



STUDY OF CASEIN CONTENT IN VARIOUS MILK BRANDS AVAILABLE IN NAGPUR, MAHARASHTRA, INDIA

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ABSTRACT

Milk is a nutrient-rich, white liquid food produced by the mammary glands of mammals. It is important part of human life. Milk is viewed as a nutritious food with lots of vitamins, minerals, fats and proteins, thus used for drinking purpose. Milk contains Casein which is a slow digesting protein and is suspended in milk in a complex called micelle. Samples of milk brands available in market were obtained and subjected to estimation of the casein along with the cow, goat, skimmed milk powder and buffalo milk. The technique of precipitation of casein was used to predict the protein content in the milk samples. The percentage and gm/ml content of casein in the samples were estimated and analyzed in results. The results were compared with the available other studies in the literature and discussed.

KEY WORDS: milk, protein, casein, branded.

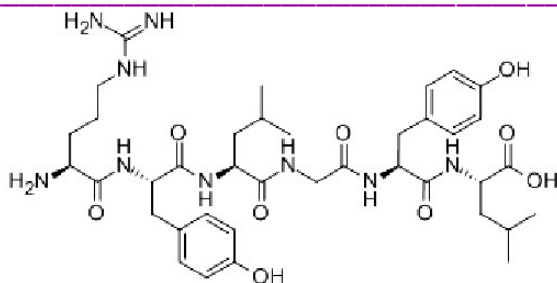
INTRODUCTION:

Milk is an opaque white fluid rich in fat and protein secreted by female mammals for the nourishment of their young. Milk contains important nutrients like Calcium, Phosphorous, Vitamin B, Potassium and Vitamin D. Plus it's an excellent source of protein. Drinking milk and dairy products may prevent Osteoporosis and Bone fractures and even help in maintaining a healthy weight. The nutritional profile of milk is impressive. Potassium, B₁₂, Calcium and Vitamin D, which are lacking in many diets. Milk is also a good source of Vitamin A, Magnesium, Zinc and Thiamine (B₁).

Additionally, it's an excellent source of protein and contains hundreds of different fatty acids including conjugated linoleic acid (CLA) and Omega-3s. Just one cup (244 grams) of milk contains: -Calories-146, Protein-8 grams, Fats-8 grams,

Calcium-28 %of Recommended Daily Allowance (RDA), Vitamin D-24% of RDA, Riboflavin (B₂)- 26%of RDA, Potassium -10% of RDA, Phosphorus-22% of RDA, and Selenium- 13% of RDA.

Milk is essentially an emulsion of fat and protein in water, along with dissolved sugar, minerals including calcium and phosphorous and vitamins particularly vitamin B complex. Commercially processed Cow's milk is commonly enriched with vitamins A and D [2]. Milk has energy required for human activities and nutrients needed for building up the human body [3].



Structure of Casein

Various commercial milk providers may have different compositions of milk and its dilutions. Also, some have milk from different animals which can differ in the casein content. Hence it is thought worth to find out the casein contents of various milk supplies from commercial or non-commercial suppliers in Nagpur city. The technique of precipitation of casein was used to predict the protein content in the milk samples [13].

MATERIAL AND METHODS:

Milk: The milk sample (500 ml pouch) from the commercial brands viz. Dinshaw, Haldiram, Amul, Govardhan, Mothers dairy were collected from authorized shops. Milk samples of Goat milk, Cow milk and Buffalo milk were collected from local husbandry (250 ml in polyethene bag sealed and refrigerated).

Methods: The standard method for estimation of casein using acetic acid (1%), saturated ammonium sulphate (AR grade) and distilled water. Fat and casein from 20ml milk was precipitated by adding 20 ml saturated ammonium sulphate solution added slowly with continuous stirring. Precipitate was filtered out and 30 ml distilled water was added to dissolve precipitated casein. A milky solution was formed with undissolved fats. This casein solution was heated to

40 ° C. Acetic acid 1% was drop by drop added to it. The casein was thus precipitated. This precipitated casein was filtered and washed with distilled water and dried at room temperature. It was then weighed on digital balance. Weight was recorded. Three such samples from each brand or source animal were processed for casein estimation and mean value was calculated. The values are tabulated for comparison.

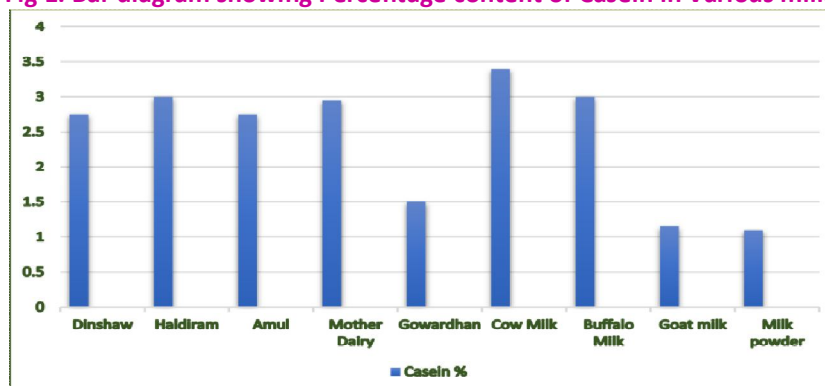
OBSERVATION AND RESULTS:

The various values of casein content found in our study are tabulated in Table no 1. From the nine sources, with three samples each, total twenty-seven samples were analyzed. Mean value of the three observations was considered for comparison.

Table No. 1

S.No.	Milk sample	Casein content (gm/20ml)			Mean casein content(X)	% casein (X*5)
		I	II	III		
1.	Brand Dinshaw	0.55	0.54	0.56	0.55	2.75
2.	Brand Haldiram	0.59	0.60	0.62	0.6	3.0
3.	Brand Amul	0.54	0.54	0.56	0.55	2.75
4.	Brand Mother Dairy	0.6	0.58	0.59	0.59	2.95
5.	Brand Gowardhan	0.29	0.3	0.3	0.3	1.5
6.	Cow milk	0.67	0.69	0.67	0.68	3.4
7.	Buffalo milk	0.63	0.55	0.59	0.6	3.0
8.	Goat milk	0.21	0.25	0.23	0.23	1.15
9.	Milk powder	0.20	0.24	0.24	0.22	1.1

Fig 1. Bar diagram showing Percentage content of Casein in Various milks



The cow's milk is showing the highest casein percentage compared to other milk sources. Buffalo and Brand H, follows it having 3% casein. Milk powder and goat milk however have low i.e. 1,1 and 1,15% casein.

DISCUSSION:

The nutritional value of milk which is supposed to be a complete diet depends on the various nutritive contents it is enriched with. Casein is the main protein component present in milk. Casein proteins are unique to milk and provide infant mammals with essential amino acids, and also bind calcium and phosphorus required for skeletal growth. The Cheese industry also requires the milk quality having high quantity casein content as it is the main constituent of cheese. Hence low casein content can be depriving the user from phosphorus and calcium which are forming the skeletal structure of the body. Thus, such studies are important to provide reliable guidance about nutrition to the society.

LIMITATIONS OF THE STUDY:

The dilution of the branded milks was beyond the control of the investigators hence it may be a confounding factor in the accuracy of the results of the study.

CONCLUSION:

This study indicates that the Casein content of the cow's milk is highest followed by buffalo milk and hence it has the best nutritive value among the available other milk resources in the present-day markets.

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