INFLUENCE OF TEMPERATURE HUMIDITY INDEX AND DRY PERIOD ON INCIDENCE OF MASTITIS IN CATTLE AND BUFFALOES

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ABSTRACT
The data was collected for the twelve years period (2000 to 2011) to find out the effect of temperature humidity index and dry period on incidence of mastitis in cattle and buffaloes. The effect of temperature humidity index score on the incidence of clinical mastitis was significant in Karan Fries cows, (P <0.05), Murrah buffaloes (P <0.05), Karan Swiss and Sahiwal cows (P< 0.01), while THI did not influence mastitis incidence in Tharparkar cows. The frequency of mastitis incidence in different duration of dry period varied from 36.76 to 39.55, 34.04 to 48.28, 27.94 to 37.50, 27.48 to 42.50 and 10.42 to 22.12 percent in Karan Fries, Karan Swiss, Sahiwal, Tharparkar cows and Murrah buffaloes.

KEYWORDS: Temperature humidity index, Dry period, Mastitis, Cow and Buffalo.

RESULTS & DISCUSSION
The effect of Temperature Humidity Index score on the incidence of clinical mastitis was significant in Karan Fries cows, (P <0.05), Murrah buffaloes (P <0.05), Karan Swiss and Sahiwal cows (P< 0.01), while THI did not influence mastitis incidence in Tharparkar cows. The incidence of mastitis ranged from 33.98 to 40.80% in Karan Fries, 22.12 percent in Murrah buffaloes.

The data on mastitis incidence was collected from history sheets, cum health record registers maintained in the institute for a period of twelve years (2000 to 2011). Lactation records (6251) comprising Karan Fries (2553), Karan Swiss (351) Sahiwal (1554), Tharparkar (323) cows and Murrah buffaloes (1470) were classified according to Temperature Humidity Index (THI) score and duration of dry period. THI was classified as< 72 (No stress), 73 to 78 (Mild stress) and 79 to 89 (Severe stress). The dry period (days) was classified as (i) up to 60 days (ii) 61 to 120 days and (iii) 121 days & above. The data was analyzed by Chi-square method as under:

Chi-square = (O – E)² / E

Where, O = Observed frequencies; E = Expected frequencies, Expected frequencies were calculated as: Eij = (Ri) (Cj) / GT

Where,
Eij = Expected frequency belong to i th row and j th column
Ri = i th row total; Cj = j th column total; GT = Grand total

The association between two variables was studied using Chi-Square statistics.
significantly low incidence of mastitis in summer season than the winter season and a non-significant effect between hot–humid and hot–dry season clearly indicated more adoptability of buffaloes to summer season in comparison to winter season. The crossbred and Sahiwal cows were more affected by high humidity and ambient temperature (THI - 79 to 89) due to less adaptability to hot–humid conditions, growth of pathogen and exposure udder to unhygienic conditions (Shinde et al., 2001; Singh et al., 2001). High humidity in the cow's shed and a draught on the udder increases susceptibility to mastitis. Wetness of the udder due to moist stalls floor or due to frequent washing of the udder increases the deleterious effect of draughts by increasing heat loss from its skin (Wani and Bhatt, 2003; Barkema et al., 1999 and De and Mukherjee, 2009). However, THI < 72 was found to have least effect on incidence of mastitis in crossbred and indigenous cows. Tharparkar cows were found to be more resistant to high ambient temperature of hot–humid season and corroborate earlier reports in Karan Fries cows and Hariana cattle (Pal, 2003 and Kaushik ; Khanna, 2004).

Thaparkar cows were found to be more resistant to high ambient temperature of hot–humid season and corroborate earlier reports in Karan Fries cows and Hariana cattle (Pal, 2003 and Kaushik ; Khanna, 2004). There was no clear cut effect of duration of dry period on mastitis incidence, except buffaloes in which the incidence increased with the duration of dry period as reported earlier (Peeler et al., 2000 and Chishty et al., 2007). It has been found that dry period length of seven weeks is associated with the lowest risk of clinical mastitis as found in Karan Fries cows and Murrah buffaloes in this study (Enevoldsea and Sorensen, 1992).

CONCLUSION
The data on incidence of mastitis was collected from the institute herd and was classified as per the duration of dry period and THI score. The effect of dry period on mastitis incidence was non-significant in ensuing lactation in crossbred (Karan Fries, Karan Swiss) and indigenous cows (Sahiwal, Tharparkar), but increase in dry period influence mastitis incidence in buffaloes. Increase in THI score significantly increased mastitis incidence in all breeds of cows but Murrah buffaloes remain unaffected. However, decrease in THI (<72) increased mastitis incidence in Murrah buffaloes and Tharparkar cows.

REFERENCES


## TABLE 1

Incidence of clinical mastitis (%) in various breeds of cattle and buffaloes in different THI score, and duration of dry period:

<table>
<thead>
<tr>
<th>Breed</th>
<th>Karan Fries</th>
<th>Karan Swiss</th>
<th>Sahiwal</th>
<th>Tharparkar</th>
<th>Murrah Buffaloes</th>
</tr>
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<tbody>
<tr>
<td>THI Score</td>
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<tr>
<td>&lt; 72</td>
<td>1104 (33.98)</td>
<td>173 (29.48)</td>
<td>760 (25.79)</td>
<td>127 (35.43)</td>
<td>557 (29.80)</td>
</tr>
<tr>
<td>73 to 78</td>
<td>427 (35.13)</td>
<td>57 (40.35)</td>
<td>238 (40.76)</td>
<td>52 (26.92)</td>
<td>236 (25.00)</td>
</tr>
<tr>
<td>79 to 89</td>
<td>1022 (40.80)</td>
<td>121 (50.41)</td>
<td>556 (42.27)</td>
<td>144 (34.03)</td>
<td>236 (25.00)</td>
</tr>
<tr>
<td>Duration of dry period</td>
<td></td>
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<tr>
<td>Up to 60 days</td>
<td>710 (36.76)</td>
<td>55 (41.82)</td>
<td>74 (36.48)</td>
<td>23 (39.13)</td>
<td>48 (10.42)</td>
</tr>
<tr>
<td>61 to 120 days</td>
<td>584 (39.55)</td>
<td>94 (34.04)</td>
<td>312 (37.50)</td>
<td>40 (42.50)</td>
<td>357 (21.29)</td>
</tr>
<tr>
<td>&gt; 121 days</td>
<td>312 (38.78)</td>
<td>58 (48.28)</td>
<td>662 (27.94)</td>
<td>131 (27.48)</td>
<td>547 (22.12)</td>
</tr>
</tbody>
</table>

NO. = Number of observation; THI = Temperature Humidity Index
Figures in parentheses indicate the number of observation of mastitic animals.