IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 4, January 2026
Impact Factor: 7.67

Preparation of Soyabean Milk

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Abstract: *Soybean milk is a nutritious, plant-based beverage prepared from soybeans. It is widely used as an alternative to cow's milk because it is rich in protein, free from lactose, and suitable for people with milk allergy or lactose intolerance. The preparation of soybean milk involves soaking, grinding, heating, and filtration of soybeans. This review discusses the method of preparation of soybean milk, important processing steps, advantages, limitations, and recent improvements to enhance quality and acceptability.*

Keywords: Soybean milk, plant-based milk, soy processing, lactose-free milk, protein-rich beverage

I. INTRODUCTION

Soybean milk is the first introduction of plant-origin milk and mention of food in history. Soybean milk is high economy and low cost raw material to obtain food protein and its popularity has increased globally in recent years (Jiang et al., 2013). Specifically, it is gaining attention in many countries such as Japan and China, which leads to rapid development of beverage and drinking market. Soy milk could be prepared from matured soaked soybeans or from cooked undried germinated soybeans with the same equipment available namely domestic soymilk maker (Nowshin et al., 2018). Germination can improve nutritional and digestibility of soybean, and furthermore is said to increase functionality. Women who have reached puberty, pregnant and breastfeeding can consume the soybean products and the soya products cannot be used as a replacement to all milk, but a multi-source milk intake.

History of soyabean milk

Origin of soy bean happened in south-eastern part of Asia and China was the first country to domesticate the soy bean cultivation. From China, soy bean was introduced to India. Traditional small scale soybean cultivation practices may be found in Himachal Pradesh, Utaranchal, eastern part of West Bengal, Manipur etc. regions of India including Central India since long time back Beneficial effects of soybean on human health and positive effects of its cultivation on soil fertility are well known, for which soy bean cultivation was promoted in India. Promoting soy bean cultivation was not that much successful because of farmers ignorance about soy bean cultivation practices, unavailability of high-yield seeds, unorganized market and unpopularity about the utilization of final produce, i.e., soybean. G.B. Pant University of Agriculture and Technology, Pantnagar (Uttaranchal-India) and the Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (Madhya Pradesh-India), in collaboration with the University of Illinois (USA) worked together for popularizing this highly nutritious bean cultivation in India, for addressing the protein malnutrition problems in India during mid 1960's

II. SOY MILK

Soy milk (also called soybean milk, soy juice and sometimes referred to as soy drink/beverage) is a beverage made from soybeans. Soy milk is a stable emulsion, which is considered as staple Asian cuisine. Overnight soaked soy beans are crushed with water and filtered to get the soy milk. Composition of soy milk and cow's milk are quite similar. Similar to milk, soy milk or plain soybean beverage is the pale liquid, which, is rich in protein and other nutrients with or without adding optional additives or ingredients. One advantage of soy milk over cow/buffalo milk is, this milk doesn't contain lactose or cholesterol and the fibers present can be removed from the final product.

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Nutritional importance of soya milk :

Rich source of high-quality plant protein (complete protein
Cholesterol-free and low in saturated fat
Contains beneficial isoflavones with antioxidant activity
Good source of vitamins (especially B-complex; often fortified with B_{12} and D)
Provides essential minerals like calcium, iron, magnesium, and potassium
Lactose-free, suitable for lactose-intolerant individual
Supports heart health and helps reduce cardiovascular risk
Helpful in bone health when calcium-fortified

Composition of soya Milk :

component	Percent component (%)
water	88-90
Protein	3.0-4.0
fat	1.5-2.5
carbohydrates	2.0-3.0
fiber	0.5-1.0
minerals	0.5-0.7
PH	6.34

Raw Material Used :

The main raw material used for the preparation of soybean milk is clean, mature yellow soybeans. Good-quality beans free from mold, insects, and foreign matter are preferred. Water is used as a solvent during processing.

III. PREPARATION OF SOYBEAN MILK

The preparation of soybean milk involves the following steps:

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3.1 Cleaning : and Sorting Soybeans are cleaned to remove dust, stones, damaged seeds, and other impurities. This step improves the quality and safety of the final product.

3.2 Soaking : The cleaned soybeans are soaked in water for 8-12 hours at room temperature. Soaking softens the beans, reduces anti-nutritional factors, and helps in easier grinding.

3.3 Dehulling : After soaking, the seed coat (hull) is removed manually or mechanically. Dehulling improves flavor, texture, and digestibility of soybean milk.

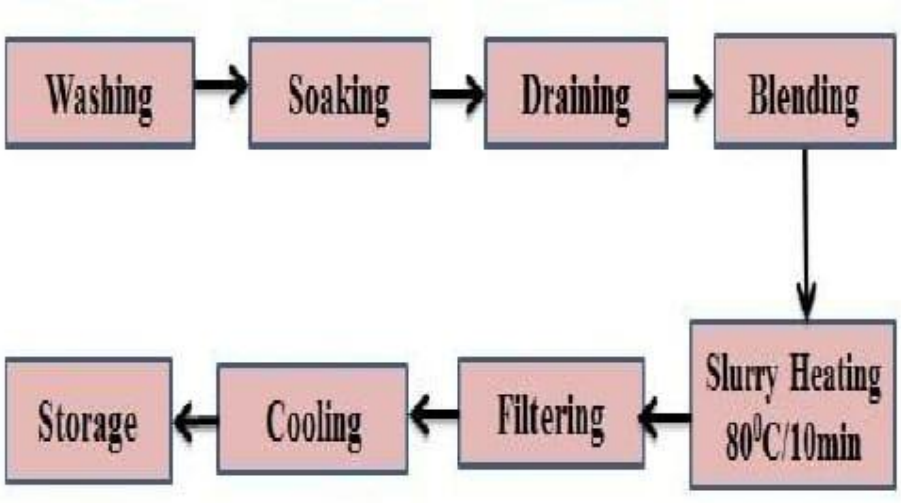
3.4 Grinding : The soaked and dehulled soybeans are ground with water using a grinder or blender to form a fine slurry. Usually, a soybean-to-water ratio of 1:6 to 1:10 is used.

3.5 Filtration : The slurry is filtered through muslin cloth or a fine sieve to separate the liquid (soy milk) from the solid residue

3.6 Heating : The filtered soy milk is boiled for 15-20 minutes. Heating is a very important

Step as it:
Inactivates trypsin inhibitors
Removes raw or beany flavor
Improves taste and safety

3.7 Flavoring and Fortification : (Optional) Sugar, salt, vanilla, cocoa, or fruit flavors may be added to improve acceptability. Vitamins and minerals such as calcium and vitamin D may be added for nutritional enhancement.



IV. ADVANTAGES

Advantages of Soybean Milk Rich source of high-quality protein Lactose-free and cholesterol-free Suitable for vegans and lactose-intolerant individuals Economical compared to animal milk Can be fortified with nutrients

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V. LIMITATIONS

Beany flavor if not properly processed Presence of anti-nutritional factors in raw beans Short shelf life without preservatives Possible allergenic reactions in some individuals

VI. RECENT IMPROVEMENTS IN SOY MILK PREPARATION

Modern techniques such as enzyme treatment, ultra-high temperature (UHT) processing, and spray drying are used to improve flavor, shelf life, and consumer acceptance. Use of improved soybean varieties has also reduced undesirable taste.

VIII. CONCLUSION

Soybean milk is a healthy and economical alternative to cow's milk. Proper processing steps such as soaking, heating, and filtration are essential to obtain good-quality soy milk with acceptable taste and nutritional value. With advancements in technology, soybean milk has become more palatable and widely accepted across the world.

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