

Microbiological analysis of the dairy products

Assignment: Analysis of the total viable count of microorganisms (see appendix) in the milk and yoghurt.

Equipment: GTKA agar medium, milk, yogurt, Petri dishes, test tubes, pipettes, microbiological hockey stick, incubator with temperature of 37 °C, physiological solution.

Workflow:

1. Measure out by the pipette 1 ml of the milk and yogurt.
2. Put samples of the milk and yoghurt in test tubes with 9 ml of physiological solution and shake them (this is the dilution 10^{-1}).
3. Make a serial dilution 10^{-2} and 10^{-3} (see appendix).
4. Put GTKA agar medium in 4 Petri dishes and let it stiffen in.
5. Inoculum 2 Petri dishes with GTKA agar medium by 100 μ l of the milk sample (dilution 10^{-3}).
6. Spread the inoculum by microbiological hockey stick.
7. The steps 5 and 6 repeat with the yogurt sample (dilution 10^{-3}).
8. Put Petri dishes in 37°C incubator for 48 hours.
9. After 48 hours you can count number of colonies on plates.

Results and discussion:

1. Calculate the total viable count of the microorganisms (see appendix) and compare yours results with microbiological legislation.
2. Make the Powerpoint presentation on your topic. This presentation will take place on Friday morning.

Appendix:

1. Total Viable Count

A total viable count uses growth of microorganisms on culture media to determine the number of microorganisms present. This is usually accomplished by counting the number of colonies formed on plate media. Each colony represents one bacterium in the original sample. If the number of bacteria in the sample is high, dilutions must be done prior to making the plates in order to see individual colonies. As an example, if one millilitre of milk is added to nine millilitres of sterile water, the sample has been diluted one-tenth. Bacterial counts in milk are given in bacteria per millilitre. Thus, if one-tenth of a millilitre is taken from the diluted sample above and placed on a plate, this would add another one-tenth factor to the dilution when counting colonies. If fifteen colonies grew on such a plate, that would represent 1,500 bacteria per millilitre in the original sample.

Calculate according to the following formula:

N = number of colonies / 0,1. 2 . 10⁻³ unit is CFU/ml or g

2. Microbiological dilution

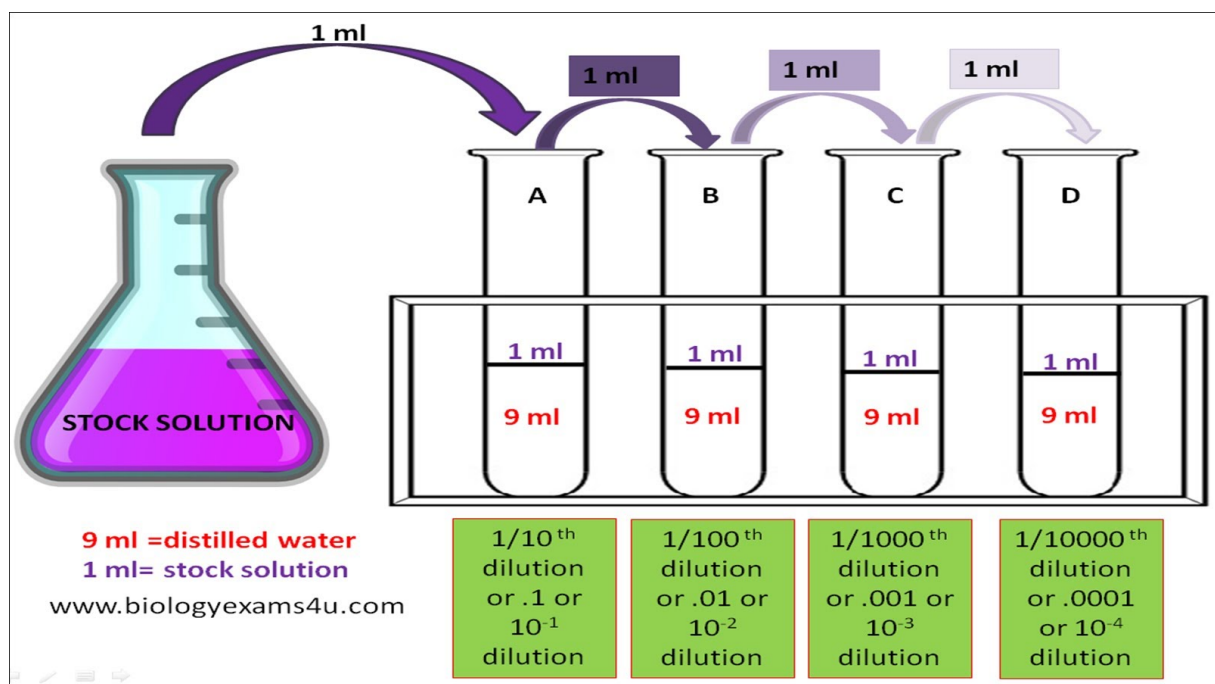


Figure 1: Microbiological dilution

Source: <https://www.youtube.com/watch?v=MCRnJHcfcpY>

3. Microbiological legislation

Nařízení Komise (ES) č. 2073/2005 o mikrobiologických kriteriích pro potraviny ve znění Nařízení Komise (ES) č. 1441/2007