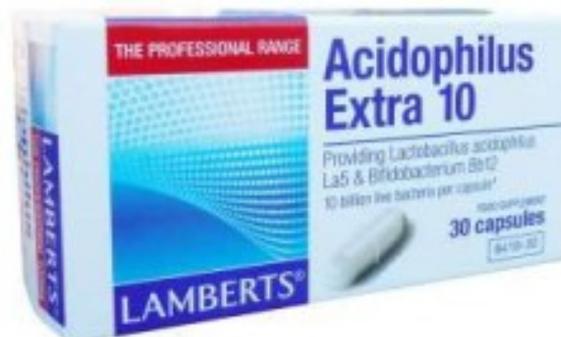


Fermented Milk Products

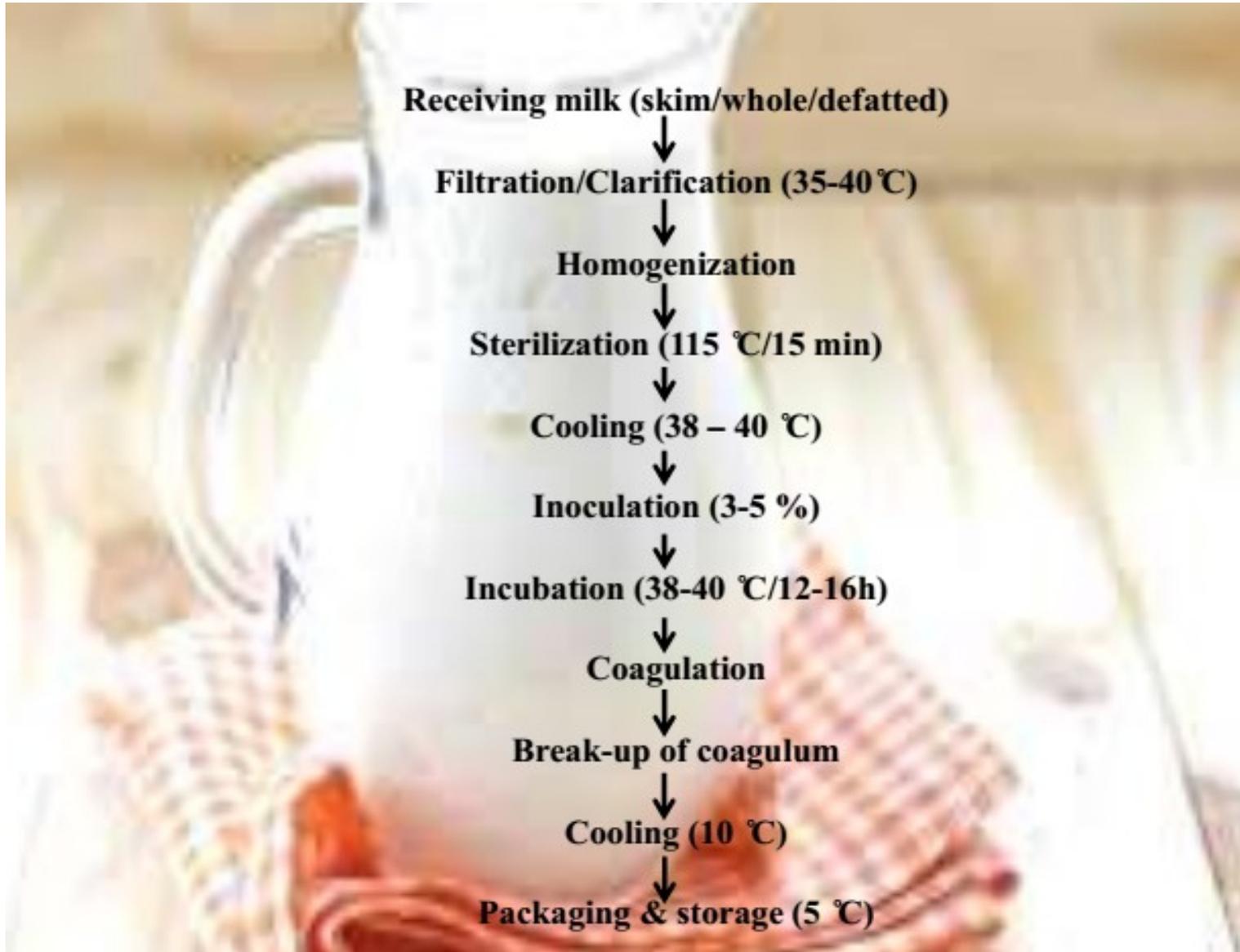


ACIDOPHILUS MILK

- Milk fermented by live cultures of the bacterium acidophilus and consumed especially to promote intestinal health.
- This cultured product is usually low in fat and has a longer shelf life than ordinary milk.
- Acidophilus milk is usually not recommended for people who have immune system problems.
- *Lactobacillus acidophilus* used as a starter culture.
- Lactic acid – 1.0% (0.6-0.7 for medicinal use) Lactobacillus counts 2000-3000million/ml



Manufacture of Acidophilus Milk



Therapeutic value of Acidophilus Milk

- Constant use of acidophilus milk helps in combating intestinal disorders.
- It exerts its effects in patients suffering from constipation and colonic ulcerative colitis.
- It was shown that feeding *L. acidophilus* milk to rats for 4 weeks significantly lowered the serum cholesterol level as compared to rats fed on either milk or water.

For a longer storage, 0.65% acidity and 16C storage temperature are recommended. The quality acidophilus milk should be creamy with a mildly acid taste with no abnormal flavours and odours.

Sweet Acidophilus Milk

- As natural fermented acidophilus milk was sour and having medicinal type of flavour, it was thought appropriate to sell as non-fermented milk. This gave birth to sweet acidophilus milk.
- It is probiotic dairy product based on unfermented milk. It is produced by adding concentrated probiotic bacteria to intensively heat treated and chilled milk.
- Heat treatment is necessary to achieve sufficient microbiological stability during storage of the final product.
- In some cases, it is also prepared by adding concentrated cells of *L. acidophilus* in chilled pasteurized milk.

Acidophilin

- Originated in USSR, obtained from cow's milk which is set or stirred, flavor may vary from mild to acid depending on the quality of starter culture.
- The principle of processing is mixed acid and alcoholic fermentation involving *L. acidophilus*, *L. lactis* subsp. *lactis* or *L. delbrueckii* subsp. *bulgaricus* and Kefir culture) at the rate of 6-9 %.

Yakult



- Yakult is a Japanese **probiotic milk**-like product made by **fermenting** a mixture of **skimmed milk** with a special strain of the bacterium *Lactobacillus casei Shirota*.
- It was created by Minoru Shirota who graduated from the Medical School of Kyoto University in 1930.
- Yakult has also introduced a line of beverages for the Japanese market that contain *Bifidobacterium breve* bacteria.



- After its introduction in Japan and Taiwan, Yakult was first sold in Brazil in 1966, due to the large number of Japanese immigrants in the country, before it was marketed elsewhere.
- Today, Yakult is sold in 32 countries, although its bacteria cultures are provided from a mother strain from Japan regardless of production location.



Yakult Central Institute for Microbiological Research, Tokyo, Japan

Technology of Yakult

- 1. Mixing of Raw Ingredients:** Live *Lactobacillus casei* Shirota strain is cultured in a 'seed tank' in laboratory. Skim milk powder is mixed with sugar, glucose and filtered, sterilized water to make a sweet milky solution.
- 2. Sterilization:** The sweet, milky solution is sterilized at a high temperature for a short time, destroying any bacteria that may be present. The solution is then transferred to a 6,500-litre culture tank via a closed system of pipes and valves.
- 3. Culture Tank:** The temperature of the tank is reduced to 37°C and live *Lactobacillus casei* Shirota strain is added. The solution is allowed to ferment for about one week until the number of *Lactobacillus casei* bacteria reaches an ideal concentration.

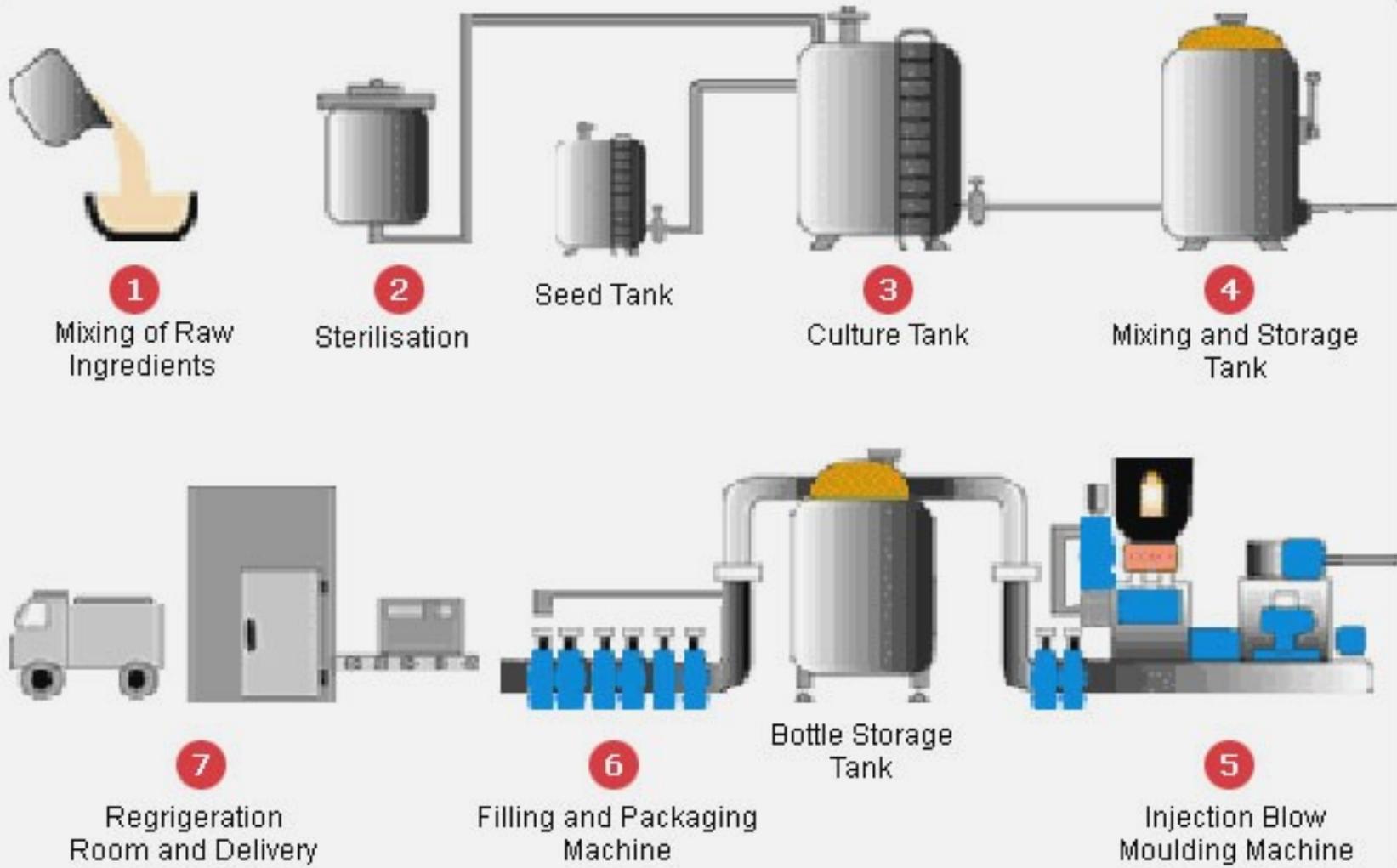
4. Mixing and Storage Tank: The concentrate is transferred to a 12,000-litre mixing and storage tank. The tank is chilled to around 2° C. Sterilized flavours, syrup solution, vitamins and calcium are added to the concentrate. Prior to bottling, the concentrate is diluted with filtered, sterile water.

5. Injection Blow Moulding Machine: The plastic bottles are produced on site. The bottles are made from polystyrene.

6. Bottling and Packaging: The bottles are wrapped with individual bottle labels. Then, they are filled with Yakult, capped with a foil lid, sealed and transferred along the conveyor belt to the packaging facility. Single bottles of Yakult are sorted into groups of five and shrink-wrapped in polypropylene film.

7. Refrigeration Room: Finished products are kept refrigerated before delivery to stores.

8. Yakult Quality Assurance: Yakult maintains a comprehensive quality assurance program in order to ensure that product is of the highest quality. For this reason, samples are collected for laboratory analysis throughout the production process to confirm that the quality assurance measures in place have been effective.



Yakult in India

- Yakult Danone India Pvt. Ltd. is a 50:50 joint venture between Yakult Honsha of Japan and Groupe Danone of France.
- Yakult Honsha is a world leader in probiotics while Groupe Danone is a leader in dairy products.
- The two companies have joined hands to launch Yakult, in India. Yakult is a leading probiotic drink globally. It is being manufactured in a state-of-the-art facility at Rai, Sonapat (Haryana).
- Today Yakult is available in Delhi, NCR, Chandigarh, Punjab, Jaipur, Mumbai, Pune and Bangalore.

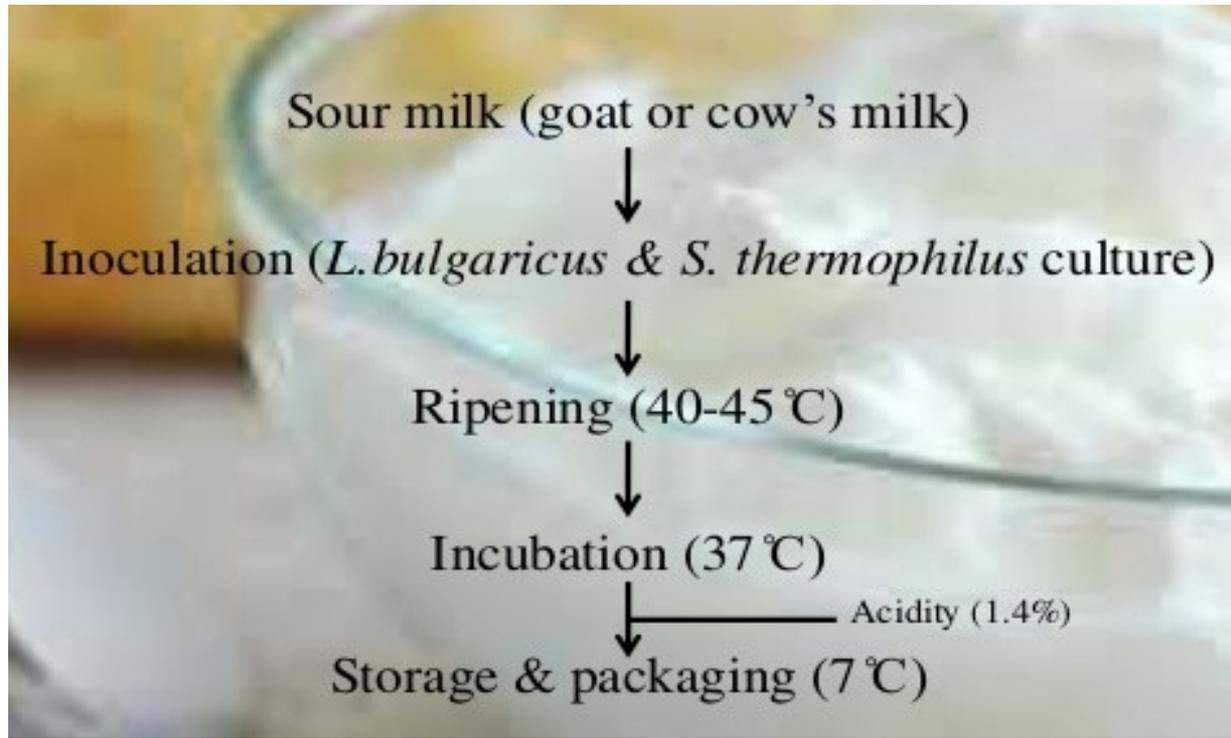


BULGARIAN SOUR MILK

- Bulgarian sour milk comes under the general category of yogurts which contain live bacteria. It is a wonderful probiotic food.
- It is prepared – using a combination of the two strains: *Lactobacillus Bulgaricus* and *Streptococcus Thermophilus*.



Manufacture of Bulgarian Sour Milk



- ❑ Originated from Traki's tradition who came from Asia to Bulgaria bringing the tradition of sour milk preparation.
- ❑ The commercial production may involve only *L. bulgaricus* or mix of both cultures.
- ❑ Acidity may reach as high as 4%.