YOGURT AS A PROBIOTIC AND pH VARIABILITY

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INTRODUCTION

Fermentation is a useful method of preserving food and has been around for thousands of years, furthermore it makes food more **digestible** as well as **nutritious**.

With specific reference to lactose, it could be considered difficult to digest for adults, but the microorganisms present in fermented lactics **transform** lactose, the main sugar in milk, into a lactic acid for **easy digestion**.

Taking this into account, **microorganisms should not be considered harmful**. Eating foods with fermented microorganisms is a very healthy way by which the digestive system is given a microbiota with **helpful properties** in terms of nutritious assimilation. Through fermented foods an increase of micro diversity can be incorporated into our organisms.

OBJECTIVES

The objectives of this project are the followings:

- To study of the variability of pH in respect of the time in homemade fermented yogurt at different temperatures (37.5ºC, 45º C)
- To prove the variation in number of bacterial colonies according to the course of time, in fermented yogurt at different temperatures.
- To prove the temperature which is needed in the process of fermentation while creating homemade yogurt, and what would happen if the temperature is raised.
- To check the difference in numbers of bacterial colonies in commercial yogurt and homemade yogurt after 1h of fermentation

METHODS

1. FIRST SESSION

The creation of agar plates by the use of bouillon cubes in a mixture made with water. Thereafter, the filtration of such mixture and afterwards its activation process by using a gelatinous substance (agar) to ensure its consistency. Finally, introduction of it in petri dishes for its following cooldown.

2. SECOND SESSION

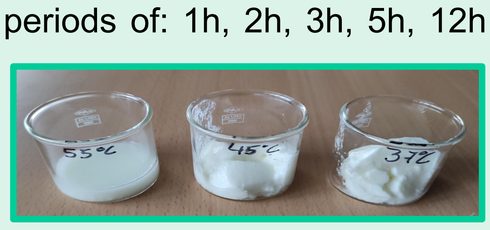
Preparation of homemade yogurt, with the use of milk, commercial yogurt and sugar to feed the bacteria. Subsequently, it's separation into three different flasks for the three different variables.

Introduction to the growing chambers at different temperatures (37.5ºC, 45ºC and 55ºC).

Measurement of pH levels on homemade yogurt made at 37,5°C and 45°C, in periods of: 1h, 2h, 3h, 5h, 12h and 24h. This will enable us to study it's variations.

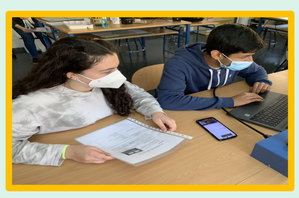
3. THIRD SESSION

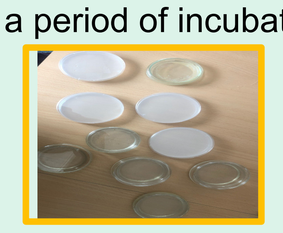
To seed bacterias in petri dishes and incubation for its subsequent recount



4. FOURTH SESSION

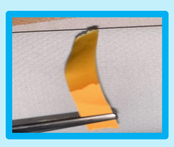
Measurement of the bacterial colonies on both types of yogurt (37.5ºC, 45ºC) after a period of incubation.

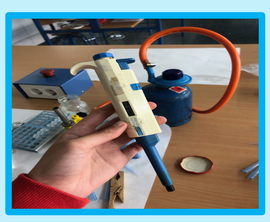


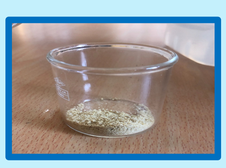


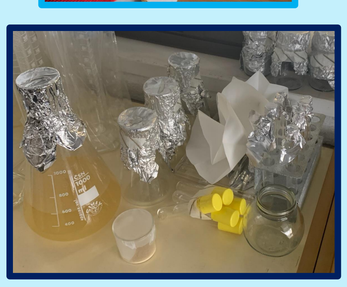
MATERIALS

- Permanent marker
- Growing chambers
- Cotton
- Bacterial culture
- Para film
- Agar
- Bouillon cube
- Water
- Cooking plate
- Pressure cooker
- Bunsen Burner
- Spoon
- pH stripes
- Sterilization stripes
- Probe
- Sewing loop
- Filters
- Blender
- Commercial yogurt
- Milk
- Sugar
- Eppendorf tubes
- Micropipette and micropipette tips

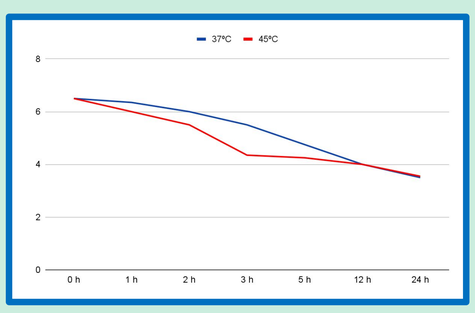




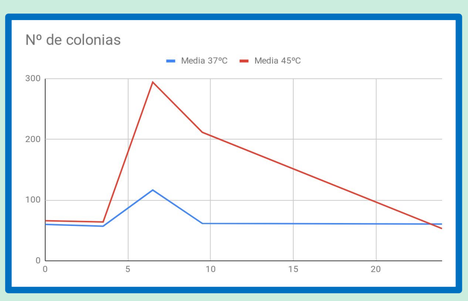




RESULTS



pH variability /time /temperature



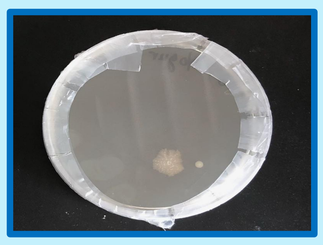
Variability in number of colonies

CONCLUSIONS

Hypotheses previously mentioned are now verified:

- It has been proven that we find a larger quantity of bacterial colonies in the commercial yogurt when compared with the homemade yogurt after one hour of fermentation, which has less bacterial colonies.
- A temperature of between 37ºC and 45ºC is needed in order for fermentation to take place, due to the fact that bacterias in charge of fermentation can only carry it out at this temperature range. However, if we increase the temperature to 55ºC, bacterias will not survive. For this reason, the milk will not fermentate.
- Given the facts, it can be proven that, milk as well as yogurt are susceptible within the course of time, to tend to become a more acidic. Thus proving its variability in pH levels

RESULTS



Homemade yogurt at 1 hour of fermentation

Commercial yogurt

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