



## Quality of Milk Sold In Gadchiroli Town

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### ABSTRACT

*The present investigation entitled "Quality of milk sold in Gadchiroli town" was undertaken during the period Dec. 2016 to April 2017. For this study total 100 samples were collected from milk producer, milk vendor, hotel and restaurant, co-operative societies and private dairy and analysed for physico-chemical quality and detection of adulteration in milk. During the entire study the milk samples were collected from various sources from Gadchiroli town. Their analysis were carried out at Post Graduate Laboratory, Section of Animal Husbandry and Dairy Science, College of Agriculture, Nagpur. The highest per cent of milk samples for specific gravity level below 1.0280 were found in private dairy (65.00%), lowest per cent were found in milk producer (25.00%). For the fat level group, highest per cent of milk samples in group of 3.5 to 4.5 were found in milk producer (70.00%), the lowest per cent were found in private dairy (20.00%) and for the SNF level group, highest per cent of milk samples showing the SNF level group of 8.5 to 9 were found in milk producer (70.00%) and the lowest per cent were found in private dairy (30.00%). and for the acidity level group, highest per cent of milk samples showing the acidity level group of below 0.15 were found in private dairy (65.00%) and the lowest per cent were found in milk producer (35.00%). Sale price of milk from different level of milk procurement are private dairy (Cow milk-Rs.35/lit. and buffalo milk-Rs.40/lit.) and co-operative societies (Cow milk- Rs.40/lit. and buffalo milk-Rs.45/lit.) have highest sale price amongst all sources followed by hotel and restaurant milk vendor (Cow milk- Rs.42/lit., buffalo milk-Rs.46/lit., toned milk-Rs.37/lit., standardized milk-Rs.42/lit.) milk vendor (Cow milk-Rs.40/lit. and buffalo milk-Rs.45/lit.) and milk producer (Cow milk-Rs.32/lit. and buffalo milk-Rs.40/lit.). It was a good report for people of Gadchiroli town that nobody added any adulterant in their milk samples, except that they are adulterating milk with water.*

**Keywords** -Milk, specific gravity, fat,SNF, acidity, adulteration

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### INTRODUCTION

India ranks first in milk production, accounting for 18.5% of world production, achieving an annual output of 146.3 million tonnes during 2014-15 as compared to 137.69 million tonnes during 2013-14 recording a growth of 6.26% whereas, the Food and Agriculture Organization (FAO) has reported a 3.1% increase in world milk production from 765 million tonnes in 2013 to 789 million tonnes in 2014. According to a FAO statement, "World milk production in 2012 is forecast to grow by 2.7 per cent to 750 MT. Asia is expected to account for most of the increase, with output in India, the world's largest milk producing country, forecast to rise by 5.2 million tonnes to 127 million tonnes." According to India's National Dairy Development Board (NDDB), 121 million tonnes. Milk was produced in the country during financial year 2010-11, which consisted close to 17 per cent of the international production. As per Centre's data, the per capita milk availability jumped to 281 gram per day during 2010-11 as compared to 278 gram per day during 2009-10 with the rising output. The Government of India records indicate that on an average 25 to 30% edibles food in the market is adulterated [1-4].

In Gadchiroli town many people are coming from different areas and residing in Gadchiroli town in Gadchiroli district and so naturally they are very much differ in their food habits. But milk is a common item in their diet. Various agencies are engaged to meet the milk requirements as like Gadchiroli milk producers, private dairies, milk vendor, hotel and restaurant etc

**Objectives:**

1. To study the quality of milk sold in Gadchiroli town.
2. To assess the physicochemical composition of milk.
3. To ascertain the adulteration of milk.
4. To know the sale price.

### MATERIAL AND METHODS

The present study was conducted by Section of Animal Husbandry and Dairy Science, College of Agriculture, Nagpur during year 2016-2017. A total of 100 raw milk samples were collected from milk producer, milk vendor, private dairy, co-operative societies and hotel and restaurant in Nagpur city. 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.

From milk producer, milk vendor, private dairy, hotel and restaurant and co-operative societies milk samples were purchased and collected in sterile sample bottles (200 ml milk) aseptically. The sample bottles were labeled properly indicating the source of milk sample procurement. These samples were preserved with formalin 36 per cent is added @ 0.1 ml for 25 ml of milk and transferred to the laboratory for determining the quality of milk. The samples were tested for specific gravity, fat, SNF, acidity and adulteration like cane sugar, sodium bicarbonate, starch, urea, salt, detergent, skim milk powder by adulteration kit supplied by NDRI, Karnal.

### RESULTS AND DISCUSSION

A total of 100 milk samples were tested for determining physico-chemical quality of milk and its adulteration. All tests were carried out at average room temperature (29°C). Raw milk received from different milk procurement levels under the different sources in Gadchiroli city. The results obtained after testing the raw milk samples are presented in Table 1 to Table 5.

It was a good report for people of Gadchiroli city that nobody added adulterants like cane sugar, urea, starch, etc.

**Table 1: Quality of milk in respect of specific gravity from different levels of milk procurement**

Sr. No.	Sources of milk sample collection	No. of samples analyzed	No. of milk samples in each group		
			Groups of specific gravity levels		
			Below 1.028	1.028 to 1.030	Above 1.030
1	Milk producer	20	05 (25.00)	13 (65.00)	02 (10.00)
2	Milk vendor	20	10 (50.00)	08 (40.00)	02 (10.00)
3	Hotel and Restaurant	20	08 (40.00)	09 (45.00)	03 (15.00)
4	Co-operative societies	20	06 (30.00)	12 (60.00)	02 (10.00)
5	Private dairy	20	13 (65.00)	06 (30.00)	01 (05.00)
6	Total	100 (100.00)	42 (42.00)	48 (48.00)	10 (10.00)

**Table 2: Quality with respect to fat content of milk from different levels of milk procurement**

Sr. No.	Sources of milk sample collection	No. of samples analyzed	No. of milk samples in each group		
			Groups of fat levels (%)		
			Below 3.5	3.5 to 4.5	Above 4.5
1	Milk producer	20	05 (25.00)	14 (70.00)	01 (05.00)
2	Milk vendor	20	12 (60.00)	08 (40.00)	00 (00.00)
3	Hotel and Restaurant	20	08 (40.00)	10 (50.00)	02 (10.00)
4	Co-operative Societies	20	07 (35.00)	12 (60.00)	01 (05.00)
5	Private dairy	20	14 (70.00)	04 (20.00)	02 (10.00)
	Total	100 (100.00)	46 (46.00)	48 (48.00)	06 (6.00)

(Figures in parenthesis indicate percentage)

It is observed from Table 1 that 42 per cent samples showed the specific gravity level below 1.028 per cent, 48 per cent samples showed the specific gravity level between 1.028 to 1.030 per cent and 10 per cent samples showed the specific gravity level above 1.030.

It is observed from Table 2 that 46 per cent samples showed the fat level below 3.5 per cent, 48 per cent samples showed the fat level between 3.5 to 4.6 per cent and 6 per cent samples showed the fat level above 4.5 per cent.

**Table 3: Quality with respect to solids not fat (SNF) content of milk from different levels of milk procurement.**

Sr. No.	Sources of milk sample collection	No. of samples analyzed	No. of Milk samples in each group		
			Groups of SNF levels (Per cent)		
			Below 8.5	8.5 to 9	Above 9
1	Milk producer	20	04 (20.00)	14 (70.00)	02 (10.00)
2	Milk vendor	20	11 (55.00)	09 (45.00)	00 (00.00)
3	Hotel and restaurant	20	10 (50.00)	10 (50.00)	00 (00.00)
4	Co-operative Societies	20	09 (45.00)	10 (50.00)	01 (05.00)
5	Private dairy	20	13 (65.00)	06 (30.00)	01 (05.00)
6	Total	100 (100.00)	47.00 (47.00)	49 (49.00)	04 (04.00)

(Figures in parenthesis indicate percentage)

**Table 4: Quality with respect to acidity content of milk from different levels of milk procurement.**

Sr. No.	Sources of milk sample collection	No. of samples analyzed	No. of Milk samples in each group		
			Groups of acidity levels (Per cent)		
			Below 0.15	0.15 to 0.20	Above 0.20
1	Milk producer	20	07 (35.00)	12 (60.00)	01 (05.00)
2	Milk vendor	20	08 (50.00)	12 (60.00)	00 (00.00)
3	Hotel and restaurant	20	10 (50.00)	10 (50.00)	00 (00.00)
4	Co-operative Societies	20	12 (60.00)	08 (40.00)	00 (10.00)
5	Private dairy	20	13 (65.00)	06 (30.00)	01 (05.00)
6	Total	100 (100.00)	50.00 (50.00)	48 (48.00)	02 (02.00)

(Figures in parenthesis indicate percentage)

It is observed from Table 3 that 47 per cent samples showed SNF content below 8.5 per cent, 49 per cent samples showed SNF content between 8.5 to 9 per cent, 4 per cent samples showed the SNF content above 9.

It is observed from Table 4 that 50 per cent samples showed acidity content below 0.15 per cent, 48 per cent samples showed acidity content between 0.15 to 0.20 per cent, 2 per cent samples showed the acidity content above 0.20.

**Table 5.: Quality with respect to adulteration tests of milk from different sources of procurement**

Sr. No.	Sources of milk sample collection	No. of samples	Detection of adulteration in milk					
			cane sugar	sodium bicarbonate	starch	urea	sodium chloride	skim milk powder
1	Milk producer	20	nil	nil	nil	nil	nil	nil
2	Milk vendor	20	nil	nil	nil	nil	nil	nil
3	Hotel and Restaurant	20	nil	nil	nil	nil	nil	nil
4	Co-operative societies	20	nil	nil	nil	nil	nil	nil
5	Private dairy	20	nil	nil	nil	nil	nil	nil

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 given below.

The presence of added water in milk detected by use of lactometer. Since the water is lighter than milk, its addition would lower the specific gravity of milk and so low lactometer reading.

**Table 6 : Quality with respect to sale price of milk from different levels of milk procurement.**

Sr. No.	Sources of milk sample collection	Price of milk in each group per litre			
		Group of milk types (Rs)			
		Cow milk	Buffalo milk	Toned milk	Standardized milk
1	Milk producer	32	40	--	--
2	Milk vendor	40	45	--	--
3	Hotel and Restaurant	42	46	37	42
4	Co-operative societies	40	45	--	--
5	Private dairy	35	40	--	--

It can be observed from the Table 6 and fig. 6 that cow milk has low sale price as compared to buffalo milk and standardized milk. The milk samples containing highest sale price are from the milk samples of buffalo milk which is sold by various sources viz. milk producer, milk vendor, hotel and restaurant, co-operative societies and private dairy.

The milk samples purchased from private dairy (Cow milk-Rs.35/lit. and buffalo milk-Rs.40/lit.) and co-operative societies (Cow milk- Rs.40/lit. and buffalo milk-Rs.45/lit.) have highest sale price amongst all sources followed by hotel and restaurant milk vendor (Cow milk- Rs.42/lit., buffalo milk-Rs.46/lit., toned milk-Rs.37/lit., standardized milk-Rs.42/lit.) milk vendor (Cow milk-Rs.40/lit. and buffalo milk-Rs.45/lit.) and milk producer (Cow milk-Rs.32/lit. and buffalo milk-Rs.40/lit.)

Overall purchase of consumer was Rs.40.10/lit. The results obtained in the present study are comparable with results reported by Rajeshwaran and Naik (2016). They reported that the consumer price of standardized milk in various parts of the country varies from Rs.37 to Rs.49 per litre and also revealed that the prices of milk are increasing day by day.

Jadhav [4] reported that the price of raw cow milk was Rs.35/lit. at dairy farm, Animal Husbandry and Dairy Science Section, College of Agriculture, Nagpur and Priyanka [8] also reported the same results.

## CONCLUSION

Based on above investigation, it may be concluded that,

1. The overall quality of milk samples as indicated by physico-chemical evaluate i.e. specific gravity, Fat, SNF and Acidity content were below the prescribed legal standard collected from private dairy in Gadchiroli town.
2. It was a good report for people of Gadchiroli town that nobody added adulterants like canesugar, sodium bicarbonate, starch, urea, sodium chloride and skim milk powder in their milk supply, except that they are adulterating milk with water
3. The maximum adulteration with water were found in private dairy (65.00%) followed by milk vendor (50.00%) and. The lowest per cent of milk samples adulterated with water were found in milk producer (25.00%).

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