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## Studies on detection of adulteration of milk received from different sources in Nagpur tahsil

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**Abstract**

The present investigation entitled "Studies on Detection of Adulteration of milk received from different sources in Nagpur tahsil" was undertaken during the period Dec. 2011 to April 2012 for this study. Total 100 samples were collected from individual producer, co-operative society, Govt. milk scheme, Agriculture College Dairy Farm and analysed for detection of adulteration in milk. Among the different adulterants cane sugar is the most common adulterants used for adulteration in milk while few sample from three levels of procurement i.e. individual producer, co-operative society, Govt.milk Scheme dock, milk were found adulterated with sodium bicarbonate and urea. No one milk sample was found adulterated with starch from any level of milk sample procurement. Among the various sources of milk sample procurement, the individual producer (48.00%) showed the maximum samples adulterated with different adulterants.

**Keywords:** Adulterant, cane sugar, sodium bicarbonate, urea, starch

**Introduction**

Milk is considered as a nearly complete single food available in nature containing nearly all essential nutrients for human nutrition. It is an almost ideal food. It provide body building proteins, bone forming minerals like calcium and phosphorus, health giving vitamins like A,D,E,K and Vit. B complex and furnishes energy giving lactose and milk fat, besides supplying certain essential fatty acid. It contains above nutrients in an easily digestible and assimilable form. It provide most of essential nutrients in significant amount than any other single food and there is no adequate substitute of milk. All these properties make milk an important food for pregnant mothers, growing children, adolescents, adults, invalids, convalescents and patients alike (De, 2001).

The chemical quality of milk and milk products is of great concern owing to a large scale adulteration in milk in India. Synthetic milk is a threat to the countries dairy industry in Rajasthan, Delhi, UP, Haryana, Punjab and Gujrat (Dairy News 1996) [4]. This toxic concoction includes urea, sugar, common salt, chalk powder, white paint, oil refinery wastes, detergents, caustic soda, shredded blotting paper and arrowroot (Misra, 2000) [7]. The adulteration not only deteriorate its nutritive value but also have bad effect on Health of the consumers. Efforts have been made to control this menace to avoid the incalculable harm it would do not only to the public but also to the dairy industry at large (Bhandair, 1996) [2].

A nationwide survey conducted by food safety standards Authority of India (FSSAI) has brought to fore the various ways in which milk is adulterated. The samples for testing were collected randomly and analysed from 33 states and union territories totaling sample size of 1791. Just around 31.5% (565) of the total samples tested conformed to the FSSAI standards while rest 68.4% (1226) failed the test.

Around 65% of the samples from Maharashtra fail the test (Kounteya sinha, 2012) [5].

**Methodology**

The present research work was undertaken at Section of Animal Husbandry and Dairying, College of Agriculture, Nagpur during the year 2011-2012.

**Collection of raw milk sample**

The raw milk samples were collected from the following sources in Nagpur Tahsil.

1. Individual producer
2. Co-operative society
3. Government milk scheme Dock
4. Agricultural College Dairy Farm.

The raw milk samples were collected in the month of Dec.2011 to April 2012. Twenty Five Samples from each sources of milk procurement were collected and total 100 sample were examined for the quality of milk.

The raw milk samples were collected aseptically as per the method recommended in BIS Handbook of Food Analysis in SP: 18 (part – XI) 1981 from various sources of milk procurement for determining the physico-chemical quality and adulteration of milk.

### Sampling procedure

The samples were collected from milk can or pail and storage tank and procedure for sampling are given below.

#### a. Milk can or pail

Milk in the can or other container as mixed with sterile

plunger and with the help of sterile dipper. Milk sample was taken into a sterile sample bottle and closed with sterile lid.

#### b. Storage tank

Milk in vat or storage tank was mixed thoroughly with the help of agitator and representative sample was drawn into sterile sample bottle with the help of sterile dipper and finally closed with sterile lid.

After taking each sample in sterile sample bottles (200 ml milk) aseptically the sample bottle were labeled properly indicating the source of milk sample procurement. These sample were preserved with formalin 36% is added @ 0.1 ml for 25 ml of milk and transferred to the laboratory for determining the quality of milk.

#### Detection of adulteration in milk

**Table 1:** Quality of milk with respect to various adulteration tests from different levels of milk procurement.

Sr. No.	Sources of milk sample collection	No. of samples analyzed	Total adulterated (%)	No. of milk samples found containing			
				Sucrose	Sodium bi carbonate	Starch	Urea
1	Individual producer	25	12 (48.00)	6 (24.00)	4 (16.00)	0 (0.00)	2 (8.00)
2	Co-operative society	25	10 (40.00)	5 (20.00)	3 (12.00)	0 (0.00)	2 (8.00)
3	Govt. milk scheme	25	5 (20.00)	3 (12.00)	2 (8.00)	0 (0.00)	0 (0.00)
4	Agri. College Dairy Farm	25	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
	Total	100 (100.00)	27 (27.00)	14 (14.00)	9 (9.00)	0 (0.00)	4 (4.00)

The quality evaluation in respect of adulteration tests of milk samples collected from different sources of its procurement was performed and results of per cent milk samples adulterated with different adulterants are tabulated in Table 1.

It can be seen from Table 1 that, in case of cane sugar adulteration in milk from different levels of its procurement, maximum milk samples adulterated with cane sugar were observed at individual producers level (24.00%) and co-operative society (20.00%) while minimum milk samples adulterated with cane sugar were observed at Govt. milk scheme (12.00%) and not a single sample was found to be adulterated with cane sugar at Agriculture College Dairy Farm.

In case of sodium bicarbonate adulteration, maximum milk samples were found to be adulterated at individual producer (16.00%) and co-operative society (12.00%) while minimum milk samples were found to be adulterated at Govt. milk scheme (8.00%) and not a single sample was found to be adulterated with sodium bicarbonate at Agriculture College Dairy Farm.

Not a single sample was found to be adulterated with starch at any level of milk samples procurement which clearly indicated that producers and other milk procurement agencies are not aware of the adulteration of market milk with starch as indicated by 100 per cent negative test for the presence of starch as an adulterant.

In case of urea adulteration, maximum milk samples were found to be adulterated at individual producer (8.00%) and remain constant at co-operative society (8.00%) and not a single samples was found to be adulterated with urea at Govt. milk scheme Dock and Agriculture College Dairy Farm.

Thus, from the data presented in Table 1 it is observed that out of total 100 samples tested during the investigation, 14.00 per cent samples were found to be adulterated with cane

sugar, 9.00 per cent samples were found to be adulterated with sodium bicarbonate, 4.00 per cent samples were found to be adulterated with urea.

Among the adulteration with different substances, the adulteration of sucrose was found to be more followed by sodium bicarbonate and urea. No one sample of milk was found to be adulterated with starch at any level of milk procurement.

The highest per cent of milk samples adulterated with different adulteration were found in individual producer (48.00%) followed by co-operative society (40.00%) and Govt. milk Scheme (20.00%), No one samples adulterated with different adulteration were found in Agriculture College Dairy Farm.

#### Conclusion

Among the different adulterants, can sugar is the most common adulterants, used for adulteration in milk. While, few samples from three levels of procurement i.e. individual producer co-operative society, Govt. milk scheme were found adulterated with sodium bicarbonate and urea. No one milk samples was found adulterated with starch from any level of milk sample procurement. Among the various sources of milk sample procurement, the individual producer (48 per cent) showed the maximum samples adulterated with different adulterants. The most common adulterant encountered was sucrose (14 per cent) followed by sodium bicarbonate (9 per cent) and urea (4 per cent). No one Samples were found adulterated with starch from different sources of milk procurement. The maximum adulteration were found in individual producer (48 per cent) followed by co-operative society (40 per cent) and Govt. milk scheme (20 percent) and no one samples adulterated were found in Agriculture College Dairy Farm.

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