Seasonality of calving in Jaffarabadi buffaloes

SN Ghodasara*, KS Murthy, PU Gajbhiye and AR Ahlawat
Cattle Breeding Farm, Junagadh Agricultural University, Junagadh-362001 (Gujarat)

ABSTRACT

The pattern of calving in Jaffarabadi buffaloes was analysed in an organized farm. Calving records of 616 Jaffarabadi buffaloes were used. Season and month had significant ($p<0.01$) effect on calving. Calving frequency was higher during rainy season (45.45%) in Jaffarabadi buffalo followed by autumn (23.86%). Lowest percentage of calving (7.31) was observed during summer season. September (18.02) and August (15.58) had maximum percentage of calving followed closely by October (14.61%). July, November, December and January months recorded 11.85, 9.25, 7.63 and 5.51 % of calving, respectively. Pattern of calving is similar to other breeds of buffaloes throughout the country and photoperiodicity seemed to play greater role in influencing season of calving.

Key word: calving; season; Jaffarabadi buffalo; photoperiodicity

*Corresponding author: Email : dr_sanjayvet@yahoo.co.in

INTRODUCTION

Since buffaloes contribute 54 per cent of total milk production in the country, season of calving is a major concern in buffalo production as it affects milk production spread throughout the year thus creating lean months with little income for dairy farmers and under utilization of established dairy plants. This is true for most of the breeds of Indian buffaloes. Jaffarabadi buffaloes are heavy dairy animals of Saurashtra region producing around 2200 litres milk per lactation. Milk of this breed is prized for its high fat (7-8%) and larger fat globular size suitable for ghee making and higher total solids content (17-19%) preferred for khoa making. Under field conditions, similar to other Indian buffalo breeds, majority of calving in Jaffarabadi occurs during the months of July-September, resulting in exodus of these animals from rural areas to urban areas during these months. Of interest to this present investigation is the pattern of calving in Jaffarabadi buffaloes recorded in an organized dairy farm.

MATERIALS AND METHODS

A herd consisting of 250 Jaffarabadi buffaloes and followers is maintained at the Cattle Breeding Farm, Junagadh Agricultural University, Junagadh. The animals are maintained under iso-managerial conditions and feeding. Buffaloes are hand milked twice daily and calves are allowed to suckle. Data on 616 calvings of Jaffarabadi buffaloes on the farm were used for this study. Data included calvings over a period of 12 years from 2001 to 2012.Year was divided into five seasons: winter (December to January), spring (February to April), summer (May to June), rainy (July to September) and autumn (October to November). The statistical analysis of data was done using SPSS Ver. 13.

RESULTS AND DISCUSSION

Maximum number of calving occurred during the months of September and August (18.02 and 15.58 percent, respectively), followed by October (14.61 percent) (Table 1). Calving in the months of July, November, December and January were 11.85, 9.25, 7.63 and 5.51 percent, respectively. The period between February to June represented the lean season for calvings (2.4 to 4% only) in the herd (Fig. 1). With respect to various seasons, highest percentage of calvings (45.45) took place in rainy season (July to September), followed by autumn (23.86) and winter seasons (13.14). The lowest percentage of calving was recorded in spring (10.39) and summer (7.31) (Fig. 2). Month and season had significant effect ($P<0.01$) on calving.

Table 1. Percent calvings in different months and seasons of a year

Month of calving	No of buffaloes calved	(%)buffalo calved	Season of calving	Percentage of buffaloes calved
February	25	4.06	Spring	10.39
March	15	2.44		
April	24	3.90		
May	24	3.90	Summer	7.31
June	21	3.40		
July	73	11.85	Rainy	45.45
August	96	15.58		
September	111	18.02		
October	90	14.61	Autumn	23.86
November	57	9.25		
December	46	7.47	Winter	12.99
January	34	5.51		

Rainy and the autumn seasons were the major calving seasons for buffaloes, when around 70% of the calvings took place, as is evident from the analysis of the data of Cattle Breeding Farm (Table 1 and Figs 1 and 2). The findings of the present study were in concurrence with those of Kushwaha et al. (2011) in Bhadawari and Murrah breeds and Hassan et al. (2007) and Hussain (2007) in Nili Ravi buffaloes in Pakistan. also reported the main calving period between July to December in Murrah, Pandharpuri, Jaffarabadi and Surti buffaloes in Haryana, Maharashtra, Gujarat and Rajasthan states, respectively (Anonymous, 2008). Sule et al. (2001) confirmed a distinct seasonality in breeding behaviour in Surti buffaloes reared in Rajasthan. Monthly and seasonal calving pattern of Jaffarabadi indicated that buffaloes calved round the year but had a distinct tendency to calve more during the rainy season (July to September) followed by the winter (October to January). Summer appeared to be unfavourable season for buffalo reproduction. Reddy et al. (1999) also reported August to November as the most favourable period for reproduction in Murrah buffaloes. El-Sheikh (1987) reported that more than 63% calvings in Egyptian buffaloes occurred during the colder season. Agarwal (2003) reported that environment is a determining factor in production and reproduction of farm animals all over the world. Season affects breeding efficiency and buffaloes have a tendency to perform better during cooler months (70- 80% of calving in buffalo occur between July and January). Misra and Sengupta (1965) observed that in India, sexual vigour in buffaloes declined during the

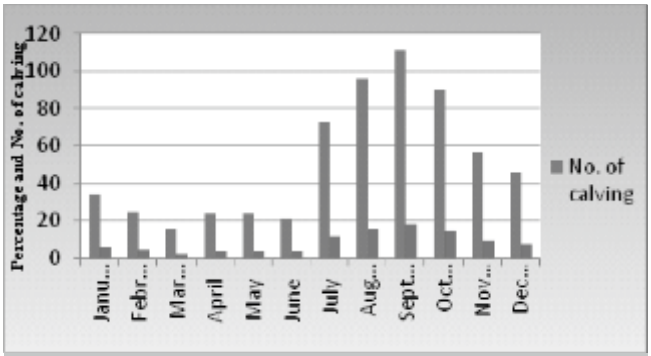

Fig. 1 Percentage and total number of calving in Jaffarabadi buffaloes during last 12 years

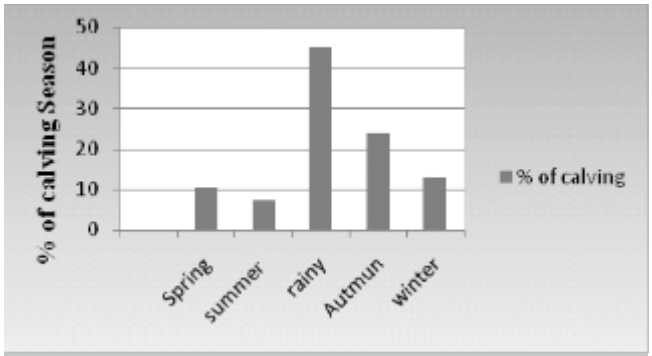

Fig. 2 calving percentage of Jaffarabadi buffalo in different season

summer and improved with the onset of the colder season. .

According to Shah et al. (1989), high environmental stress together with under-nutrition (during summer season, farmers underfeed due to non-availability of fodder) might be responsible for the long periods of seasonal anoestrus in buffaloes. Similar affects of these factors on oestrus activity were also reported by McCool et al. (1987) in Australian swamp buffaloes. However, Borghese (2005) reported that the reproductive seasonality in buffaloes did not seem to depend on diet, food availability or metabolic status, while climate and particularly photoperiod, depending on Melatonin secretion played a vital role. Parmeggiani et al. (1993, 1994) found high levels of Melatonin during the night and persistency of these levels was clearly related to photoperiod: they were the highest in December and decreased progressively from March-April to June. Borghese et al. (1995), also reported, in a study on buffalo heifers and cows in Italy, that the melatonin concentration showed remarkable differences between seasons. In June (the summer) the lowest value and least persistency of Melatonin peak were found because of shorter nights, while higher values were noted at the equinoxes, particularly in September, the month corresponding to the start of hypothalamus pituitary- ovarian axis activity.

From the present study, it was clear that Jaffarabadi buffaloes in the Saurashtra region of Gujarat followed a similar seasonal calving trend as detected in other breeds in different parts of the country as well as most parts of the world. The seasonality in calving observed in this breed of buffaloes indicates that the photoperiodicity in different seasons played a greater role than the diet, since these animals were maintained under iso-managerial conditions and fed properly throughout the year. Keeping in view the relationship between photosensitivity and seasonal reproductive behaviour in buffaloes, one should not neglect optimum feeding regimen of concentrate and cultivated green fodder throughout the year with proper housing for economical buffalo production and to minimize the effect of season of calving.

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