



Improved traditional practices

**Milk processing in East Africa**

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## Dairy Products Processing

### Advantages of milk processing

- Improves family nutrition
- Improves quality and safety of milk
- Capture the added value
- Generates women employment
- Provides regular income
- Better handling and transporting



## Pasteurization

Pasteurization is the first step in milk processing. milk pasteurization is achieved by raising the milk temperature up to minimum of 63°C for 30 min. This leads to the death of bacteria and other microorganisms that affect the consumer's health.

Pasteurization makes milk consumption safe and increases its preservation period.

There are two common types of pasteurization:

- Low temperature long time pasteurization (LTLT) is heating the milk at 65°C/30 min
- High temperature short time pasteurization (HTST) is heating the milk at 73°C/15 sec



Always use an alcoholic thermometer to check for the proper temperature

Do not estimate temperature by using finger

## Milk fat separation

### Gravity Separation

When milk is allowed to stand undisturbed for some time, a cream layer will form on top of milk. The light fat globules will move very slowly in the heavier skim milk by gravity.

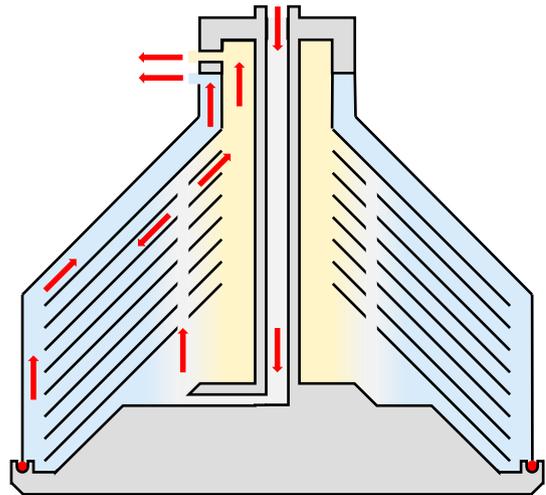
### Centrifugal Separation

The cream separation is forced by centrifugal force for which a rotational mechanism is used.



### Milk fat separator

The milk fat separator is a device that accelerates the separation of fat by the centrifugal force. Milk is entering down the separator bowl holding a stack of conical discs, the milk rises back up through holes. The milk between discs is subjected to a centrifugal force in the rotating bowl and thereby tends to fly out from the center. The skim milk fraction, moves away to the outer edge of the discs, whereas the fat gather on the inside edge. The incoming milk forces the separating layers further and upward out at the top of the bowl



where the fat is directed to the cream outlet under the inner cover and the skimmed milk is directed to the outlet over the inner cover.

## Procedure

- Filter the milk
  - Heat the milk to 45-55°C
  - Switch on the separator and wait to reach the proper speed
  - Put the milk in the separator milk container
  - Put a proper clean container under skim milk and cream outlets
  - Open the milk tap and collect the skim milk and the cream.
- Clean the device properly
  - Check sealing O ring sealing by filling the separation bowl with water
  - In case of disturbed separation, dismantle the separation bowl and remove sludge and sediments
  - Acidic milk affects adversely affect the separation efficiency

## Cleaning and maintaining the milk fat separator

- Flush the separator with warm skim milk or warm water.
  - Dismantle all parts of the machine (bowl, bowl cover, discharge spouts, float, supply tank and buckets) and wash with a brush, hot water and detergent
  - Rinse with hot water and allow the parts to drain in a clean place protected from dirt and flies.
  - Check oil level in case of manual separator and add if necessary.
- ### Factors affecting cream separation
- proportional to
    - to difference between the densities of fat and skim milk and
    - to the square of fat globule diameter,
  - inversely proportional to the viscosity of skim milk.

## Smoking of milk

Smoking of milk utensils is a crucial traditional practice for assuring the quality and safety of milk and dairy products. The main reasons for for farmers to fumigate is for flavor and to extend shelf life

The most plants used by farmers for milk container are:

Local name	Scientific name
Baddana okole	<i>Balanites aegyptiaca</i>
Ejersa, Wera	<i>Olea europaea subsp. africana</i>
Daanse	<i>Faurea speciosa</i>
Rukeessa	<i>Combretum molle</i>
Xaaxessaa	<i>Premna resinosa</i>
Birreessa	<i>Terminalia brownii</i>



To prevent additional contamination by the wood (wood may be placed in a places where it be contaminated with manure). Using glowing woods to smoke plastic container may affect consumer health as dioxin may be released.

The use of simple smoker enables the production of clean and dense smoke that can be directed into the different types of containers including plastic.

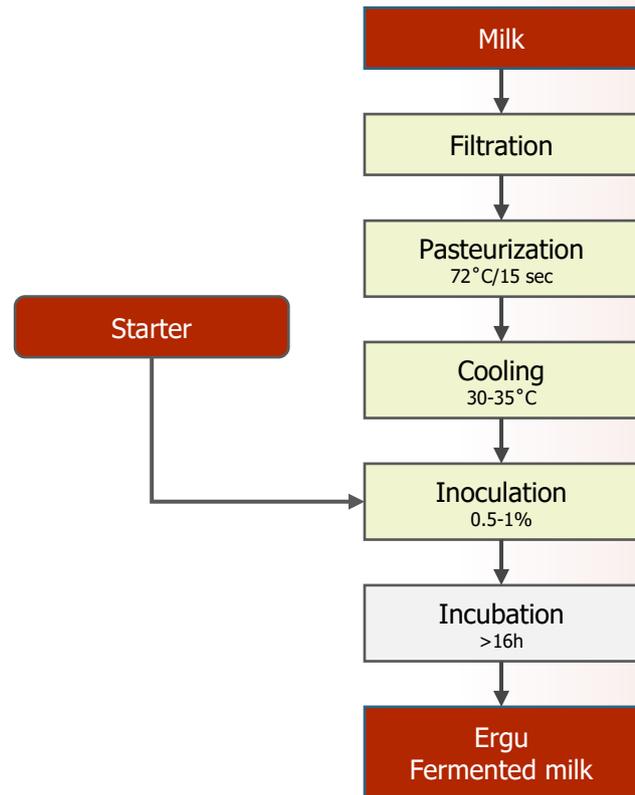


## Dairy products

### Ergu

Is a traditional Ethiopian fermented milk. Ergu is a semi fluid light texture product. Traditionally, Ergu is made in smoked pumpkin container where milk is fermented spontaneously.

After milking milk should be filtered and thermally treated at minimum at 73°C/5 min as a minimum. Fermentation is achieved by inoculating a mesophilic culture and incubation for 8 hours.



## Ititu

Is a traditional concentrated ergo in the southern part of Ethiopia. Kibe is considered as a traditional cheese.

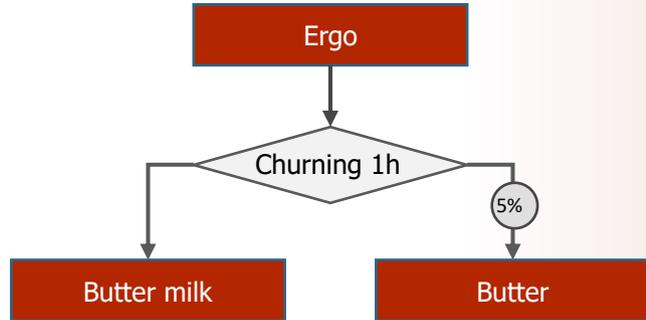
Ergo is left for several days to ferment and is observed daily to remove any whey appearing by sucking through a straw.

The process can be speeded up by draining Ergo in a clean cheese cloth for few hours. This enable a mass production of Kibe.



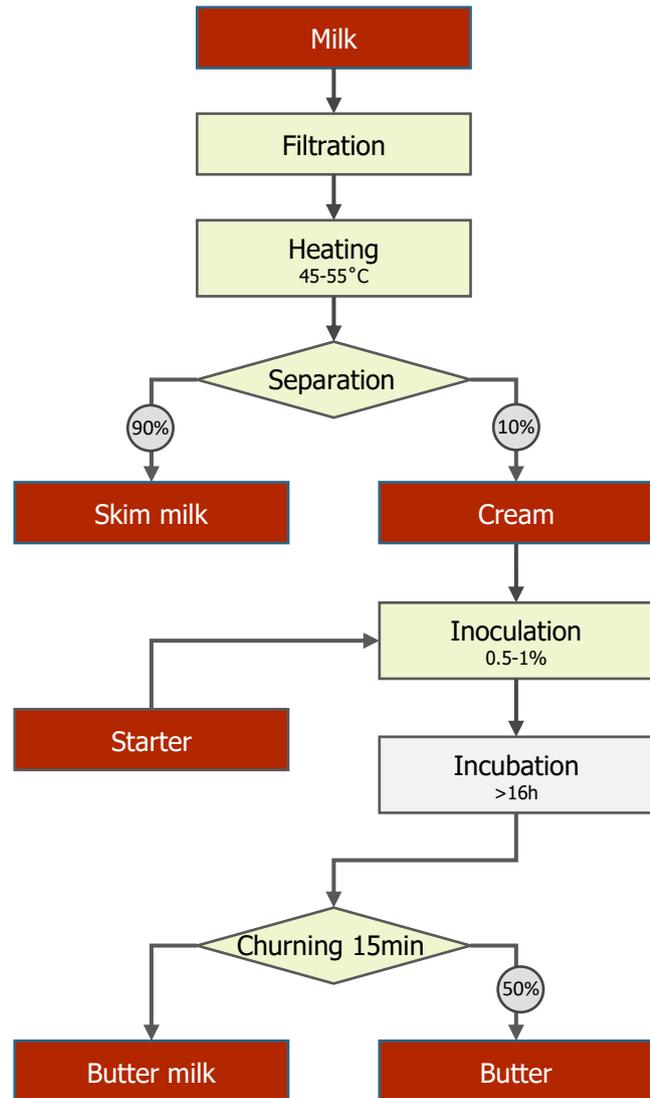
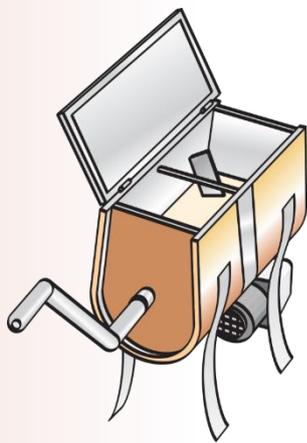
## Butter or Kibe

Kibe is traditionally made out of Ergo that is stored up 20 days before churning. Churning may last up to 4 hours depending on the ambient temperature that also affect the churning efficiency.



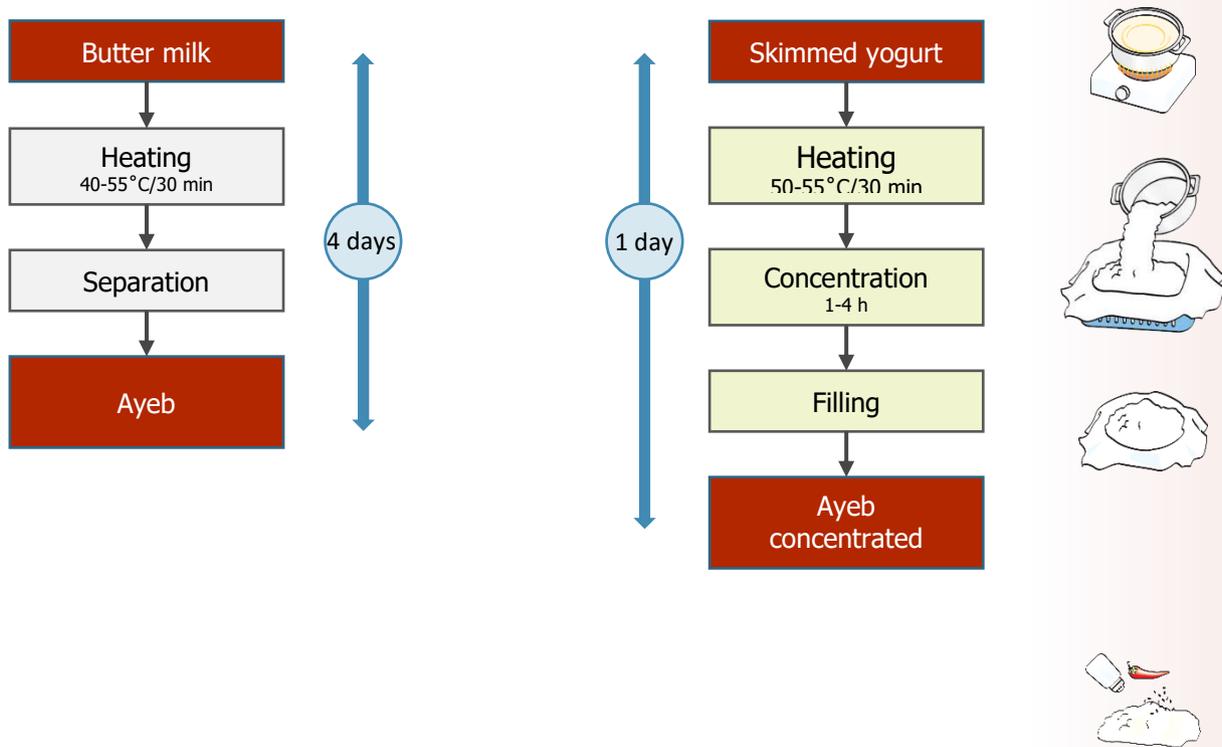
## Advanced method for butter production

The use of milk fat separator enables the processing of butter and valuable products from the skim milk like cheese and skimmed ergo and yogurt.



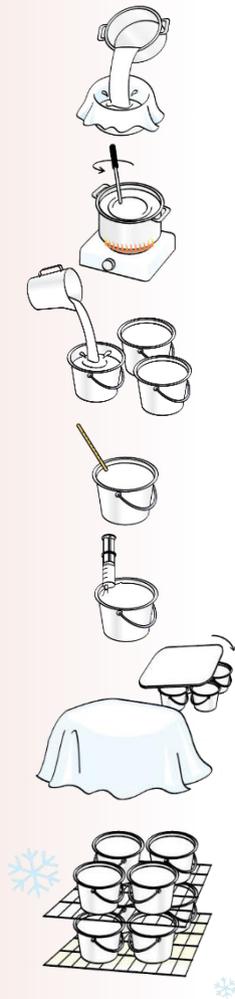
## Ayeb

Ayeb is traditional well-known popular Ethiopian dairy product. Ayeb is white in color and is acidic in taste. Ayeb is consumed fresh and also spiced with hot spices, salt and other herbs.

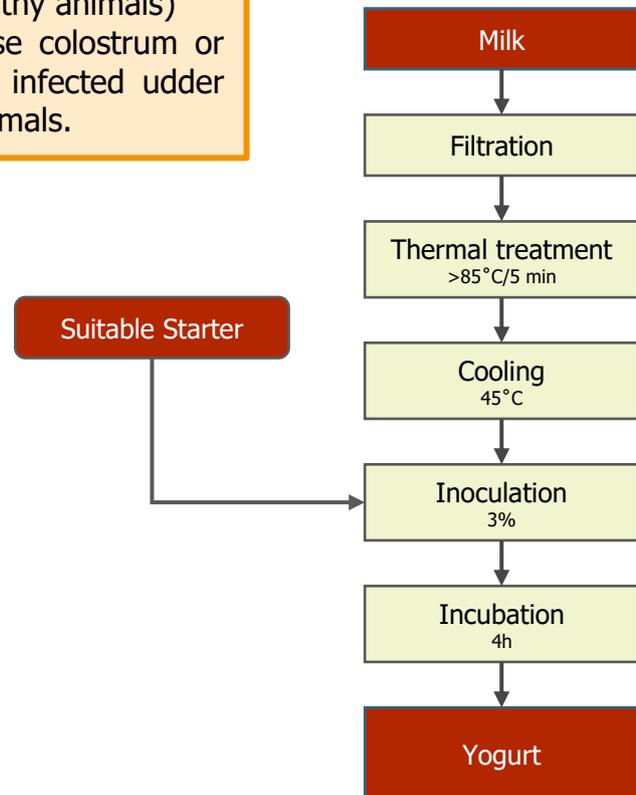


## Yogurt

Yoghurt is a semi solid product produced by milk fermentation. milk should be thermally treated at least at 85°C/5 min to obtain a firm texture that can resist during transportation.

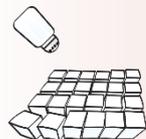
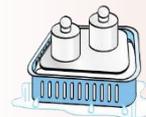
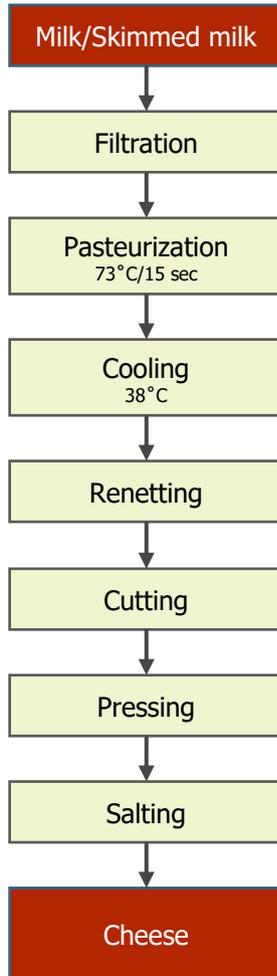


- Milk used in processing should be fresh and free of antibiotic residues (from healthy animals)
- Do not use colostrum or milk from infected udder or sick animals.



## Cheese

Milk or skimmed milk is coagulated after pasteurization using rennet. The curd is cut into small pieces 1×1 cm to encourage whey separation. After the curd is resting for 15 min it will be filled in cheese cloth and then pressed. The pressed cheese is then salted before marketing and consumption.







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