A STUDY OF CASEIN CONTENT IN DIFFERENT MILK SAMPLES OF LUMBINI DAIRY MILK

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This study examines the amount of casein present in different sample of milk and comparison between the protein found in those sample.

CONTENTS

I. INTRODUCTION

Natural milk is an opaque white fluid secreted by the mammary glands of female mammals.The main constituents of natural milk are protein, carbohydrate, minerals, vitamins, fats and qatar are considered as a complete balanced diet. Fresh milk is sweetish in taste. However, when it is kept for a long time at a temperature of 5^0C, it becomes sour because of bacteria present in the air. These bacteria convert lactose of milk into sour lactic acid. In acidic conditions, the casein of milk starts separating as a precipitate. When the acidity in milk is sufficient and the temperature is around 36^0C it forms a semi-solid mass, called curd. Cow's milk contains about 3%. Casein is a family of related phospho-proteins. Casein is present in milk as calcium caseinate in the form of micelles. These micelles have a negative charge and on adding acid to milk the negative charges are neutralized.

Calcium caseinate + acetic acid $\rightarrow$ $casein_{(s)}$+ calcium $acetate_{(aq)}$

Milk also contains Casein, the chief protein in milk and the essential ingredient of cheese. In pure form, it is an amorphous white solid, tasteless and odorless, while its commercial type is yellowish with a pleasing odor. Dry casein keeps well if protected from insects and rodents: damp casein is quickly attacked by molds and bacteria and acquires a disagreeable odour. The specific gravity is 1.25 to 1.31

Casein is a mixture of phosphoproteins of differing molecular weight. Casein is usually made from skim milk (rarely from buttermilk), by one of three methods:

1. Naturally soured casein curdles when enough lactic acid develops from fermentation of milk sugar by the ever present bacterium streptococcus lactis.

2. Acid casein is precipitated by adding dilute hydro-chloric acid or sulphuric acid.

3. For rennet casein, warm skim milk is set with rennet extract until the calcium paracaseinate clots, after which the clot is cut into small pieces to allow the whey to drain. In all three methods the whey is drawn off, the curd washed with water, drained or pressed, dried in warm air, ground, and packed for sale. Rennet casein retains much of the calcium phosphate from the milk.

Casein is used in prepared foods, in medicines and dietary supplements, and in cosmetics. Minor industrial applications include the seasoning and dressing of leather, cleaners and polishes for shoes, textiles printing and sizing, insecticides sprays, soap making and many uses in which casein serves as a protective colloid, emulsifying agent or binder. Major applications of caseins are paper coatings, glues, paint, plastics and man made fibres.

II. REQUIREMENTS

1. Beakers(250 ml)
2. Filtration flasks
3. Measuring cylinder
4. Glass rod
5. Spatula
6. China dish
7. Dropper
8. Weight Box
9. Different samples of milk
10. 10% Acetic Acid

III. PROCEDURE

1. A clean dry beaker had been taken and added 200 ml of cows's milk into it and also added 20 ml of saturated ammonium sulphate solution slowly and with stirring, fat along with casein was precipitated out.
2. The solution was filtered and transferred to another beaker. Add about 30 ml of water to the precipitate. Only casein dissolved in water forming a milky solution leaving fat undissolved.
3. The milky solution was heated to about 40^0C and added 10% acetic acid solution drop wise when casein got precipitated.
4. Filter the precipitate, wash with water, and the precipitate was allowed to dry.
5. Weigh the dry solid mass in a previously weigh watch glass.
6. The experiment was repeated with other samples of milk.

IV. OBSERVATION

Sample	Source	Yield of casein	% of casein
1.	Full cream milk	17.71	8.85
2.	Light milk	13.8	6.90
3.	Cow milk	17.61	8.80
4.	Buffalo milk	16.08	8.04

The volume of milk taken in each case was 200ml % of casein= (Weight of case in/volume of milk0*100.

V. RESULT

We found that the casein percent is high in full cream milk as compared to other kinds of milk we have taken as a sample. Higher the casein percent higher the protein content in the milk. So, full cream has more protein than other samples of milk.

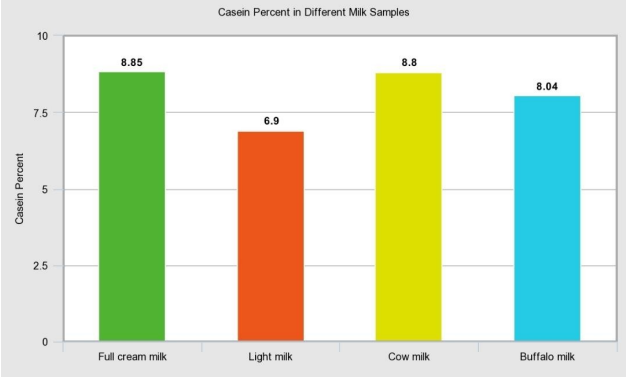

FIG. 1. Bar graph of Casein Present in Different Milk Samples

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REFERENCES

1. Pioneer Chemistry Grade XII, First Edition, Dreamland Publication Pvt Ltd, Anamnagar, Kathmandu, Nepal
2. Pioneer Practical Chemistry Grade XII, First Edition, Dreamland Publication Pvt Ltd, Anamnagar, Kathmandu, Nepal