of soybeans include soy milk, from which tofu and tofu skin are made. Soybean is one of the most important edible plants known for its seeds as a source of protein, oil and nutrition. The soybean proteins are important as a vegetable of a source for protein based products, with abundance quantity of amino acids. It also contains fats and PUFA are also important nutritional point of view. This paper focuses on the origin and history, production, and products of Soybean.

Keywords: soybean, edible, seeds, protein, nutrition, amino acids,

Introduction

Origin and History: Soybean Originate from China: In 2583 DC, Emperor Sheng-Nung of China Discover soybean plants was domesticated between 17th and 11th century BC in the Eastern hub China where they are cultivated into a food crop. From about the first Century AC to the age of discovery (15-16) Soybean were introduced into several countries such as Japan, Indonesia, Philippines, Vietnam, Thailand, Malaysia, Burma, Nepal and India. The spread of Soybean was due to establishment of sea and land trade routes. The earliest Japanese reference to the Soybean is in the classic Kojiki (records of ancient matters) which was completed in 712 AC.

The first soybeans arrived in America in the early 1800's as ballots abroad ship! It wasn't until 1879 that a few brave farmers begin to plant soybeans as forage for their livestock. The plants flourished into hot, humid summer weather characteristics of the north, eastern Carolina. Around 1900 the US department of agriculture was conducting tests on the soybeans and encouraging farmers to plant them as a animal feed. 1904, the famous American chemist, G.W. Carver discovered that soybeans are a valuable source of protein and oil. He encouraged farmers to rotate their crops with soybeans. To the surprise of farmers, this produced a better crop. In 1929 mores spent 2 years researching soybeans in China where he gathered more 10,000. Soybeans really took in America.

Production

Although soybeans are native to Southeast Asia, 55% production is in United States. The US produced 75 million metric tons of soybeans which more one-third was exported. Other leading producers of soybeans are Argentina, Brazil, China and India. Brazil is now the world's biggest soybean exporter displacing the US from the top. Currently Brazil is the top most producing country in the world. Second is America, Argentina, China and India. In recent 5 years soybean producing countries are given in the following chart.

Export in million metric tons

Year	US	Brazil	Argentina	China	India	Paraguay	Canada	Mexico	UK	Other	Total
2021-22	119.884	144.00	52.000	19.000	11.200	10.500	6.400	0.300	2.800	19.440	385.524
2020-21	112.549	137.00	47.000	19.600	10.450	9.900	6.350	0.240	2.575	18.402	364.066
2019-20	96.667	128.50	48.800	18.100	9.300	10.100	6.145	0.235	2.616	18.955	339.418
20	12	11	55	15	10	8.	7.4	0.3	2.	19	361

18-19	0.515	9.700	.300	.967	.930	520	17	35	667	.926	.277
2017-18	120.065	123.000	37.800	15.283	8.350	11.046	7.717	0.433	2.539	17.548	344.181

Source: www.sopa.org

Uses of Soybean:

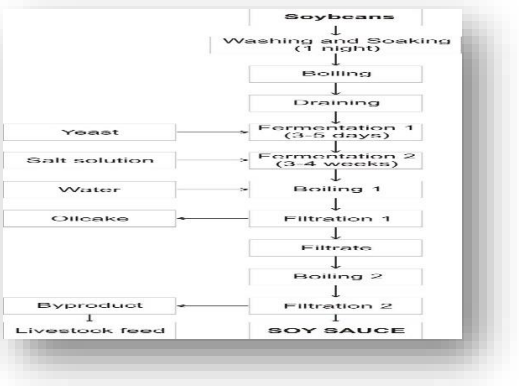
- **Soybean as a food ingredient**: Soybean is used as a raw material for oil milling and soya residue used as a feed stuff in domestic animals soybean contains a high concentration oil (18-25%) and protein (38 – 50%) and soybean is a popular food all over the world. In Asian countries soybean used fermented and non fermented food stuff. Such as Soy sauce, miso, natt, yogurt, kinako, protein crisp, desserts baby food and soymilk which is further processed in tofu. Mature seeds of soybean contains approximately 35% protein, 31% carbohydrates, 17% fats, 5% mineral and 12% moisture (messing and lane 2007)

  Soybean and its food products:

  Large seeded soybeans for tofu, soymilk production. Oriental soy foods, both fermented and non fermented products, some food products are:

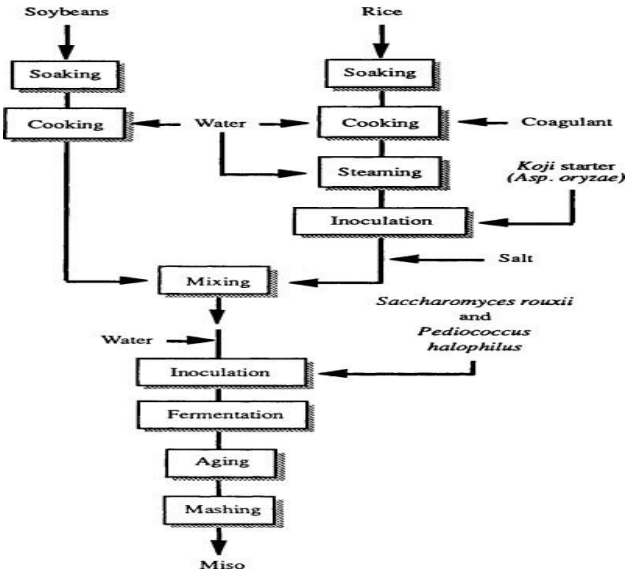
- **Soy Sauce:** It is fermented product of soybean. Soy sauce is made either by hydrolysis or fermentation. Traditional soy sauces are made by mixing soybeans and grains with mold cultures. Such as

Aapergillus, oryzae and other related microorganisms and yeasts. Soy sauce contains 10 calories 2 grams of proteins, 0.1 grams of fat, 0 gram of carbohydrates and 920 miligrams of sodium. Soy sauce is becoming more popular in US and Europe.



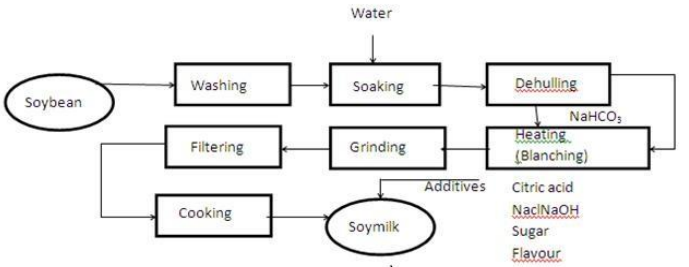
- **Soy Miso:** Miso is a Japanese traditional paste produced by fermentation of soybean with fungus Aspergillus oryzae and salt, and sometimes with rice, wheat or oats. It contains vitamins, minerals, proteins, carbohydrates, isoflavins and lecthine. The Miso paste is used for sauces and spreads, pickling vegetables or meats and Japanese culinary stapple ((Rat et al., 2014). One table spoon (17g) of miso paste contain calories 33.7, Fat 1gm, Sodium 634mg, Carbohydrates 4.3g, Fiber 0.9gm, Sugars 1.1g, Protein 2.2g. Information provided by the USDA.

Flow Chart



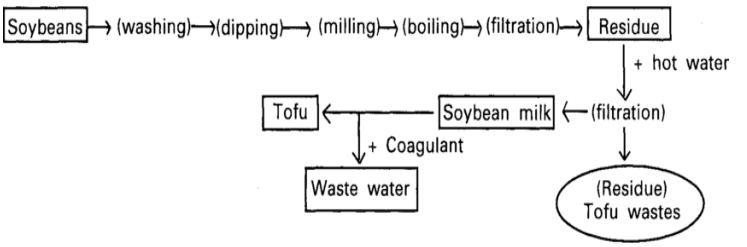
- **Soymilk:** Soymilk is originated in china. Soymilk is plain as well as flavoured. The plain soymilk consists of pure water, soybean extract, sugar and salt. And flavoured soymilk may consist of pure water, soybean extract, sugar, salt, flavours and permitted food colors. The soy milk (plain or falvoured) is ready to drink and applicable to all sections of people. Soy milk has 3 to 4% protein, 1.5 to 2 % fat and 8 to 10 %carbohydrates, ash6.5% (maximum) and moisture 80% (maximum). It is available in 200 to 500 ml polythene bags / tetra packs/Bottles. The soymilk is valid for 6 months and can be else for few weeks under refrigerator. It is essential to ensure product safety.

Flow Chart:



- **Soy Paneer (tofu):** It is good source of proteins. It is made by adding calcium or magnesium salts to soy milk, which enables the soy protein to coagulate to form curd. A simple and low cost technology for making tofu is made with calcium, calcium becomes an essential component. Soy paneer contains proteins 5%, fat 3%, crude fiber 0 to 1 %, carbohydrates 2%, Ash 0 to 5% and moisture approximately 0 to 90%. The texture of tofu can vary from extra firm, firm, soft and silken. Again it is essential to ensure product safety.

Flow chart



- **Soy biscuits**: Soy biscuits are consumed directly at any time either with tea or directly at any time either with tea or alone. Soy biscuits contain protein 12%, fat 5%, crude fiber 0 to 4%, Ash max 6.5 % and moisture 0 to 10 %. Soy biscuits are available in sealed polythene bags or laminated packages or hermitically sealed metal containers. It is essential to ensure products safety.

- **Soy bread:** Soy bread contains Protein 30%, Fat 5%, Crude fiber, 0-4% and Moisture maxi. 40%. Soy Bread is consumed directly at any time with tea/ alone. It is available in sealed polythene bags or laminated packages. It will be fresh for 6 days at normal retail shelf temperatures. It is essential to ensure product safety.

- **Conclusion**: Soybeans is best source of protein mainly and also contains nutritional value for health. Soybean is available in food products, which can be consumed by all age of people. It is easily available in market.

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