



Much more than dahi.....

**How to make
Chakka Dahi**

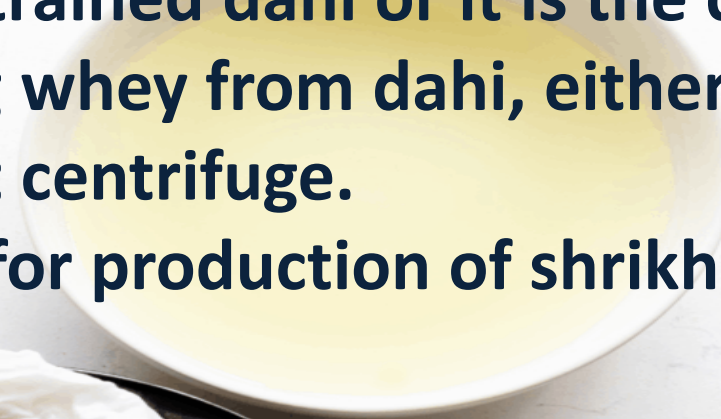


Chakka Shrikhand

*Product description, standards,
method of manufacture, small
scale and industrial process of
production, packaging and
preservation aspects*

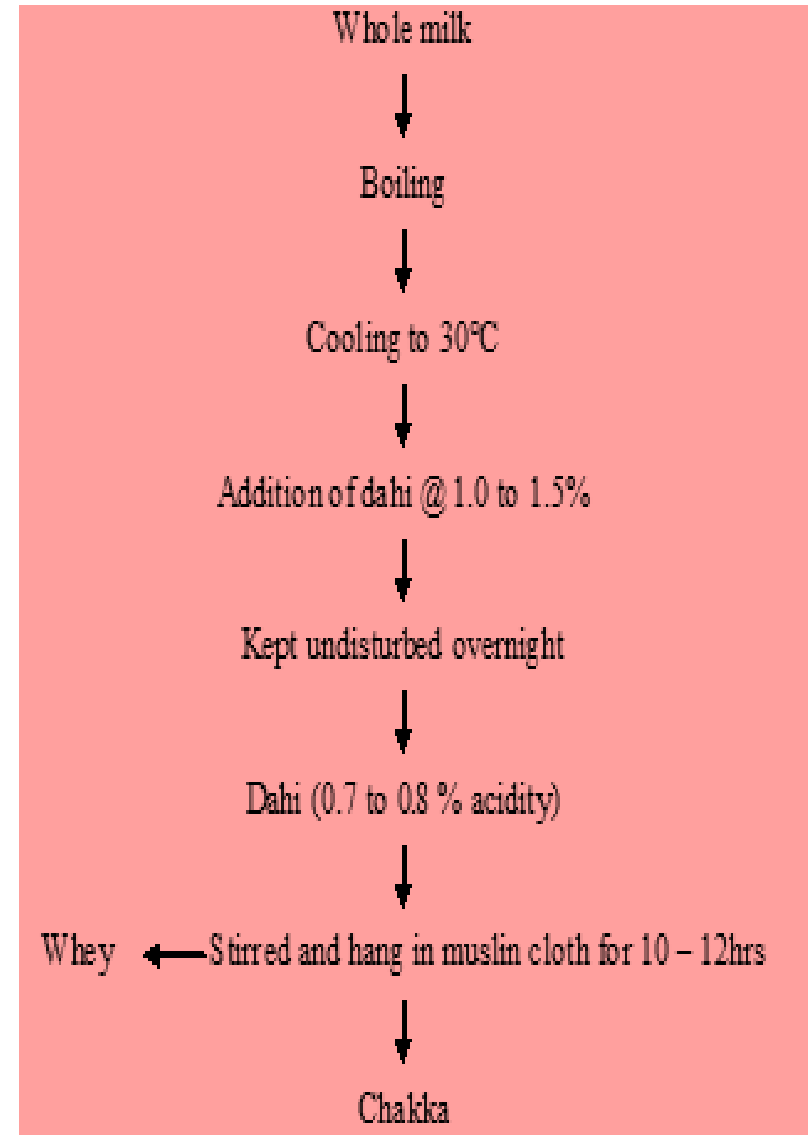


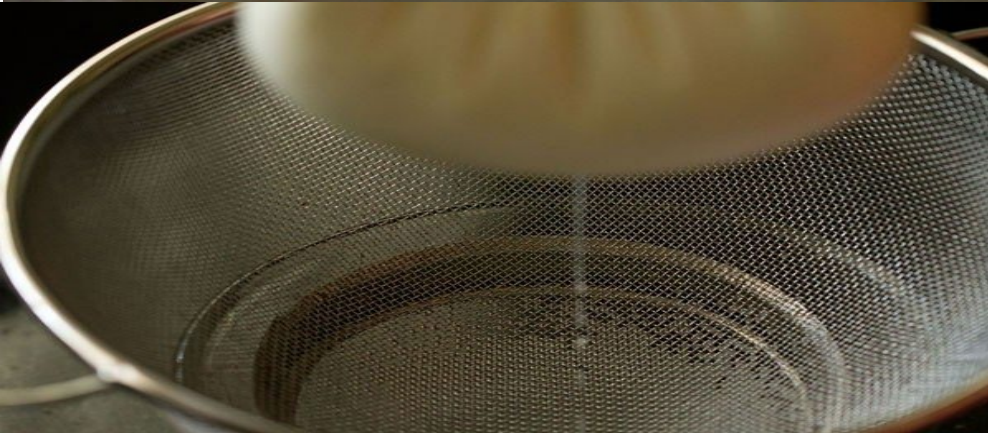
- **Chakka** is a fermented, intermediate dairy product obtained during the production of Shrikhand.
- Described as strained dahi or it is the curd mass obtained after removing whey from dahi, either through muslin cloth or basket centrifuge.
- Base material for production of shrikhand and shrikhand wadi.



Traditional Method of Preparation

- Cow or buffalo or mixed milk is boiled thoroughly and cooled to room temperature (30°C).
- Previous day curd is added to this milk at the rate of 1 to 1.5 %.
- Milk is left undisturbed overnight at room temperature to set firmly.
- It is then stirred and hung in muslin cloth for 10 to 12 hrs to drain off whey.
- Curd mass obtained after removal of whey is called as chakka.

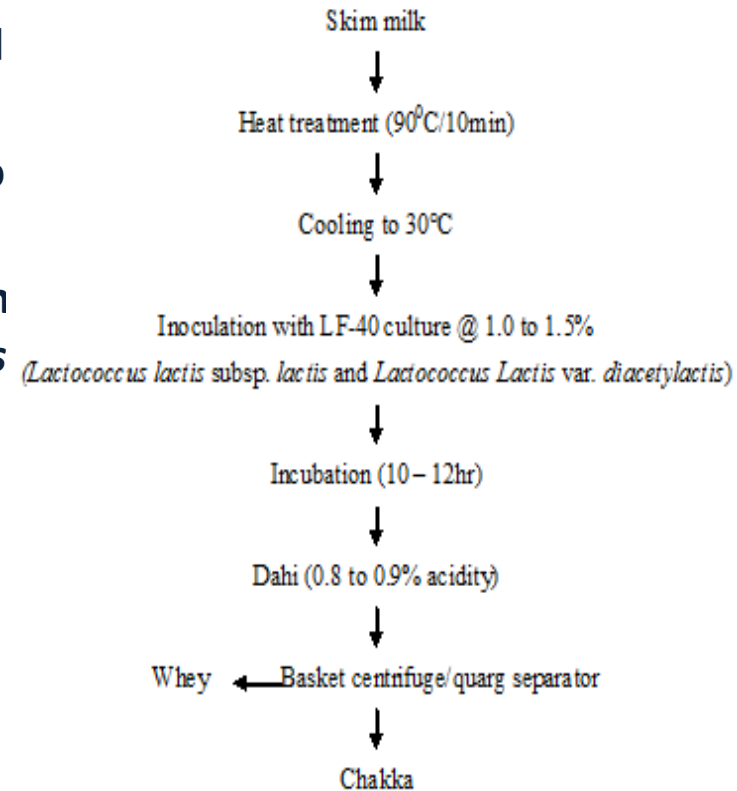




Hung Curd Ready.....

Industrial Method

- Skim milk is used in commercial production of chakka.
- Low fat in the curd resulted with significant reduction in fat loss through whey, faster moisture expulsion and lower moisture retention in the final product.
- Fresh, good quality skim milk is received and heated to 90°C for 10 min.
- Heat treated milk is cooled to 30°C and inoculated with LF-40 culture containing *Lactococcus lactis* subsp. *lactis* and *Lactococcus lactis* var. *diacetylactis* (1.0 – 1.5%).
- Milk added with culture bacteria is incubated at 30°C for 10- 12 h.
- After required acidity of 0.8 to 0.9% LA is reached, the curd is taken into basket centrifuge to remove whey from the curd.
- Use of quarg seperator for removal of whey has increased the chakka production to 8 tonnes/day.



Sl. No.	Components	FSSR (2011)		BIS	
		Skim milk Chakka	Whole milk Chakka	Skim milk Chakka	Whole milk Chakka
1	Total Solids (% Min) on DM	20.0	30	20.0	30
2	Milk Fat % on DM	5.0 (Max)	33.0 (Min)	5.0 (Max)	33.0 (Min)
3	Milk Protein % (Min) on DM	60.0	30	60.0	37
4	Titrateable Acidity (% LA) Max	2.5	2.5	2.5	2.5
5	Total Ash on DM (% Max)	5.0	3.5	5.0	3.5
6	Total plate count/g	Max 50,000			-
7	Coliform/g Max	10	10	10	10
8	Yeast and Mould/g (Max)	10	20	20	20

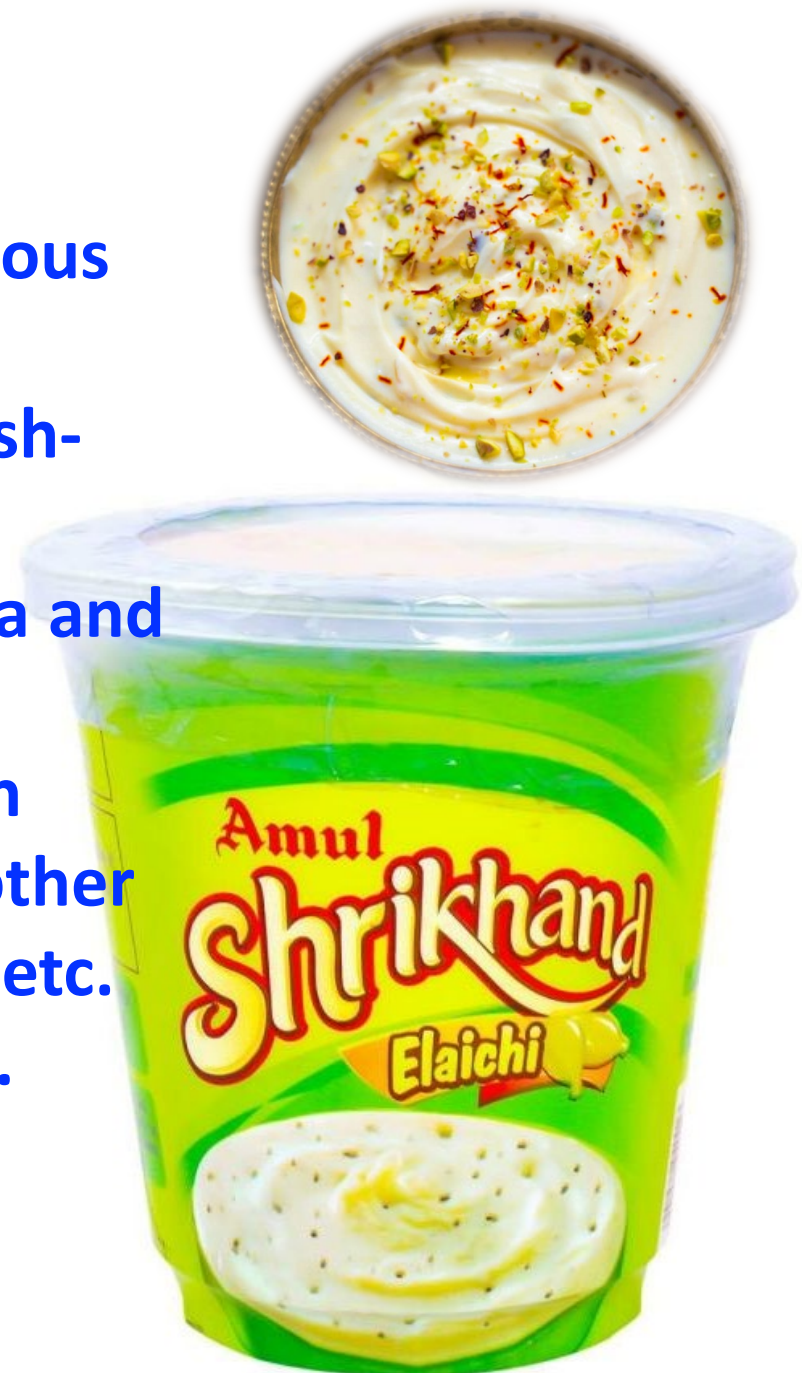
FSSR (2011) and BIS requirement

Yield of chakka produced traditionally is about 650 g per 1000 g of milk and yield of shrikhand is about 1.5 to 2.0 kg per kg of chakka. Yield of Chakka is about 20% more and shrikhand is 38.5% more than that of traditional method, when produced commercially.

Chemical Composition

Constituent	%
Moisture	71-72
Fat	11.5
Proteins	12.5
Lactose (dry matter basis)	2.5-3.5
Total ash	1.0
Titrateable acidity (% LA max.)	2.1

- **Shrikhand** is a popular fermented, sweetened, indigenous dairy product having semi solid consistency with typical sweetish-sour taste.
- Popular in Gujarat, Maharashtra and part of Karnataka.
- Prepared by mixing chakka with sugar, color, flavor, spices and other ingredients like fruit pulp, nuts etc. to form soft homogenous mass.



FSSR (2011) / BIS standards for Shrikhand

Particulars	BIS	FSSR (2011)
Total solids (percent, by mass min.)	58.0	58.0
Milk fat (% on dry matter, min.)	8.5	8.5
Milk protein (% on dry matter, min.)	10.5	9.0
Titratable acidity (max.)	1.4	1.4
Sucrose (% on dry matter, max.)	72.5	72.5
Total ash (% on dry matter, max.)	0.9	0.9
<u>Coliform</u> count (cfu/gm, max.)	10	10
<u>Yeast and mould</u> (cfu/gm, max.)	50	50

Traditional Method of Preparation

- Prepared by boiling cow/buffalo/mixed milk and cooled to room temperature (30 C).
- Heated and cooled milk is added with previous day dahi at the rate of 0.5 to 1 %.
- Milk is left undisturbed overnight at room temperature to set firmly.
- It is then stirred and hung in a muslin cloth for 10 to 12 hr to drain off whey.
- The curd mass obtained after removal of whey is called as chakka.
- Chakka is then added with calculated amount of sugar, color, flavour and other optional ingredients like fruits, nuts, spices, herbs and served chilled.
- Chakka obtained from whole milk/ standardized milk has smooth body, whereas the one obtained from skim milk is little rough and dry.
- When whole milk is used for chakka making, high fat loss occurs in whey thereby affecting the recovery of fat in chakka. Therefore, it is preferred to use skim milk for chakka making and then mixing of cream or unsalted butter to adjust the fat in the finished product.
- Homogenization of milk leads to slow drainage of whey giving higher moisture content in chakka and a product with very soft consistency.
- Moisture content affects the yield, consistency and composition, whereas acidity affects the taste and quantity of sugar to be added.

Cardamom

Saffron

**Almond And
Pistachio Slivers**

Sugar

Milk

Yogurt

1



2



5



6



3



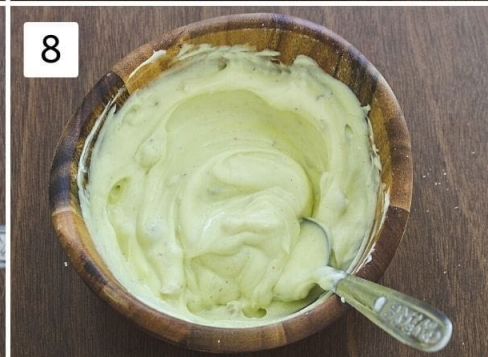
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Industrial Method

- ✓ First modern plant has been established at Baroda District Cooperative Milk Producers Union Ltd.
- ✓ Baroda Dairy has adopted a process which involves use of basket centrifuge for speedy draining of whey and planetary mixer for kneading and mixing of ingredients.
- ✓ For industrial production, fresh skim milk is used as raw material.
- ✓ Use of skim milk has got many advantages: fat losses are eliminated, faster moisture expulsion and less moisture retention
- ✓ Skim milk is heated to 85 C for 30 min, cooled to 30 C and inoculated with LF-40 culture containing *Lactococcus lactis* subsp. *lactis* and *Lactococcus lactis* var. *diacetylactis* at rate of 1.0 – 1.5%.
- ✓ After required acidity of 0.8 to 1.0 is reached, curd is taken into basket centrifuge to remove whey from curd.
- ✓ Chakka is taken into planetary mixer or scraped surface heat exchanger.
- ✓ Sugar at the rate of 80% w/w, calculated amount of plastic cream (80% fat) to give at least 8.5% FDM in finished product are added and mixed thoroughly.
- ✓ Color, flavor, fruits, nuts etc. can be added at this stage.
- ✓ Then packed at room temperature and stored at refrigeration temperature.

Skim milk (100kg) of 9% T.S. 0.13% TA 6.7 pH



Heat treatment 85°C for 30 min



Cooling to 30°C



Inoculation (*L.Lactis* + *L.Lactis* Var. *diacetylactis* is 1.0 to 1.5%)



Incubation for (10 to 12 hrs)



Dahi 0.9% TA & 4.6 pH (0.7 to 0.8% acidity)



Whey ← Basket Centrifuge 900rpm for 90 min at 30°C



Chakka 20 kg of 25% T.S. (T.S. in chakka is 5 kg)



TA 2.1 to 2.2% pH 4.4 to 4.6

Planetary mixer (35 to 45 rpm for 40 min)



Cream 80% fat 2.4 kg, sugar @ 80% w/w of chakka, cardamom @ 1 g/ kg of chakka

Shrikhand

(pH 4.4 to 4.6, TA 1.03 to 1.05%, fat 5-6% Protein 6.5 to 7%
Sucrose 40-43%, Ash 0.49 to 0.53, T.S. 57-60%)



Packaging at room temperature and cold storage

- Use of basket centrifuge or quarg separator for the production of Chakka - increased curd production to 80 kg/hr. Quarg separator has got capacity to produce 2,500 kg of curd per hour.
- Use of planetary mixer or scraped surface heat exchanger for mixing chakka with sugar and other optional ingredients. These processes produce homogenous mixture and increase production capacity to 40 to 500 kg per batch.
- Starter culture – different combination of lactic strains have been developed to produce superior quality of shrikhand e.g. *Lactococcus lactis*, *Lactococcus lactis* var. *diacetylactis*, and *Leuconostoc cremoris* in ratio of 1:1:1, *Streptococcus thermophilus* and *Lactobacillus bulgaricus* in the ratio of 1:1.

Chemical Composition of Shrikhand

Constituent	%
Moisture	35-40
Fat (dry matter basis)	8.5-9.0
Proteins (dry matter basis)	9.5-12.5
Lactose (dry matter basis)	2.5-3.5
Sucrose (dry matter basis)	70-74
Total ash (dry matter basis)	0.6-0.5
Titratable acidity (max.)	1.0-1.30
pH	4.3-4.1

Packaging and Shelf-life:

- As shrikhand is a semi solid product, heat sealable polystyrene cups of 100 g to 1000 g capacity are commonly used for packing shrikhand.
- Small manufacturer sell product in wax coated paper board boxes.
- Due to both high acid and sugar levels, shrikhand has a fairly long shelf-life of 30-40 days at 8°C and 2-3 days at 30°C.
- Shelf-life depends largely on initial level of contaminating organisms particularly yeast and molds.
- Shelf life of shrikhand can be increased by addition of potassium sorbate 0.05% or by thermization at 65°C for 10 min coupled with addition of 0.02% sorbic acid.
- For industrial purposes pasteurization of shrikhand at 65 C/10 min and subsequent freezing can increase the shelf life upto 12 months at -26 C.