PREPARATION OF YOGURT

When we learned about microorganisms (microbes) (such as bacteria, Protists, Fungus and the non-cellular viruses), we discussed how these microbes contaminate our food supply (See: "Bacterial Contamination of Foods"). We have already learned about the process of fermentation, an anaerobic alternative to the process of cellular respiration and we know that some microbes assist in the production of substances we use as food. Yeasts, for example, can be used for the production of bread and of certain types of fermented beverages, such as beer. Some molds (a type of fungus) help produce cheeses, such as Camembert, blue cheese and Roquefort.

In this procedure, you will observe an example of how microorganisms can benefit instead of harm us. This lab procedure presents another positive way in which we can use microbe - for the production of yogurt, a product of the fermentation of lactose (milk sugar) by bacteria.

Two different species of bacteria can ferment lactose: Lactobacillus bulgaricus and Streptococcus thermophilus.

Enzymes in the bacteria convert the sugar lactose into an acid called lactic acid. As the acid accumulates in a solution, the milk thickens and takes on a "sour" taste. A variation in pH can make the yogurt sweeter and thinner (higher pH) or thicker and more sour (lower, more acidic pH). More milk protein coagulates when the pH is lowered.

PROCEDURE

1-Empty 250 ml (8 ounces) of milk into a clean container. We will use beakers reserved just for this process.

2-Heat the solution in a water bath until it reaches 96°C (205°F), but do NOT boil the solution.

3-Remove the solution from the water bath and cool it to 46°C (115°F) while stirring.

4-Add 1.25 mls (1/4 teaspoon) of yogurt starter culture to the milk.

5-Place a lid on the container, tape the container closed and be certain it is labeled with your name.

6-Place the container in the incubator box. It will be kept there for 8 hours, and then we will move it to a refrigerator where it will be stored until our next class meeting.

7-Next time we meet you will get to check your product.

NOTE: If you are making yogurt at home, heat a gallon of milk to 96°C (205°F), cool the milk to 46°C (115°F), add 20 grams (or 4 teaspoons of actual homemade unsweetened yogurt) of yogurt starter powder and incubate. You may incubate the yogurt by wrapping the container in big towels to keep it warm.