EXPERIMENT 6 PREPARATION OF SHRIKHAND

Structure

6.1 Introduction
6.2 Objectives
6.3 Experiments
   Principle
   Requirements
   Procedure
   Observation
   Results
6.4 Precautions

6.1 INTRODUCTION

Shrikhand is a semi-solid-soft, sweetish-sour fermented dairy product. It is prepared from either cow, buffalo or mixed milk. Lactic acid fermented dahi is obtained by the associative action of micro-organisms on the milk constituents. Dahi is cut or stirred to expel whey through a muslin cloth. This results in a solid mass known as chakka. Chakka is mixed subsequently with the required amounts of sugar, colour, flavour, etc. to produce shrikhand. The composition of the shrikhand depends on the initial composition of the milk, the degree of fermentation, the extent of whey removal and the quality of sugar added. The standards outlined by BIS (Bureau of Indian Standards) are in Table 1.

<table>
<thead>
<tr>
<th>Characteristics (by weight)</th>
<th>Skim milk</th>
<th>Whole Milk Chakka</th>
<th>Shrikhand Chakka</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total solids % Min</td>
<td>20.0</td>
<td>30.0</td>
<td>58.0</td>
</tr>
<tr>
<td>Milk fat (%) DM</td>
<td>5.0 (Max)</td>
<td>33.0 (Min)</td>
<td>8.5</td>
</tr>
<tr>
<td>Milk protein (%) Min on DM</td>
<td>60.0</td>
<td>37.0</td>
<td>10.5</td>
</tr>
<tr>
<td>Titratable acidity % LA</td>
<td>2.5</td>
<td>2.5</td>
<td>1.4</td>
</tr>
<tr>
<td>Total ash (%) Max on DM</td>
<td>5.0</td>
<td>3.5</td>
<td>0.9</td>
</tr>
<tr>
<td>Sugar (%) Max on DM</td>
<td>—</td>
<td>—</td>
<td>72.5</td>
</tr>
<tr>
<td>Coliform (per g) Max</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Yeast and mould (per g) Max</td>
<td>20</td>
<td>20</td>
<td>50</td>
</tr>
</tbody>
</table>

6.2 OBJECTIVES

The should be able to:

a) Prepare chakka and shrikhand by the traditional and industrial method.

b) Compare the yield and quality of chakka and shrikhand prepared by the two methods.
Practical Manual—
Dairy Products-III

c) Prepare sweetened, fruit shrikhand.

d) Evaluate the quality of different types of shrikhand.

6.3 EXPERIMENT

i Principle

Shrikhand, a semi-solid, sweetish sour fermented milk product, is very close to flavoured quarg of Germany. Shrikhand is prepared by fermentation of milk with lactic acid bacteria, expulsion of whey from the curd, followed by mixing with sugar, flavouring and species. The composition of this product is 34-40 per cent moisture, 43-45 per cent sugar, 4-6 per cent fat, and 10-12 per cent milk solids-not-fat.

ii Requirements

A. By Traditional Method

i) Stainless steel (SS) kettle/ vat/ degchi.

ii) Stirrer/ plunger.

iii) Thermometer (0-120°C).

iv) Fat and acidity testing unit.

v) Incubator.

vi) Muslin cloth.

vii) Mixer/ kneader.

viii) Sugar.

ix) Milk

x) Lactic starter culture.

xi) Flavouring substances.

xii) Packaging material

B. By Industrial Method

i) Cream separator.

ii) Plate pasteurizer.

iii) Storage/ incubation tanks.

iv) Basket centrifuge.

v) Planetary mixer with variable speeds.

vi) Filling machine.
iii. Procedure

A. By Traditional Method

i) Standardize good quality (having no off flavour and COB test negative) buffalo milk to 5.0 per cent fat.

ii) Transfer this milk into a kettle/ vat/ container through a muslin cloth.

iii) Heat the milk either up to just boiling or up to 90°C for 10 minutes.

iv) Cool to 30°C.

v) Add lactic starter culture at the rate of 0.5 per cent of milk and mix well with the help of a stirrer/ plunger (The starter should preferably be dahi of the previous day/ batch).

vi) Incubate the milk at 30°C till the desired acidity (0.80 – 1.0 per cent lactic acid) is developed. It usually requires 10-12 hours.

vii) After the curd/ dahi has been properly set and the required acidity developed, transfer the contents into a clean and wet muslin cloth.

viii) Hang the cloth bag on a stand for the draining of whey. Gentle pressure can also be applied to facilitate the expulsion of whey. Collect whey in a clean container for analysis and further use.

ix) After all the free whey has been drained, a semi-solid mass is obtained. This is called chakka and is used for making shrikhand.

x) Take the weight of the chakka and transfer it into a mixer/ blender/ kettle.

xi) Add good quality sugar to the chakka. The amount of sugar should be equivalent to 80 per cent weight of the chakka. A slight adjustment in weight of the sugar can be made; depending upon the acidity of the chakka, i.e. if the acidity is too high, a slightly higher amount of sugar can be added.

xii) Knead/ mix both, either mechanically or manually, to a homogenous consistency.

xiii) Add flavouring and additives, like fruits, nuts, colour, etc., depending on the consumers’ requirement.

xiv) Record the weight of the product.

xv) Finally package the product in polystyrene cups and store under refrigerated condition.

By Industrial Method

i) Select good quality milk and separate it into cream and skim milk using a centrifugal cream separator. The skim milk should be completely devoid of fat. Cream should preferably be of high fat (70 per cent or above).
ii) Heat the skim milk to 90°C for ten minutes followed by cooling to 30°C. Alternatively, a batch pasteurizer can also be used. Simultaneously, pasteurize the required quantity of cream at 85°C for 16 seconds for later use.

iii) Take the heated skim milk in a pre-sterilized incubation/storage vat and add 0.5 per cent lactic starter and mix well with the help of a mechanical agitator. Maintain the temperature of the vat at about 30°C with the help of circulation of the warm water.

iv) Incubate it for about eight hours.

v) After the curd has properly set and acidity developed in the range of 0.8 – 1.0 per cent, stop incubation.

vi) Separate whey by centrifuging the curd for 60 minutes using a basket centrifuge (at about 1100 rpm). Thus, chakka is obtained.

vii) Transfer the known quantity of chakka in to a planetary mixer.

viii) Add the required amount of pasteurized cream (the fat in the final product should be about six per cent) and sugar (about forty two per cent in the final product) to the chakka.

ix) Mix the contents by running the mixer at variable speeds. Normally, it takes 40 minutes at 110 rpm for getting a homogenous mass.

x) Flavour and other additives may also be added during the mixing of chakka, sugar and cream.

xi) Cool the final product and fill in the wax coated paper cups/polystyrene cups (100 or 500 gm capacity).

xii) Store under refrigerated condition.

**iv. Observations**

i) Particular of Milk

<table>
<thead>
<tr>
<th>Type</th>
<th>Fat %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>Solids-not-fat %</td>
</tr>
<tr>
<td>Acidity</td>
<td>% lactic acid</td>
</tr>
</tbody>
</table>

ii) Particular of Starter culture

| General characteristics | Acidity % lactic acid Flavour |

iii) Processing of Milk

| Time/ temperature adopted |

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26
Temperature of cooling _____________ °C.

Time taken for a) Heating _______ min b) Cooling _______ min.

iv) Inoculation

Amount of inoculum _____________ %

Temperature of milk at inoculation _____________ °C.

v) Setting of Dahi

Incubation Temperature _____________ °C

Period of setting _____________ hr.

vi) Quality Testing of Dahi

Organoleptic _____________

Acidity _____________ % lactic acid Amount _____________

kg.

vii) Particulars of Chakka

Mode of drainage of whey _____________

Period of drainage _____________ hr.

Amount of chakka obtained _____________ kg.

TS of chakka _____________ %

Acidity of chakka _____________ % lactic acid

Organoleptic quality _____________

viii) Preparation of Shrikhand

Amount of cream and sugar added _____________ kg.

Mode of blending _____________

Types of flavourings and additives used _____________

Time required for blending _____________ min.

Amount of shrikhand produced _____________ kg.

Yield (on milk basis) _____________ %

i) Quality of Shrikhand

Total solid _____________ % Fat _____________ %

Acidity _____________ %

Organoleptic quality _____________
v. Results

Write your observations in a tabular form and compare the quality of different types of shrikhand.

6.4 PRECAUTIONS

i) Use fresh and good quality of milk.

ii) Milk should be free from antibiotics and other inhibitory substances.

iii) Standardize milk to appropriate fat/ SNF level.

iv) Use fresh and good quality starter cultures.

v) Maintain aseptic conditions during the processing transfer of cultures and packaging.

vi) In case of fruit shrikhand, use fresh and good quality fruits.

v i i ) I n preparation of sweetened shrikhand, sugar should be properly heat treated to avoid yeasty fermentation temperature.