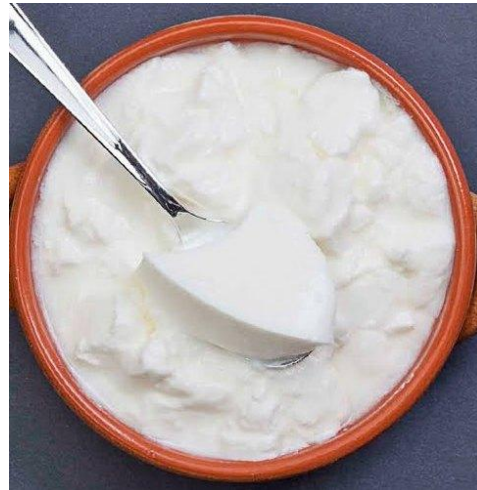


DAHI (CURD) PROCESSING



AATMANIRBHAR BHARAT

**PM Formalisation of Micro Food Processing
Enterprises Scheme (PM FME Scheme)**

INTRODUCTION

- ✓ Dahi is a set-type fermented dairy product originated in the Indian Subcontinent.
- ✓ Consumption of fermented milk products is associated with several types of human health benefits partly because of their content of lactic acid bacteria.
- ✓ Dahi added with probiotic bacteria enhances its health benefits such as immune enhancement, blood pressure reduction, antiatherogenic effect, antidiabetic effect, anticarcinogenic effect, antioxidative effect and curing of gastrointestinal disorders.

FSSR(2011) AND BIS DEFINITION OF DAHI

Characteristics	FSSR(2011)	BIS
Acidity % lactic acid	-	0.6 - 0.8
Total Plate count	Not more than 1000000/g	-
Coliform count	10 per g max	10 per g max
Escherechia coli	Absent in 1g	-
Salmonella	Absent in 25g	-
Shigella	Absent in 25g	-
Stephylococcus aurius	Not more than 100/g	-
Yeast and Mould	100 per g max	100 per g max
Anaerobic spore	Absent in 1g	-
Listeria monocytogenes	Absent in 1g	-
Phosphatase test	-	Negative
Other requirements	It should have the same minimum percentage of fat and SNF as the milk from which it is prepared. If no standards declared then standards prescribed for dahi from buffalo milk shall apply	Dahi shall conform to the requirements of milk fat and MSNF, as laid down in FSSR, 2011

COMPOSITIONAL STANDARDS OF DAHI

The product shall conform to the compositional specifications provided in the table below:

Components	Whole milk Dahi (%)	Skim milk Dahi (%)
Water	85-88	90-91
Fat	5 – 8	0.05 - 0.1
Protein	3.2-3.4	3.3-3.5
Lactose	4.6-5.2	4.7-5.3
Lactic acid	0.5-1.1	0.5-1.1
Ash	0.7-0.75	0.7-0.75

Process Flowchart (in general)

Raw milk from silos to balance tank by milk transfer pump



Homogenizer



Pasteurizer



Processed Milk Silo



PROCESS FLOWCHART (cont..)

Processed milk from silos



Curd setting tank (after culture addition)



Cup Filling and Sealing Machine



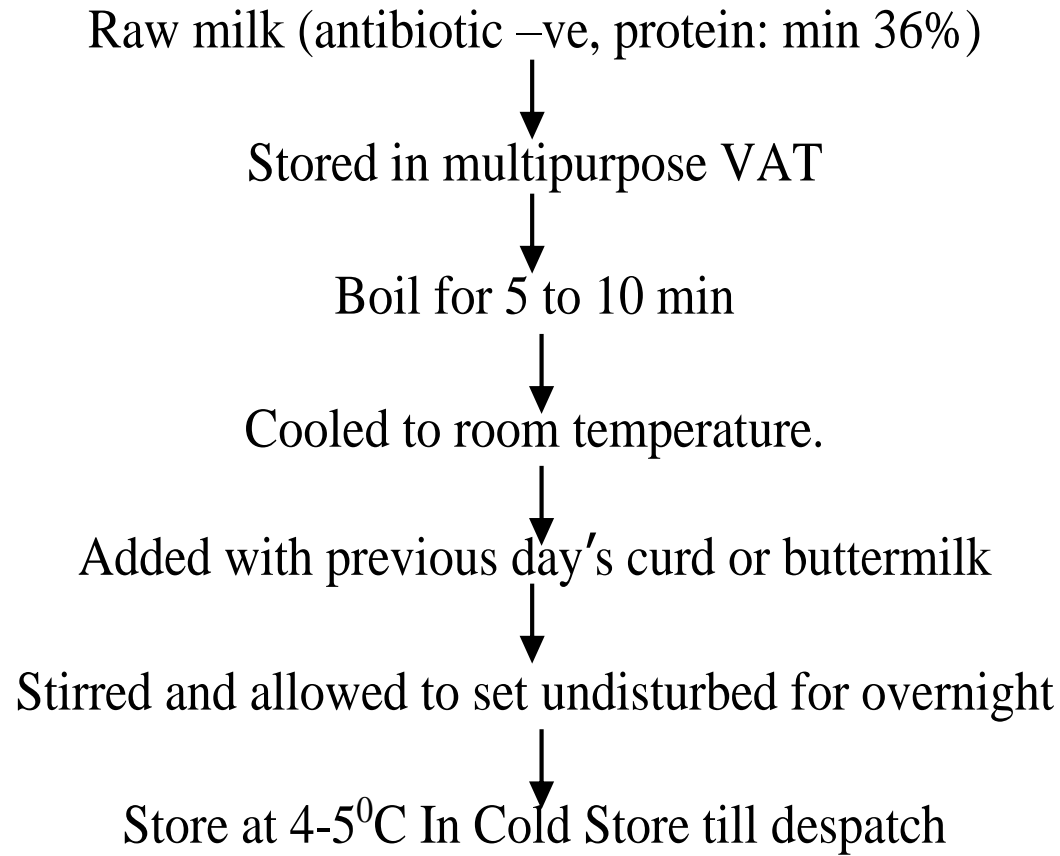
Curd Incubation Room



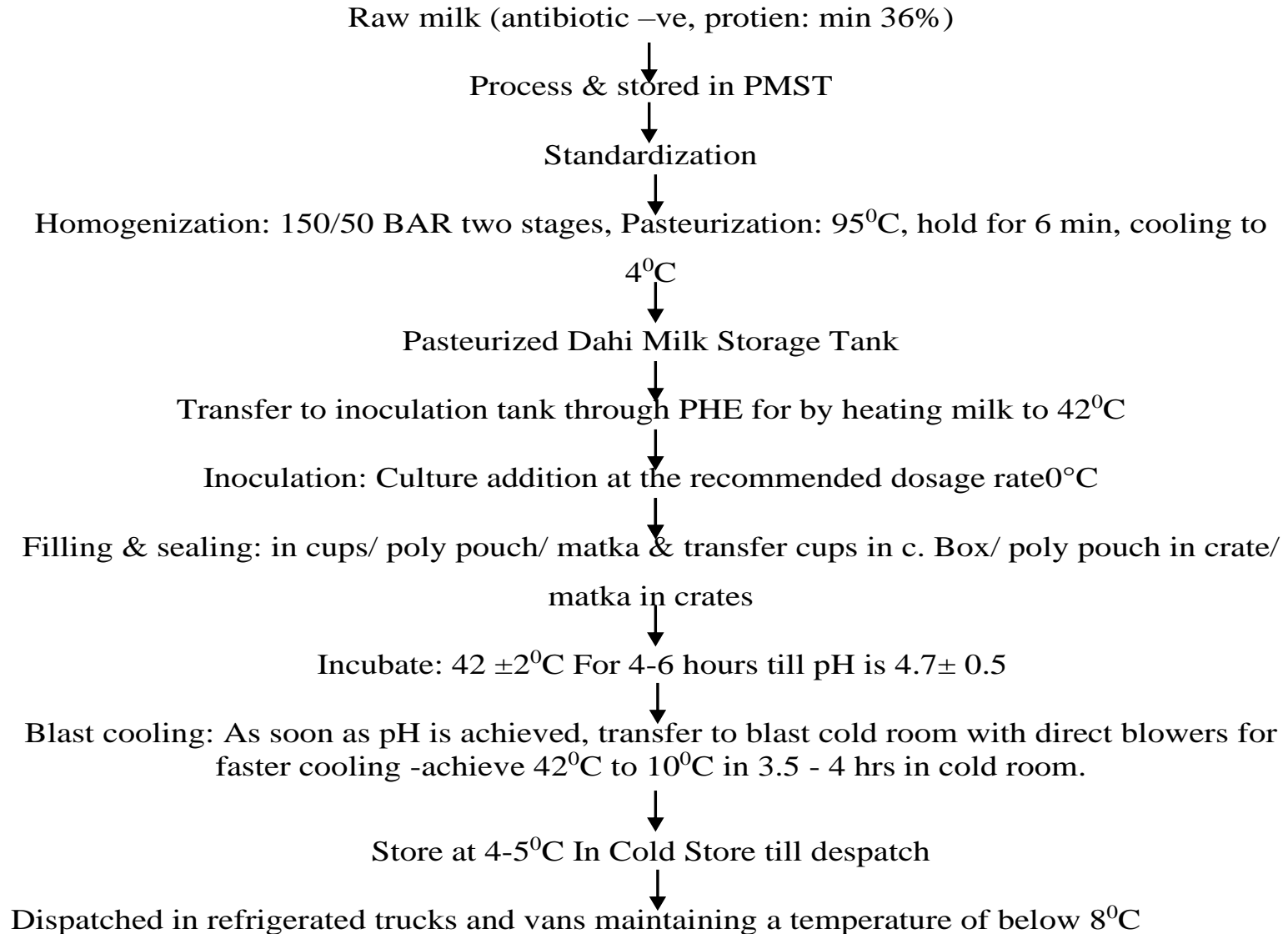
Cold room



DAHI PROCESSING FLOW CHART (TRADITIONAL METHOD)



DAHI PROCESSING FLOW CHART (INDUSTRIAL METHOD)



EQUIPMENT REQUIRED

- a) Raw milk storage tank
- b) Milk pasteurizer and homogenizer
- c) Pasteurized milk storage tank
- d) Curd setting tank (after culture addition)
- e) Cup Filling and Sealing Machine
(100/200/400gm – 25 cups per minute)
- f) Curd Incubation Room
- g) Lab facilities for raw and processed milk
- h) Cold room

Standard Operating Procedures (SOP's) of Dahi Manufacturing

- i) Raw Milk Reception:** Raw Milk tankers/ cans is weighed either in weighbridge or in weighing bowl, Batch wise sampling & testing need to be done as per defined procedures.

- ii) Filtration:** The accepted milk is weighed and unloaded in the Dump Tank and Pumped through a chiller after property filtering, such milk is stored in the silos through the previously cleaned, sterilized/ steamed pipeline, and silos act.

Standard Operating Procedures (SOP's) of Dahi Manufacturing

- iii. **Chilling:** Filtered milk is chilled through a chiller ensuring the temperature not more the temperature not more than 5 deg C. chilled milk is stored in the silos through the previously cleaned, sterilized/ steamed pipeline, silos etc.

- iv. **Standardization of Milk:** Milk Pasteurization and Standardization of milk is planned as per product requirement and fat & SNF is maintained.

Standard Operating Procedures (SOP's) of Dahi Manufacturing

- v. **Homogenization and Pasteurization:** Homogenization of milk is done at 150/50 bar in two stages and then Pasteurization at 95⁰C by passing through automatic holding tube for 6 mins and cooling to 4⁰C. Milk is then transferred to storage tank.

- vi. **Inoculation and culture addition:** Now transfer the milk to inoculation tank through PHE for heating milk at 42⁰C. Take appropriate quantity of milk so that filling is over in one hour. Culture addition is done at recommended doses.

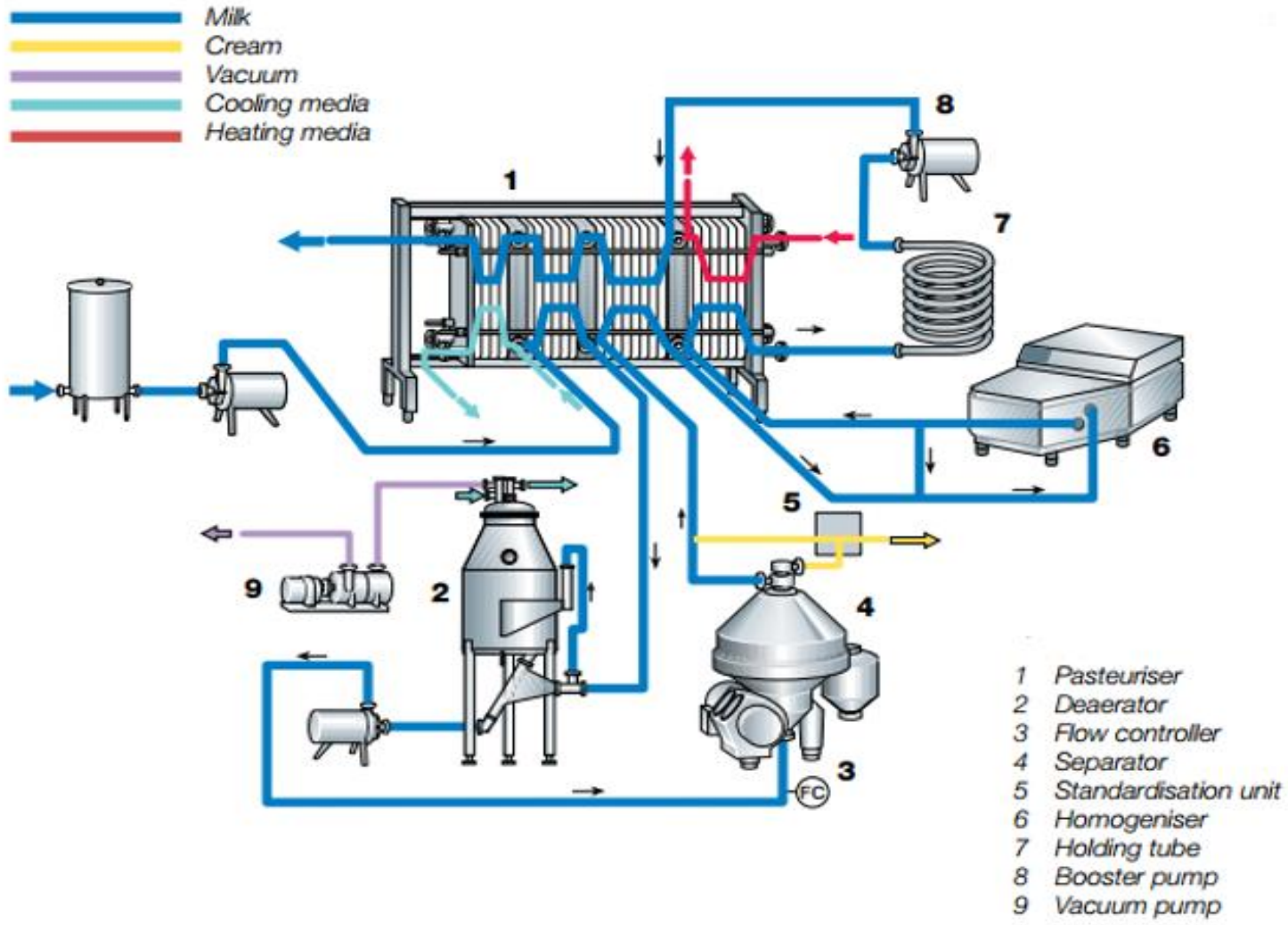
Standard Operating Procedures (SOP's) of Dahi Manufacturing

- vii. Filling and Sealing:** Milk with culture is filled in required packing sizes and stacked in trolleys.
- viii. Incubation:** Trolleys then moved to incubation room maintained a temperature of $42 \pm 2^{\circ}\text{C}$. Incubation is done for 4 to 6 hours till pH of 4.7 ± 0.5 is achieved.
- ix. Blast Cooling:** As soon as pH is achieved, trolleys are transfer to blast cold room at zero degree with direct blowers so that the product temperature of 10°C is achieved within 3.5 to 4 hrs mins.

Standard Operating Procedures (SOP's) of Dahi Manufacturing

- x. **Cold Storage:** After 3.5 - 4 hrs transfer the trolleys in cold storage under 5⁰C till the time of dispatch.
- xi. **Dispatch:** Product is dispatched in refrigerated trucks and vans maintaining a temperature of below 5⁰C.

MILK PASTEURIZATION PROCESS (WITH CREAM SEPARATION AND HOMOGENIZATION)



CREAM SEPARATION

Cream separation is mainly done

1. To recover fat from milk: Fat is used to prepare value added products such as cream, butter, ghee etc.
2. To obtain a low fat or fat-free milk (Skim milk): Skim milk is used to prepare skim milk powder, dairy whitener, condensed skim milk etc.
3. To standardize the fat content of milk.

There are two different methods separate cream from milk



CREAM SEPARATION

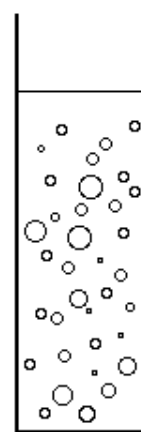
Centrifugal Method: In this method, a centrifugal agitation is given to the milk with some agitator manually or a dedicated machine called cream separator. Cream separator is installed along with pasteurizer, normally after regeneration section 1. The percentage of cream to be separated from the milk can set in the machine.



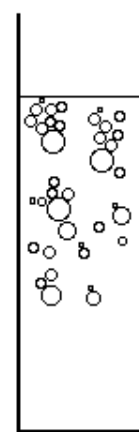
Blue - incoming whole milk
Pink - separated cream
Yellow - skim milk moving down cones
Green - skim milk moving up & over cones

Homogenization

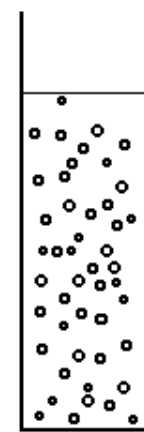
- ✓ Homogenization is the process of reducing the size of fat globules in milk.
- ✓ It prevents the formation of a cream layer and easy digestion.
- ✓ Homogenized milk has a uniform flavour throughout.
- ✓ It tastes richer, smoother and creamier than unhomogenized milk due to an increase in the surface area of the fat globules which are uniformly distributed in milk



Raw milk



**Cold, raw milk
after 1 hour**



**Homogenized milk
during storage**

PACKAGING MACHINES

DAHI POUCH PACKING MACHINE

- ✓ Automatic FFS (form fill and seal) machine.
- ✓ Filling Range: 200ml, 250ml, 500ml & 1ltr
- ✓ Filling System: Gravity filler
- ✓ Packing Material: LDPE film
width: 324 ± 2 mm
- ✓ Pouch length: Mechanical adjustment
- ✓ All contact parts: Stainless Steel



Dahi Packaging Machine (in pouch)



Single Head VFFS



Double Head VFFS

Dahi Packaging Machine (in cups)



COMMON DEFECTS IN DAHI

SI No.	Defect	Probable Cause	Remedy
Flavor defects			
1	Insufficient flavor	Low citrate level in milk, Low diacetyl content	Add 0.02 to 0.05% Sodium citrate prior to mixing the starter culture. Cool rapidly after culturing
2	Oxidized flavor	Copper contamination Exposure to fluorescent light Exposure to sunlight	Avoid usage of copper utensils. Protect product from direct exposure to Sunlight/ UV light
3	Yeast/cheesy	Contaminating yeast growth	Sanitation check
4	Rancid flavor	Lipolytic activity	Do not mix pasteurized and raw dairy ingredients prior to homogenization
5	High acid	Addition of more culture, Increased incubation time Use of sour milk	Optimum culture addition Blast cools the product immediately after optimum pH is reached. Use good quality fresh milk

COMMON DEFECTS IN DAHI

SI No.	Defect	Probable Cause	Remedy
Flavor defects			
Body and textural defects			
1	Weak body	<p>Insufficient heat treatment to the mix</p> <p>Too low milk SNF</p> <p>Severe agitation after fermentation</p>	<p>Heat treatment should not be less than 85°C/30min.</p> <p>Homogenize the dahi mix prior to homogenization.</p> <p>Increase the MSNF content to 11% by adding Skim milk powder</p>
2	Grainy texture	<p>High acidity</p> <p>Improper dispersion of Skim milk powder</p>	<p>Rapidly cool the product to <5°C after attaining optimum acidity</p> <p>Use in line screen/filter</p>

COMMON DEFECTS IN DAHI

SI No.	Defect	Probable Cause	Remedy
Flavor defects			
Body and textural defects			
3	Syneresis	<p>Insufficient heat treatment to the mix</p> <p>Improper standardization and too low milk SNF</p> <p>Agitation/disturbances during fermentation</p>	<p>Heat treatment should not be less than 85°C/30min.</p> <p>Increase the MSNF content to min. of 11% by adding Skim milk powder.</p> <p>Do not disturb the cups during fermentation</p>
4	Ropiness	<p>Contamination of milk with psychotropic microorganisms</p> <p>Culture contamination/impure culture</p>	<p>Proper heat treatment of milk,</p> <p>Avoid cold storage of milk before pasteurization/thermization</p> <p>Use of pure culture</p>

STORAGE CONDITIONS

- a) Plain dahi was in good condition up to 3 days of storage period
- b) At refrigeration temperature plain dahi was suitable for consumption up to 12 days.
- c) The packaged product should be stored at $<5^{\circ}\text{C}$ for extended shelf life.



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