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DETECTION OF FOOD ADULTERATION IN MILK AND MILK PRODUCTS COLLECTED RANDOMLY IN AKOLA REGION

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ABSTRACT

This study was "Detection of food adulteration in selected food items". In this food groups like milk & milk products were selected. Both branded as well as unbranded samples were selected for the study to determine the adulteration levels & the qualitative differences between them. The tests were carried out by chemical analysis in a majority of products and through visual inspection in the few products. After the tests, the products containing adulterants were identified in branded & unbranded food products. This study attempted to bring in awareness to the public on the important subject to food adulteration & various simple methods available to detect food adulteration.

KEYWORDS: Food Adulteration, milk, milk products, Akola region.

INTRODUCTION

The story of milk goes back to the beginning of civilization itself. Cattle were domesticated even in prehistoric times and milk was one of the most essential of all foods. Because milk is one of the most complete single foods available in nature for health and promotion of growth, the cow is considered as a sacred animal and even worshipped in India. Milk is the normal secretion of the mammary gland of mammals. Its purpose in Nature is to provide good nourishment for the young of the particular species producing it. Man has learnt the art of using milk and milk products as a food for his well-being and has increased the milk-producing function of the animals best adapted as a source of milk for him. The cow is the principal source of milk for human consumption in many parts of the word: other animals as

source of milk for human being are the buffalo, goat, sheep, etc. In India, more milk is obtained from the buffalo than the cow. Some amount of goat milk also is consumed.[1]

Adulteration of milk reduces the quality of milk and can even make it hazardous. Adulterants like soap, acid starch, table sugar and chemicals like formalin may be added to the Milk. Most of the chemicals used as adulterants are poisonous and cause health hazards. A national survey in India has revealed that almost 70% of the milk sold and consumed in India is adulterated by contaminants such as detergent and skim milk powder, but impure water is the highest contaminant. Food safety standards authority of India (FSSAI) conducted a survey in 2011 on milk adulteration in selected rural and urban areas, according to them the most common adulterant was found to be the addition of water and the main reason for deviation from the standards was addition of glucose and skimmed milk powder. It also found that in some samples, detergent was mixed.[2,5]

Survey Method

The local milk vendors were chosen via random sampling method. 20 samples from various vendors were collected in a sterilized container and subjected to laboratory techniques to determine the adulterants present in milk and its products.

METHODOLOGY[6,7]

The study methods are given by the following procedure and the test was done in laboratory with both the chemical & physical analysis. Each item in the food groups were analyzed for various adulterants. The following table show the food items tested in each food groups.

Table 1: Food Groups Food Items.

Food Groups	Food Items.
Milk & Milk products.	Milk, Paneer, Sweet Curd, Khoa, Rabdi

Procedure[8,9]

Collected sample were tested as per following test.

Table 2: Test procedure of selected samples.

Sample name	Adulterants	Test	Observation	Inference
Milk	water	The drops of pure milk put on a polish slanting surface.	If milk flow immediately.	It indicate the milk is adulterated.
	Urea	Take milk in a test tube and add soyabean powder to it and shake well. After 5 min dip litmus paper to it.	If red litmus paper turns blue.	It indicate the presence of urea.
	Starch	A few drops of tincture of iodine solution.	If formation of blue colour	It indicate the presence of starch
	Detergent	Shake 5-10 ml.ofsample with an amount of water.	If formation Lather	It indicate the presence of detergent.
Khoa	starch	Boil a small quantity of khoa in water. thencol this mixture after that add a few drop of tincture iodine solution to it.	If colour of the mixture tuns blue.	It indicate the presence of starch.
Rabdi	Blotting paper	Take a teaspoon of rabdi in a test tub add 3ml of HCL. and 3ml of distilled water. stir the content with a glass rod remove the rod and examine.	If presence of fine fibres to the glass rod.	It indicates the presence of blotting paper in rabdi.
Paneer	starch	Boil a small quantity of sample with some water, cool and add a few dros of iodine solution.	If formation of blue colour.	It indicate the presence of starch.
Sweet curd	Vanaspati	Take a 1 teaspoon full of curd in a test tube add 10drops of HCL. mix up the content shaking the test tube gently. after 5 min examine the mixture	If red colourisation	It indicates presence of vanaspati.

OBSERVATION

Table 3: Observation and Inference of the Selected samples.

Sample name	Adulterants	Test	Observation	Inference
Milk	water	The drops of pure milk put on a polish slanting surface.	Sample:-1 Milk not flows immediately. Sample:-2 Milk flow immediately. Sample:-3 Milk flow immediately Sample:-4 Milk does not flow immediately	Sample:-1 It indicate the milk is not adulterated. Sample:-2 It indicate milk is adulterated. Sample:-3 It indicate milk is adulterated. Sample:-4 It indicates milk is not adulterated.
	Urea	Take milk in a test tube and add soyabean powder to it and shake well. After 5 min dip litmus paper to it.	Sample:-1 Red litmus paper remains red. Sample:-2 Red litmus remains red Sample:-3 Red litmus remains red	Sample:-1 It indicate the absence of urea. Sample:-2 It indicate the absence of urea Sample:-3 It indicate the absence of urea Sample:-4

			Sample:-4 Red litmus turn to blue	It indicates milk is adulterated
	Starch	A few drops of tincture of iodine solution.	Sample:-1 No Formation of blue colour. Sample:-2 Formation of blue colour Sample:-3 Formation of no blue colour Sample:-4 No formation of blur Colour.	Sample:-1 It indicate the absence of starch Sample:-2 It indicate the presence of starch. Sample:-3 It indicate the absence of starch. Sample:-4 It indicates the absence of starch.
	Detergent	Shake 5-10 ml. of sample with an amount of water.	Sample:-1 Formation Of Lather . Sample:-2 AbsenceOf Lather Sample:-3 Absence Of Lather. Sample:-4 Absence of lather	Sample:1 It indicate the presence of detergent. Sample:-2 It indicate the absence of detergent. Sample:-3 It indicate the absence of detergent. Sample:-4 It indicates absence of detergent
Khoa	starch	Boil a small quantity of khoa in water. thencol this mixture after that add a few drop of tincture iodine solution to it.	Sample:-1 Colour of the mixture does not turns blue. Sample:-2 Colour of the mixture turns blue. Sample:-3 Colour of the mixture does not turns blue. Sample:-4 Colour of mixture does not turn blue	Sample:-1 This sample does not contain starch. Sample:-2 This sample contains starch. Sample:-3 This sample does not contain starch. Sample:-4 This sample does not contain starch
Rabdi	Blotting paper	Take a teaspoon of rabdi in a test tub add 3ml of HCL.and 3ml of distilled water.stir the content with a glass rod remove the rod and examine.	Sample:-1 Presence of fine fibres to the glass rod. Sample:-2 Absence of fine fibres to the glass rod. Sample:-3	Sample:-1 This sample contain blotting paper in rabdi. Sample:-2 This sample does not contain blotting paper in rabdi. Sample:-3 This sample does not

			Absence of fine fibres to the glass rod. Sample:-4 Absence of fine fibres to the galas rod.	contain blotting paper in rabdi Sample:-4 This sample does not contain blotting paper in rabdi.
Paneer	Starch	Boil a small quantity of sample with some water, cool and add a few drop of iodine solution	Sample:-1 No formation of blur Colour. Sample:-2 No formation of blue colour. Sample:-3 No formation of blue colour. Sample:-4 No formation of blue colour.	Sample:1_ The sample does not contain Starch. Sample:-2 The sample does not containStarch. Sample:-3 The sample does not contain starch. Sample:-4 The sample does not contain Starch.
Sweet Curd	Vanaspati	Take a 1 teaspoon full of coordinates tube add 10 drops of HCL. Mix up the content shaking the test tube gently. After 5 min examine the mixture.	Sample:-1 No red colourisation. Sample:-2 Red colourisation. Sample:-3 No red colourisation. Sample:-4 No red colourisation.	Sample:-1 The sample does not contain vanaspati. Sample:-2 The sample contain vanaspati. Sample:-3 The sample does not contain vanaspati. Sample:-4 The sample does not contain vanaspati.

RESULT

On the above observations it is found that the three different samples of each food product show different percentage of adulteration. These four samples of each food group collected from different places. Milk (water shows 50%, urea shows 25%, starch shows 0%, detergent shows 0%). Khoa shows 25% adulteration, Rabdi shows 25% adulteration, Paneer shows 0% adulteration, Sweet Curd shows 0% adulteration. Most of the samples showed higher percentage of adulteration which is the alarming factor for the consumers to be aware about screening of adulteration time to time so that contaminated food should be avoided.

Table 4: Adulteration Percentage.

Food Item	Adulteration Percentage
Milk	
1) water	50%
2) urea	25%
3) starch	0%
4) detergent	0%
Khoa	25%
Rabdi	25%
Paneer	0%
Sweet curd	25%

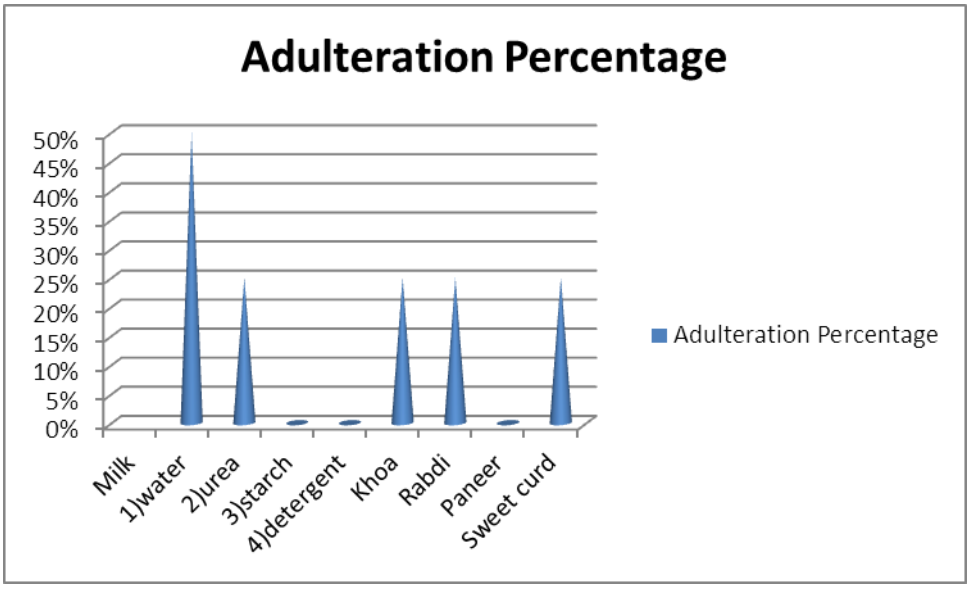

Fig. 1: Graphical representation of Adulteration in Milk.

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