

Chemistry Project

Abstract

Aim is To determine the quantity of Casein present in different samples of milk. Natural milk is an opaque white fluid Secreted by the mammary glands of Female mammal . The main constituents of natural milk are Protein, Carbohydrate, Mineral Vitamins, Fats and Water and is a complete balanced diet.

Fresh milk is sweetish in taste. However , when it is kept for long time at a temperature of 5 degree it become sour because of bacteria present in air. These bacteria convert lactose of milk into lactic acid which is sour in taste. In acidic condition casein of milk starts separating out as a precipitate. When the acidity in milk is sufficient and temperature is around 36 degree, it forms semi-solid mass, called curd. Casein is present in milk as calcium caseinate in the form of micelles. These micelles have negative charge and on adding acid to milk, the negative charges are neutralized.

Milk is a complete diet as it contains in its proteins, carbohydrates, fats, minerals, vitamins and water.

- Average composition of milk from different sources is given below.

Source of Milk	Water (%)	Minerals (%)	Proteins (%)	Fats (%)	Carbohydrates (%)
Cow	87.1	0.7	3.4	3.9	4.9
Human	87.4	0.2	1.4	4.0	4.9
Goat	87.0	0.7	3.3	4.2	4.8
Sheep	82.6	0.9	5.5	6.5	4.5

- Casein is the major protein constituent presents in the milk and is a mixed phosphor-protein.
- Casein has isoelectric pH of about 4.7 and can be easily separated around this pH.
- It readily dissolves in dilute acids and alkalies.

Materials Required:

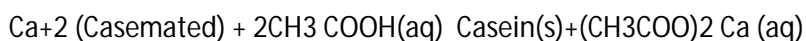
Beakers (250 ml), filter-paper, glass-rod, weigh-box, filtration-flask, Buchner-funnel, water pump, test-tubes porcelain dish, burner, different samples of Milk, 1% acetic acid solution, saturated ammonium sulphate solution.

Procedure

- Take a clean dry beaker, put into it 20cc of goat's milk and add 20 ml of saturated ammonium sulphate solution slowly and with stirring. Fat along with casein will precipitate out.
- Filter the solution and transfer the precipitates in another beaker.
- Add about 30 ml of water to the precipitate.
- Only casein dissolves in water forming milky solution leaving fat undissolved.
- Heat the milky solution to about 40°C and add 1% acetic acid solution drop wise, when casein gets precipitated.
- Filter the ppt., wash with water, and let the ppt. dry.
- Weigh the dry solid mass in a previously weighed watch glass.
- Repeat the experiment with other samples of milk.

Observation Table

If an acid is added to milk, the negative charge are neutralized and the neutral protein precipitated out.



Volume of milk taken in each case = 20 ml.

Conclusion

Different samples of milk contain different percentage of Casein..