EFFECT OF SEASONS ON THE SEX RATIO AND CALVING FREQUENCY OF BUFFALOES IN BUFFALO RESEARCH STATION, ANDHRA PRADESH

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ABSTRACT
Environmental cues, such as changing day-light or increase temperature, are known to influence the onset of breeding and affect the fertility. The study was based on 247 calvings over a period of 7 years in a buffalo research station maintained at West Godavari district of Andhra Pradesh. Calving records from April 2007 to March 2014 were taken in to account. Sex ratio and calving percentage were studied in winter, summer and rainy seasons. The high percentage of birth rate was recorded during rainy (53%) followed by winter (35%) and summer (12%) seasons. The male to female sex ratio during winter, summer and rainy seasons are 54.9:45.1, 48.3:51.7, and 52.9:47.1 respectively.

Keywords: Buffalo, Calvings, Sex Ratio, Seasons

INTRODUCTION
Buffalo (Bubalus bubalis) is known as the world’s second most important milch animal because it shares more than 95% of the milk produced in South Asia (Javaid et al., 2009). In tropical and subtropical areas, high ambient temperature is the major constraint on animal productivity (Marai et al., 2008) and the effect of heat stress is aggravated when heat stress is accompanied with high humidity (Marai et al., 2008). Seasonality in buffalo reproduction has been reported from India, Pakistan and many other parts of the world (Barile, 2005) which has been attributed to environmental factors more directly than the genetic factors (Zicarelli, 1994). Seasonal high environmental temperatures were found to be associated with low breeding efficiency, when estimating the relationship between ambient temperature and breeding efficiency (Cavestany et al., 1985).

The Buffalo Research Station, Venkataramanagudem is located at upland area where the water source is mainly dependent on rainfall and borewell. The temperature in this area varies from 44°C during sever summer to 10°C during winter. This highly humid area lies between 16.88 latitude to 81.50 longitude of Andhra Pradesh. The animals in this farm are fed with perennial fodder grass along with concentrates and dry grass. Even though these Godavari areas are meant for buffalo population demand for milk is increasing greatly especially during summer season.

Misra and Sengupta (1965) reported that in India, the buffalos sexual vigour declines during the summer and improves with the onset of the colder season. The fertility of buffaloes is significantly influenced by the climatic conditions (Madan and Raina 1987). Shah et al., (1989) stated that the biggest limiting factor influencing the productivity of the buffaloes is the seasonality in displaying oestrus, conception rate and calving rate. Misra et al., (1963) stated that high humidity acts as additional thermal stress in buffalos.

Seasonal high environmental temperatures were found to be associated with low breeding efficiency, when estimating the relationship between ambient temperature and breeding efficiency (Cavestany et al., 1985).

Though seasonality of reproduction is observed in buffaloes, they can come in to estrous and conceive under rigorous summer conditions provided they are well sluiced, allowed to wallow and provided with shade (Mehta et al., 1979).

Zicarelli (1997) observed the resumption of the reproductive cycle took place from September until January. Buffalos calving during an unfavourable season may not resume cyclic ovarian activity until the next favourable season (Jalatge and Buvanendran, 1971). The objective of the study was to document the
calving pattern during different seasons and sex ratio in murrah buffaloes at the Buffalo Research Station, Venkataramanagudem, Andhra Pradesh.

MATERIALS AND METHODS
This work was documented in 247 calvings over a period of 6 years calving records along with sex ratio from April 2007 to march 2014 were taken in to account. The entire year was divided into three seasons i.e Summer (March –June), Rainy (July to October), Winter (November to February). The collected data was tabulated and analyzed using suitable statistical methods.

RESULTS AND DISCUSSION
During the present study the high percentage of births were recorded during Rainy (53%) followed by winter (35%) and summer (12%) seasons. Maximum births are recorded months of September and October. Minimum births were recorded during months of April and May and zero births were recorded during month of June.
Singh et al., (2005) stated that in order to increase the calving frequencies during March to July animals have to come to estrous during these months. The animals should be supplied with adequate green fodder deworming at 20 days interval. Improving the feeding status of buffaloes especially in early lactation, but more so during summer, is a key measure of improving the productive performance of the village buffaloes (Shukla and Supekar, 1983).

Table 1: Number and percentage of calvings in different seasons

<table>
<thead>
<tr>
<th>Calving season</th>
<th>No of calvings</th>
<th>Percentage total births</th>
<th>Male(%)</th>
<th>Female(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter</td>
<td>91</td>
<td>35</td>
<td>50(54.9)</td>
<td>41(45.1)</td>
</tr>
<tr>
<td>Summer</td>
<td>31</td>
<td>12</td>
<td>15(48.3)</td>
<td>16(51.7)</td>
</tr>
<tr>
<td>Rainy</td>
<td>136</td>
<td>53</td>
<td>72(52.9)</td>
<td>64(47.1)</td>
</tr>
<tr>
<td>Total calvings</td>
<td>258</td>
<td>100</td>
<td>137(50.7)</td>
<td>121(46.8)</td>
</tr>
</tbody>
</table>

Table 2: Percentage of calvings in different months of the year

<table>
<thead>
<tr>
<th>Month</th>
<th>Calvings (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>8.52</td>
</tr>
<tr>
<td>February</td>
<td>3.10</td>
</tr>
<tr>
<td>March</td>
<td>1.55</td>
</tr>
<tr>
<td>April</td>
<td>0.77</td>
</tr>
<tr>
<td>May</td>
<td>0.77</td>
</tr>
<tr>
<td>June</td>
<td>0</td>
</tr>
<tr>
<td>July</td>
<td>2.32</td>
</tr>
<tr>
<td>August</td>
<td>17.05</td>
</tr>
<tr>
<td>September</td>
<td>21.07</td>
</tr>
<tr>
<td>October</td>
<td>19.37</td>
</tr>
<tr>
<td>November</td>
<td>14.72</td>
</tr>
<tr>
<td>December</td>
<td>10.07</td>
</tr>
</tbody>
</table>

In the present study highest calving percentage was recorded during rainy season and lowest percent of calving was observed in summer. These results were similar to Kushwaha et al., (2011) Khosla et al., (1984) reported the maximum calving during July to October or in rainy season. Heat stress results in two-fold higher prolactin concentrations in non-sprinkled acyclic buffaloes than those sprinkled with cold water for 2h during mid-day (Kaker et al., 1982). Razdan et al., (1981) suggested the lack of LH surge...
during summer as the main cause of ovarian inactivity. Most (52%) calving were recorded during the rainy months of September to December (Rafidah et al., 2014).

In the present study the male and female percentage ratio during winter, summer and rainy seasons are 54.9:45.1, 48.3:51.7, and 52.9:47.1. According to Reddy et al., (1960) the male to female birth ratio in murrah buffalo was 108.75: 100.

Graph 1: Representation of percentage of calvings during the year

Ghavi et al., (2012) recorded the ratio of males to females was 53:47. Visscher et al., (2004) observed non-significant effects of year and maternal lactational status on fetal sex ratio in the African buffalo and fetal sex ratio was 50.8:49.2 in favor of males.

Conclusion

Buffaloes are seasonal breeder and their reproductive function is affected by environmental factors and there is a decrease in the fertility of postpartum buffaloes inseminated in the summer compared winter. Summer anoestrus is one among the major obstacles hindering the reproductive efficiency in buffalo and causing huge economic losses to the buffalo breeders as well as dairy industry. The plasma levels of LH and estradiol are decreased in heat stressed buffalo and this is one of the factors contributing to low fertility during the hot months of the year.

Heat stress may affect the secretion of the gonadotrophins through mechanisms that modify the synthesis or the secretion of GnRH, the responsiveness of the gonadotrophs to the actions of GnRH or the feedback actions of gonadal hormones. A good and sound management is the best approach to tackle the summer infertility while other interventions like hormonal treatments can be employed with varying success. Attempts should be made to identify effective hormonal regimes for good conception rate rather than better induction of oestrus in summer affected buffaloes.

REFERENCES


