Shrikhand: Nutritional composition, types and associated health benefits

Sanket Chopade, Ajay Gavhane and Mahendra Gunjal

Abstract

Shrikhand is a semi-soft, sweetish-sour Indian dairy dish that is made with whole milk. It is popular in Gujarat, Maharashtra, and some parts of Karnataka, Madhya Pradesh, and Rajasthan. To prepare chakka, roughly mix strained curd/yoghurt with sugar and flavouring seasonings. Shrikhand has a significant nutritional content, as well as a nice aroma, flavour and therapeutic potential. It aids the digestive system by strengthening the immune system. The objective of this review article is to describe how Shrikhand is important into our diet as a healthy supper.

Keywords: Shrikhand, chakka, dairy, nutritional, therapeutic potential

1. Introduction

Functional foods are gaining popularity in the food industry because they have been shown to improve human health. Because of their nutritious importance, dairy products are projected to remain key dietary components in the future, making the dairy business particularly vital to the Indian economy. Lactic acid fermentation is used to make it. Chakka is produced by combining strained yoghurt/curd, sugar, and other ingredients in a coarse blender. It's nutrient-dense, just like fermented milk products. It's refreshing, similar to Dahi (curd), and especially good in the heat. It's popular because of its distinct flavour, taste, and edible qualities, as well as the possibility of therapeutic benefits. (Yadav et al., 2018) [26]. Traditional dairy products prepared in India via coagulation, desiccation, and fermentation include ghee, makkhan (33%), dahi/yoghurt/Shrikhand (7%), khoa (7%), and chhana/paneer (3%). (Pugazhenthii et al., 2020) [18]. Shrikhand, is a semisolid light, sweetish sour fermented dairy product, was created in response to contemporary consumer demands for decreased or low-fat diets that can help to lower the risk of chronic degenerative diseases. (Sharma et al., 2021) Shrikhand is a well-known fermented milk product known for its flavour and medicinal benefits.

Shrikhand has a considerable quantity of milk protein and phospholipids and is created from lactic acid fermentation by Lactobacillus bulgaricus, Streptococcus lactis, Streptococcus diactylactis, Lactobacillus citrovorum, and Streptococcus thermopiles. (Gupta et al., 2018) [7]. Shrikhand is well-known in the western region of India's southern peninsula. The product with historical records is gaining appeal in other nations, in addition to the United States. Protein, vitamins, and minerals abound in this dish. (Hole et al., 2017) [8]. Dahi (curd), Shrikhand (sweetened concentrated curd), and lassi (stirred curd) are three popular fermented milk products in India that are similar to yoghurt, quarg, and stirred yoghurt in the West. The nutritional and therapeutic significance of Dahi and Shrikhand has long been acknowledged. (Sarkar et al., 2018) [22]. Shrikhand is made by blending chakka with 50-100 percent sugar. Despite Shrikhand's popularity and growing market in India and beyond, organised marketing choices are limited due to a lack of systematic packaging and half life studies. (Khojare et al., 2018) [11]. Today's shoppers are looking for foods that promote good health and disease prevention. Low-fat fermented foods are advised as part of a balanced diet for those with obesity and cardiovascular disease because they help the human body produce vitamin B complex and avoid gastrointestinal issues. (Singh et al., 2017) [23]. Fermented foods have long been recognized for their nutritional and therapeutic properties, and they play an important role in the creation of the vitamin B complex in the human body. These products also protect stomachic problems since certain lactic organisms produce natural antibiotics. (Devi et al., 2018) [5]. Curd is particularly nutritious because of the increased vitamin content due to the employment of certain cultures in its production.
Yogurt is good for avoiding bacterial growth and digestive ailments such as constipation, diarrhea, and dysentery. It has a longer shelf life than milk and curd. Yogurt aids in the reduction of blood cholesterol levels. (Mane et al., 2017) [14]. The objective of this review article is to study nutritional profile of Shrikhand and different fruit pulp added in Shrikhand.

1.1 History of Shrikhand
Shrikhand is a fermented and sweetened milk product from India, derived from the Sanskrit word ‘shrikhirni,’ which means sugared curd. It is popular in Gujarat, Maharashtra, and some parts of Karnataka, Madhya Pradesh, and Rajasthan. Its distinctive sweet-sour flavour, on the other hand, is gaining appeal in other parts of the country. Shrikhand has a semi-solid consistency, smoothness, firmness, and palatability, making it ideal for snacking or eating with 'puree' or bread right after a meal. (Jaybhay et al., 2019) [9].

2. Nutritional Composition of Shrikhand
The Nutritional composition of Shrikhand shown in (Table no.1) and mineral composition of Shrikhand shown in (Table no. 2)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Parameter</th>
<th>Amount</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Protein</td>
<td>7 to 8%</td>
<td>Singh et al., (2017) [23]</td>
</tr>
<tr>
<td>3.</td>
<td>Total soluble solid</td>
<td>55 to 60 brix</td>
<td>Dhotre et al., (2017) [6]</td>
</tr>
<tr>
<td>4.</td>
<td>Fat</td>
<td>12 to 14%</td>
<td>Ojha et al., (2016) [17]</td>
</tr>
<tr>
<td>6.</td>
<td>Titrable acidity</td>
<td>0.70 to 0.90</td>
<td>Kumar et al., (2019) [12]</td>
</tr>
<tr>
<td>7.</td>
<td>Ash</td>
<td>0.70 to 0.85%</td>
<td>David et al., (2015) [2]</td>
</tr>
</tbody>
</table>

3. Different Flavoured Shrikhand
3.1 Apple fruit pulp incorporated in Shrikhand
Sahu et al., (2021) [20] make goat milk shrikhand by including apple fruit pulp into the chakkas at 15, 20, and 25% apple fruit pulp concentrations. Apple fruit pulp with a concentration of 25% was found to be acceptable. Fruits are essential components of human life since they are high in macro and micronutrients and provide fibre. The addition of apple fruit pulp increased the consistency, cohesiveness, and work of cohesion of goat milk shrikhand while also masking the goaty flavour. Orange peel extract incorporated Shrikhand.

3.2 Orange pulp extract incorporated Shrikhand
Pugazhenthi et al. (2020) [18] perform the functional shrikhand by incorporating aqueous and ethanol extracts of fresh, dried orange fruit peels at various concentrations. When the functional shrikhand with 20% aqueous and 15% ethanol extracts of fresh and dried orange fruit peels was compared to the control, it was discovered that the functional shrikhand with 20% aqueous and 15% ethanol extracts of fresh and dried orange fruit peels was the best. It was discovered that aqueous extracts (20%) of fruit peels with shrikhand can be used as a value-added functional dairy product in the human diet. Shrikhand is a traditional fermented milk product made from chakka that has a pasty texture and a moderate sweetish sour flavour. Fruit peel extracts added to the shrikhand would provide value not only in terms of diversity, but also in terms of healthfulness. The technology packages for such food products also encourage the efficient utilisation of fruit waste.

3.3 Shrikhand by blending papaya and banana pulp
According to Gupta et al., (2018) [7] Shrikhand is prepared by blending papaya and banana pulp. Shrikhand was prepared with whole milk chakka, varied levels of papaya and banana pulp, and varying levels of sugar (30 percent by weight of chakka) at the rate of quantity of chakka 50, 40, and 30% treatment. The use of whole milk, as well as the addition of papaya and banana to the blended Shrikhand, resulted in an excellent recipe. Shrikhand from treatment T1 was found to have the best organoleptic features and received the highest organoleptic score (colour & appearance, body & texture, flavour & taste, overall acceptability). Date pulp incorporated Shrikhand.

3.4 Date pulp incorporated Shrikhand
Deshmukh et al., (2022) [4], investigated date pulp incorporating shrikhand at three different levels of date pulp: 10%, 20%, and 30%. Date pulp is a type of fruit that can improve the nutritional and compositional quality of food while also enhancing, conserving, and expanding the functions of food. The date pulp might be utilised to produce shrikhand successfully. It aids in the functional, nutritional, and storage properties of the product.

3.5 Shrikhand production from soymilk
Soymilk, is a popular non-dairy milk alternative made from nutritious soybeans, is a popular non-dairy milk substitute. Soyshrikhand is a low-cost, high-protein, versatile soybean-based cuisine. Soyshrikhand contains more protein and has less fat than buffalo milk shrikhand. The goal of this research was to investigate whether there was a way to use coagulation, desiccation, and fermentation to generate soymilk and transform it into a product (Kadam et al., 2016) [10].
4. Health benefits Associated to Shrikhand

Shrikhand is made by fermenting milk with lactic acid bacteria. These lactic acid bacteria are well-known for their role in the fermentation of dairy products, but they can also serve as excellent ambassadors for the microbial world, which is frequently misunderstood. They are crucial not only for economic reasons, but also for maintaining and increasing human health. Lactic acid bacteria help to lower cholesterol levels in the bloodstream while also increasing vitamin B levels in the product. (Bhandage et al., 2020)[1].

Shrikhand is a fermented milk product with a number of advantages over fluid milk, including ease of digestion and palatability, distinct flavour, richness, delicacy, variety, and a longer shelf life. Pomegranate fruit peel includes phytochemicals, which make food more functional and beneficial to health by acting as an antioxidant, anti-cancer, and anti-inflammatory agent. (Pugazhenthi et al., 2020)[18]. Tulsi extract, which is found in shrikhand, can help us with a range of health issues, including preventing diabetes, protecting the heart, decreasing stress, dissolving kidney stones, preventing cancer, quitting smoking, keeping our skin healthy and radiant, and repairing respiratory diseases. Tulsi is used to make Shrikhand, a healthful food. (Rai et al., 2018)[26].

Functional foods is essential for maintaining one's health and providing the nutritional requirements of the body. Food with functional components could be added to increase customer desire and acceptability. The ashwagandha augmented shrikhand has a high protein, ash, total solids, acidity, and fat content. Medically relevant herbs in food products are not readily accepted due to their bitter taste and ugly look. Incorporating whole herbs into culinary goods may result in undesirable dietary effects. Botanical extracts with active components could be a preferable option for nutraceutical foods. (Yadav et al., 2018)[26]. Date pulp in shrikhand offers a wide range of therapeutic effects, including antihyperlipidemic, anticancer, gastro-protective, hepato-protective, and nephro-protective properties, in addition to antioxidant, antimutagenic, and immune-modulatory properties. (Deshmukh et al., 2021).

5. Conclusion
Shrikhand has a high nutritional content, flavour, taste, pleasant quality, and potential health benefit, regardless of whether it is produced from curd or yoghurt. Shrikhand is a refreshing Indian fermented dairy dish that strengthens the immune system while also improving digestion. We may infer that shrikhand is a health food based on all of the above nutritional benefits.

Fig 1: Associated Health benefits of Shrikhand
6. References
4. Deshmukh MS, Padghan PV, Jadhav SB. Studies of Physico-chemical properties of date pulp added Shrikhand. 2022.