EFFECT OF SEASON OF CALVING ON PRODUCTION PERFORMANCE OF PURNATHADI BUFFALOES

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ABSTRACT
The effect of season of calving on production performance of "Purnathadi" buffaloes was studied. The calving of the buffaloes were not equally distributed in all month of the year. However the maximum number of calving occurred in rainy season followed by winter and summer. Season had significant (P<0.01) effect on the milk yield, lactation length, dry period and calving interval. It was observed that the buffaloes calved during summer season especially in the month of February had longest lactation length (321 days), dry period (249.90 days) and highest milk yield (1205.07 liters) per lactation.

INTRODUCTION
Animal's life has a constant struggle against the forces of nature, and one important force is climate. Climate affects animals, both directly with expression on their systematic function and indirectly by governing the availability of nutrients. Changes in climatic situation prevailing in different season, particularly high ambient temperature and humidity affects all productive function of animal through their heat regulation mechanism. The environmental temperature modify the ability of mammals to secrete milk through affecting the neuro-endocrine system and altering appetite and nutrient intake of animals.

"Purnathadi" a strain of Nagpuri breed of buffalo is a prominent milch animal in Akola district of Vidarbha region.

Vidarbha a region of the Maharashtra state is characterized by hot dry summer and moderately cool winter. The minimum temperature ranges from 12.3 to 27°C and the maximum temperature from 26.2 to 40.8°C along with relative humidity between 73 to 86 per cent. About 33 per cent Vidarbha comes under assured rainfall zone. While in few district the total number of rainy day ranges from 59 to 75 day (Atkare, 1999). With this view, the present study was conducted to know the effect of season of calving on production traits in Purnathadi buffaloes.

MATERIAL AND METHODS
The data comprised of 60 lactation records of 60 Purnathadi buffaloes maintained at Livestock Instructional Farm, Akola from 1979-1998. The data was processed for calculating calving frequency, milk yield in relation to calving season, milk yield per lactation, dry period and calving interval.

In order to find out the effect of climate on milk yield in buffaloes during different season, the data were plotted against the climatic attributes, for this complete year was divided in to 3 seasons as under

\[ \begin{align*}
S_1 & - \text{ Rainy } \quad \text{June - September} \\
S_2 & - \text{ Winter } \quad \text{October - January} \\
S_3 & - \text{ Summer } \quad \text{February - May}
\end{align*} \]

The data on climatic attributes was collected from the University Department of Agronomy (Meteorological observatory) Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. The data were collected in respect of Temperature (°C), Relative humidity (per cent) and weekly rainfall (mm).

The data was analyzed as per procedure recommended by Snedecor and Cochran (1967).

RESULTS AND DISCUSSION
The effect of season of calving on production performance of Purnathadi
Table 1. Production performance of Purnathadi buffaloes in different seasons

<table>
<thead>
<tr>
<th>Season</th>
<th>Month</th>
<th>No.of calvings (with %)</th>
<th>Milk yield (litre)**</th>
<th>Lactation length [Day]*</th>
<th>Dry period [Day]*</th>
<th>Calving interval [Day]*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainy S1</td>
<td>June</td>
<td>15 (4.42)</td>
<td>807.3±34.96</td>
<td>286.2±12.97</td>
<td>167.0±12.46</td>
<td>451.8±16.33</td>
</tr>
<tr>
<td></td>
<td>July</td>
<td>23 (6.78)</td>
<td>736.9±24.83</td>
<td>282.2±10.78</td>
<td>167.0±15.49</td>
<td>436.7±15.56</td>
</tr>
<tr>
<td></td>
<td>August</td>
<td>48 (14.66)</td>
<td>778.6±20.80</td>
<td>269.1±7.79</td>
<td>163.0±12.04</td>
<td>433.4±9.65</td>
</tr>
<tr>
<td></td>
<td>September</td>
<td>79 (23.31)</td>
<td>798.4±16.84</td>
<td>279.8±5.84</td>
<td>178.0±5.46</td>
<td>451.2±8.83</td>
</tr>
<tr>
<td>Total S1</td>
<td></td>
<td>165 (48.68)</td>
<td>793.2±11.05a</td>
<td>276.3±4.65a</td>
<td>169.7±5.54a</td>
<td>443.6±4.58a</td>
</tr>
<tr>
<td>Winter S2</td>
<td>October</td>
<td>53 (15.63)</td>
<td>973.2±17.35</td>
<td>297.0±6.82</td>
<td>195.1±10.69</td>
<td>481.5±11.61</td>
</tr>
<tr>
<td></td>
<td>November</td>
<td>41 (12.09)</td>
<td>1033.5±21.81</td>
<td>305.0±26.36</td>
<td>220.5±13.45</td>
<td>517.4±14.45</td>
</tr>
<tr>
<td></td>
<td>December</td>
<td>26 (7.67)</td>
<td>1005.2±23.58</td>
<td>310.5±11.16</td>
<td>226.2±15.06</td>
<td>539.0±19.76</td>
</tr>
<tr>
<td></td>
<td>January</td>
<td>17 (5.02)</td>
<td>1014.5±27.19</td>
<td>306.1±15.00</td>
<td>232.0±25.75</td>
<td>526.9±26.73</td>
</tr>
<tr>
<td>Total S2</td>
<td></td>
<td>137 (40.41)</td>
<td>1014.5±27.19</td>
<td>302.0±4.70b</td>
<td>231.0±20.40b</td>
<td>510.4±8.32</td>
</tr>
<tr>
<td>Summer S3</td>
<td>February</td>
<td>13 (3.83)</td>
<td>1205.0±65.48</td>
<td>321.0±20.40</td>
<td>249.9±30.33</td>
<td>557.4±21.8</td>
</tr>
<tr>
<td></td>
<td>March</td>
<td>11 (3.24)</td>
<td>1145.2±70.74</td>
<td>317.5±17.82</td>
<td>239.2±44.57</td>
<td>532.3±45.69</td>
</tr>
<tr>
<td></td>
<td>April</td>
<td>06 (1.77)</td>
<td>1094.5±73.94</td>
<td>320.5±21.58</td>
<td>220.2±13.41</td>
<td>518.2±19.88</td>
</tr>
<tr>
<td></td>
<td>May</td>
<td>07 (2.06)</td>
<td>1058.1±46.42</td>
<td>301.5±16.23</td>
<td>213.1±21.13</td>
<td>511.6±30.18</td>
</tr>
<tr>
<td>Total S3</td>
<td></td>
<td>37 (10.91)</td>
<td>1144±34.13c</td>
<td>315.6±10.29</td>
<td>325.0³22.02c</td>
<td>534.3±20.97c</td>
</tr>
<tr>
<td>Mean±S.E.</td>
<td></td>
<td>339 (100.00)</td>
<td>915.7±10.15</td>
<td>299.9±3.06</td>
<td>195.4±4.96</td>
<td>496.3±12.49</td>
</tr>
</tbody>
</table>

Different superscripts in different columns differs significantly
* P<0.05, ** P<0.01

buffaloes are presented in Table 1.

Production performance of Purnathadi buffaloes in different seasons

Lactation length: The average lactation length in Purnathadi buffaloes ranged between 269 to 321 days with mean of 291.99±3.06 days which appeared slightly shorter than that of the standard lactation length of 305 days. The present findings were higher than the findings reported by Kaikini and Pargaonkar (1969), Duddalwar (1989) and Bire et al. (1994) for Berari buffaloes, whereas slightly more than Murrah buffaloes as reported by Das and Balaine (1985).

Calving pattern: The calving of the buffaloes were not equally distributed in all months of the year. The maximum calving (48.68 per cent) took place in rainy season with minimum percentage of calving (10.91) in summer season. There was no significant influence of season on calvings, indicating that Puranathadi buffalo could be a regular breeder and the frequency of calving could be adjusted equally through out the year. The maximum number of calvings occurred in the month of September (23.31 per cent) followed by October (15.63 per cent) and November (12.09 per cent). The present findings suggested that the favourable period of calving in buffaloes could be from August to November, which are in agreement with Tomar and Tomar (1960); Kadu et al. (1978) and Dani and Gaikwad (1972). It was also observed that maximum per cent of calving in buffaloes was in rainy season followed by winter and summer. The present trend was similar to the trend reported by Pereira and Prasad (1986), Singh et al. (1991) and Rao and Rao (1996).

Milk yield: The average milk yield ranged between 778.62 to 1205.07 liters with the mean of 915.70±10.15 liters. However, the lactational milk yields of Nagpuri buffaloes reported by Pargaonkar (1969), Khire et al. (1983) and Bire et al. (1994) are higher than the present values. While the yield of 819.10 kg was reported by Duddalwar (1989) for Berari buffaloes which was lower than the present value. It was observed that the summer calver produced significantly highest (P<0.01) milk yield (1144.60±34.13) followed by winter calver (1014.52±71.98 liter) and rainy calver (793.20±11.05 liter). Probably, the favourable condition for milk production in terms of feed and fodder might be available to summer calvers during their peak yield period i.e. in the month of June-July. The observations of the present study are also similar to the findings reported...
by Tomar and Tomar (1960); Ambalkar (1971) and Dani and Gaikwad (1972). It was also noticed that buffaloes calved in the month of February and March produced more milk than rest of the month calvers (Tomar and Tomar, 1960; Sharma and Singh, 1974). The season of calving showed significant (P<0.05) effect on lactation length. The summer calvers had the longest lactation length of 315.67±10.29 days followed by winter calvers (302.07±4.70 days) and rainy calvers (276.35±4.65 days).

Dry period: The mean dry period in Purnathadi buffaloes was 195.49±4.96 days with a range from 163.02 to 249.96 days which clearly indicates that buffaloes remained dry for more than 6 months which is substantially higher than that of recommended practice of 2 to 4 months. The dry period can be kept within normal limits by adapting proper feeding and management practices particularly detection of heat in order to minimize the dry period. In this context, the past workers like Ambalkar (1971), Goley (1971), Deb and Kadu (1977) and Khire et al. (1983) pointed out that the Berari buffaloes were regular breeder, maintaining a dry period between 105.05±5.12 to 150.09±2.59 days. Their observation also support the contention that the dry period could be controlled with proper management approach. However the observation for dry period reported by Siddiquee et al. (1984), Giri (1987), Duddalwar (1989) and Bire et al. (1994) are in close agreement with present trend.

With regard to the effect of season of calving on dry period, it was observed that there was significant increase (P<0.05) in dry period of rainy calver (169.70±5.54 days) while summer calvers had significantly (P<0.05) highest dry period i.e. 225.03±22.02 days. Similar findings were reported by Ambalkar (1971) and Umrikar and Deshpande (1985) who reported significant effect of month and season of calving on dry period in Nagpuri buffaloes. However the findings of Rao and Rao (1994) are contradictory to present trend.

It was observed that the season of calving significantly (P<0.05) affected the intercalving period. The rainy calvers had shortest calving interval (443.65±4.58 days) than that of winter and summer calvers. Moreover the summer calvers recorded significantly longer values of calving interval i.e. 534.43±20.97 days. The present observation are in agreement with the findings of Gurani et al. (1976); Pargaonkar and Kaikini (1977) and Rao and Rao (1994).

**CONCLUSION**

The buffaloes are seasonal breeders. This same trend was also observed in Purnathadi buffaloes, therefore the calving frequency in summer season was lowest. However the dry period can be kept within normal limits by adapting proper feeding and management practices particularly detection of heat in order to minimize the dry period in Purnathadi buffaloes of the Vidarbha region.

**REFERENCES**


