

HOME PRACTICAL: YOGHURT

Grow your own culture of lactic acid bacteria

Lactic acid bacteria (LAB), predominantly *Lactobacillus delbrueckii* subspecies bulgaricus and *Streptococcus thermophilus* are used in food production to turn milk (and non-dairy alternatives) into yoghurt on an industrial scale. LAB like to ferment sugars, particularly lactose, to produce energy. Unlike the yeast that you used in the Week 2 home practical, LAB produce lactic acid as the main by-product (not CO₂ or ethanol) of fermentation, which gives yoghurt its characteristic 'tangy' taste and texture.

The first step in yoghurt production is to heat the milk to around 80°C for a few minutes. This kills potential pathogens (pasteurisation) and also changes the structure of the milk proteins (it denatures them) so that they form a more stable gel-like structure. The milk is then cooled to between 40 - 45°C before the bacterial culture is added (if the bacteria are added when the milk is too hot they die). It is then kept at this temperature for 6 - 8 hours for the bacteria to grow and ferment the sugars into lactic acid. This causes the pH to drop, which helps prevent the growth of pathogens, but the LAB is able to tolerate the acidic conditions they create.

What you will need.

- Thermos flask
- Saucepan
- Bio-live natural yoghurt (or 1-2 capsules of probiotic)
- Measuring jug with spout
- Water
- Milk (cow's, sheep's, goat's) or soya milk
- Measuring spoons
- Towel
- Thermometer



Instructions

1. Sterilise the flask by filling it with boiling water and letting it stand for 10 minutes with the lid on.
2. In the meantime, heat the fresh milk to 80°C (it should start steaming but shouldn't actually bubble) to kill any potential pathogens (pasteurisation) and denature the milk proteins. Pour the milk into a thermos flask and wait for it to cool to 40°C.
3. Add a tablespoon of bio-live natural yoghurt (or the powdery contents of one or two capsules of probiotic) and stir. If you add this to the milk when it is too hot you will kill the bacteria and they won't be able to ferment the milk to make yoghurt. Keep a record of the names of the bacteria that are in your live yoghurt or probiotic supplement (if there are no bacterial names on the label the product may not contain live bacteria and therefore may not be suitable to use to make yoghurt).
4. Wrap the flask in towels and place somewhere warm, for example, an airing cupboard for 6 - 8 hours until it looks and tastes like yoghurt - then store it in the fridge and enjoy. Don't be tempted to add sugar or fruit before the yoghurt is made as this will prevent the fermentation process, add this after it has made.

