Plant vs Animal Yogurt Lab

How does soy-based yogurt compare to whole milk-based yogurt?

Define the following terms:

Fermentation

Glycolysis

Lactose

Enzymes

Anaerobic

Glucose

Galactose

Lactic acid

Casein

Lactobacillus bulgaricus

Streptococcus thermophilus

Pasteurization

Stachyose

Raffinose

Bifidobacterium

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Problem: How does soy milk based yogurt compare to whole milk based yogurt?

Hypothesis:

Variables:
Independent:
Dependent:
Controls:

Materials: (you will need to add based on which recipe you select)

Procedure

Making Animal Milk Based Yogurt: (unsweetened/plain)

1. Measure out 180mL of whole fat milk and pour into clean beaker. Heat milk to until it reaches 82° Celsius (180°F). Milk will begin bubbling on the sides of beaker.
2. Remove beaker from heat and allow to cool to 37°Celsius (98.6°F).
3. Stir in 25g of plain yogurt starter to the warm milk in the beaker. Stir mixture until all yogurt is incorporated and smooth.
4. Pour mixture into a labeled glass jar and place into yogurt maker.
5. Once jars are loaded into yogurt maker, close lid and turn on the power switch. Samples need to cook for 8-12 hrs depending on the fat content of the milk. (Refer to user guide of the yogurt maker.)

Making Plant Based Yogurt: (unsweetened/plain)

1. Measure out 180mL of soymilk and pour into clean beaker. Heat milk to until it reaches 93°Celsius (200°F). Milk may begin bubbling on the sides of beaker.
2. Remove beaker from heat and allow to cool to 44°Celsius (112°F).
3. Then stir in 25g of plain soymilk yogurt starter to the warm milk in the beaker. Stir mixture until all yogurt is incorporated and smooth.
4. Pour mixture into a labeled glass jar and place into yogurt maker.
5. Once jars are loaded into yogurt maker, close lid and turn on the power switch. Samples need to cook for 8-12 hrs depending on the fat content of the milk. (Refer to user guide of the yogurt maker.)

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Optional: To make sweetened/flavored yogurt samples:

Using Fruit:

Cook 40g of fruit in 20g sugar and 34mL of water over low heat for 10-15 minutes or until thickened. Let mixture cool to 110°F. Beat together the culture and milk until desired consistency reached.

Using Jam/Jelly:

Warm 20g of jam or jelly in a pan over low heat. Add small amounts of the heated milk, stirring until all milk has been added and texture is smooth. Let cool again to appropriate temperature before adding 25g of yogurt starter to small jars.

Using Honey/Sweetener:

After cooling boiled milk to cool to appropriate temperature, add the following amount of selected sweetener:

Honey - 20g

Granulated Sugar- 12g

Agave - 20g

Following cooking and chilling, test your yogurt samples and fill out the table on the following page. **Do NOT taste the yogurt** unless you have followed aseptic technique and prepared your samples following food safe protocols.

Follow SLOP #2019 to perform a gram stain on the bacteria contained in your yogurt samples.

Data from Yogurt Samples

Data

Comparison of Yogurt Types

Yogurt Type	pH	Color	Odor	Consistency	Texture/ Mouthfeel	Bacteria stain color & shape of bacteria
Soy Milk Based (Store Bought)						
Soy Milk Based (Homemade)						
Whole Milk Based (Store Bought)						
Whole Milk Based (Homemade)						

Conclusion Questions

REE: Restate evidence from the data and incorporate the answers to the post lab

1. What are the two most common bacteria used in yogurt making?
2. During the fermentation process, what happens to the lactose (milk sugar)? What are the end products of fermentation?
3. Why does yogurt taste sour?
4. What causes the milk to thicken and form “curds”?
5. Why must you heat the milk before making yogurt? What do you think would happen if you added the “starter culture” before the milk was cooled to 32°C?