Study of Buffalo Milk Versus Cow Milk Samples Containing Added Glucose and Ammonium Sulphate.

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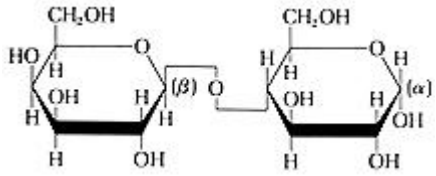
***Abstract*- Milk is extracted from mammals during or soon after pregnancy and is used as food for humans. Milk is a white liquid produced by the mammary glands of mammals. It is the primary source of nutrition for young mammals before they are able to digest other types of food. Early-lactation milk contains colostrum, which carries the mother's antibodies to its young and can reduce the risk of many diseases. Milk is important part of human life. In this paper quality of milk and comparative study of added Glucose and ammonium sulphate present in the milk was done. Various milk samples was analyzed and found that added Glucose and ammonium sulphate were absent in all samples of milk.**

Keywords- Spectrophotometer, preparation of solutions, Reagents, Identification of colours, Milk products and different types of Cow and Buffalo milk samples etc.

I. INTRODUCTION

Milk is important part of human life. Lactose, the disaccharide sugar component of all milk, must be cleaved in the small intestine by the enzyme, lactase, in order for its constituents, galactose and glucose, to be absorbed. The production of the enzyme lactase declines significantly after weaning in all mammals. Consequently, many humans become unable to digest lactose properly as they mature. There is a great deal of variance, with some individuals reacting badly to even small amounts of lactose, some able to consume moderate quantities, and some able to consume large quantities of milk and other dairy products without problems. An individual who consumes milk without producing sufficient lactase may suffer diarrhea, intestinal gas, cramps and bloating, as the undigested lactose travels through the gastrointestinal tract and serves as nourishment for intestinal microflora that excrete gas in processes known as fermentation and anaerobic respiration. Lactose-intolerant people vary in how much lactose they can tolerate, but dairy and aged cheeses are easier to digest because processing has already broken down some of the lactose. If you take supplemental lactase, which is an enzyme that breaks down lactose, you can generally enjoy these foods and other dairy products without experiencing the unpleasant side effects.

Lactose is a disaccharide composed of D-galactose and D-glucose.



Ammonium sulfate $[(NH4)_2SO_4]$ was one of the first and most widely used nitrogen (N) fertilizers for crop production. It is now less commonly used, but especially valuable where both nitrogen (N) and sulfur (S) are required. Its high solubility provides versatility for a number of agricultural applications. A solution containing dissolved ammonium sulfate is often added to post-emergence herbicide sprays to improve their effectiveness at weed control. This practice of increasing herbicide efficacy with ammonium sulfate is particularly effective when the water supply contains significant concentrations of calcium, magnesium, or sodium. A high-purity grade of ammonium sulfate is often used for this purpose to avoid plugging spray nozzles.

II. MATERIALS AND METHODS

For this Buffalo and Cow milk samples were used (each type four samples).All these samples were collected from Anandnagar, Dhyari, Hadapsar, Katraj around Pune in Maharashtra. The samples were kept refrigerated at 4°C and transported to the laboratory within 24 hours, prior to refrigeration. All the milk samples were stored at -20°C until analysis.

Determination of Added Glucose in the Milk

Procedure- To 1 ml of milk sample or 1 ml of reconstituted milk powder in a test tube add equal volume of acetate buffer and filter. To 0.2 ml of filtrate add 2.8 ml water and 2 ml of modified Barford's reagent. Heat the tube in boiling water for 4 minutes. After cooling for 2 minutes add 3 ml of

phosphomolybdic acid and mix the contents. Development of deep blue colour indicates the presence of glucose.

Filter the contents of the tube through Whatman No 42 filter paper. Collect the filtrate in a colorimetric tube, after discarding first 1 ml. Measure the absorbance in a photoelectric colorimeter, using red filter or determine absorption maxima in a spectrophotometer between 620-780 um against blank prepared identically from a pure milk sample. The concentration of glucose in the sample can be determined with the help of a standard curve prepared from milk samples containing known amounts of added glucose i.e., 0.5, 1.0, 2.0, 5.0 percent glucose in milk.

Determination of Ammonium sulphate in the Milk

Procedure-Take 1.0 ml of milk add 0.5 ml of 2% sodium hydroxide, 0.5 ml of 2% sodium hypochlorite and 0.5 ml of 5% phenol solution. Heat for 20 seconds in boiling water bath, bluish colour turns deep blue in presence of ammonium sulphate. The development of pink colour shows that the sample is free from Ammonium sulphate.

III. OBSERVATION TABLE

Sample Description	B_1	B_2	B_3	B_4	C_1	C_2	C_3	C_4
Added Glucose %	AB	AB	AB	AB	AB	AB	AB	AB
Ammonium Sulphate %	AB	AB	AB	AB	AB	AB	AB	AB

Note- (1) Buffalo milk samples-B_1, B_2, B_3, B_4 and Cow milk samples-C_1, C_2, C_3, and C_4.
(2) Chemical Analysis was done per 100 gm

IV. RESULTS AND DISCUSSION

Kit for detection of Adulterants in milk

NDDB is in the quest to combat adulteration in milk. NDDB has undertaken measures to ensure that quality of milk in maintained at the dairy and household levels.NDDB has developed and commercialized ready-to-use kit for detection of commonly used adulterants in milk. Simple and rapid test procedures used in the kit can detect the presence of **Urea, Ammonia fertilizers, Nitrate fertilizers/Pond water, Starch and Cereal flours, Sucrose, Glucose, Salt, Neutralizers and Hydrogen peroxide** by comparing the colors developed after addition of test reagents to milk. The kit can be used by unskilled persons with little or no training at all.

Lactose-

Milk sugar is called lactose. Lactose gives milk its sweet taste and contributes approximately 40% of whole cow's milk's calories. Lactose can definitely raise your blood glucose. An enzyme called lactase splits it up into glucose and galactose. Because this split takes time, some nutritionists say lactose converts to blood glucose relatively slowly (that is to say, it has a low glycemic index or GI). But others say that dairy may have a low GI but stimulates insulin as if it had a high GI. People who don't have sufficient lactase to digest lactose will be "lactose intolerant," and may suffer diarrhea, intestinal gas, cramps, and bloating from drinking milk.It is estimated that 30 to 50 million Americans are lactose intolerant, including up to 75% of Native Americans and African-Americans, and 90% of Asian Americans.

According to the U.S. Dairy Export Council, lactose in low on the glycemic index, meaning it takes longer to digest and keeps you full for longer periods of time. It offers a prolonged energy supply, increases mineral absorption in your body and stimulates the growth of healthy intestinal bacteria. Dairy foods that contain lactose, such as milk and yogurt, are also rich in protein and calcium.

Loren Cordain, PhD, of Colorado State Department of Health and Exercise Science, believes this may be due to the combination of lactose and some of the amino acids in whey proteins.

Cordain, author of The Paleo Answer, says the insulin response to milk is "extreme," and advises people concerned about diabetes to avoid milk products. It's hard to reconcile the supposedly healthful affects of dairy fat with the supposedly harmful effects of dairy sugar. Should we drink it or not?

Since milk is generally viewed as nutritious food with lots of vitamins, minerals, fats, proteins etc thus used for drinking purpose. There are different sources of milk samples available. Milk is processed into a variety of dairy products such as cream, butter, yogurt, kefir, ice cream, and cheese. Modern industrial processes use milk to produce casein, whey protein, lactose, condensed milk, powdered milk, and many other food-additives and industrial products. Comparative study between the different types of milk is not available much, so present study was carried out to compare the added Glucose and ammonium sulphate present in the milk and to check the quality of milk.

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