

## **INVESTIGATING THE CORRELATION BETWEEN UDDER AND LEG HYGIENE SCORES AND SUBCLINICAL MASTITIS IN DAIRY COWS**

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### **Article Info**

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### **Abstract**

Dairy production is a major contributor to the economy of Anand district in Gujarat, India. However, subclinical mastitis continues to be a significant challenge faced by dairy farmers. This study investigated the relationship between udder and leg hygiene scores and the incidence of subclinical mastitis in lactating crossbred cows. The study sampled 200 cows from 13 different dairy farms in the district. Subclinical mastitis was assessed by collecting approximately 10ml of foremilk sample from each quarter during evening milking, and udder and leg hygiene scores were assessed during milk sample collection. The study found a linear increase in the incidence of subclinical mastitis with an increase in udder and leg hygiene scores. Specifically, cows with higher udder hygiene scores (UHS) and leg hygiene scores (LHS) had higher incidences of subclinical mastitis, with UHS 4 and 5 and LHS 4 and 5 having 20% and 22% higher incidences of subclinical mastitis, respectively, compared to UHS 1 and LHS 1. The results reveal the significant impact of dairy farming practices on milk quality, udder health, and animal welfare in Anand district. The findings also highlight the need for improved milking practices, including regular teat dipping, to reduce the incidence of subclinical mastitis.

### **Introduction**

Milking practices followed by dairy farmers have effect on quality and hygienic condition of milk as well as its effects on health condition of udder. After milking, the teats should be dipped in an antiseptic solution, which disinfects the teat and removes the film of milk which normally remains on outside of the teat after milking. Application of teat dipping also reduces the SCC of milk [7]. Moisture, mud, and manure present in the surroundings environment of the cows are the primary sources of environmental mastitis pathogens, and hygiene scores of cows provide visible evidence of exposure to these potential sources. Milking hygiene reduces the pathogenic organisms from inhabiting the immediate environment or skin of the animals and minimizing their spread during milking process. The practice of regular teat dipping is not much more common at household level

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in India. Therefore, prevalence of mastitis in cows and buffaloes is more at unorganized dairy farms as compared to organized dairy farms. Udder hygiene is significantly associated with the risk of intra-mammary infection in cows

### Material and Method

The study was carried out in Anand District of Gujarat state which is a seat of Dairy Development and White Revolution. Total 200 lactating crossbred cows of different parities and at different stages of lactation from 13 different dairy farms of Anand district were randomly selected. All the cows were apparently healthy and free from clinical mastitis.

#### 1. Assessment of Subclinical mastitis by Somatic cell count/ml of milk

Approximately 10 ml foremilk sample was collected aseptically from each quarter of cow during evening milking of all 200 lactating crossbred cows into 50 ml capacity centrifuge plastic sampling bottles. The first two to three streams of milk from each teat were discarded. The plastic sampling bottles were thoroughly cleaned, washed, dried and sterilized in an Autoclave for 15 minutes at 121 °C temperature and 15 psi pressure prior to collect the milk samples. Thus, total 800 milk samples were formed the experimental materials. The milk samples were packed in thermo coal box having ice and ice packs and were brought to the laboratory of LRS/Department of Animal Science, AAU, Anand. The samples were kept overnight under refrigeration temperature (4°C). Next day morning the samples were thawed at room temperature and laboratory tested for estimation of Somatic cell count using Fossomatic™ Minor cell counter (A/S N. Foss Electric, Hillerod, Denmark) as described by Gonzalo *et al.* [2]. The samples with more than 5,00,000 SCC/ml of milk were considered as subclinical mastitis positive [3].

#### 2. Udder and leg hygiene score assessment

Udder and leg hygiene score (1 to 5 point scale) was assessed during milk sample collection using a method described by Reneau *et al.* [5]. For scoring purpose only lower rear legs (area from point of hock to floor including hoof) were observed (Figure 1). For udder scoring, both fore and rear udders as well as udder floor and teats were observed (Figure 2). Udder and lower legs of experimental cows were compared with the model animals shown in photographs on the scoring sheets and given a score based on following categories (Table 1). **Table 1. Score card for Udder and leg hygiene score**

Score	Description
1	Completely free of dirt
2	Very little dirty
3	Slightly dirty
4	Mostly covered by dirt
5	Completely dirty with caked-on dirt

### Result and Discussion

Udder and leg hygiene score (1 to 5 point scale) was assessed during milk sample collection using a method described by Reneau *et al.* [5]. Movement from score 1 to score 5 denotes progressive dirtiness of udder and legs. Relationship between udder and leg hygiene score and incidences of subclinical mastitis is presented in Table 2. Data in Table 2 indicated a linear increase in incidence of subclinical mastitis with increase in udder and leg hygiene score. Schreiner and Ruegg [6] also reported that cows with UHS 3 and UHS 4 had 1.5 times more chances to have major pathogens isolated from milk samples compared with cows with UHS1 and UHS 2 which supports present finding. Similar to present finding, Manzi *et al.* [4] observed trend in which intra-mammary infections were detected in mammary quarters of 15.0% clean udders, 16.9 % of dirty udders and 18.5 % of very dirty udders. In present study, higher incidence of subclinical mastitis was observed in cows with UHS 4 (60.00

%) and UHS 5 (60.00) and LHS 4(60.60 %) and LHS 5 (62.50 %). Similarly, lower incidence of subclinical mastitis was noticed in cows with UHS 1 (40.74 %) and UHS 2 (51.06 %) and LHS 1(38.75 %) and LHS 2 (51.11 %). Thus, UHS 4 and UHS 5 had nearly 20 % more incidence of subclinical mastitis as compared to UHS 1. Similarly, LHS 4 and LHS 5 had 21 to 22% higher incidence of subclinical mastitis as compared to LHS 1.



1



2



3



4



5

Figure 1 Udder Hygiene score from 1 to 5 scale



1



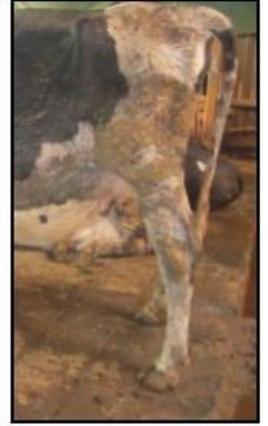
2



3



4



5

Figure 2 Leg Hygiene score from 1 to 5 scale

**Table 2. Relationship of udder and leg hygiene score with incidences of subclinical mastitis.**

Udder hygiene score	Cows observed (n)	SCM positive cows	
		N	%
1	81	33	40.74
2	47	24	51.06
3	37	20	54.05
4	30	18	60.00
5	5	3	60.00
<b>Overall</b>	<b>200</b>	<b>98</b>	<b>49.00</b>
<b>Leg hygiene score</b>			
1	80	31	38.75
2	45	23	51.11
3	34	19	55.88
4	33	20	60.60
5	8	5	62.50
<b>Overall</b>	<b>200</b>	<b>98</b>	<b>49.00</b>

## References

- Compton, C.W.R., Mc Dougall, S., Parker, K. and Heuer, C. (2007). Risk factors for peripartum mastitis in pasture-grazed dairy heifers. *J. Dairy Sci.*, 90(9):4171-4180.
- Gonzalo, C., Martínez, J.R., Carriedo, J.A. and San Primitivo, F. (2003). Fossomatic cellcounting on ewe milk: comparison with direct microscopy and study of variation factors. *J. Dairy Sci.*, 86(1): 138-145.
- IDF (1987). Machine milking factors affecting mastitis- a literature review. In International Dairy Federation Bulletin 215, Machine Milking and Mastitis. 2-32.
- Manzi, M.P., Nobrega, D.B., Faccioli, P.Y., Troncarelli, M.Z., Menozzi, B.D. and Langoni Hello (2012). Relationship between teat-end condition, udder cleanliness and bovine sub-clinical mastitis. *Res. Vet. Sci.*, 93(1):430-434.
- Reneau, J.K., Seykora, A.J., Heins, B.J., Bey, R.F. and Farnsworth, R.J. (2003). Relationship of cow hygiene scores and SCC. Proc., Natl. Mastitis Council Annual Meeting, Technology Transfer Session. Feb. 2003. p. 362.

Schreiner, D.A. and Ruegg, P.L. (2003). Relationship between Udder and Leg Hygiene Scores and Subclinical Mastitis. *J. Dairy Sci.*, 86(11): 3460–3465.

Singh, M. and Dang, A.K., (2002). Somatic cell counts of milk, NDRI publication No. 1/2002