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Effect of season of calving on reproductive characteristics of Murrah buffalo at organized dairy farm

Pankaj Gunwant, AK Pandey, Ramkaran and Praveen Kumar

Abstract
Buffaloes trends to reproduce mainly in winter season as compared to summer season in tropical and subtropical countries. Reproductive efficiency is the primary factor affecting productivity of water buffaloes. Therefore, the present investigation was designed with the objective to study the effect of season of calving on reproductive characteristics of Murrah buffaloes in India. Murrah buffaloes (190) maintained at organized dairy farm were included in the study and it was observed that season of calving significantly (p<0.05) effects first intercalving interval and service period. However, no significant association was found with other traits. Thus, buffaloes calved in summer season had longer intervals from calving to estrus and subsequent conception.

Keywords: Murrah buffalo, reproductive characteristics, organized dairy

Introduction
India ranks first in milk production as well as in buffalo population in world. Water buffalo is one of the most important dairy animals concentrated largely in tropical and sub-tropical countries. Buffalo can survive on poor quality forage and adapt to harsh environmental conditions but seasonal pattern of reproduction is one of the main prominent factor responsible for poor reproductive efficiency of buffaloes. In equatorial zone, buffalo exhibit estrous throughout the year, but become seasonally polyestrous with distance from the equator and it may be attributed to the environmental factors and photoperiod (Perera, 2011; Zicarelli, 1994) [6, 10]. Water buffaloes exhibits seasonal pattern in terms of expression of estrous and calving. Further, buffalo calved in summer season had longer intervals from calving to estrus and conception indicating that season of calving influenced the intervals from calving to estrus and conception (Abayawansa *et al*., 2011) [1]. In subtropical countries like India, hot and humid environment conditions during summer months adversely affect the reproduction as well as production potential of buffalo. Therefore, the present study was designed to investigate the effect of season of calving on reproductive characteristics of Murrah buffaloes.

Materials and Methods
In the present study 190 Murrah buffaloes, calved for the first time (1st parity) were used and date of calving of each buffalo was recorded. These buffaloes were maintained at two organized dairy farms located in Hisar, Haryana, India. Only buffaloes those calved normally were included in the study. These buffaloes were fed as per standard feeding regimen meeting the requirement of adult lactating animals. Buffaloes were inseminated at standing oestrous and pregnancy diagnosis was performed by experienced veterinarian 90 days post insemination. The reproductive activity of all the buffaloes between first and second calving was observed and recorded. Further, various traits such as interval between first and second calving (first calving interval), interval between calving to next conception (Service period), peak milk yield and total milk yield in entire period were studied. Moreover, age at first conception and age at first calving were also recorded from record register and analyzed. Keeping in view the climatological data, the period of calving was divided into two seasons: winter (August to January) and summer (February to July). Statistical analysis was carried out on subpopulation of all the buffaloes using the Stasticial package for social sciences, version 16. Numerical data are presented as mean ± SD. Differences at a p-value less than 5% (P<0.05) was considered statistically significant. Analysis of variance was used to analyze the association between various seasons and reproductive characteristics (first calving interval, Service period, peak milk yield, total milk yield, age at first conception and age at first calving).

Results and Discussion

The overall mean with standard deviation of different traits of Murrah buffaloes during summer and winter season are summarized in Table 1. The average intercalving interval reported in the study was 479.58 days and is in agreement with Hussain *et al* (2006) [3] and Charlini and Sinniah (2015) [2]. The overall service period in Murrah buffaloes was 161.58 days and similar findings were reported by others (Kukde and Gire, 1992) [4]. Although values for calving interval and service period reported in present literature, is much longer than the optimum value expected for buffaloes. Therefore, efforts must be taken to reduce the calving interval and service period through better management of both nutrition and breeding.

Table 1: Average intercalving interval

Parameters	Summer season	Winter season
Age at first conception	936.92±222.05	906.61±222.90
Service period	119.88±69.61	197.32±107.16*
First calving interval	431.92±72.60	520.43±113.80*
Age at first calving	1285.83±234.05	1278.00±262.54
Total milk yield	248.2±479.57	241.4±617.64
Peak yield	10.89±1.91	11.14±1.86

*(p<0.05) differ significantly within row

The present study demonstrated that season of calving effects first intercalving interval and service period with overall means being significantly higher (p<0.05) in buffaloes those calved in winter as compared to those calved in summer season. The results of the present study are consistent with earlier reports in this species (Naqvi, 2000; Charlini and Sinniah, 2015) [5, 2]. However, Shafiq and Usmani, (1996) [9] reported that season of calving has no significant effect on service period. In the present study, no seasonal effect on age at first conception and age at first calving was reported. Thus it could be suggested that season has a very marked effect on inter-calving interval and service period such that buffaloes calved in the days with shorter photoperiod (winter season) have longer intercalving intervals as compared to those calved during days with longer photoperiod (summer season). Buffaloes calved during winter season did not show first partum estrous into that season and may undergo summer anestrous. Indeed, resumption of reproductive activity in these buffaloes was delayed until there was a significant reduction in daylight hours and consequently, resulting in longer service period and inter-calving period. Furthermore, previous studies also reported that buffalo cows exhibit a longer postpartum anoestrus during days with increasing day length (Presicce *et al.* 2004; Presicce 2007) [8, 7]. Therefore, summer anestrous contribute considerably to service period and intercalving interval in buffaloes those calve during winter season as compared to summer season.

The results of the present study depict that total milk yield and peak yield was not influenced by season of calving in Murrah buffaloes in India. Charlini and Sinniah, (2015) [2] reported that Milk yield in buffaloes was unaffected by breed, age at first calving, calving interval, parity, dry period, lactation length, sex of calf, season of calving and year of calving. Productive performance of animal is generally affected by nutritional and managemental conditions. The non significant association between season of calving and milk production performances observed in the present study may be attributable to the fact that all the animals in the farm are fed as per standard feeding regimen, meting the requirement of the animals and under appropriate managemental conditions.

In conclusion, season of calving affects the intercalving interval and service period in Murrah buffaloes in subtropical region of India. However, no significant seasonal effect was reported with respect to other productive and reproductive traits in Murrah buffaloes. Better feeding and managemental practices may be opted for optimum calving interval and service period.

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