FACTORS AFFECTING MORTALITY IN BUFFALOES AND CALVES

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The present study was designed to investigate the effect of dams on calf mortality, the number of stillbirths and abortions, the effect of environment difference on the calf mortality, the relation of age and parity number to calf mortality. Certain managemental and aetio-pathological factors contributing mortality were also studied from data of two dairy farms one located in Okara (Punjab Province, Pakistan) and the other in Malir Karachi (Sind Province Pakistan) from March 2003 to February 2010. The unadjusted means and Standard Deviation (SD) of stillbirth was 7.59 ± 13.49% and calf abortion was 2.64 ± 3.59%. Mean value of abortion reveals that herd (farm) and sex were the most significant ($P < 0.01$) sources of variation in stillbirth in buffalo calves. However, herd (farms) year of birth did not affect abortion rate. The variation noted was attributed to the management practices. The feeding regime and the age of the dam seem to have contribution in this regard.

Keywords: Mortality, Causes, Calves, Buffaloes, Dams

INTRODUCTION

Calves are the future herd and keeping them in a fit and healthy condition not only makes an effect on a livestock farms' efficiency but also contributes to the economy and production outputs in the years to come. Mortality in the calves renders not only economical losses but also contributes to the low production of the herd when taking futuristic terms for the farming scenario (Ablaha et al., 1995). This situation contributes to the low per capita consumption of dairy produce and the meat on the national level: which has been estimated to be 150 L of milk and 19 kg of meat per head per annum in Pakistan and is far below the recommended dietary allowances level of an individual in most of the advanced countries (Husnain, 2006). Hence, the diet of an average common man in Pakistan is
critically deficient in animal protein. This serious shortage in protein supply can be met by enhancing the meat and milk production in the country. Apropos the present study was planned to explore the factors, which contribute to mortality in calves and adult buffaloes.

MATERIAL AND METHODS

Source of the Data

Records of buffaloes and calves maintained at two Government Dairy Farms situated in Okara (Punjab Province, Pakistan) and Malir (Sind Province, Pakistan) during the period from March 2003 to February 2010 were utilized for the present study. Malir is arid irrigated and the weather is hot humid throughout the year with relative humidity from 55 ± 5 to 65 ± 5. While the Okara is a canal irrigated and climate is relatively dry. Rains usually occur during the months of July to September with relative humidity ranging from 50 ± 1.5 to a maximum of 82 ± 1.6.

Collection of Data

Postmortem examination reports/death reports were consulted thoroughly and related observations were recorded like the name and number of the calf, cause of death, sex, the calf and age of the calf at death. Additional information like, date of birth of a calf, type of birth, season of birth weight of calves at birth, dam’s number and number of abnormal calving (stillbirths and abortions) were also recorded. Other related records were analyzed and observations were recorded age of dam at the time of parturition, the parity number of the dam, herd size, feeding regimes and husbandry practices. Similarly, three age groups of calves made to determine the most critical stage where the mortality was the higher included up to 1 month, 1-3 months and above 3 months.

Miscellaneous group included bloat, heat stroke, heart attack, diarrhea, dystokia, white scour, snake bite and retention of urine, etc.

Statistical Analysis

An effort was made to estimate the various factors causing abortion and stillbirth in buffalo calves and mortality in buffaloes. Effect of environmental factors, viz, herd, year of birth, type of sex and parity number was calculated by Least Square Analysis of Variance using Mixed Model Least Square and Maximum Likelihood Computer Program (Harvey, 1987).

RESULTS

Calf Mortality

The data of calves born from March 2003 to February 2010 showed that the mortality rate of 48.26 and 19.18% between 153 and 840 calves at Malir and Okara farm respectively. The stillbirth rate at Malir farm was 30.64 and 34.88 whereas it was 22.31% and 23.66% at Okara farm in male and female calves respectively (Table 1). The unadjusted means and standard deviation of stillbirth was 7.59 ± 13.49%. The percentage of abortion cases was 67.08, 66.19, 15.68, and 14.06 in male and female calves at Malir and Okara farms respectively (Table 2). The least square analysis variance for abortion indicated that lactation number (parity number) significantly (P < 0.05) affected the abortion rate in calves. The calving during the off-breeding season (November-June) resulted mortality in 18.91, 14.13 in males whereas it was 27.00 and 12.31% at Malir and Okara farm calves respectively (Table 1). The least square analysis variance for abortion indicated that lactation number (parity number) significantly (P < 0.05) affected the abortion rate in calves. The calving during the off-breeding season (November-June) resulted mortality in 18.91, 14.13 in males whereas it was 27.00 and 12.31% in females at Malir and Okara farm calves respectively. The greatest losses (13.21 and 2.24%) were caused due to pneumonia followed by enteritis (9.73 and 4.18%) in female and male calves at Malir and at Okara farm.
**Dam Mortality**

There was a marked and significant rise in the number of deaths among third and sixth lactation at both the farms. The highest cause of death remained dystokia, septicemia and pneumonia beside miscellaneous causes (Tables 4a and 4b).

**DISCUSSION**

**Overall Calf Mortality**

The data showed that the mortality rate was 48.26 and 19.18% among 153 and 840 calves. Both the farms were in two different climatic zones.

### Table 1: The Stillbirth Rate of Buffalo Calves at Two Military Dairy Farms

<table>
<thead>
<tr>
<th>Farms</th>
<th>Male Mortality (%)</th>
<th>Female Mortality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malir</td>
<td>30.64</td>
<td>34.88</td>
</tr>
<tr>
<td>Okara</td>
<td>22.32</td>
<td>23.66</td>
</tr>
</tbody>
</table>

### Table 2: The Abortion Rate of Buffalo Calves at Two Dairy Farms

<table>
<thead>
<tr>
<th>Farms</th>
<th>Male Mortality (%)</th>
<th>Female Mortality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malir</td>
<td>67.09</td>
<td>66.19</td>
</tr>
<tr>
<td>Okara</td>
<td>15.68</td>
<td>14.06</td>
</tr>
</tbody>
</table>

### Table 3: Effect of Parity Number on Mortality % in Adult Buffaloes

<table>
<thead>
<tr>
<th>Parity Number</th>
<th>1&lt;sup&gt;st&lt;/sup&gt;</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt;</th>
<th>3&lt;sup&gt;rd&lt;/sup&gt;</th>
<th>4&lt;sup&gt;th&lt;/sup&gt;</th>
<th>5&lt;sup&gt;th&lt;/sup&gt;</th>
<th>6&lt;sup&gt;th&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malir</td>
<td>5 (5.61)</td>
<td>9 (10.11)</td>
<td>21 (23.59)</td>
<td>16 (17.97)</td>
<td>12 (13.48)</td>
<td>27 (30.33)</td>
</tr>
<tr>
<td>Okara</td>
<td>20 (7.78)</td>
<td>21 (8.17)</td>
<td>54 (21.01)</td>
<td>49 (19.06)</td>
<td>51 (19.84)</td>
<td>62 (24.12)</td>
</tr>
</tbody>
</table>

Note: Gp-I = 3 years; Gp-II = 3.1-8 years; and Gp-III = above 8 years.

### Table 4a: Causes of Mortality in the Dams of Three Age Groups at Malir Farm

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>Gp-I</th>
<th>Gp-II</th>
<th>Gp-III</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mortality</td>
<td>%</td>
<td>Mortality</td>
</tr>
<tr>
<td>Gastroenteritis</td>
<td>4</td>
<td>4.49</td>
<td>5</td>
</tr>
<tr>
<td>Dystokia</td>
<td>2</td>
<td>2.24</td>
<td>3</td>
</tr>
<tr>
<td>Septicemia</td>
<td>6</td>
<td>6.74</td>
<td>8</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>3</td>
<td>3.37</td>
<td>4</td>
</tr>
<tr>
<td>Miscellaneous Causes</td>
<td>5</td>
<td>5.61</td>
<td>8</td>
</tr>
</tbody>
</table>

### Table 4b: Causes of Mortality in the Dams of Three Age Groups at Okara Farm

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>Gp-I</th>
<th>Gp-II</th>
<th>Gp-III</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deaths</td>
<td>%</td>
<td>Deaths</td>
</tr>
<tr>
<td>Gastroenteritis</td>
<td>4</td>
<td>1.55</td>
<td>10</td>
</tr>
<tr>
<td>Dystokia</td>
<td>20</td>
<td>7.82</td>
<td>30</td>
</tr>
<tr>
<td>Septicemia</td>
<td>10</td>
<td>3.89</td>
<td>12</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>4</td>
<td>1.55</td>
<td>10</td>
</tr>
<tr>
<td>Miscellaneous Causes</td>
<td>12</td>
<td>4.66</td>
<td>28</td>
</tr>
</tbody>
</table>

Note: Gp-I = 3 years; Gp-II = 3.1-8 years; and Gp-III = above 8 years.
our study the farm at Okara showed overall low mortality, i.e., 19.18% as compared to at Malir, i.e., 48%.

**Stillbirth**
The pattern of stillbirth was same as the overall pattern of mortality among the two farms however higher mortality was observed in female calves at Malir. The unadjusted means and standard deviation of stillbirth was 7.59 ± 13.49. The least square analysis of variance for stillbirth shows the significant difference ($P < 0.01$) among the two farms. In our study no significant difference between the sex was observed which was in accordance with Parekh and Singh (1981). However, the still births reported by these scientists ranged between 0.67 to 9.2%. Whereas in our study much higher still birth rate (up to 34%) was observed. The variation among the records of the present study may be due to the age and body weight of the dam or the birth weight of the calf as described by Hearnshaw et al. (1984).

**Abortion Rate**
The higher trend of abortion among the male calves was observed on both farms. The data showed that the sex of calves and lactation number (parity number) significantly ($P < 0.05$) affected the abortion rate in calves. However, herd (farms) year of birth did not affect abortion rate ($P > 0.05$). In our study the high abortion rate at Malir is clearly in accordance with Drew (1988).

**Season and Calf Mortality**
Two seasons, i.e., calving season (July-October) and off-calving season (November-June) were selected and observations were made on 317 (male) and 4379 (female) calves born at Malir and Okara farm respectively. In both the seasons the mortality in female calves was higher at Malir, i.e., 24.25% and 27% whereas it was higher in males in Okara in both the seasons, i.e., 25.24% and 14.13%. The season has also been considered as an important risk factor Bebe et al. (2001).

**Causes of Calf Mortality**
Female calves showed higher death percentages at both the farms. The greatest losses (13.21 and 2.24%) were caused due to pneumonia followed by enteritis (9.73 and 4.18%) in female and male calves at Malir and at Okara farms. The results of our study are in line with Verma and Kalra (1974) and Otesile et al. (1983).

**Effect of Parity Number of Mortality in Adult Buffaloes**
Consistent results at both farms, where high trend of mortality among the sixth lactation was observed. At the sixth lactation the age might have contributed to this high mortality.

**CONCLUSION**
In conclusion, the controlling of calf mortality is one of the most important factors for increasing profits from dairy farming. Many research workers conducted their research studies on calf mortality in different regions of the world.

Knowing the risks and understanding common causes of mortality in dams and calves can help producers to implement good management practices to reduce these losses. An effective herd-health and production management program would typically include biosecurity practices to prevent the spread of disease agents, nutrition and preventive health programs to improve disease resistance of buffaloes and calves and optimize reproductive success, and reproductive management practices, to enable timely assistance for dams and calves during calving season. The early death of cow calves affects not only the milk and meat
production but also result in reduction of genetic progress, and disruption of breeding programs due to early mortality of male and female calves. Early mortality reduces the availability of males for the selection and production of quality sire and females for further replacement. Further study is needed to assess the controlling the mortality on early stages.

REFERENCES


