15.

Investigation of Bacteria Content In Milk

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Abstract:

Milk is a useful food source for human being and other animals. Bacteria inevitably enter in the milk either from the cow (if it is ill) or during milking, handling and fermentation process. Most of bacteria found in milk are acidic bacteria such as streptococcus lactic, lactobacillus paracasei, and lactobacillus fermentum. The more the acidity of the milk, the larger the number of bacteria it contains.

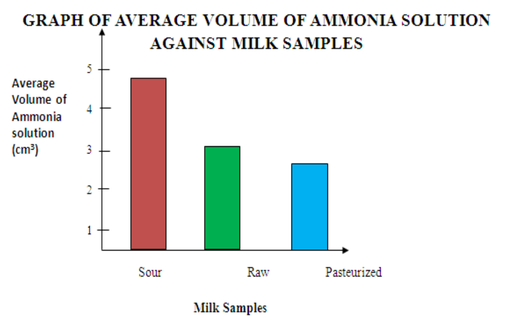
This project is interesting to determine the bacteria content in raw, pasteurized and sour milk. The project will help to reduce the milk born diseases in most affected societies such as Masai, Sukuma and Gogo people.

Method:

In this project the method used to determine the bacteria content in milk is Titration and the materials and chemicals used were 2M of dilute Ammonia solution (NH_4OH), milk samples, phenolphthalein indicator, burette, measuring cylinders, Bunsen burner, beakers and droppers.

Titration is used to determine the volume of ammonia solution (NH_4OH) which is used to neutralize the lactic acid found in milk. Different volumes of raw and sour milk were taken and phenolphthalein (P.O.P) was added as an indicator to show the end point of reaction. The solution was titrated with ammonia solution to observe the volume of Ammonia Hydroxide solution used per each solution. In case of pasteurized milk, we observed the volume of ammonia solution used in the milk of below, above and at 72 ^oC.

This project based on investigating either raw, pasteurized or sour milk containing large amount of Ammonia Hydroxide solution.



Results:

The average volume of Ammonia solution (NH_4OH) used in sour, raw and pasteurized milk is 4.67m^3, 2.50cm^3, and 1.97 cm^3 respectively. Much Ammonia hydroxide solution is used in sour milk and raw milk than pasteurized milk, because sour milk contains large volume of lactic acid hence large number of bacteria.

Titration of different volumes 10, 15, 20, 25, cm^3 of sour, raw and pasteurized milk.

Variation of temperature during experiment.

Quantity of milk limits the accuracy of experimental data.

Air especially oxygen may interfere the chemical composition of the ammonia solution

Lack of facilities like modern equipment's such as incubator, lactometer, sterile nutrient agar plates and inoculating loop.

TITRATION					
MILK SAMPLES	BURETTE READINGS (cm^3)	PILOT	1	2	3
SOUR	Final volume (cm^3)	2.70	7.80	12.30	16.70
	Initial volume (cm^3)	0.00	2.70	7.80	12.30
	Volume of NH_4OH used	2.70	5.10	4.50	4.40
RAW	Final volume (cm^3)	1.90	4.40	6.70	9.40
	Initial volume (cm^3)	0.00	1.90	4.20	6.70
	Volume of NH_4OH used	1.90	2.30	2.50	2.70
PASTEURISED	Temperature	72°C	40°C	30°C	90°C
	Final volume (cm3)	0.60	2.30	4.70	6.50
	Initial volume (cm^3)	0.00	0.60	2.30	4.70
	Volume of NH_4OH (cm^3)	0.60	1.70	2.40	1.80

Conclusion:

All fresh or natural milk obtained directly from the animals must be pasteurized at the boiling point of 72°C to destroy any pathogenic bacteria. Drinking raw milk can lead to milk borne illnesses such as Brucella and Listeriosis, while sour milk is also not safe for ulceric and other people because it contains high amount of lactic acid and large number of bacteria especially when is fermented without being pasteurized. So handling, packaging and delivering to the store should be maximum hygienic.

References:

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