



## Research Article

# Cattle Hygiene Status and Its Relation with Subclinical Mastitis: A Study in Commercial Farms in Rampur, Nepal

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### Abstract

**Objective:** The main objective of this study was to determine the hygiene status of cattle in commercial farms of Rampur and its association with subclinical mastitis.

**Study Design:** Purposive study with cross sectional design.

**Methods and Methodology:** Hygiene Scorecard devised by N.B Cook University of Wisconsin- Madison, USA was taken as reference to evaluate hygienic status of rear and hind parts of animal with score of 1 to 4, 1 for the cleanest and 4 for the dirtiest. For screening test of subclinical mastitis, California mastitis test with 211 cows with all their 4 quarters were examined from November 2015 till February 2016.

**Results:** The overall prevalence rate was reported as 69% in cattle. Mean hygiene score of cow was 2.4 with udder, lower leg and flank being 2.80, 2.42 and 2.64 respectively. Mean CMT score of different quarters was found to be left front, left hind, right front, and right hind being 0.86, 0.83, 0.88, and 0.74 respectively. Hygiene score of cow of different parts and SCM presence percentage in all individual scores were calculated to make obvious relation that with increasing score from 1 to 4, SCM presence rate was increased making it clear that with compromised hygienic condition SCM presence was high.

**Conclusion:** The study revealed that prevalence of Subclinical mastitis was high with increasing hygiene score of rear body parts that is with increasing unhygienic condition. Udder was competitively cleaner than rear and flank regions. Mastitis test (CMT) was done in a total of 211 cows with 844 quarters.

**Keywords:** California Mastitis Test; prevalence; subclinical mastitis; hygiene score

### Introduction

In any farm situation, hygienic measures adopted ensure the safety and health of animals. Moreover, these measures followed reflect the condition of animal welfare and care

provided to them. Cleanliness conditions of animals can be correlated with the prevalence of subclinical mastitis (Reneau *et al.*, 2003). Rampur municipality is a dairy pocket of Chitwan district and farmers here are very concerned

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about factors that affect productivity in their dairy animals. Awareness campaigns for farmers regarding production diseases has always been promoted by Institute of Agriculture and Animal Science (IAAS, Tribhuvan University) Rampur Campus. If animal can be screened early for Sub-Clinical Mastitis (SCM) and treated, it will be much more cost effective than in treating clinical mastitis (Schukken, 2003). SCM is financially much more important as besides causing loss in milk production, it also increases the chances of clinical mastitis (Khanal & Pandit, 2013). The California Mastitis Test (CMT) is an effective screening and detection method for SCM (Fosgate *et al.*, 2013) which was employed in this research.

## Materials and Methodology

We conducted a study in different types of commercial farms: NARC, IAAS and individual owned dairy farms around Rampur area during November, 2015 to February, 2016 during the winter months using a 1x1 grid in a 7 kilometer radius from Rampur Campus. Information for this was obtained from the local municipal council. Ethical procedures were followed during the entire process and consent was always obtained for taking samples and questioning animal handlers. Ethical approval was obtained from university and local governing bodies. Questionnaires with animal handlers were done only after the milking process. We determined a theoretical sample size of 384 using formula given by (Daniel, 2012) for samples having a previous prevalence. An inclusion criterion of commercial farm and active dairy animals was established. Also some farmers refused to give samples or answer questions and this reduced the sample size to 211 animals. A farm was called a commercial dairy farm if it had more than 5 cattle in active lactation. A purposive cross sectional study using hygiene score card was carried out along with the milk sampling which assessed the farmers on their hygienic practices and information regarding those things were obtained.

Farms were visited during the evening time so that visits coincided with normal milking time. All farmers cleaned the cow's udder before milking. Sample was taken only after a couple of squirts from each udder was done. Milk samples of 3ml were collected directly into CMT paddle and testing of the milk was carried out according to the standard procedure. The results were marked as N (negative) for no thickening: homogeneous, T (trace) for slight thickening: reaction disappears in 10 seconds, Score 1 for distinct thickening but no gel formation, Score 2 for thickening immediately where gel begins to form and levels in the bottom of cup whereas Score 3 is when gel is formed and surface elevates with a central peak above the mass. All the information regarding each sample was recorded. For assessment of cow udder, rear & front part, hygiene standard method outlined by (Reinemann & Cook, 2007) was used. Three main body parts of animal were marked with scores;

udder, lower leg, upper leg and flank with 1 for the cleanest of all, 2 for the one with dirt in 2-10% surface area, 3 for the one with 10-30% surface dirt and 4 for more than 30% of the dirt was taken to follow it.

## Results

69% of dairy cattle in commercial farms turned out positive in the CMT testing process. The mean hygiene score of cow was 2.4 with udder, lower leg and flank being 2.80, 2.42 and 2.64 respectively. Mean CMT score of different quarters was found to be left front, left hind, right front, and right hind being 0.86, 0.83, 0.88, and 0.74 respectively. Recording of data coming from CMT was done with high sensitivity and even if trace was present, the data was recorded as positive to the CMT test.

Comparing cleanliness score of different rear parts with SCM presence in case of cattle are as follows: when udder score is 1 in 27 samples SCM presence rate was 29.63%, whereas in score 2 in 84 samples presence rate was 61.9% and in score 3 presence rate was 57.89%. Similarly, for lower leg, with increase in score from 1 to 4 SCM presence was increased being score 1 in 13 samples with 46.15% SCM positive, with score 2 in 70 samples 62.86% is SCM positive and in score 3, 77.59% is SCM positive followed by 88.89% SCM positive in case of score 4. Similar results were in upper leg and flank score being 47.37%, 47.5%, 55.22%, 70.83% SCM presence percentage with increase in score from 1 to 4. The score card of cattle shows that udder of cow was the cleanest part of animal whereas lower leg and upper leg were more dirty. With an increase in score from 1 to 4, presence of subclinical mastitis was increased; where 1 was very clean body part and 4 was very dirty.

## Discussion

The result obtained in our work is similar to Reneau *et al.* (2003) indicating dirty cows had a higher prevalence of subclinical mastitis and clean cows have less. Our results are similar to the results obtained in relationships between cow cleanliness and measures of milk quality by Hughes (2001), where positive relation is there between hygiene and milk quality. A comparison of linear somatic cell scores and hygiene score was done by Reneau *et al.* (2003). Similar results were obtained which indicates that above relation exist. However, prevalence rate of SCM was slightly different from that of Adhikari (2009), where the prevalence of SCM in different VDCs of the Chitwan district was found to be 27% by CMT. According to Thapa (2006), proper hygiene can significantly reduce mastitis caused by contagious pathogens, which is similar to conclusions drawn from our work.

## Conclusion and Recommendation

The study revealed that with increasing hygiene score of rear body parts prevalence of Subclinical mastitis was high. Subclinical mastitis was abundantly present in cattle around Rampur. Data analysis showed one of the strong reasons for

subclinical mastitis was poor hygienic status of animal and housing system. Commercial farms are completely profit oriented hence sanitation of individual animal and adequate housing and care is compromised. The dirtier the animal and its shed more will be the reading of CMT test. Udder hygiene scores were significantly associated with leg hygiene scores and varied among farms. Moreover, in score analysis udder and rear parts are comparatively cleaner but not as it should be. Udder needs to be cleanest area after all it is washed before milking twice. So it is recommended to have adequate housing with proper sanitation and cleanliness. Washing of rear parts of body of animal, regular screening for early detection and treatment of infected animals is very important in prevention and control of mastitis.

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