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DETECTION OF ADULTERANTS IN MILK SOLD IN DIFFERENT AGENCIES OF KANPUR CITY

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ABSTRACT

The study was conducted in the month of March-April 2013. In different agencies i.e. University dairy farm, Amul dairy, Parag dairy vendors and halwais milks. The milk samples were analysed for colours, appearance, flavour, specific gravity, fat, total solid, S.N.F., pond water, starch, sodium-bicarbonate, urea and detergent powder are observed the present investigation. The maximum physical quality is observed in Amul Dairy, Maximum specific gravity was noted in Amul Dairy, highest fat and total solid, S.N.F., starch, sodium bicarbonate in Halwais milk, pond water, detergent powder, urea—Rawatpur market. The milk samples collected from Rawatpur market had the maximum (50%) detergent powder positive, whereas the samples collected from Govind Nagar market had minimum (16.67%). On an average the milk supplied in Kanpur city found (33.33%) detergent powder. However none of the samples were found to be detergent powder positive i.e. Amul dairy, Parag dairy and university dairy Kanpur. It is also concluded that milk samples obtained from Amul dairy and Parag dairy were free from adulteration. It is suggested that Government should adopt all possible steps to check the fraudulent adulteration practices being used in the milk business.

Key words : *Detection, adulterants, milk sold, Kanpur.*

Adulteration in milk is one of the most difficult problem of the industry calling for an urgent action to day. Our government should adopt all possible measures to minimize the population growth so as to ensure adequate milk availability for existing population. The gap between the demand and availability of milk has led to certain unscrupulous activities like the age old tradition of adding water to milk, removal of fat/cream, recently introduction of synthetic milk into the market. Milk is a commodity which can very easily be adulterated and marketed without the adulteration being detected in most cases. The milk samples collected from some of the cities in India were found to be adulterated from 19 to 66 per cent. The extent of water addition varied from 16 to 29 per cent. Adulteration is affected through a number of fraudulent practices, which lowers the quality and makes the milk and milk products, unfit for human consumption. The common method of adulterating milk are :

- Reduction of fat by (i) The addition of water, (ii) Skimming of milk, (iii) Both skimming and watering, (iv) Mixing of cow milk with buffalo milk
- The addition of thickening agents to restore consistency, viscosity and solids contents i.e. urea, detergent powder etc.
- The addition of colouring matter to restore the colour lost by skimming or diluting to make naturally poor milk appear rich.
- The addition of preservatives.

MATERIALS AND METHODS

In all 30 samples were collected from different sources of milk supply and number of samples taken from different sources are as follows.

Name of the sources	No. of samples
C.S.A.U. Dairy Farm (cow milk)	6
Amul Dairy Milk	6
Parag Dairy milk (P.C.D.F.)	6
Vendors milk	6
Halwais Milk	6
Total	**30**

All samples were collected in the month of March-April, 2010, into 250 ml sterilized milk samples bottles. The samples were filled at the time of sampling in milk sampling bottles. The samples were collected in the morning time.

Factors to be studied

1. Colour and appearance, 2. Flavour, 3. Specific gravity, 4. Fat percentage, 5. Total solids, 6. Solid not fat (S.N.F.), 7. Detection of pond water, 8. Detection of sugar, 9. Detection of starch, 10. Detection of sodium-bicarbonate in milk, 11. Detection of urea, 12. Detection of detergent powder in milk

RESULTS AND DISCUSSION

The milk sample collected from Amul dairy had the highest colour and appearance score (7.60) whereas, the milk samples collected from govind Nagar had lowest (6.10). on an average colour and appearance score of milk supplied in Kanpur city was (7.34) which was much lower than the score (8.16) of milk samples obtained from university Dairy Kanpur.

The milk sample collected from Amul dairy had the highest flavour score (7.66) whereas, the milk samples collected from Govind Nagar had lowest (6.00). On an average flavour score of milk supplied to Kanpur city was (7.66) which was much lower than the score (8.23) of milk samples obtained from University Dairy, Kanpur.

The milk samples collected from Amul dairy had the highest specific gravity (1.0288) whereas Rawatpur market had lowest (1.0286). on an average specific gravity value of milk supplied in Kanpur city contained (1.0287), which was some lower than the value 1.0288 of milk samples collected from university dairy Kanpur.

The milk samples collected from Govind Nagar market had highest (4.5%) fat whereas the milk samples collected from Parag dairy had lowest (3.0%). On an average fat value of milk supplied in Kanpur city contained (3.65%), which was lower than the value (3.9%) of milk samples collected from university dairy Kanpur.

The milk samples collected from Govind Nagar Market had highest (13.30%) total solid, whereas the milk samples collected from Parag dairy had lowest (11.50%). On an average total solid value of milk supplied in Kanpur city found (12.26%) which was lower than the value (12.60%) of milk samples collected from University dairy Kanpur.

The milk samples collected from Govind Nagar market had highest solid not fat score (8.8%) whereas the milk samples collected from Parag dairy had lowest (8.50%). on an average solid not fat score of milk supplied in Kanpur city was (8.6%) which was some lower than the score (8.70%) of milk samples obtained from University dairy, Kanpur.

The milk samples collected from Rawatpur market had the maximum (50%) pond water positive, whereas the samples collected from Govind Nagar market had

Table-1: Showing mean value of milk samples obtained from different sources in Kanpur city along with University Dairy, Kanpur.

Sources	Colour and appearance	Flavour	Specific gravity	Fat %	Total solid %	S.n.f %
C.S.A. University Farm, Kanpur	8.16	8.23	1.0288	3.9	12.60	8.70
Amul Dairy	7.60	7.66	1.0288	3.1	11.60	8.50
Parag Dairy	7.16	7.40	1.0287	3.0	11.50	8.50
Vendor milk Rawatpur Market	6.83	6.20	1.0286	4.0	12.66	8.66
Halwais milk Govind Nagar Market	6.10	6.00	1.0287	4.5	13.30	8.80

Table 2: Showing the effect of pond water test in milk samples obtained from different sources in Kanpur city along with university dairy, Kanpur

Markets	C.S.A. Univ.	Amul dairy	Parag dairy	Vendors milk	Halwais milk
Total no. of samples	6	6	6	6	6
No. of positive samples	(0)	0 (0)	0 (0)	3 (50)	2 (33.33)
No. of negative samples	6	6	6	3	4

Table-3: Showing the effect of sugar test in milk samples obtained from different sources in kanpur city along with university dairy, Kanpur

Markets	C.S.A. Univ.	Amul dairy	Parag dairy	Vendors milk	Halwais milk
Total no. of samples	6	6	6	6	6
No. of positive samples	0 (0)	0 (0)	0 (0)	3 (50)	5 (83.33)
No. of nega- tive samples	6	6	6	3	1

Table-4: Showing the effect of starch test in milk samples obtained from different sources in kanpur city along with university dairy, Kanpur

Markets	C.S.A. Univ.	Amul dairy	Parag dairy	Vendors milk	Halwais milk
Total no. of samples	6	6	6	6	6
No. of positive samples	0 (0)	0 (0)	0 (0)	2(33.34)	3 (50)
No. of negative samples	6	6	6	4	3

Table-5: Showing the effect of sodium-bicarbonate test in milk samples obtained from different sources in Kanpur city along with university dairy, Kanpur

Markets	C.S.A. Univ.	Amul dairy	Parag dairy	Vendors milk	Halwais milk
Total no. of samples	6	6	6	6	6
No. of positive samples	0 (0)	0 (0)	0 (0)	3 (33.34)	5 (50)
No. of negative samples	6	6	6	4	1

Table-6: Showing the effect of urea test in milk samples obtained from different sources in kanpur city along with university dairy, Kanpur

Markets	C.S.A. Univ.	Amul dairy	Parag dairy	Vendors milk	Halwais milk
Total no. of samples	6	6	6	6	6
No. of positive samples	0 (0)	0 (0)	0 (0)	4 (66.67)	2 (33.34)
No. of negative samples	6	6	6	2	4

Table-7: Showing the effect of detergent test in milk samples obtained from different sources in kanpur city along with university dairy, Kanpur

Markets	C.S.A. Univ.	Amul dairy	Parag dairy	Vendors milk	Halwais milk
Total no. of samples	6	6	6	6	6
No. of positive samples	0 (0)	0 (0)	0 (0)	3 (50)	1 (16.67)
No. of negative samples	6	6	6	3	5

minimum (33.34%). On an average the milk supplied in Kanpur city contained (41.67%) pond water. However, none of the samples were found to be pond water positive from Amul dairy, Parag dairy and university dairy Kanpur.

The milk samples collected from Govind nagar market had the maximum (83.33%) sugar positive, whereas the samples collected from Rawatpur market had minimum (50%). On an average the milk supplied in Kanpur city found (66.66%) sugar however, none of the samples were found to be sugar positive i.e. Amul dairy, Parag dairy and university dairy Kanpur.

The milk samples collected from Govind nagar market had the maximum (50%) starch positive, whereas the samples collected from Rawatpur market had minimum (33.34%). On an average the milk supplied in Kanpur city found (41.67%) sugar. However none of the samples were found to be starch positive i.e. Amul dairy, Parag dairy and university dairy Kanpur.

The milk samples collected from Govind nagar market had the maximum (50%) sodium bicarbonate positive, whereas the samples collected from Rawatpur market has minimum (33.34%). On an average the milk supplied in Kanpur city found (41.67%) sodium bicarbonate. However none of the samples were found to be sodium bicarbonate positive i.e. Amul dairy, Parag dairy and university dairy Kanpur.

The milk samples collected from Rawatpur market had the maximum (66.66%) urea positive, whereas the samples collected from Govind Nagar market has minimum (33.34%). On an average the milk supplied in Kanpur city found (50%) urea. However none of the samples were found to be urea positive i.e. Amul dairy, Parag dairy and university dairy Kanpur.

The milk samples collected from Rawatpur market had the maximum (50%) detergent powder positive, whereas the samples collected from Govind Nagar market had minimum (16.67%). On an average the milk supplied in Kanpur city found (33.33%) detergent powder. However none of the samples were found to be detergent powder positive i.e. Amul dairy, Parag dairy and university dairy Kanpur.

CONCLUSION

It is concluded that university dairy milk (cow milk) was found to be genuine. While the milk samples obtained from Rawatpur market and Govind Nagar market contained pond water, sugar, starch, sodium bicarbonate, urea and detergent powder.

It is also concluded that milk samples obtained from Amul dairy and Parag dairy were free from adulteration. It is suggested that Government should adopt all possible steps to check the fraudulent adulteration practices being used in the milk business.

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