Teacheesy

Farmhouse and Artisan Cheese & Dairy Producers European Network

Erasmus+

Technical sheet 2

Making an indigenous thermophilic starter from MILK

- Good Starter comes from Good Milk

  Use **milk from animals in perfect health, according with the requirements of the law** and make the starter **without cooling the milk**

  Milk coming from alpine pastures, milked by hand, is usually richer in microorganisms including lactic acid bacteria

- The **tools** to keep the milk must be **clean and disinfected**
- **Thermization**: a short heat treatment at 62°C for 10 minutes maximum may help reduce the presence of antagonistic bacteria (pathogenic or spoilage microbes). In this case, **cool the thermised milk after 10 minutes,** to avoid damaging the positive microflora

- Milk is then incubated at 44-45°C for about 8 hours until natural coagulation occurs. It is imperative to keep the milk container **immersed in water above the milk level.** For this process use milk containers that can transmit heat well and place them in a *bain-marie* to keep them at the desired temperature

- With this procedure, we select a microbial population composed **mainly (but not only)** of strains of ***Streptococcus thermophilus***

- The indigenous starters obtained can be stored at +4°C for three days maximum. It may be stored by freezing, but it should be used within 10 weeks following storage at -18°C

- This type of natural culture is called “Mother” or “Lattoinnesto", and we can use it to make “Lattofermento” (“mother-daughter" method), with UHT milk or boiled milk with 1% of natural “Mother” incubated at 44°C for about 3 hours. The culture obtained can be stored in a clean container at +4°C for 3 days maximum. **It is not advisable to postpone the Lattofermento’s use by freezing.**

It is a **Good Manufacturing Practice** to check the activity of the natural starter. This is done by adding 1% of natural starter to UHT or boiled milk and then in milk used to make cheese and check the time needed to reach the correct pH. This test can help to choose the right % of starter to put in dairy milk.

Mesophilic starter

It is important to respect all the GMP rules described for the thermophilic starter but note that it is not recommended to carry out thermisation because the optimum growth for the mesophilic bacteria is between 20-25°C. Thermisation could damage the positive microflora.

Follow the procedure described step by step:

Step 1

Put about 100 ml fresh raw milk in a sterile pot and close the lid. Keep it at 20°C, use an incubator to keep the temperature constant. Wait until the milk is acidified; you can see this because it sets (becomes a gel) or there is a separation of liquid, with small particles. The milk's acidification can take 2-4 days. Sometimes it will not acidify at all. If this is the case, then start again with fresh milk. When the milk is acidified, go to step 2.

Step 2

Boil the milk or use UHT milk from the store. Put 100 ml of this boiled or UHT milk in a pot. Add 1 ml of the acidified milk to the sterile milk. You can use a syringe for this; make sure that you don't touch the outside of the syringe with your hands. Take the acidified milk from below the surface of the starter. Keep the newly inoculated milk at 20°C until it is acidified, this can take 1 to 3 days. Keep a record of the time needed for the milk to set.

Step 3

Continue with step 2 until the milk is acidified within 20-24h at 20°C. Now you have selected the fast acidifying cultures.

With this sample, you can start to multiply until you have reached the amount needed for your cheese production (level of addition 1% starter).

To preserve this starter: carry out step 2 and store the inoculated (but not fermented) milk in the freezer at -18°C for three months.

Note on acidity measures

In Italy the standard method for measuring total acidity in milk is with Soxhlet-Henkel degrees over 50 ml of milk, so we write °SH/50 ml.

To convert **°SH/50 ml** in **percent lactic acid (% L. a.)** is necessary to **multiply by 0.045**).

The following table is a converter for other standard measurement units:

$$°SH/50 = \frac{°SH}{2} = \frac{°D}{4,5} = \frac{°L}{0,045}$$