

# Fermented milk products



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**dreamstime**®

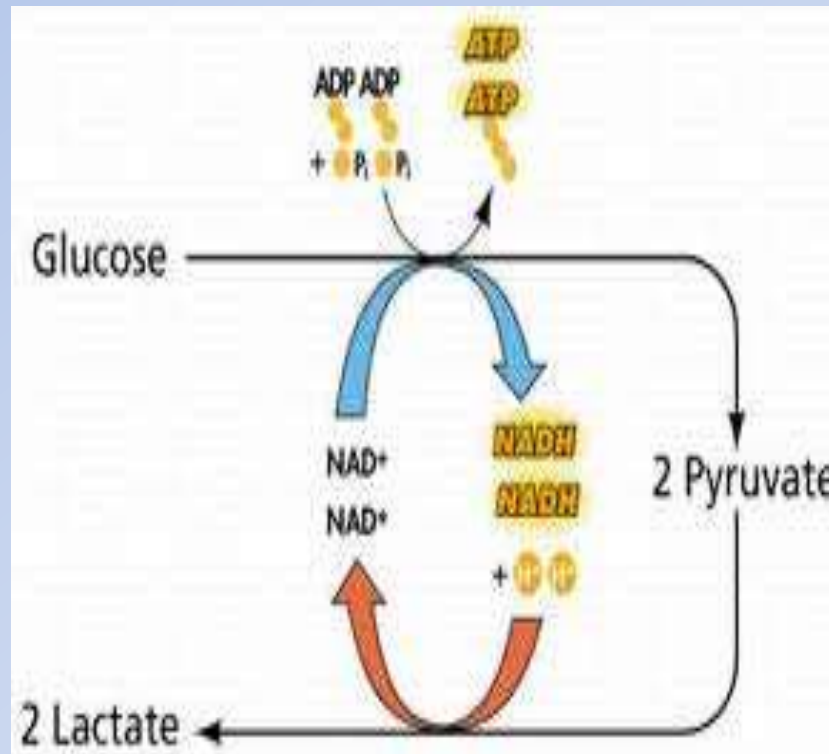
# INTRODUCTION

A glass of milk with a straw, splashing milk, and the word 'dreamstime' at the bottom.

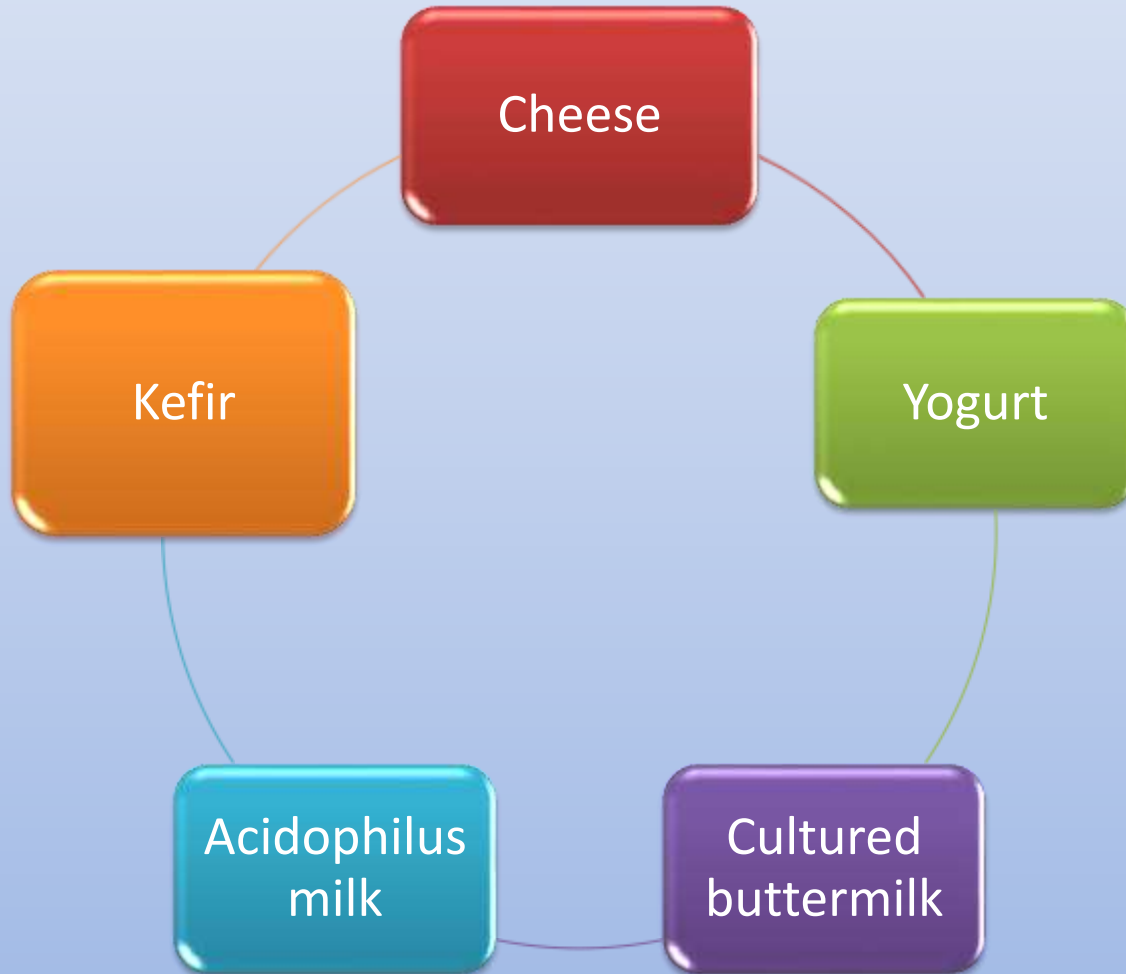
- ✓ Milk is a whitish liquid containing proteins (2.5%), lactose (5%), fats (3.6%), water (87.5%) and various minerals and vitamins (0.7%) produced by the mammary glands of all mature female mammals.
- ✓ The milk produced by cows, goats and other animals is used for human consumption.
- ✓ Milk is extremely perishable and various methods are employed to preserve it, the most prominent being fermentation.

# What Is Fermentation?

- ✓ Fermentation is a metabolic process in which an organism converts a carbohydrate such as starch and sugar into alcohol and/or acid.



# Fermented Milk Products

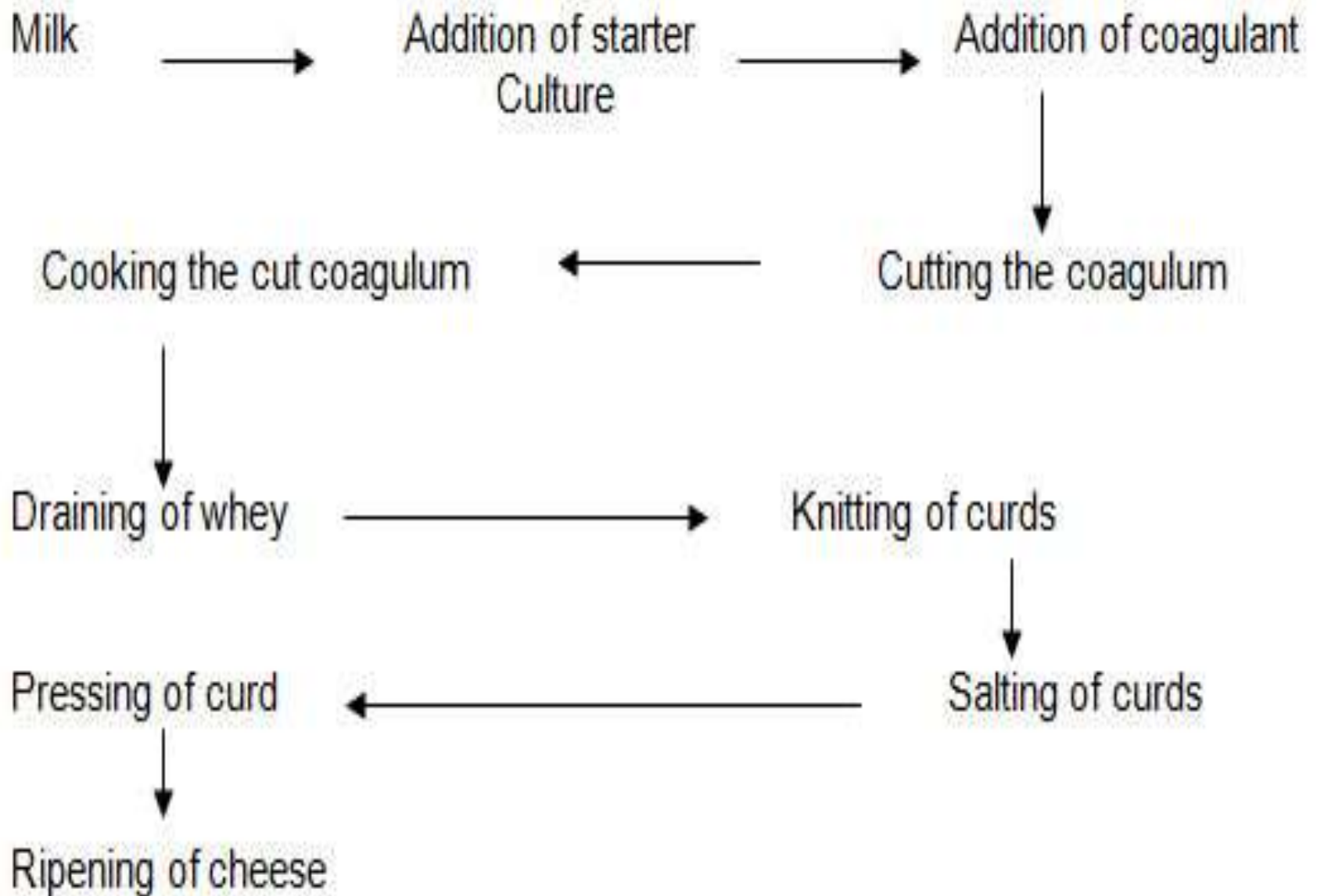


# Cheese



- ✓ Cheese is a concentrated form of 2 major milk components – milk protein (casein) and milkfat.
- ✓ Besides milk, it contains a selected strain of bacteria, a milk clotting agent and sodium chloride.
- ✓ Variations in in the basic constituents, use of additional ingredient and different environmental conditions surrounding the manufacture and subsequent ripening of cheese have given rise to various varieties of cheese.
- ✓ Standard cheese processing is as follows-





# Types Of Cheese (Examples)

1. Soft cheese (camembert, feta, etc.)
2. Semi soft cheese (gouda, port soft, etc.)
3. Hard cheese (mimolette, pelorina, etc.)
4. Semi hard cheese (cheddar, cantal, etc.)
5. Fresh cheese (cottage cheese, mozzarella, etc.)
6. Blue cheese (roquefort, stilton, etc.)
7. Processed cheese

# Types Of Cheese (organisms used)

The background of the slide features several petri dishes containing various cheese cultures. The cultures show different textures and colors, ranging from smooth and yellow to more textured and blue-veined. A hand is visible on the left side, holding one of the petri dishes.

1. Soft cheese (*Streptococcus cremoris*, *Penicillium camemberti*)
2. Semi soft cheese (*Lactococcus lactis*, *Brevibacterium linens*)
3. Hard cheese (*Lactobacillus casei*, *Lactobacillus plantarum*)
4. Semi hard cheese (*Lactobacillus casei*, *Streptococcus cremoris*)
5. Fresh cheese (*Streptococcus* sp.)
6. Blue cheese (*Penicillium roqueforti*, *Lactococcus lactis*)
7. Processed cheese (fungi or fungal spores used during ripening)





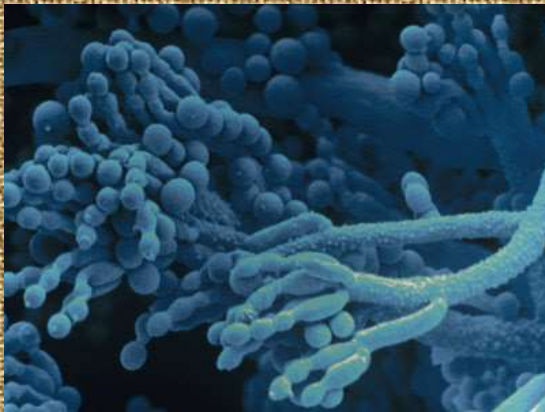
*Lactococcus lactis*



*Brevibacterium linens*



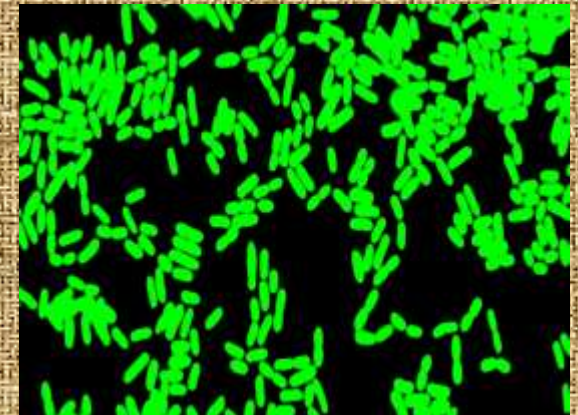
*Streptococcus cremoris*



*Penicillium roqueforti*



*Lactobacillus casei*



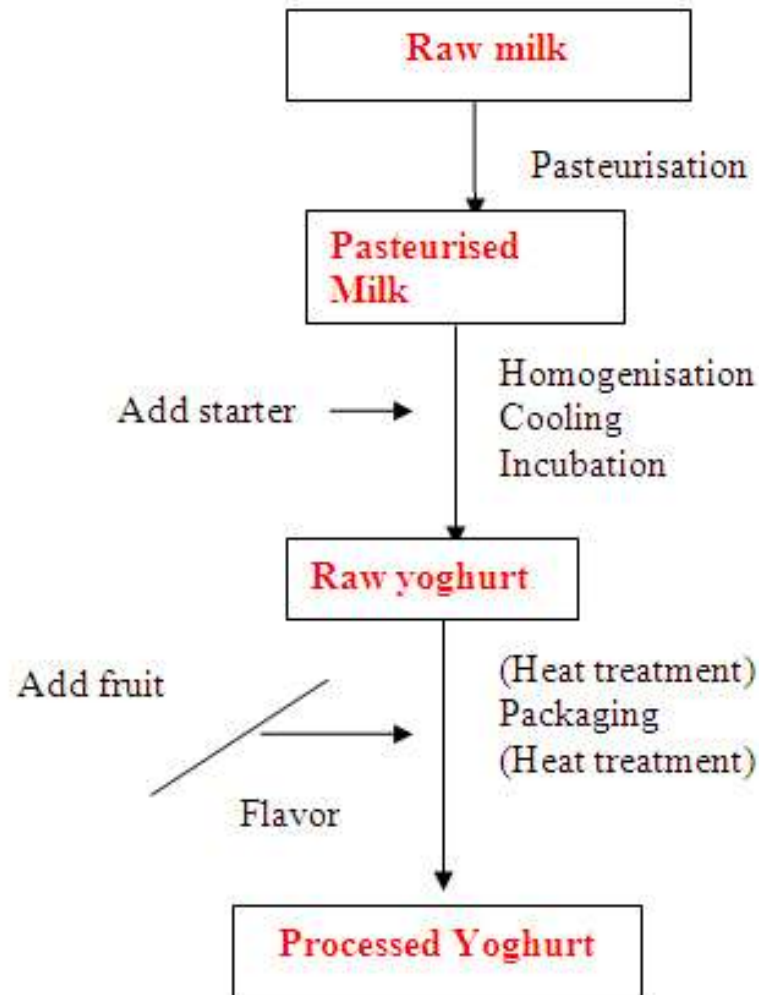
*Lactobacillus plantarum*

# Yogurt

A glass bowl filled with white yogurt, with a silver spoon resting on the surface. The background is a soft, out-of-focus white.

- ✓ Yoghurt is produced by the controlled fermentation of milk by two species of bacteria *Lactobacillus bulgaricus* and *Lactotococcus thermophilus* (*Streptococcus thermophilus*).
- ✓ The lactose is fermented to lactic acid and it is the one which cause the characteristic curd to form.
- ✓ *Streptococcus thermophilus* brings the pH of the milk down to 5.5
- ✓ *Lactobacillus bulgaricus* converts lactose to lactic acid
- ✓ Proteolytic enzymes from *L. bulgaricus* break down milk proteins into peptides.
- ✓ These peptides stimulate the growth of *L. themophilus* which in turn produces formic acid and carbon dioxide.
- ✓ These are the growth stimulants for *L. Bulgaricus*.

# Production of yogurt





# Types Of Yogurt



**Set yogurt**



**Stirred yogurt**



**Drinking yogurt**



**Flavoured yogurt**



**Concentrated /greek yogurt**



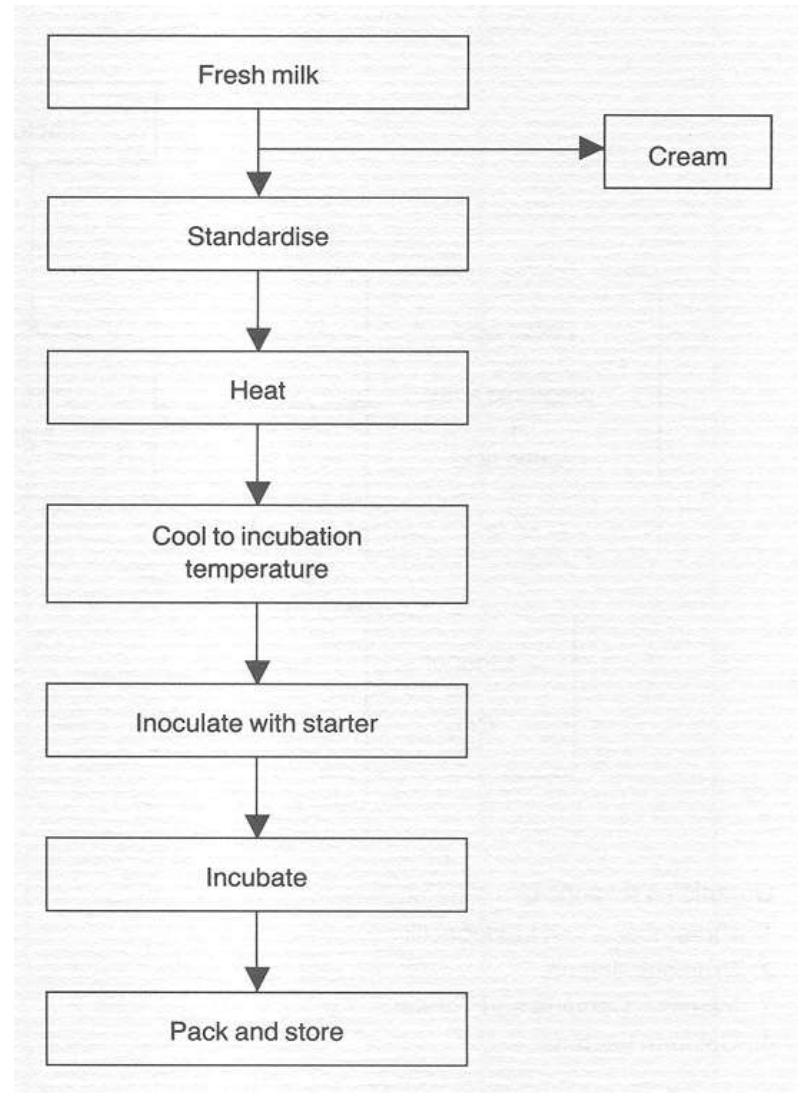
**Frozen yogurt**



# Cultured Buttermilk

- ✓ Cultured buttermilk is the fluid remaining after ripened or sour cream is churned into butter using mesophilic starters.
- ✓ Different products are produced by using different strains of lactic acid bacteria as starter cultures and different fractions of whole milk as the starting substrate
- ✓ Cream is starting substrate , butter is normally made by churning cream that has been soured by lactic acid bacteria
- ✓ Sour cream uses *Streptococcus cremoris* or *S. lactis* for producing lactic acid and *Leuconostoc cremoris* for characteristic flavor
- ✓ Ripened cream uses *Streptococcus cremoris* or *S.lactis* to produce lactic acid rapidly and *Leuconostoc citrovorum* produce the necessary flavors

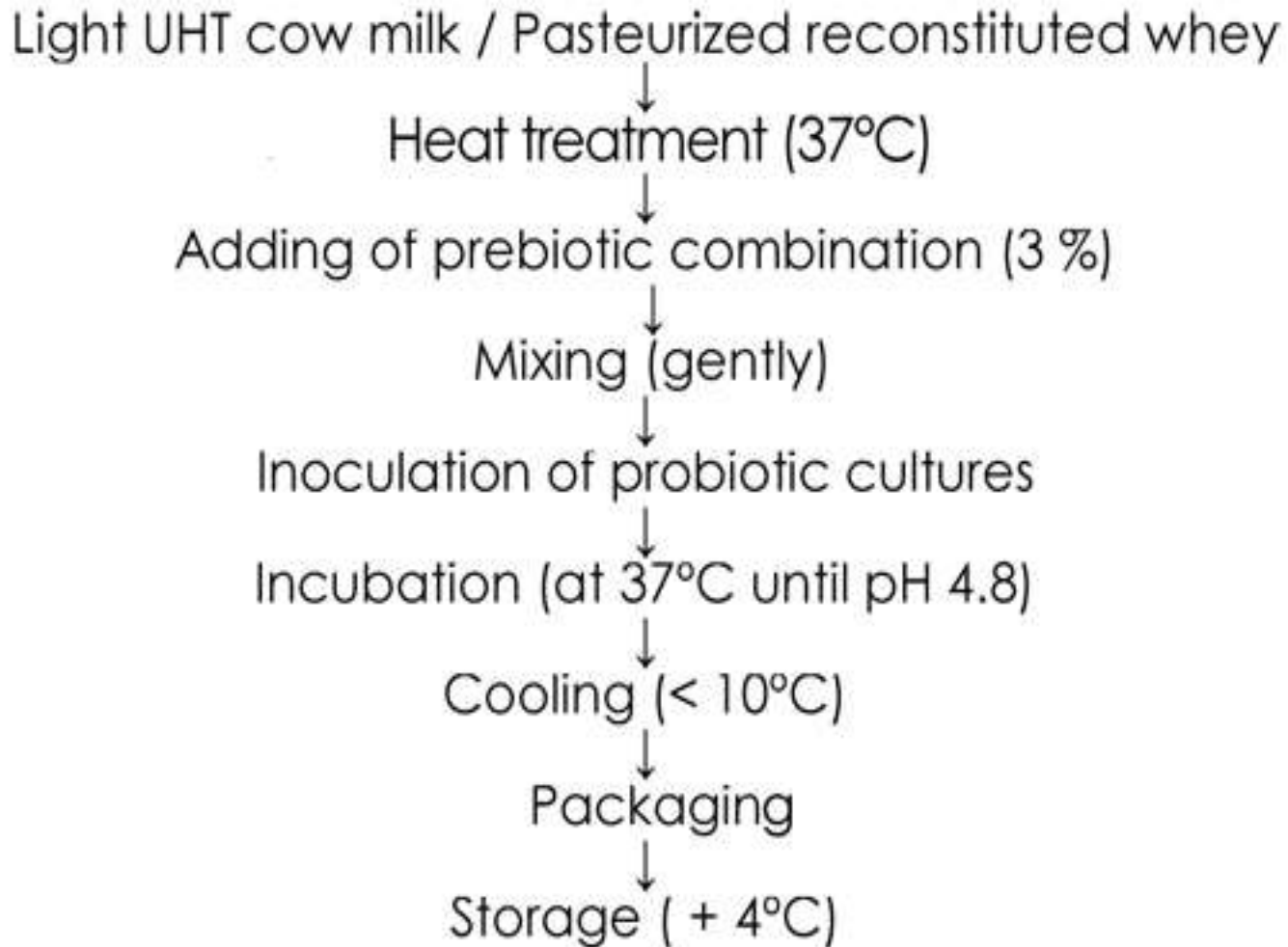
# Production Of Cultured Buttermilk



# Acidophilus Milk

- ✓ Whole or skimmed milk is fermented with *Lactobacillus acidophilus* which is said to have therapeutic benefits in the gastrointestinal tract.
- ✓ It has an overall beneficial effect on people esp. those suffering from frequent diarrhoea & intestinal gas.
- ✓ It has a very harsh acid taste & thus faces rejection by consumers
- ✓ To overcome this, sweet acidophilus milk was developed
- ✓ In this, the bacteria are grown separately & added to pasteurised milk and the inoculated milk is kept at 4 degree celcius
- ✓ When this milk is consumed, the beneficial bacteria are activated in the warm stomach and intestinal tract

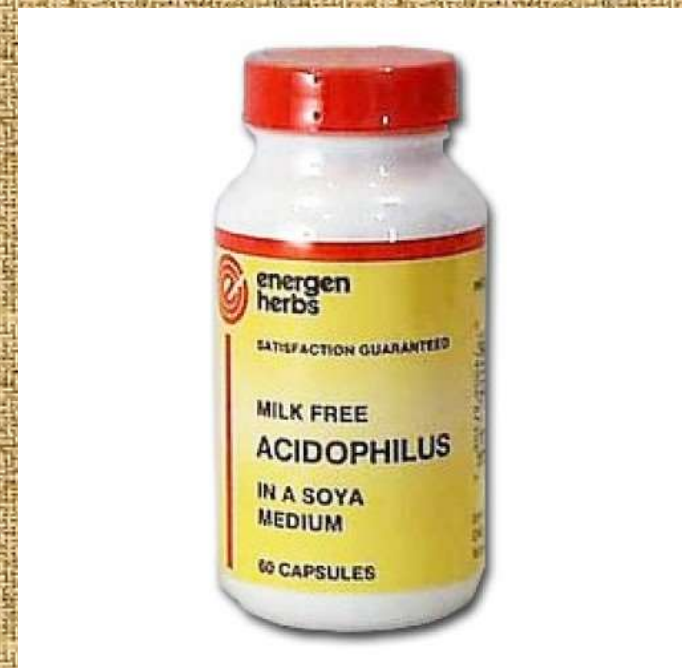
# Production Of Acidophilus Milk







***Lactobacillus acidophilus***



***L.Acidophilus* in a soya medium**



# Kefir

- ✓ Kefir is a beverage produced by the action of lactic acid bacteria, yeast and acetic acid bacteria on milk, which produces a distinctive fermented milk product with unique properties
- ✓ It is produced by adding a starter culture called “kefir grains” directly to milk. The kefir grains are a mass of several different bacteria and yeasts embedded in a complex matrix of protein & carbohydrate.
- ✓ Traditionally prepared kefir contained 1-2% alcohol, due to the complex fermentative process of kefir grains. But new and improved production methods have resulted in much lower levels.
- ✓ The mouth feel of kefir is described to be ‘prickly’ & ‘sparkly’





**Wide range of flavoured kefir**



**Kefir grains**



THANK YOU

