MINISTRY OF FOOD PROCESSING INDUSTRIES
GOVERNMENT OF INDIA

PROCESSING OF FLAVOURED MILK

AATMANIRBHAR BHARAT

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

INTRODUCTION

- As per Food Safety and Standards Regulations (FSSR), 2011 “Flavoured Milk” means the product prepared from milk or other products derived from milk, or both, and edible flavourings with or without addition of sugar, nutritive sweeteners, other non-dairy ingredients including, stabilizers and food colours. Flavoured milk shall be subjected to heat treatment as provided in sub-regulation 2.1.1 (General Standards for Milk and Milk Products).

INTRODUCTION

- ✓ Flavoured milk is sweetened dairy based beverage.
- ✓ It is a ready to drink product and widely accepted in all age of people.
- ✓ It is prepared with milk, sugar, flavourings (natural or artificial) like banana, pineapple, orange, chocolate etc.
- ✓ The shelf life is normally increased by UHT process or retorting.

INTRODUCTION

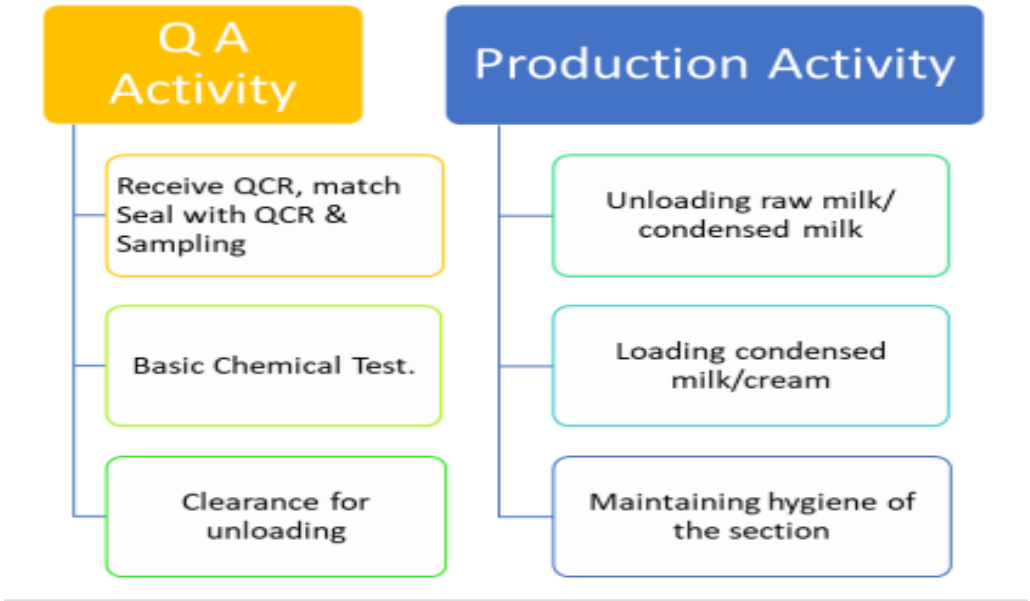
- ✓ As per National Nutrient Database for Standard Reference, Release 21, 2008., Flavored milk is a nutrient-rich beverage providing the same nine essential nutrients as unflavored milk, including calcium, potassium, phosphorus, protein, vitamins A, D and B12, riboflavin, and niacin (niacin equivalents).
- ✓ Studies establish that flavored milk drinkers had higher calcium and nutrient intakes compared to nondrinkers but did not have higher added sugar or total fat intakes.

IMORTANCE OF FLAVORED MILK

- ✓ To make more palatable to those who do not relish it as such.
- ✓ To increase consumption of milk.
- ✓ To put skim milk to profitable use.
- ✓ To increase the sales of milk.
- ✓ It is better than drinking soft-drinks.
- ✓ To fulfill the nutrition value on daily bases.

OPERATIONS IN FLAVORED MILK PROCESSING UNIT

Raw Milk Reception Dock (RMRD)

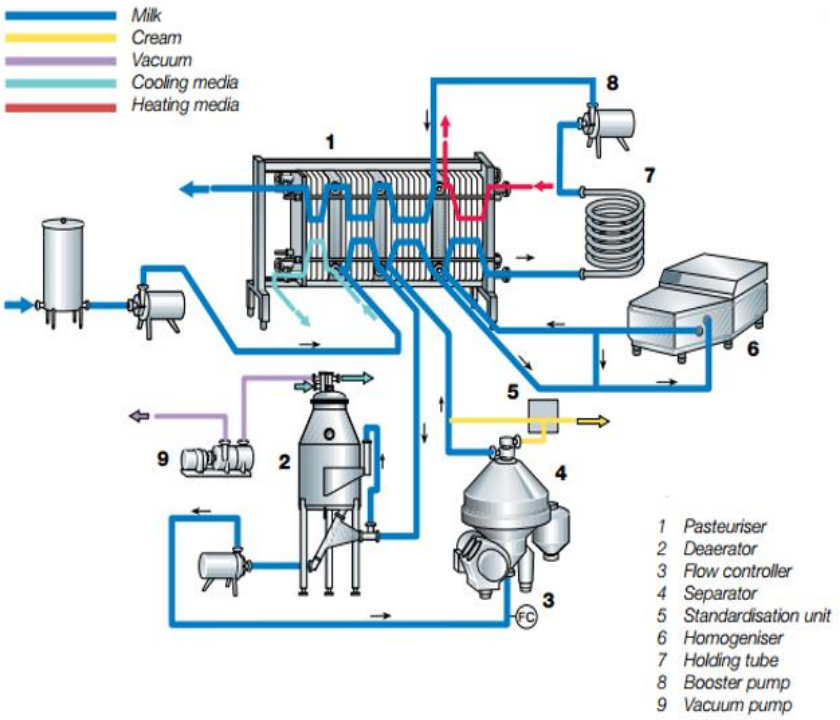


Responsibilities at RMRD

OPERATIONS IN FLAVORED MILK PROCESSING UNIT

Pasteurization of Milk

- The Pasteurisation process involves heating milk to 72°C for at least 15 seconds (more than 25 seconds).
- The time temperature combination varies with elevation, the same shall be defined by the process owner and validated.
- Looking into the nature of the heat treatment, it sometimes referred to as the 'High Temperature Short Time' (HTST) process.



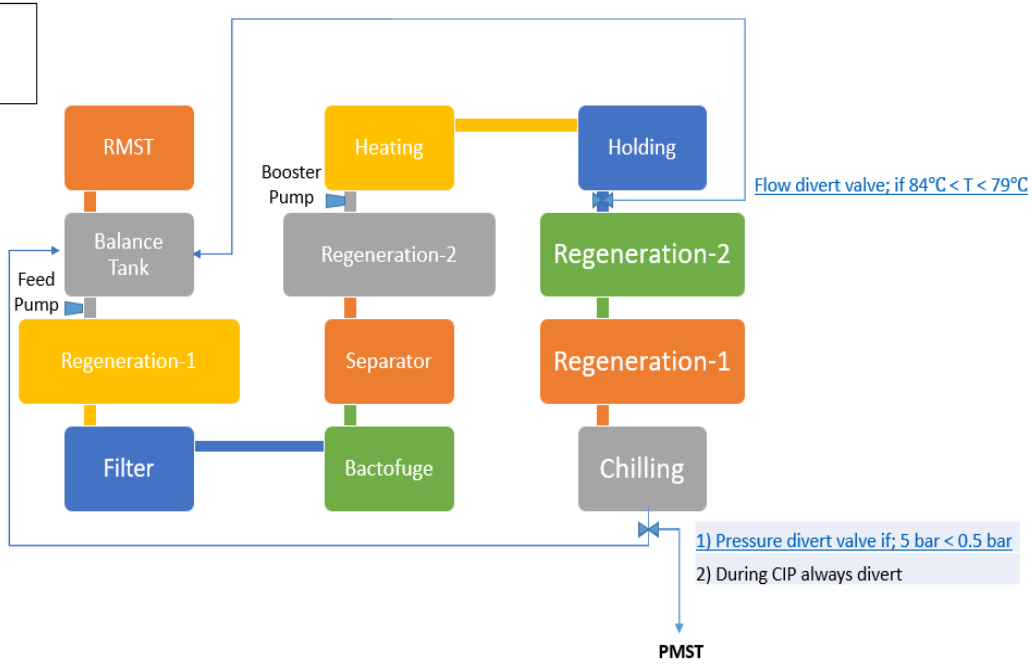
Pasteurizer flow diagram

OPERATIONS IN FLAVORED MILK PROCESSING UNIT

Pasteurization:
Temp: 82±2°C
Holding Time: 15 Sec.

Pasteurization of Milk

- Once the milk is heated to the defined temperature, it is cooled quickly to less than 3°C temperature.
- The equipment used to heat and cool the milk is called a 'heat exchanger'.
- There are different types of heat exchangers used in process industry.
- The most commonly used heat exchanger is plate heat exchanger (PHE).



OPERATIONS IN FLAVORED MILK PROCESSING UNIT

Standardization of Milk:

- Standardization of milk generally refers to balancing the percentage of fat and solid not fat (SNF), to comply with the legal requirements of market milk

- Skim milk powder, condensed skim milk and fresh cream is used generally to standardize.

OPERATIONS IN FLAVORED MILK PROCESSING UNIT

Example:

How much whole milk with 3.9% fat and skimmed milk with 0.04% fat content will you need to produce 2000 kg of standardized milk with 2.5% fat?

Solution:

Using mass balance method:

TMB: $W + S = 2000$

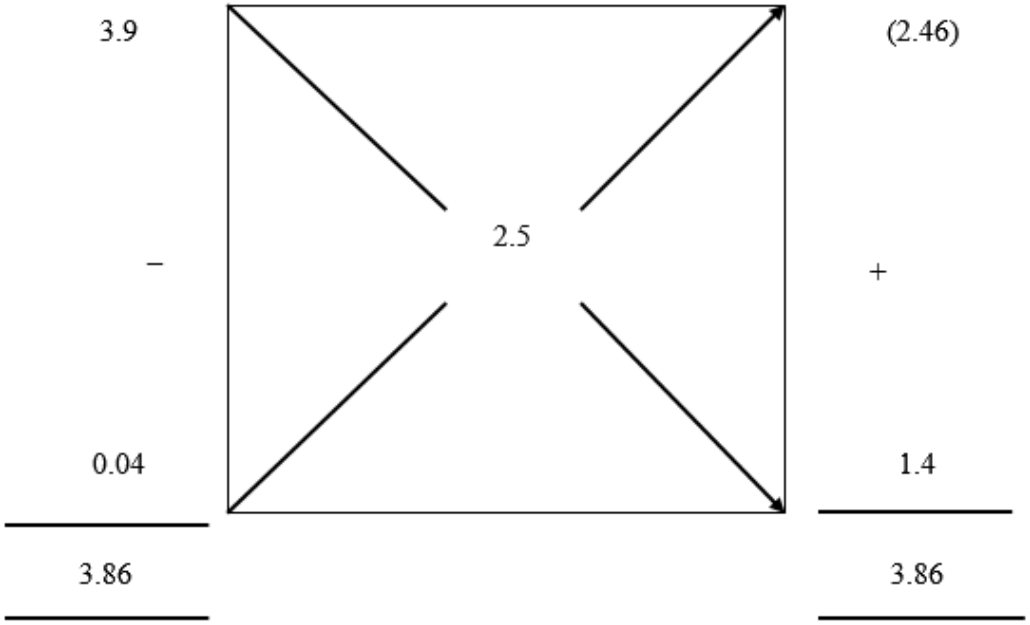
FMB: $0.039*W + 0.0004*S = 0.025*2000$

Solving for W = 1274.6 kg and S = 725.4 kg

W= Quantity of whole milk (kg)

S= Quantity of skim milk (kg)

USING PEARSON'S SQUARE METHOD



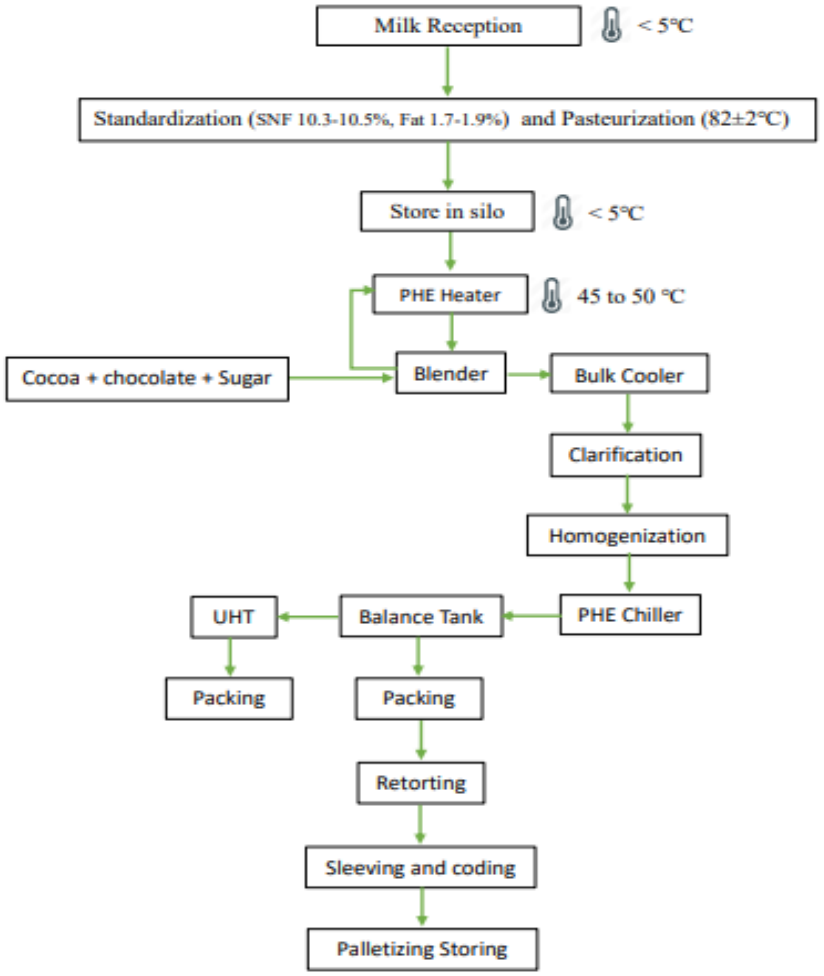
Proportion of the whole milk = 2.46/3.86
Amount of whole milk required = (2.46/3.86)*2000 = 1274.6 kg
Proportion of skimmed milk = 1.4/3.86
Amount of skimmed milk required = (1.4/3.86)*2000 = 725.4 kg
(or 2000 – 1274.6)

OPERATIONS IN FLAVORED MILK PROCESSING UNIT

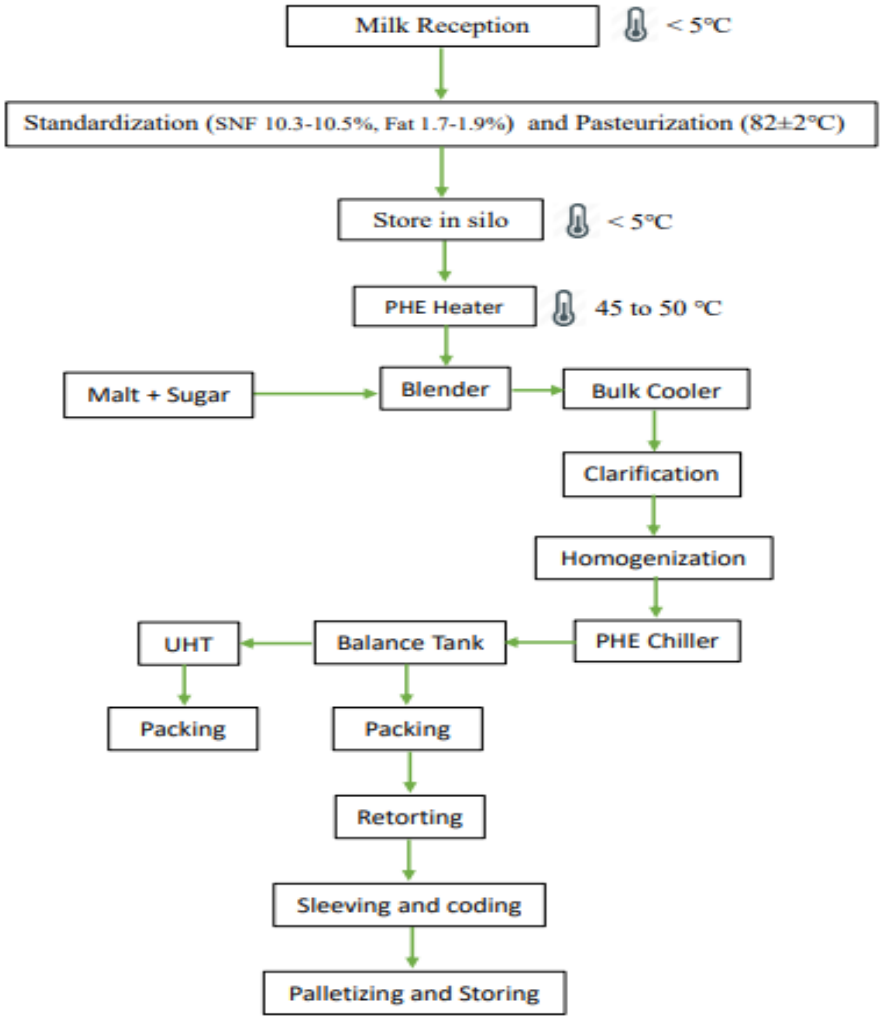
Homogenization of Milk: Homogenization is the process of reducing the size of fat globules in milk. It prevents the formation of a cream layer and easy digestion. Homogenized milk has a uniform flavour throughout.

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.

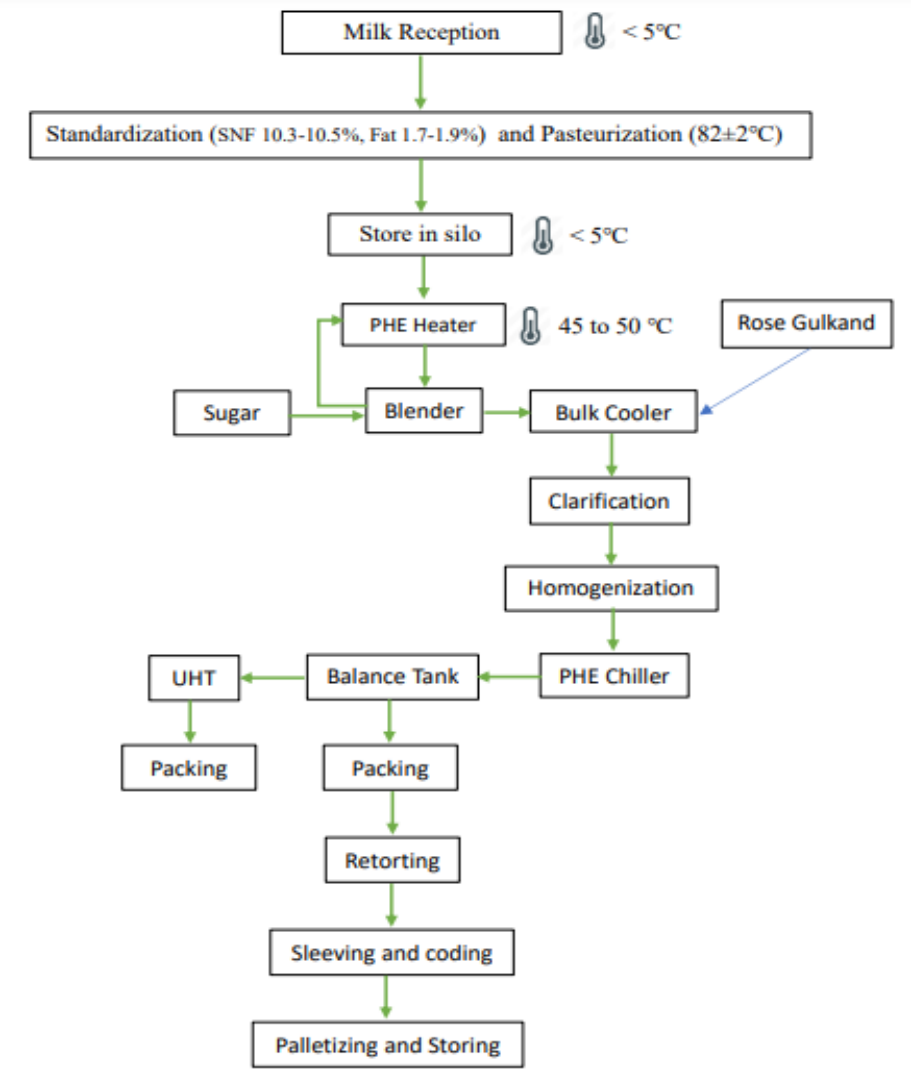
FLAVORED MILK PROCESSING (CHOCOLATE FLAVOUR)



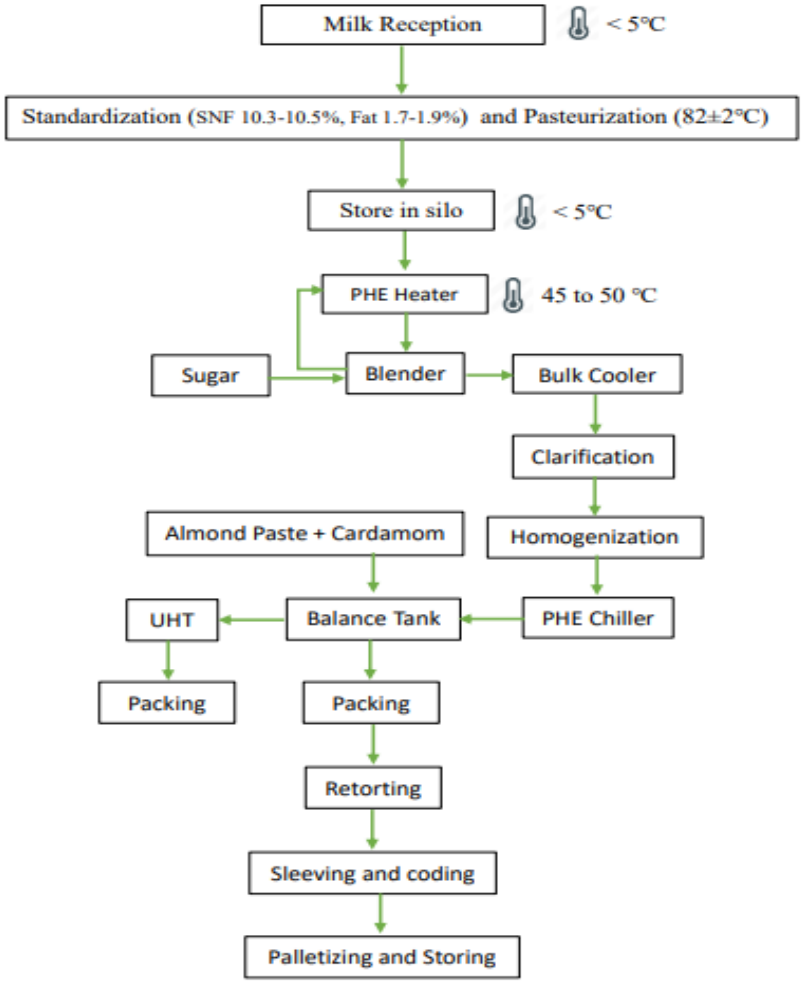
FLAVORED MILK PROCESSING (MALT FLAVOUR)



FLAVORED MILK PROCESSING (ROSE FLAVOUR)



FLAVORED MILK PROCESSING (ALMOND FLAVOUR)



RETORT PROCESSING

1. Retorting is a heat treatment process. It increases the shelf life of the product by destroying the spoilage microorganism (all mesophilic microorganisms, as well as spores of Clostridium botulinum) present in the food item.
2. Thermal processing/sterilization of shelf stable, low acid foods (i.e. defined as products with a finished equilibrium pH greater than 4.6 and a water activity greater than 0.85) is usually performed at temperatures at or above 250°F or 121°C, give or take ~10°F/5.6°C.

Retort Processing

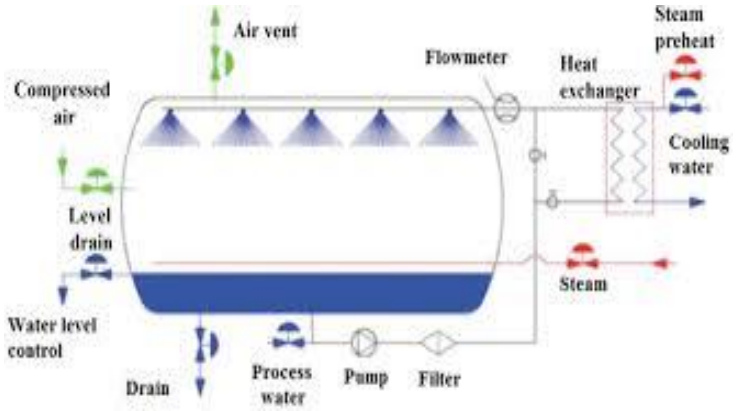
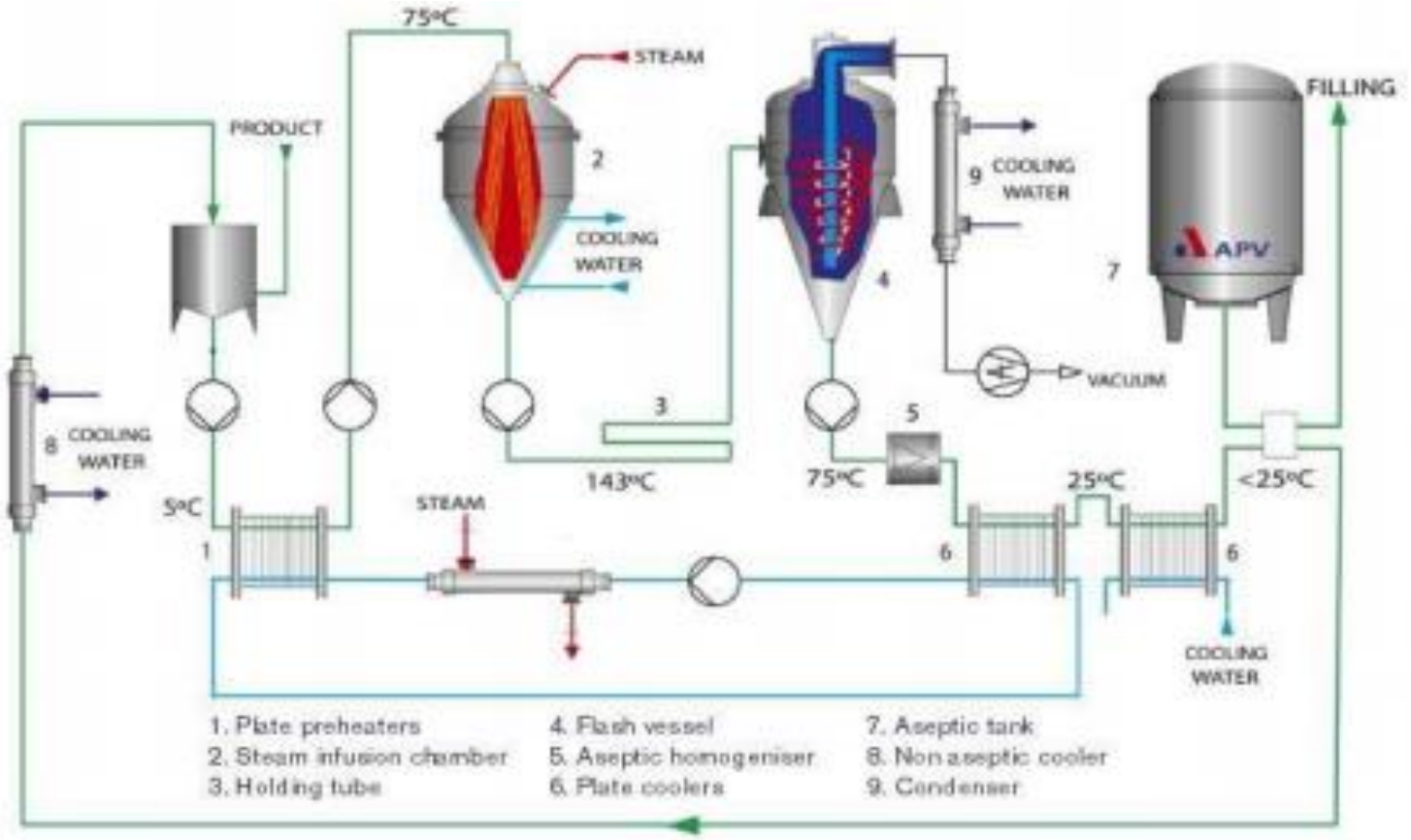


Fig. - JBT Retort

ULTRA-HIGH-TEMPERATURE (UHT) PROCESSING

1. Ultra-high-temperature processing (UHT) of flavoured milk involves heating for 1–8 sec at 135–154°C.
2. Aseptic packaging of UHT milk produces a shelf-stable product.
3. Aseptic packaging involves placing a sterile product in a sterile package.
4. Such processing must take place in a sterile environment. UHT processing is a continuous process.
5. This will save both heating and cooling costs and regeneration efficiencies greater than 90% are attainable.

ULTRA-HIGH-TEMPERATURE (UHT) PROCESSING



AVP UHT Line

TYPES OF PACKAGE AVAILABLE IN MARKET

1. LDPE pouch
2. Aluminum laminated standalone pouch
3. PET/PP Bottle
4. Metal/PP cans
5. Tetrabrick or Asceptic pack

Fig. - Asceptic packing machine

ADVANCEMENT IN FLAVOURED MILK

- Hiland Dairy adds Custard flavor to flavored milk lineup
- The Farmer's Cow re-releases its root beer-flavored milk for July
- Oakhurst introduces wild blueberry-flavored milk
- The Farmer’s Cow launches coffee-flavored milk for the New Year
- The Farmer's Cow releases limited-edition Pumpkin Pie-flavored milk
- and many more coming up…

MANUFACTURES (MACHINERIES)

- Tetrapak Pvt Ltd.
- GEA Process Engineering
- IDMC Ltd
- GOMA Engineering
- Tirth Engineering, Shivane, Pune, Maharashtra
- Food and Biotech Pvt Ltd.

For More details Contact:

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