



FLAVOURED MILK

Product/process description

Flavoured milk is a ready to drink product which is produced from skim milk, added sugar and natural flavours (e.g. banana, pineapple, orange, chocolate etc).

Principles of preservation and methods of processing

The principles of preservation are to destroy most enzymes and spoilage bacteria and all pathogenic bacteria by heat during pasteurization at 63°C for 30 minutes. This time and temperature combination is described by regulations in some countries and should be carefully adhered to.

Process flow diagram

Process	Notes
Fresh skimmed milk	
Mix ←sugar	Sugar is added to the milk and thoroughly dissolved. The amount added is mainly determined by the sweetness required in the final product.
Pasteurise	Use batch pasteuriser. Control of temperature and time is very important for correct pasteurisation to give expected shelf life. The vessel to be used should be fabricated from stainless steel or aluminium or bought locally from hardware shops. Milk should be heated with constant stirring to prevent the product overheating/burning at the bottom.
Cool	Cool quickly to temperature below 10°C. Cooling is done by placing the pan containing the hot product into another vessel which contains cold water. The product is stirred continuously until the temperature drops.
Mix ←flavour	This has to be done after pasteurization, because the colour and flavour can easily deteriorate during the heating process. Flavours are usually supplied as concentrated essences and, with proper hygiene, will not re-contaminate the pasteurized milk with bacteria. Only food grade colours or natural fruit extracts can be used.
Pack	Pack into sterilised bottles and seal with sterile lids using a small filling and capping machine. Storage Storage should be in either a cooler or a refrigerator at below 10°C. The milk should not be exposed to sunlight as this will heat it, promote rancidity of milk fat and destroy the vitamin riboflavin.

Transport

The transportation of milk from the storage room to the market should be in a refrigerated vehicle if the distance to be covered is long. But for a short distance which takes less than an hours drive, refrigeration is not necessary.

Quality control**Hygiene and raw material control**

As milk is a low acid food that is very susceptible to spoilage and transfer of pathogenic bacteria to consumers, the methods used to handle milk at the dairy play an important role in determining the quality of the final product. The main hygienic requirements are:

- Thoroughly clean and sterilize (with chlorine solution or boiling water) all equipment and utensils before and after processing (NB aluminium equipment should not be cleaned with chlorine solution).
- Strict enforcement of personal hygiene measures.
- Filter milk after milking to remove visible dirt and any 'ropiness'
- Cool milk immediately to control further growth of micro-organisms and enzyme activity.

Process control

The main control points are the temperature and time involved in heating and cooling the milk. Overheating and slow cooling causes changes to flavour, colour and nutritional value; underheating may result in inadequate destruction of enzymes and micro-organisms leading to a reduced shelf life and the risk of food poisoning.

Packaging and storage

During packaging the most important quality control check is to ensure that filling equipment, bottles and caps are thoroughly cleaned and sterilized to prevent recontamination of the heat treated milk. This is especially important if the bottles are reused. Bottle fill weights should be accurately controlled and storage temperatures should be controlled below 10°C.

Equipment/materials:

- Filling machine
- Capping machine
- Bottle sterilising equipment
- Thermometer
- Filtering pads
- Milk cooler
- Refrigerator

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