EFFECT OF MANAGEMENTAL PRACTICES ON PREVALENCE OF SUBCLINICAL MASTITIS AT MACHINE MILKED DAIRY FARMS IN PUNJAB

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ABSTRACT

The present study was conducted to assess the effect of managemental practices adopted at machine milked dairy farm on the occurrence of subclinical mastitis. Study of 218 lactating dairy cows at 10 machine milked dairy farms revealed prevalence of specific subclinical mastitis as 57.80 per cent on animal basis and 30.73 per cent on quarter basis. The occurrence of mastitis at various farms was very much related to managemental practices adopted at a particular farm. The prevalence was minimum at Farm II (14.29\%) where regular cleaning of milking machine, keeping of milking machine variables at standard recommended values and good hygienic measures were followed. On the other hand, prevalence (41.67\%) was higher at Farm X where no such practices were followed. Also, there was poor premilking udder preparation as they were washing the udders but not dry wiping as per recommended standard procedure. Poor condition of teat liners and carelessness in following the recommended machine hygiene procedures were found to be the other possible reasons for high prevalence of disease at one or the other farm. It was concluded that milking machine management should be given due importance in farm management practices.

Key word : Cows, machine milking, subclinical mastitis, management practices.

Bovine mastitis a global problem, isone of the most challenging diseases of animals causing huge economic loses to the dairy industry throughout the world (1). Mastitis can occur as clinical form or subclinical form. About 70 to 80\% of the estimated $140 to $300 loss per cow per year from mastitis relates to decreased milk production caused by asymptomatic subclinical mastitis (2). In a study, (3) concluded that the udder health, welfare of the cow and dairy enterprise profitability can best be improved by using hygienic procedures, hygienic teat management and regular machine maintenance. Poor management and improper functioning of Milking machines have adverse effect on udder health due to the damage or change in the resistance of the cow’s first line of defence: teat skin, teat canal, and mucosal tissue, making it susceptible to colonization by mastitis-causing organisms and intramammary infections (4). Proper management of milking machine has a positive impact on udder health, bulk tank somatic cell count and that ultimately improves the milk quality. (5) claimed that milking machine has little effect on mastitis if properly operated. Milking equipment cleaning and sanitisation is a critical point in the milking procedure and cleaning failure could influence the level of bacterial contamination of bulk tank milk. Milk residues or remaining washing water, left on milking equipment contact surface, support the growth of a variety of microorganisms (6, 7, 8).

In India, Milking machine is now being used increasingly in the dairy sector particularly in Punjab, but literature on the impact of machine milking on the udder health and the effect of the milking machine management is scarce. The present study was designed to see the effect of milking machine management on the udder health of crossbred dairy cows in various dairy farms of Punjab state.

MATERIALS AND METHODS

Herd Selection and visit protocol : The present study involved 10 machine milked dairy cow herds in various districts of Punjab. A total of 218 HF x Sahiwal cross-bred dairy cow in milk were studied. The farms were visited during the routine afternoon milking hours (3 and 5 pm). A complete history with respect to animals i.e., detailed information on total number of animals at the farm, animals in milk, animals dry, young stock, and age, breed, parity, milk yield and lactation stage of the individual animals. Farm management related practice such as type of housing system, feeding schedule, type of milking parlour, floor type, milking time, total milk production at farm, udder cleaning, post milking teat dipping and number of labourer working in the farm etc. were recorded. The machine related factors recorded were type of milking machine, milking frequency, routine cleaning of milking clusters, frequency of cluster change and milking machine cleaning etc. The various milking machine variables such as vacuum, pulsation ratio, number of liner slips, if any, technique of cluster detachment, individual animal milking time and total milking time at the farm were observed and recorded during process of milking.

RESULTS AND DISCUSSION

A considerable relationship existed between the prevalence of subclinical mastitis and management
**Table-1 :** Management practices related to machine milking and occurrence of mastitis

<table>
<thead>
<tr>
<th>Farm No.</th>
<th>Farm ID</th>
<th>MM make</th>
<th>Vacuum (mm Hg)</th>
<th>Cluster change</th>
<th>Machine cleanliness</th>
<th>Cluster detachmen t method</th>
<th>Liner slips</th>
<th>Chemicals for washing</th>
<th>Teat dipping</th>
<th>Percent specific mastitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Farm I</td>
<td>De Laval</td>
<td>380</td>
<td>6-8 m</td>
<td>15-20 d</td>
<td>SOD*</td>
<td>Nil</td>
<td>De Laval Detergent</td>
<td>B+G**</td>
<td>17.65</td>
</tr>
<tr>
<td>2.</td>
<td>Farm II</td>
<td>De Laval</td>
<td>350-400</td>
<td>3 m</td>
<td>Daily</td>
<td>SOD 1</td>
<td>De Laval detergent</td>
<td>B+G</td>
<td>36.82</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Farm III</td>
<td>De Laval</td>
<td>350</td>
<td>1 yr</td>
<td>Daily</td>
<td>SOD 3</td>
<td>Caustic soda, Detergent supplied, water</td>
<td>Nil</td>
<td>B+G</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Farm IV</td>
<td>West Falia</td>
<td>400</td>
<td>1yr</td>
<td>Weekly</td>
<td>SOD Nil</td>
<td>Chemical Supplied</td>
<td>B+G</td>
<td>23.75</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Farm V</td>
<td>Van Sun</td>
<td>400</td>
<td>No change (1 Y)</td>
<td>Weekly</td>
<td>SOD Nil</td>
<td>Water only</td>
<td>Daipal</td>
<td>30.26</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Farm VI</td>
<td>Van Sun</td>
<td>410</td>
<td>6 m</td>
<td>Daily</td>
<td>SOD Nil</td>
<td>Surf</td>
<td>Nil</td>
<td>39.58</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Farm VII</td>
<td>De Laval</td>
<td>380</td>
<td>No change (1.5 Y)</td>
<td>10 days</td>
<td>SOD 2</td>
<td>Surf</td>
<td>Nil</td>
<td>25.00</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Farm VIII</td>
<td>West Falia</td>
<td>300-350</td>
<td>yearly</td>
<td>Daily (Vim)</td>
<td>SOD Nil</td>
<td>Teepol + Vim</td>
<td>Nil</td>
<td>36.96</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Farm IX</td>
<td>De Laval</td>
<td>350</td>
<td>No change (3 yrs)</td>
<td>Weekly</td>
<td>SOD Nil</td>
<td>Surf</td>
<td>Nil</td>
<td>27.63</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Farm X</td>
<td>De Laval</td>
<td>350-400</td>
<td>Once a year</td>
<td>Weekly</td>
<td>SOD 3-4</td>
<td>Potassium Permanganate</td>
<td>Nil</td>
<td>41.67</td>
<td></td>
</tr>
</tbody>
</table>

* SOD= Switched off then detached; ** B+G = Betadine + Glycerine

The prevalence of subclinical mastitis was highest at Dairy Farm X (41.67%) where milking machine was used improperly and practice of teat dipping was followed. In the dairy farm under question the teat were washed ignorantly with very concentrated potassium permanganate solution due to which teat health was very poor; most of teats were having rough to very rough teat end and had dry skin surface. The teats were very much dry which is considered a risk factor for increased colonization by the contagious and environmental pathogens. Teat-end hyperkeratosis may be exacerbated by disinfectants that cause chemical irritation to teat skin or may be improved by the use of a disinfectant with a high concentration of an effective emollient(10). Also during machine milking comparatively higher (3-4) liner slips were reported which could have been due to the low vacuum or use of heavy cluster. In general a higher rate of liner slips results in a higher rate of new IMI presumably because it increases the frequency or severity of impacts against teat ends (14, 15, 16). Another factor that would have been responsible is cluster change. The farms where incidence was higher than 20%, (i.e., Farm III-X) they were not changing the cluster regularly. It has been observed as the liner deteriorates then the teat massage becomes increasingly ineffective and the teats are subject to more mechanical stress and increase the incidence of infection (17). Furthermore, at some of these farms (V, VI, VIII, X),...
Effect of management practices on prevalence of subclinical mastitis

cows with clinical mastitis were milked along with the healthy. It is recommended that cows with intramammary infections should be milked after healthy cows as it aids in control of the spread of contagious mastitis pathogens. Thus, milking order could have had a significant impact on the prevalence of mastitis and the herd SCC seen in this study. Also there was poor premilking udder preparation e.g., udders were washed but were not dried wipe as per recommendations (At farms IV, V, VIII, X). Wetting the udder can increase surface drainage of water contaminated with bacteria which can enter teat cup liners and may increase bacterial contamination of milk, and can affect the milk quality (18; 19). Poor condition of teat liners and carelessness in following recommended machine hygiene procedures were found to be the other possible reasons for high prevalence of disease at one or the other farm.

REFERENCES