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Monograph

# Lassi: Chemical Composition and manufacturing process and health benefits

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## Introduction

Lassi (stirred dahi) is a ready-to-serve fermented milk beverage popular in India particularly in summer months. Good quality lassi should have creamy consistency, smooth texture and white colour with yellowish tinge. Mild acidic flavour and sweetish taste of lassi make it a refreshing soft drink. It is flavoured either with salt or sugar and other condiments or spices like ginger, coriander, and mint, depending on regional preferences. Lassi is obtained from pasteurized whole milk or partly skim milk, cultured with lactic and aroma/flavour producing organisms. In many parts of the country, products like buttermilk, chhach, mattha obtained after churning of sweet cream, or whole milk dahi and removal of butter are termed as lassi and usually consumed in salted or spiced form. It is also a product prepared from cultured skim milk, commonly known as cultured buttermilk is classified as lassi. Lassi contains all essential nutrients needed for growth, development and tissue differentiation, soured milk contains growth hormones-gastrin and hypoglycaemic agent (Arora, 2006). Lassi has been called "the most popular and traditional yogurt-based drink" in India (Shah, 2021). Jahanvi *et al.*, (2022) develops a sugar free lassi.

## Chemical Composition

Lassi is a white to creamy-white viscous liquid with a sweetish, rich aroma and pleasant mild acidic taste. The chemical composition of lassi depends on the type of milk, initial composition of milk, level of concentration of milk solids and the sugar level. The proximate composition of lassi is given in table-1.



**Table -1 Proximate composition of lassi**

<b>Constituents</b>	<b>Approx. value</b>
Milk fat	1.5 – 3.8%
Milk TS	9.00%
Sugar	13 – 20%
Sodium dihydrogen phosphate optional	0.5%
Low methoxy Pectin optional	0.5%
Acidity (minimum)	0.7% LA

### **Manufacturing Process of Lassi**

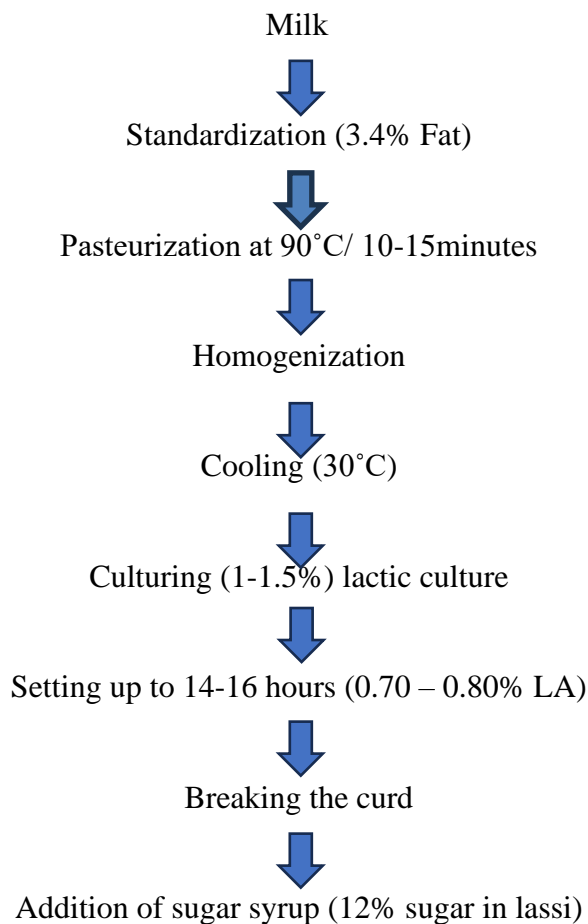
Production of lassi has been confined, to a large extent, to the households and local halwais mainly because of non-availability of a standardized technique for the manufacture of uniform quality lassi and its limited shelf life. In 1972 the technology was standardized at NDRI, Karnal and regular production of lassi started. The method of manufacture of lassi involves standardization, heating and cooling of milk to inoculation temperature, addition of starter culture and setting of milk. Sugar@ 12-15% of milk dissolved in equal quantity of water is added in the form of a syrup which has been pasteurized and cooled separately. Smooth consistency of lassi is obtained by homogenization of the mix. Flavour is added before packaging. In general, the quality of milk, starter culture and the method of manufacture influence the quality of lassi. Chemical quality of milk is important for desired body and texture and consistency and to meet the legal requirements, if any. But the more important effect of chemical and bacteriological quality of raw milk is on the growth of starter organisms. Therefore, the milk, which serves as a growth medium for the microorganisms must be of high microbial quality and free from mastitis milk, lipolytic rancidity, residual antibiotics and germicides. There should not be any bacteriophage contamination.

Pooled milk is considered to be the most suitable for the manufacture of fermented milk products, like, yoghurt, dahi, shrikhand etc. A suitable heat treatment is applied to milk to make it free from most of the vegetative cell of microorganisms associated with raw milk. However, some spore formers and stable enzymes remain unaffected by the commonly employed heat treatment in the manufacture of fermented milks. The basic role of starter culture is to bring about acid coagulation of milk and impart characteristic flavour. The culture must be pure, active and free from gas producing microorganisms. Presence of more than one type of lactose fermenting



microorganisms in the starter culture is required for the production of diacetyl flavour in dahi. A lactic culture comprising of *Lactococcus lactis subsp. lactis*, *Lactococcus lactis subsp. cremoris* and *Lactococcus lactis subsp. diacetylactis* is used for dahi for lassi making. Setting of milk is terminated at an acidity of 0.70 – 0.80 % LA. To the set curd sugar syrup is added which requires sufficient heat treatment (80-90°C) to prevent microbial contamination through sugar. It is also essential to cool the syrup to room temperature before addition to dahi to prevent hardening of fine curd particles and whey separation. Homogenization prevents cluster formation, rising of fat to the surface and improves consistency.

In a typical method of manufacture of lassi, standardized milk (4% fat) is heated to 90°C for 10 min and cooled to 25°C before addition of starter culture @1%. Cultured milk is incubated for 12-16 hrs. at 25-28°C, the set curd is broken by stirring and sugar syrup is mixed. The mixture is homogenized and packaged after the addition of flavour. On an average the product contains 3 per cent fat., 6-7 per cent SNF and 10-11 per cent sugar. The acidity ranges from 0.6 to 0.7% LA. Flowchart for mechanized production of lassi is depicted in Fig. 1.



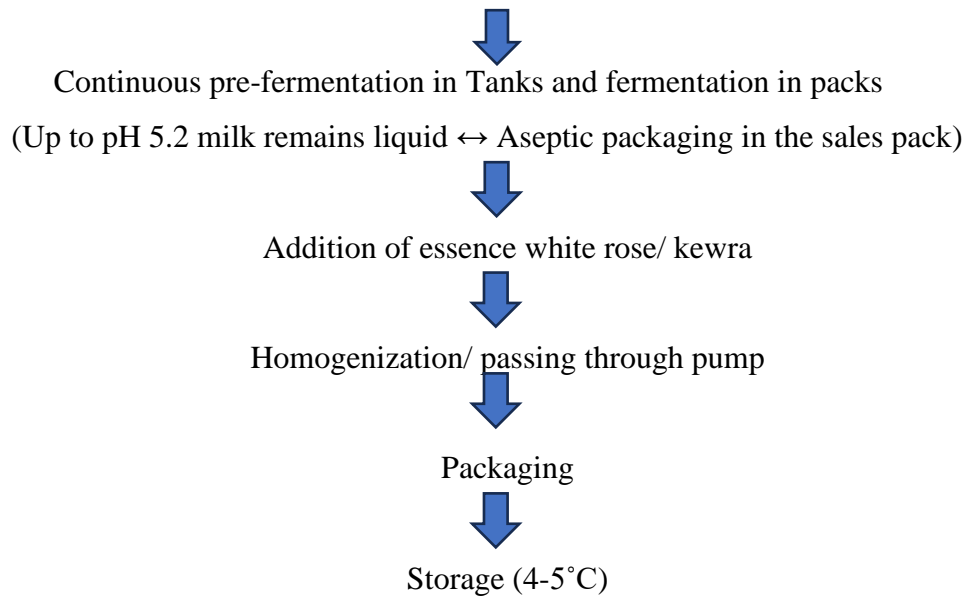


Fig. 1 Flow diagram depicted for manufacture of lassi

### **Technical Developments**

Lassi keeps good only for a day or two at room temperature. Under refrigeration, the keeping quality of lassi is extended considerably. Further extension of shelf life is achieved by UHT processing after fermentation and packaging aseptically. Wheying off may occur but it can be avoided by using a suitable stabilizer and proper processing conditions.

### **UHT Lassi:**

Significant advancements have been made towards the industrial production of lassi through application of UHT. Standardized milk (9-10%SNF and 0.5-1.0% milk fat) is warmed to 85°C for 30 minutes or 91°C for 2.5 to 5 minutes and cultured with suitable lactic culture (dahi culture at 31°C). It is then fermented at 22°C to lower its pH to 4.5. Set curd is broken with the help of a stirrer while sugar solution (30% in water) is added to give 8-12 percent sugar concentration in the blend. Lassi is then homogenized at 13.7 Kpa (2000 psi) and UHT processed at 135-145°C for 1-5 seconds and packaged aseptically employing standard equipment.

### **Lassi Powder**

In order to meet the seasonal and regional requirements of lassi, a technology has been developed for the manufacture of lassi powder, which upon reconstitution yields lassi like beverage. The method involves concentration of skim milk by reverse osmosis process, standardization of the concentration with cream to contain 10 per cent fat and 30 per cent total



milk solids, inoculation with starter culture and setting of curd. The curd is broken by agitation to obtain a smooth slurry which is subsequently spray dried under predetermined conditions. Sugar is dry blended. The powder on reconstitution with water yields lassi like beverage. Acceptability of the beverage could be enhanced by fortification with fruit juices. The lassi powder was found to contain moisture 5 per cent, fat 29-31 per cent and protein 23-34 per cent.

### **Health benefits of Lassi**

Lassi is used for the afternoon meal. Lassi settles the upset stomach and it's the cooling agent (Anonymous, 2006). Lassi helps in changing the food into energy and it gives a high energy level because of the presence of proteins, vitamins, minerals, calcium, potassium, metallic element and different enzymes essential for the body. Lassi helps in reducing accumulated fat, particularly on the belly. Lassi helps the various health benefits. Some of the health benefits of lassi are given below:

- i. It lowers body temperature. Lassi is a refreshing beverage that quickly lowers the temperature of the body in summers.
- ii. It improves digestion.
- iii. It strengthens the immune System.
- iv. It is effective for bone health.
- v. It may Reduce Blood Pressure.
- vi. It protects skin.
- vii. It is used for weight loss.
- viii. It also helps in detoxification.

### **Conclusion**

Fermented milk products is in high demand because of their known health benefits. It is becoming major part of milk product in Indian Dairy Market. Lassi helps in changing the food into energy and it also gives a high-level energy because of the presence of nutrients like proteins, vitamins, minerals, calcium, potassium, metallic element essential for the body. Lassi helps in reducing accumulated fat, particularly on the belly.

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