Analysis of Adulteration Present in Milk Products

Dadasaheb Navale[1], Shelley Gupta[2]

[1]*Sinhgad Jr. College Vadgaon. Pune.*

[2]*Parvatibai Genba Moze Engineering College Wagholi. Pune*

Abstract: **Milk may contain some harmful microorganisms like bacteria along with some potentially beneficial microbes. Microbiological analysis of milk is carried out to determine the degree of bacterial contamination in milk and to understand the chemical changes brought in milk as a result of microbial action. Pasteurization is done to destroy such harmful bacteria. If pasteurization of milk is not carried out properly there will be presence of larger count of bacteria in the milk.**

Milk contains many other nutrients and the carbohydrate lactose. An emulsion is a suspension of droplets of one liquid into another liquid. Milk is an emulsion of fat in water. Butter is an emulsion of water in fat. Milk is a pale 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 colostrums, which carries the mother's antibodies to its young and can reduce the risk of many diseases.

The solute is known as the dispersed phase and the solvent is known as the continuous phase. Other examples of emulsions include margarine, mayonnaise, cream, and salad dressing. A colloidal solution is when matter exists in a state of division in between a true solution, which is sugar in water, and a suspension, which is chalk in water. The characteristics of a colloid are small particle size, electrical charge, and affinity of the particles for water molecules. In milk, the whey proteins are in colloidal solution. This paper detects various types of adulteration present in milk products.

Keywords: Types of adulterants and adulterations etc.

I. INTRODUCTION

Milk and milk products form a significant part of the diet and a substantial amount of our food expenditures goes on milk and other dairy products. Milk is very valuable food, readily digested and absorbed. It consists of nutrients, which are needed for proper growth and maintenance of body. In Pakistan, milk is transported from the point of production to consumers and processing plants by middlemen called "Gawalas".

They don't maintain proper hygienic conditions during this transport, which leads to increase the total viable bacterial count. They also adulterate milk to increase their profit margin by several chemicals like urea, starch, flour, cane sugar, vegetable oils, detergents etc. Various preservatives like formalin and some antibiotics are also added in milk to increase its shelf life. This addition decreases the nutritive value of milk. These adulterants, preservatives and drugs in milk cause very serious health related problems.

Methylene blue Reduction test is used to detect the presence of bacteria in milk. This test works on the principle that the methylene blue indicator is present in an oxidized form, but in the presence of bacteria, leads to the reduction of this indicator in a comparatively short span of time. The blue color developed on addition of the indicator to the milk will change to white color within a short period indicates the presence of bacteria in the milk and thus denotes improper pasteurization**.** This paper detects various types of adulteration present in the milk products.

II. WHAT IS ADULTERATION?

Food is the basic necessity of life. One works hard and earns to satisfy our hunger and relax (enjoy) later. But at the end of the day, many of us are not sure of what we eat. We may be eating a dangerous dye, sawdust, soap stone, industrial starch, and aluminum foil and so on! Contaminated foods and drinks are common sources of infection. Often, we invite diseases rather than good health.

Food adulteration is an act of intentionally debasing the quality of food offered for sale either by the admixture or substitution of inferior substances or by the removal of some valuable ingredient.

Food Adulteration takes into account not only the intentional addition or substitution or abstraction of substances which adversely affect nature, substances and quality of foods, but also their incidental contamination during the period of growth.

II. MATERIALS AND METHODS

(1) Ice Cream and Washing Powder:

i. Put some lemon juice, bubbles are observed if washing powder is present.
ii. Add 1 ml of Hydrochloric acid (HCl) to a little of Sugar. If you observe effervescence, then washing powder is present.

(2) Cottage Cheese, Milk Powder and Coal Tar Dyes:

Add 5 ml of dil. H2SO4 or conc. HCL to one teaspoon full of melted sample in a test tube. Shake well. Pink colour (in case of H2SO4) or crimson colour (in case of HCl) indicates coal tar dyes. If HCl does not give colour dilute it with water to get the colour.

(3) Starch in Khoya & It's Products:

Boil a small quantity of sample with some water, cool and add a few drops of Iodine solution. The Formation of blue colour indicates the presence of Starch.

(*4) Starch In Chhena or Paneer:*

Boil a small quantity of sample with some water, cool and add a few drops of Iodine solution. The formation of Blue colour indicates the presence of starch.

(5) Sweet Curd and Vanaspati:

Take1 teaspoon full of curd in a test tube. Add 10 drops of hydrochloric acid. Mix up the contents shaking the test tube gently. After 5 minutes, examine the mixture. The red colouration indicates the presence of vanaspati in the curd.

III. CONCLUSION

Adulterated Milk and Milk Products are dangerous to any leaving organism. Knowledge of adulteration of any food is essentional for each and every leaving organism.

REFERENCES

[1]. Subrahmanyam, M. (1981). Market survey of the quality of butter. Indian dairyman.
[2]. Sharma G.S (1991) Quality Of Creamery Buller Marketed In Agra City M.Sc Thesis Submitted To Agra Univ. Agra
[3]. Sharma M.B. Gupta M.P. (1982) Quality Of MawaBhurfi Sold In Agra City Asian J. Dairy Res 1: 165-168
[4]. Batis, V.K., Garg, S.K., Chander, H. And Ranganathan, B. (1981) .Indian Dairyman 33,435.
[5]. Lechner E., Klostermeyer H. (1981). NachweisEinerVerfälschung Von Magermilchpulver MitMolkenpulver (Polarographische Methode), Milchwissenschaft, 36, 267-270.
[6]. DE Souza E.M.T., Arruda S.F., Brandao P.O., Siqueira E.M. DE Almeida. (2000). Electrophoretic Analysis To Detect And Quantify Additional Whey In Milk And Dairy Beverages, Ciênc. Tecnol. Aliment., 20(3), 314-317.
[7]. Panda, D. And Bindla, M.P. (1998 A) Detection Of Adulteration In Ghee With Animal Body Fats And Vegetable Oils Using Opacity Test. J. Dairying Foods & Home Sci. 17:31-36.
[8]. Ferreira, I. M., & Oliveira, M. B. P. P. (2003). Determination of Caseinomacropeptide by an RP-HPLC Method and Monitoring of the Addition of Rennet Whey to Powdered Milk. J. Liq. Chrom. Relat. Tech., 26(1), 99-107.
[9]. Panda, D. And Bindal, M.P (1998 B) Detection Of Adulteration In Ghee With Animal Body Fats And Vegetable Oils Using Crystallization Tests Indian Dairyman 50: 13-16
[10]. Kumar, R., Singh, D.K. And Chawla, N.K. (1998). Adulteration / Contamination Of Milk Demystified. Indian Dairyman 50: 25-33
[11]. DGHS (2005). Manual of Methods of Analysis of Foods – Milk and Milk Products. Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India.
[12]. FAO (2009). Milk Testing and Payment Systems Resource Book – A Practical Guide to Assist Milk Producer Groups. FAO, Rome. Pp. 38-43
[13]. Roy, N.K. and Sen, D.C. (1994). Rapid Analysis of Milk. In Textbook of Practical Dairy Chemistry. Kalyani Publishers. New Delhi. Pp. 85-118.
[14]. Darshan Lal, Raman Seth, Rajan Sharma and Arun Kumar (2005). Approaches for detection of Adulteration in Milk Fat –An Overview. Indian Dairyman, 57, 10. Pp. 31-43.
[15]. Gunnery, K.S. (1979). Additives in Milk and Their Detection. Indian Dairyman, 31, 9. Pp. 665 669.
[16]. BIS (1960). Indian Standard – Methods of Test for Dairy Industry. Part I Rapid Examination of Milk (IS 1479 (Part I): 1960)
[17]. BIS (1961). Indian Standard – Methods of Test for Dairy Industry. Part II Chemical Analysis of Milk (IS 1479 (Part II): 1961)
[18]. BIS (2006). Indian Standard: Quick Methods for Detection of Adulterants/Contaminants in Common Food Products – Chemical Methods (IS 15642 (Part 2): 2006)
[19]. Miralles, B., Bartolomé, B., Amigo, L., & Ramos, M. (2000). Comparison of three methods to determine the whey protein to total protein ratio in milk. Journal of dairy science, 83(12), 2759-2765.
[20]. Kumar A., Lal, D., Seth, R. And Sharma, R (2002) Recent Trends In Detection Of Adulteration In Milk Fat A Review Indian J. Dairy Sci. 55: 319-330
[21]. PFA Act (1954) Prevention of Food Adulteration Act And Rules. Govt Of India Publication As Amended Upto Date.
[22]. Sharma, S. K., Hill, A. R., & Mittal, G. S. (1993). An improved method to measure glycomacropeptides (GMP) in renneted milk.Milchwissenschaft,48, 71-73.
[23]. Singhal, O. P. (1980). Adulterants and methods for detection. Indian dairyman, 32(10), 771-774.
[24]. Ghodekar, D.R., Dudani, A.J AndRanganathan, B (1974). J. Milk FdTechn 37,199.
[25]. Bordin, G., CordeiroRaposo, F., De la Calle, B., & Rodriguez, A. R. (2001). Identification and quantification of major bovine milk proteins by liquid chromatography. Journal of chromatography A, 928(1), 63-76
[26]. Dubey, P.C. And Gupta, M.P. (1986) Studies on Quality of Rabri. J. AgricSci Res 28:9-14. Milk Adultration: Methods Of Detection & Remedial Measures www.eshancollege.com 20www.erpublication.org
[27]. Kumar M., Rao, Y.S And Gupta, M.P. (1981) Chemical Quality Of Milk Based Sweets Sold In Agra And Mathura Cities. J. AgricSci Re 23:13-17
[28]. Methods (IS 15642 (Part 2): 2006)20] Meisel H (1995) Application of fourth derivative spectroscopy to quantitation of whey protein and casein in total milk protein. Milchwissenschaft 50 247–251.