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Calving trend in mithun

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Mithun (*Bos frontalis*) is a semi-wild, free–range, rare bovine species in the North-Eastern hill (NEH) region of India (Simoons 1984). Calving trend depends on forage production, incidence of diseases, mortality rate and calving to conception interval. Starting of the breeding season at or just prior to peak native forage production are important to enhance conception rate, excellent calving conditions, reduce calf mortality and faster return to estrus. In Nagaland, the forage production indirectly influences the breeding and subsequent calving trend of mithun. Therefore, a retrospective data analysis of calving trend was done to identify grounds for suitable management provision to enhance breeding efficiency in mithun.

The study was conducted at the National Research Centre on Mithun, Indian Council of Agricultural Research (ICAR). The retrospective study on calving trend was carried out in the herd of mithun maintained at Jharnapani Mithun Farm, NRC on Mithun (ICAR), Nagaland, to take appropriate measures such as fodder cultivation, preventive measures against different reproductive ailments and various disease condition to enhance overall reproductive efficiency in future course of management. The calving data from 2002 to 2012 were collected and analysed.

The results revealed that highest birth rate was observed in September followed by December and January and lowest was in May and June. The birth rate increased from July to January and then declined to June (Table 1) and broadly, maximum calving was recorded in winter and lowest was in summer. Sex of calf varied between the months. Highest percentage of male calf was born in August and October (71.42%) and lowest was in December (27.27%), whereas highest percentage of female calf was born in December (72.73%) and lowest was in August and October (28.58%) (Table 1), though it is said that Mithun bred throughout the year and no definite breeding season was observed but the trend of calving at mithun farm Jharanapani compel us to speculate that some sort of seasonality do exist in mithun. Even in semi-intensive condition most of the breeding took place in jungle itself and mithun farm records indicated that maximum calving took place in January and February, i.e., most of the breeding might have taken place in April; and similarly lowest calving recorded during May and June means a very small number of animals had been in estrus in August to October considering the gestation length of mithun varies from 270 to 290 days. Proper jungle vegetation is available throughout the year and in lean period the animals were compensated with supplementary feed at farm in semi-intensive condition. Further, it could be contemplated that temperature and humidity might be affecting the sexual desire of the animal as comparatively lesser number of animals bred during the period of heavy rain fall i.e. August to October, which might scare the animal to exhibit estrus behaviour as it is also observed in cattle in

Table 1. Month wise calving percentage and percentage male and female calf born

Month	Sex	No of calves	Total no. of calves
January	Male	5 (45.45%)	11 (11%)
	Female	6 (54.55%)	
February	Male	4 (44.44%)	9 (9%)
	Female	5 (55.56%)	
March	Male	5 (62.50%)	8 (8%)
	Female	3 (37.50%)	
April	Male	5 (62.50%)	8 (8%)
	Female	3 (37.50%)	
May	Male	3(50.00%)	6 (6%)
	Female	3 (50.00%)	
June	Male	2 (40.00%)	5 (5%)
	Female	3 (60.00%)	
July	Male	3 (42.86%)	7 (7%)
	Female	4 (57.14%)	
August	Male	5 (71.42%)	7 (7%)
	Female	2 (28.58%)	
September	Male	9 (69.23%)	12 (12%)
	Female	4 (30.77%)	
October	Male	5 (71.42%)	8 (8%)
	Female	2 (28.58%)	
November	Male	2 (28.58%)	8 (8%)
	Female	5 (71.42%)	
December	Male	3 (27.27%)	11 (11%)
	Female	8 (72.73%)	

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other parts of India, though this is the flush season when they get abundant of green grass, fodder, herbs and shrubs in jungle. Maximum number of animals bred in April and May i.e. months of low rain fall and there is bit paucity of the fodder but that might have compensated with concentrate ration fortified with salt and mineral mixture in semi-intensive condition.

Though the mithun is polyestrous animal and adult female shows repeated estrus cycle after every 19–24 days interval with silent oestrous without bellowing and having standing heat period ranging from 4–16 h. The expression of estrus behaviour is silent in mithun unlike cattle it is difficult to detect heat in female mithun by clinical symptoms (Mondal *et al.* 2008). To establish that the mithun is also a seasonal breeder like yak in the same agro-ecological climate of north eastern hill of India, it warrants further study involving detail study of endocrinological profiles of different hormones of the animal throughout the year in a larger population in semi-intensive condition and also incorporation of field data obtained from the mithun rearing farmers as mithun thrives on the jungle forages, tree fodders, shrubs and herbs. Farmers do not provide any additional feeding. Though the animals are owned by the farmers, they are kept under natural forest in a semi-wild condition (Das *et al.* 2011). However, farmers occasionally provide common salt, especially at the time of restraining for local animal husbandry practices. As the mithun entirely depends on the locally available jungle fodders and in steep hilly slope, the leaching of mineral elements is a common phenomenon especially during rainy season. Therefore, in a particular hilly grazing gradient, the soil will be deficient in some important mineral elements. In that case, the vegetation of that particular area will also be deficient in some of the mineral elements, inducing mineral deficiency (Das *et al.* 2011), which probably affects estrus exhibition in rainy season too. However, the salt licking behaviour as well as drinking of mineral water sources in the hills is the natural way to meet the requirement of minerals in these animals (Prakash *et al.* 2013). Mithun being the endemic species and heavily built massive animal which is found only in the few states of the NEH region demands the timely care and attention at all levels to enhance reproductive efficiency of the animals.

SUMMARY

The present retrospective study was conducted to assess the calving trend in mithun in semi – intensive. The calving data were collected from 2002 to 2012 from the calving register of mithun farm. The data were analysed month-wise, season-wise and sex ratio in month wise. Results revealed that highest birth rate was at September followed by December and January and lowest in May and June. Maximum calving rate was in winter and lowest was in summer. Highest percentage of male calf was born in August and October (71.42%) and lowest in December (27.27%), whereas highest percentage of female calf was born in December (72.73%) and lowest in August and October (28.58%). The result of calving trend at mithun farm, compel us to speculate that some sort of seasonality do exist in mithuns.

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