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Quality assessment of cow milk affected by subclinical mastitis

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Abstract

The present experiment entitled “Quality Assessment of Cow milk affected by subclinical mastitis” was conducted during the year 2013-14 in Animal Husbandry and Dairy Science Section, College of Agriculture, Nagpur, with an aim to assess the quality (fat, SNF, TS and pH) of cow milk as affected by subclinical mastitis. The experimental material consisted of 25 milk samples from affected quarters and 25 milk samples from normal quarters of same cows. More fat percentage (4.40) in normal milk and lowest (3.80) corresponding figures for subclinical mastitis milk recorded as 3.70 and 3.20 in villages. The average fat percentage was 4.16 ± 0.040 and 3.48 ± 0.026 for normal milk and subclinical mastitis milk respectively. Higher Solids not fat percentage and total solids in normal milk (10.10 and 14.10) and lowest (9.00 and 13.60) Solids not fat percentage and total solids recorded in that villages. Overall Solids not fat and total solids percentage recorded as 9.73 ± 0.053 and 13.86 ± 0.030 in normal milk and for subclinical mastitis milk, 8.03 ± 0.059 and 11.68 ± 0.047 , respectively. The values of pH significantly increased by 0.35 units. Results obtained from testing the significance between subclinical mastitis milk and normal milk revealed that, the average fat, solids not fat and total solids content of the affected samples decreased significantly. Experimental results showed that subclinical mastitis hampered the milk quality of cow milk.

Keywords: cow, milk quality and subclinical mastitis

Introduction

India ranks first in livestock population in world. Generally cow and buffaloes bred specially use for dairy purpose. Mastitis is considered as one of the most costly disease affecting dairy cows.

Mastitis is a complex disease that occurs in clinical and subclinical forms in Buffaloes and Cows. It is a worldwide problem of the dairy industry responsible for heavy economic losses due to clinical and subclinical mastitis (SCM) to the tune of Rs.6053.21 corers in India. The subclinical mastitis (SCM) usually goes unnoticed because the milk and udder appear normal. Subclinically infected quarters can developed clinical mastitis. The determination of the somatic cell count (SCC) is most commonly used for detecting SCM. (Supriya, 2010) [13]. The mastitis is characterized by biochemical changes in composition of milk. These compositional changes reflecting the degree of physical damage are well marked and can be used as a basic indicator for diagnosis of subclinical mastitis. These changes not only alter the nutritional quality of milk but also preservation quality. So, investigation on biochemical profile of subclinical mastitis is important.

Mastitis is characterized by physical, chemical and bacteriological changes in the milk and pathological changes in the glandular tissue of the udder and affects the quality and quantity of milk. The bacterial contamination of milk from the affected cows render it unfit for human consumption and provides a mechanism of spread of diseases like tuberculosis, sore-throat, Q-fever, brucellosis, leptospirosis etc. and has zoonotic importance. (Sharma 2011) [9]. Mastitis is considered as one of the most costly disease affecting dairy cows. Many studies conducted previously to estimate the economic loss due to mastitis in India were based on the data collected from organize dairy farms.

Materials and Methods

The present experiment was based on the survey made during the year 2013-14 in four villages in Lakhani Tahsil of Bhandara district.

Total 100cow, 25cow from each village viz., Palandur, Dighori, Kolari and Kharashi around Bhandara were screened against subclinical mastitis by Modified California Mastitis Test

(MCMT) as per method of Schalmand Noorlandure (1957) [8]. Out of 100 cow, 400 halves were tested and 35 cow i.e., 10, 09, 09 and 07 (35 %cow) and 65 quarters i.e., 18, 17, 16 and 14 (16.25 quarters) in Palandur, Dighori, Kolari and Kharashivillages were found positive for presence of subclinical mastitis. The milk samples were collected in sterilized glass bottles. Milk samples from all four quarters were collected separately at the time of milking in morning. Total 25 milk samples obtained from subclinical mastitis quarters and 25 samples from normal quarters of same cow (5 cow from each village) subjected to chemical analysis viz., fat by Gerber's method as described in BIS: 1224 (Anonymous, 1958) [4]. Solids not fat percentage was determined according standard procedure as described in SP: 18, Part-XI of BIS (Anonymous, 1981) [3]. Total solids determined according to Gravimetric method described in SP: 18 Part-XI of BIS (Anonymous, 1981) [3] and pH was determined by using indicator strip described in SP: 18 Part-XI of BIS (Anonymous, 1981) [3] and digital pH meter. Analysis of the milk samples were done at Animal Husbandry and Dairy Science Section, College of Agriculture, Nagpur. A student 't' test was used to test the significance between normal and subclinical mastitis milk of cow described by Snedecor and Cochran (1994) [10].

Results and Discussion

The fat per centage of normal milk was range between 3.80 to 4.40 per cent than that of subclinical mastitis milk range between 3.2 to 3.70 per cent. The average fat percentage in normal milk and subclinical mastitis milk was observed as 4.16 ± 0.040 and 3.48 ± 0.026 per cent respectively (Table 1). The average percentage of fat significantly (P<0.01) decreased in subclinical mastitis milk samples. Mohamed *et al.* (2001) and Sonea (2009) [11] also reported that the composition of milk was significantly decreased in infected halves of mastitis udder in cow. Present results are in

agreement with their results.

The solid not fat percentage of normal milk was rent between 9.00 to 10.10 per cent than that of sub clinical mastitis milk range between 7.40 to 8.40 per cent. The average solids not fat content in normal milk 9.73 ± 0.053 per cent and that of subclinical mastitis milk was 8.03 ± 0.059 per cent. Thus, it decreased significantly in all subclinical mastitis samples. Antre (2011) [1] noticed decreased solid not fat content of cow milk affected by subclinical mastitis.

The total solids percentage of normal milk was rent between 13.60 to 14.10 per cent than that of sub clinical mastitis milk range between 11.25 to 12.00 per cent. The average total solids percentage in normal milk and subclinical mastitis was observed as 13.86 ± 0.030 and 11.68 ± 0.047 per cent, respectively. The average total solids per cent of subclinical mastitis milk deceased significantly (P<0.01). Sung (2001) observed that, the total solids content of milk was positively correlated with milk somatic cell count (SCC).

The pH percentage of normal milk was rent between 6.35 to 6.80 per cent than that of sub clinical mastitis milk range between 6.69 to 7.15 per cent. The average pH content in normal milk and subclinical mastitis milk was 6.60 ± 0.025 and 6.95 ± 0.027 respectively. Thus, pH increased significantly (P<0.01) by 0.35 unit in subclinical mastitis as compared to normal milk. More or less Similar results were reported by Boechat and Favarin (1992) [5] and Antre *et al.* (2011) [1]. They also observed increase in pH values of cow milk affected with subclinical mastitis. Increased in pH of subclinical mastitis milk in the experiment could be due to increased permeability of the gland tissue to blood components which results in higher values in milk. This might be partially due to increased movement of bicarbonate ions into milk, since the lactose production decreased and the alkaline salts from the blood entered the milk which becomes more alkaline showing pH above 7.0 as indicated by Rao (1990) [7].

Table 1: Effect of subclinical mastitis on quality of cow milk

Samples	N o r m a l m i l k				S u b c l i n i c a l m a s t i t i c m i l k			
	F a t	Solids not fat	Total solids	p H	F a t	Solid not fat	Total solid	p H
1	4 . 3 5	9 . 8 0	1 3 . 7 0	6 . 6 3	3 . 4 0	7 . 8 5	1 1 . 9 0	6 . 9 5
2	4 . 0 0	1 0 . 0 0	1 4 . 0 0	6 . 7 5	3 . 2 0	8 . 2 0	1 1 . 8 5	7 . 0 5
3	3 . 9 5	9 . 6 0	1 3 . 8 0	6 . 3 8	3 . 6 0	7 . 6 5	1 1 . 8 0	7 . 1
4	4 . 3 0	1 0 . 1 0	1 4 . 1 0	6 . 6 5	3 . 5 0	8 . 2 0	1 1 . 5 0	6 . 9 9
5	4 . 4 0	9 . 7 0	1 3 . 8 0	6 . 4 8	3 . 7 0	7 . 7 5	1 1 . 6 0	6 . 9 8
6	4 . 1 5	9 . 8 0	1 4 . 0 0	6 . 6 3	3 . 4 0	8 . 3 1	1 2 . 0 0	6 . 7 0
7	4 . 3 5	9 . 6 0	1 3 . 9 0	6 . 7 8	3 . 4 0	7 . 4 0	1 1 . 7 0	7 . 0 0
8	4 . 2 5	9 . 3 0	1 4 . 1 0	6 . 6 5	3 . 5 0	8 . 1 5	1 1 . 2 6	6 . 8 5
9	3 . 8 5	9 . 9 0	1 3 . 8 5	6 . 7 2	3 . 7 0	7 . 8 0	1 1 . 4 0	6 . 9 9
1 0	3 . 9 0	1 0 . 0 5	1 4 . 0 0	6 . 8 0	3 . 3 0	8 . 2 5	1 1 . 5 5	6 . 8 2
1 1	4 . 2 5	1 0 . 1 0	1 3 . 7 5	6 . 4 8	3 . 5 0	7 . 5 5	1 1 . 2 5	6 . 7 9
1 2	4 . 0 0	1 0 . 0 0	1 3 . 6 0	6 . 5 7	3 . 3 0	7 . 6 5	1 1 . 8 0	7 . 0 3
1 3	4 . 2 5	9 . 8 0	1 3 . 9 5	6 . 5 5	3 . 7 0	8 . 3 0	1 1 . 6 6	6 . 9 9
1 4	4 . 2 5	9 . 4 0	1 4 . 1 0	6 . 7 5	3 . 6 0	8 . 4 0	1 1 . 9 0	7 . 0 0
1 5	3 . 8 0	9 . 0 0	1 3 . 8 5	6 . 5 8	3 . 5 0	8 . 2 0	1 1 . 6 1	6 . 7 4
1 6	4 . 2 0	9 . 6 0	1 3 . 7 0	6 . 3 5	3 . 4 0	8 . 1 5	1 1 . 9 0	7 . 0 4
1 7	3 . 9 0	9 . 9 0	1 3 . 9 5	6 . 6 2	3 . 5 0	8 . 2 5	1 1 . 6 5	7 . 1 3
1 8	4 . 4 0	9 . 5 0	1 3 . 6 0	6 . 4 2	3 . 3 0	8 . 3 0	1 1 . 9 5	7 . 1 5
1 9	4 . 3 0	9 . 6 5	1 3 . 9 5	6 . 5 2	3 . 5 0	8 . 2 0	1 2 . 0 0	6 . 6 9
2 0	4 . 3 5	9 . 6 0	1 3 . 6 5	6 . 7 0	3 . 6 0	8 . 1 0	1 1 . 4 0	6 . 8 0
2 1	4 . 4 0	9 . 8 0	1 3 . 7 0	6 . 6 5	3 . 4 0	8 . 4 0	1 1 . 8 5	6 . 9 8

2	2	4 . 2 0	9 . 5 5	1 3 . 9 0	6 . 7 5	3 . 5 0	7 . 5 5	1 1 . 3 5	7 . 0 3
2	3	4 . 2 0	9 . 6 0	1 3 . 9 0	6 . 5 5	3 . 4 0	8 . 3 0	1 1 . 5 0	7 . 0 5
2	4	3 . 8 0	9 . 9 0	1 3 . 7 5	6 . 4 6	3 . 6 0	8 . 0 5	1 2 . 0 0	6 . 8 0
2	5	4 . 3 0	1 0 . 0 5	1 3 . 9 0	6 . 6 2	3 . 5 0	8 . 0 0	1 1 . 8 0	7 . 1 0
A v .		4 . 1 6	9 . 7 3	1 3 . 8 6	6 . 6 0	3 . 4 8	8 . 0 3	1 1 . 6 8	6 . 9 5
SE (m) ±		0 . 0 4 0	0 . 0 5 3	0 . 0 3 0	0 . 0 2 5	0 . 0 2 6	0 . 0 5 9	0 . 0 4 7	0 . 0 2 7
					't' cal=14.24**	't' cal=20.11**	't' cal=38.64**	't' cal=9.42**	

** Significant at 1% level (P<0.01)

References

1. Antre GR. Prevalence of subclinical mastitis in cows in Karanjatahsil of Wardha district. M.Sc. (Agri) Thesis (unpub). Submitted to Dr. P.D.K.V, Akola, 2011.
2. Ali MA, Ahmad MD, muhamadand AK, Anjum A. Prevalance of subclinicalmastitis in dairy buffaloes of Punjab. Pakistan J. Anim. Plant Sci. 2011; 21(3):477-480.
3. Anonymous. Handbook of food analysis in SP: 18, part-XI. Bureau of Indian Standards, Manak Bhavan, New Delhi, 1981.
4. Anonymous. Determination of whole milk by Gerber method.IS 1224. Bureau of Indian Standards, Manak Bhavan, New Delhi, 1958.
5. Boechat JUD, Favarin V. Chemical and physical changes in goat milk as influenced by subclinical mastitis. J. Aurquivosda Universidad federal Rural do Rio de Janeiro, 1992; 15:93-103.
6. Mohamed IE, Osman AO, Elowni AO, Galaledein Mohamed E. Factors affecting composition of mastitis milk of Friesian cattle in Sudan, 1998.
7. Rao KSR. Milk Formation Alteration in mastitis milk composition. Indian Dairyman. 1990; 42(7):314-316.
8. Schalm, Noorlandure. Experiments and observation leading to development of the California Mastitis Test. J. Anim. Res. 1957; 130:199-207.
9. Sharma N, Singh NK, Bhadwal MS. Relationship of somatic cell count and mastitis. Asian-Aust. J. Anim. Sci. 2011; 24(3):429-438.
10. Snedecor GW, Cochran WG. Statistical methods. 6th Ed. Oxford and IBH publishing Co., New Delhi, 1994.
11. Sonea C, Colceri D, Bacila V. Research on sublinical mastitis effect on milk quality. Zootehnie Biotechnology, 2009; 42(2):337-340.
12. Sudhan NA, Singh R, Singh M, SSoodan J. Studies on prevalence, etiology and diagnosis of subclinical mastitis among crossbred cows. Indian J. of Anim. Research. 2005; 39:127-130.
13. Supriya Saxena V, lather D. Prevalence of subclinical mastitis in an organized cow herd, Haryana. 2010; 49:64-65.