*Practical Exercise 14*

# *Preparation of toned milk, double toned milk, flavoured milk and reconstituted milk and recombined milk*

## *Objective*

*To know about the method of preparation of*

*a) toned milk and double toned milk*

*b) flavoured milk*

*c) reconstituted milk and*

*d) recombined milk*

## Principle

Milk should meet the minimum legal requirements prescribed by Food Safety Standards Authority of India (FSSAI) in order to sell in market. FSSAI prescribe the minimum fat and SNF level for different market milks as listed below.

| | Fat % (min.) | SNF% (min.) |
|---|---|---|
| Toned Milk | 3.0 | 8.5 |
| Double tone milk | 1.5 | 9.0 |

The flavoured milk should have minimum fat and SNF level as that of toned or double toned or from the milk which has been prepared. The standards for reconstituted milk were not suggested as reconstituted milk has not been sold in the market rather reconstituted milk is used for standardization purpose largely. The recombined milk should have minimum fat and SNF level as that of toned milk. So standardization is an important step in preparing all these types of milk. Homogenization may be performed to avoid cream plug in the milk and for better quality. Thermal processing of these milk is performed either pasteurization or UHT processing or retort sterilization. Retort sterilization is applicable largely for flavoured milk preparation

## a) Preparation of toned milk and double toned milk

### Requirements

Stainless steel containers, Conical flask, pipettes, burette, beaker, weighing balance, measuring cylinder, water bath, ice-bath, milk butyrometer, lactometer, thermometer, lock stoppers, lactometer jar, Gerber acid, amyl alcohol, homogenizer

### Procedure

i. Analyse the raw materials given for preparation of toned milk.

ii. Calculate the quantity of various ingredients required for making toned milk and double toned using the methods described at Exercise No. 07.

iii. Carefully weigh the liquid ingredients in a clean and dry container required for preparation of both the products.

iv. Carefully weigh dry ingredient (SMP if required) in a clean and dry container.

v. Pre-heat liquid ingredients to 35 – 40°C and mix well.

vi. SMP can be mixed at pre-heating temperatures.

vii. Filter the contents and heat to 65°C and pass through homogenizer at 2500 psi in first stage and 500 psi in the second stage.

viii. Heat the milk further to 72°C for 15 seconds if it is continuous mtheod or heat to 63°C for 30 minutes

ix. Immediately cool the contents to 4° C.

x. Fill in requisite containers or packaged in VFFS machine and store at 4° C in a cold room.

xi. Draw a representative sample and test the final product.

## Observations

| | |
|---|---|
| Amount of skim milk used | ____kg |
| Amount of cream used | ____kg |
| Amount of whole milk used | ____kg |
| Fat & SNF percent in cream | ____% and ___% |
| Fat & SNF percent in skim milk | ____% and ___% |
| Fat & SNF percent in whole milk | ____% and ___% |

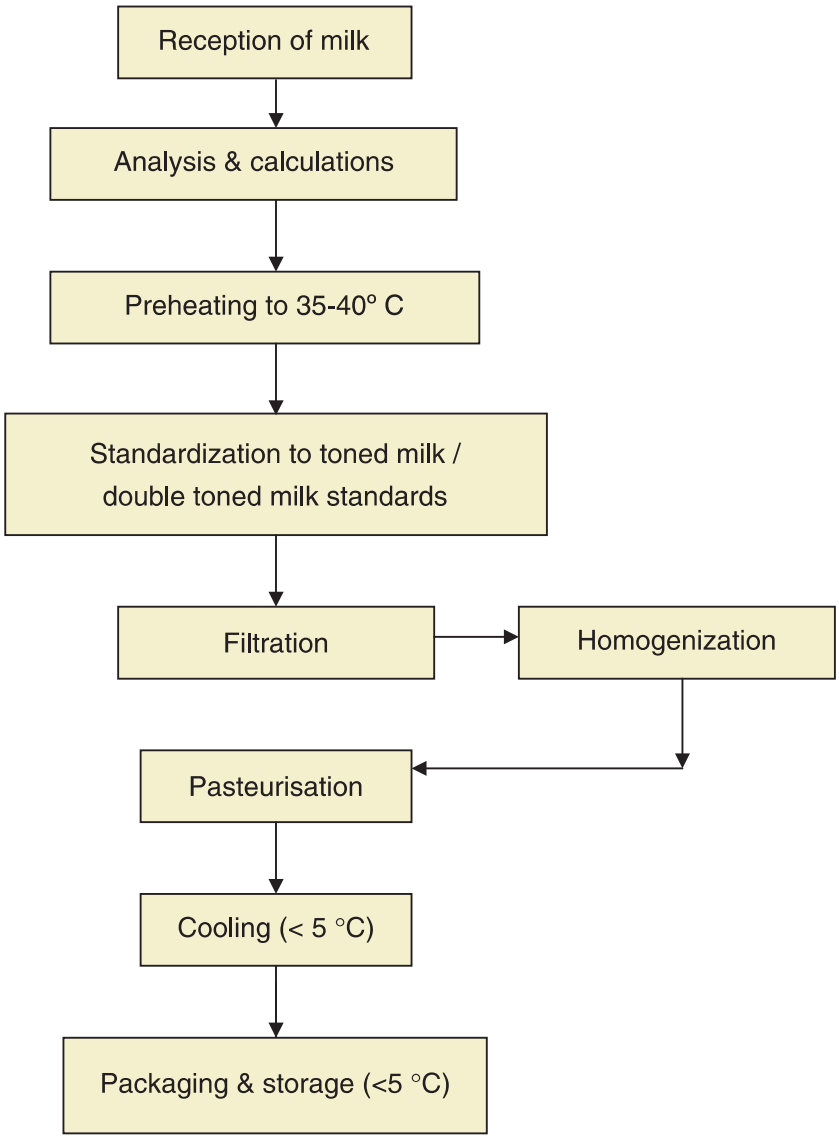


**Fig.14.1. Preparation of toned milk and double toned milk**

## b) Preparation of sterilized flavoured milk

**Requirements**: - Stainless steel containers, pipettes, beaker, weighing balance, measuring cylinder, homogeniser, sterilizer, glass bottles crown cork, sterilizer, corking machine, milk butyrometer, lactometer, thermometer, lock stoppers, lactometer jar, Gerber acid, amyl alcohol

### Procedure:

i. Prepare the milk to either of toned milk or double toned milk standards.

ii. Heat to 40 – 45°C

iii. Add sugar (7 – 8 %), colour (less than 100ppm)and flavor (0.15 to 0.2%) and mix thoroughly and then filter it.

iv. Heat to 65°C and homogenize in a double stage homogenizer

v. Fill the contents in crown cork bottles and hermetically seal with crown cork.

vi. Stack the bottles in a vertical or horizontal sterilizer.

vii. Close the lid of the sterilizer tightly to avoid leakage of steam.

viii. Start the sterilizer and open the vent.

ix. When steam starts to escape, close the vent fully.

x. Allow to built 15 psi pressure and maintain the same for 15-20 minutes.

xi. Open the vent slowly and allow the steam to release until pressure is neutralized.

xii. Open the lid of the sterilizer and remove the bottles and allow cooling at room temperature.

xiii. Store sterilized milk bottles at room temperature and cool to 8° C before use.

### Observations

| | |
|---|---|
| Quantity of milk used | ____kg |
| Fat & SNF percent of milk | ____% and ___% |
| Quantity of sugar | ____kg |
| Quantity of colour added | ____kg |
| Colour used | ____ |
| Quantity of flavor added | ____ml |
| Fat & SNF percent of finished product | ____% and ___% |

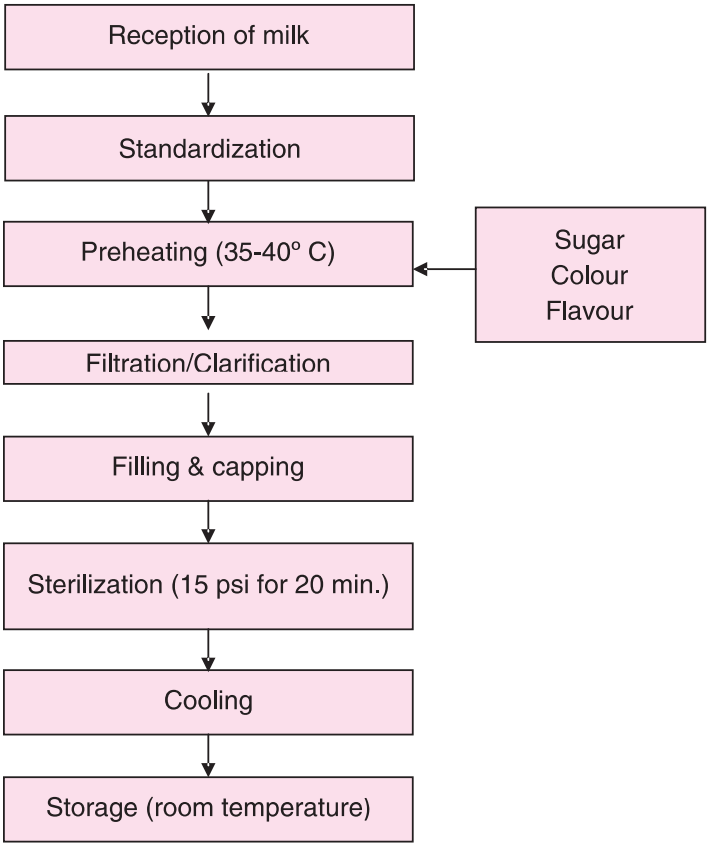


**Fig.14.2. Preparation of sterilized flavoured milk**

## c) Preparation of reconstituted milk

### Requirements

Stainless steel containers, Conical flask, pipettes, burette, beaker, weighing balance, measuring cylinder, water bath, ice-bath, crate, bottles, milk butyrometer, lactometer, thermometer, lock stoppers, lactometer jar, Gerber acid, amyl alcohol, SMP, WMP

### Procedure:

i. Take good quality Whole or Skim milk powder.

ii. Analyse milk powder for fat and SNF content.

iii. Calculate the quantity of milk powder and water needed for required amount of reconstituted milk.

iv. Take the calculated amount of water in a clean container and heat to 40-45° C.

v. Slowly add calculated amount of milk powder while mixing the contents.

vi. Continue mixing until all the milk powder is properly dissolved.

vii. Pasteurize the contents at 72° C for 16 seconds or 63° C for 30 minutes.

viii. Immediately cool the contents to 4 – 6° C using chilled water or ice bath.

ix. Fill into clean and dry container (bottles) and secure with a cap.

x. Place the bottles in a crate.

xi. Store the crates containing bottles of reconstituted milk at 4°C in a cold store.

## Observations

Amount of skim milk powder used ____kg

Amount of water used ____kg

Quantity of reconstituted milk obtained ____Kg

Fat & SNF percent of skim milk powder ____% and ___%

Fat & SNF percent of reconstituted milk ____% and ___%

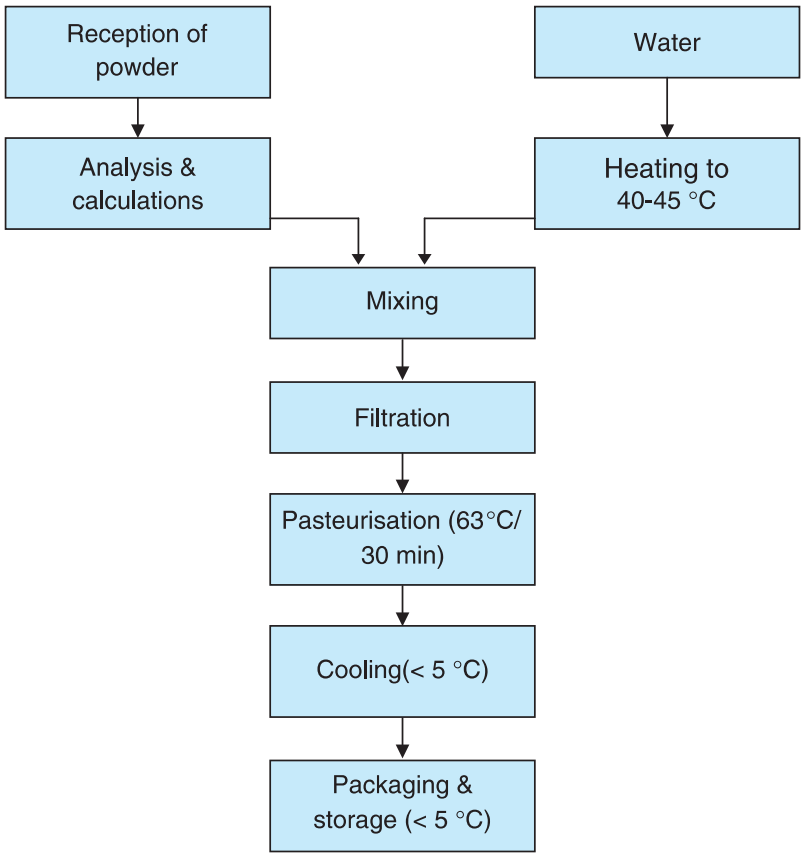


**Fig.14.3. Flow diagram for preparation of reconstituted milk**

## d) Preparation of recombined milk

### Requirements

Stainless steel containers, Conical flask, pipettes, burette, beaker, weighing balance, measuring cylinder, water bath, ice-bath, milk butyrometer, lactometer, thermometer, lock stoppers, lactometer jar, Gerber acid, amyl alcohol

### Procedure

i. Take calculated amounts of fresh or reconstituted skim milk as a source of SNF for the resultant product.

ii. Take calculated amount of high fat cream, butter or butter oil as a source of fat.

iii. Bring the temperature of the contents to 40 – 45°C and mix well.

iv. Homogenize the contents in a double stage homogeniser using pressure of 2000psi and 500psi.

v. Blend and standardize the mixture to desired fat and SNF content.

vi. Pasteurize the contents at 73°C for 15 seconds or 63°C for 30 minutes.

vii. Immediately cool to 4°C and fill in required containers.

viii. Store at 4°C in cold room.

### Observations

| | |
|---|---|
| Quantity of reconstituted or fresh skim milk used | ____kg |
| Quantity of butter or cream butteroil used | ____kg |
| Fat & SNF percent of cream / butter / butteroil | ____% and ___% |
| Fat & SNF percent of reconstituted or fresh skim milk | ____% and ___% |
| Fat & SNF percent of recombined milk | ____% and ___% |
| Quantity of recombined milk obtained | ____kg |

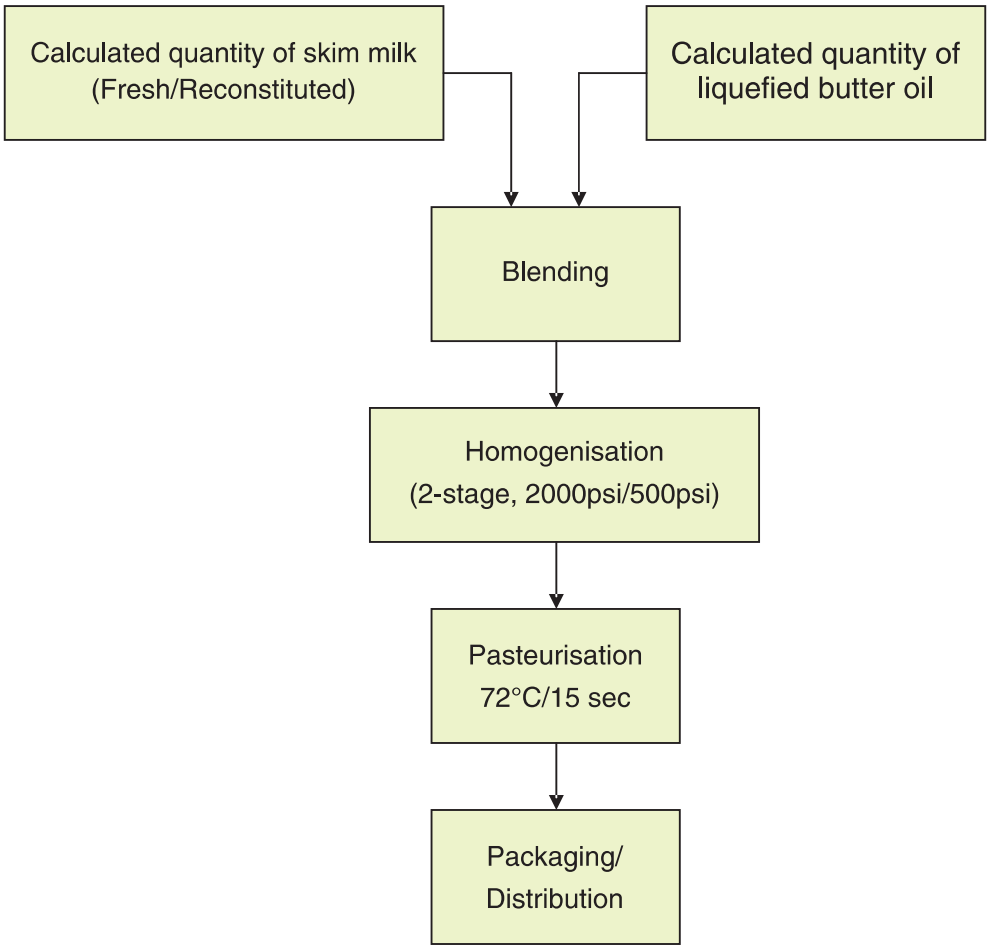


**Fig.14.4. Flow diagram for preparation of recombined milk**

## REVIEW QUESTIONS

1. Describe method for preparation of toned and double toned milk?
2. What is the procedure for preparing flavoured milk?
3. What is reconstituted milk?
4. Briefly describe method to prepare reconstituted milk.
5. Briefly describe method to prepare recombined milk.