PJBS

Pakistan
Journal of Biological Sciences

A Comparative Analysis on Factors Affecting Calf Mortality of Buffalo in a Breeding Farm

[1]M.R. Khatun, [2]Md. Arifuzzaman and [2]A. Ashraf
[1]Animal Biotechnology Division, National Institute of Biotechnology, Dhaka, Bangladesh
[2]Biotechnology and Genetic Engineering Discipline, Khulna University, Khulna, Bangladesh

Abstract: Study of calf mortality was carried out on three breeds of buffalo in a buffalo breeding and development farm. There were three types of buffalo such as Nili-Ravi, Indigenous and their crosses were reared here. Data for this study had been taken from record registrar books maintained in the farm. One hundred thirty one dead calves were studied for mortality. Pure Nili-Ravi showed higher mortality rate. The highest life span of dead calves was found as 717 days in Nili-Ravi and lowest 1 day in all breeds. The effect of breed on the life span of dead calves was insignificant ($p > 0.05$). Furthermore, female calves are more prone to death as compared to male counterpart.

Key words: Buffalo calf, calf mortality, Nili-Ravi, Indigenous

INTRODUCTION

Water buffalo with different characteristics classified into two genetic groups. One is River buffalo (*Bubalus bubalis*) primarily used for milk production and the other is Swamp buffalo (*Bubalus carabanesis*) used for meat and work. The milk and meat production from buffaloes were 96000 and 16000 MT in 2005 (DLS, 2006). Calf plays an important role in the development and profitability of a farm, as future of a dairy herd solely depends upon the successful raising of young calves. Healthy calves are not only essential for sustenance of the dairy industry but essential for preserving and maintaining good quality germ plasm also. Heavy losses of young buffalo calves throughout the world are caused, in large measure, by the roundworm *Toxocara vitulorum*. Common symptoms are diarrhea (or alternating diarrhea and constipation), dehydration, dullness, weakness, coma and finally death (Ligda, 1997, 1998). Among above symptoms diarrhea is one of the major causes of neonatal calf mortality (Khan and Khan, 1991).

Survival of neonatal calves is imperative for livestock propagation; however, a large number of calves die during the first year of their life causing heavy drain on the economics of livestock production. A heavy toll of neonates has been reported in buffalo calves, particularly during first three months of their postnatal life (Jain, 2005). However, environmental and management factors hasten the occurrence of such conditions (Khan and Khan, 1991). Monsoon is most susceptible season to calf disease and mortality (Islam *et al.*, 2005). Calf mortality is associated with the type of housing, feeding, management practices, weather, external and internal parasitic infestation and bacterial infections especially those causing septicaemia and enteritis (Radostits *et al.*, 1994). Colostrum helps neonatal calf to make a defense against infectious disease. In commercial dairy farm owners did not feed the colostrum timely. They waited for the expulsion of placenta and on many occasions the animal did not release placenta for more than 7-8 h, thus the colostrum feeding was delayed, leading to lowered immunity level in calves and susceptible to disease (Ahmad *et al.*, 2009).

The number of buffalo in the coastal area is highest within Bangladesh, it is 250 per household (Faruque, 2000). Buffalo Breeding and Development farm, Bagerhat was established in 1985. Buffalo population here consisted of Nili-Ravi and Indigenous (Deshi) river type and their crosses. Female calves are especially kept for herd replacement and male calves are for bull development. The aim of this farm is to produce outstanding buffalo bulls and cows for increasing the productivity of these animals in order to service common people in the country. Mortality of young calves of different breeds became a problem for sustaining the farm. The purpose of this research is to find out whether different breeds had any effect on excessive calf mortality.

MATERIALS AND METHODS

Farm: Buffalo Breeding and Development farm is a government farm located at Fakirhat thana in Bagerhat district. The farm is in the coastal area of the country. The

Corresponding Author: Scientific Officer, Animal Biotechnology Division, National Institute of Biotechnology, Gonokbari, Savar, Dhaka-1349, Bangladesh

farm was supervised and managed by a Manager who was assisted by an Assistant Manager and a Fodder Cultivation Officer. Animals were housed in tied up tail-to-tail system, with a high raised manger in which the animals were fed. There was one cemented water tank for every two animals. Animals were washed once or twice a day in a lake inside the farm. Animals were fed roughage two or three times a day and also provided concentrate mixture consisting of wheat bran/rice bran, oilcake and salt. The quality of concentrate fed varies depending on sex and age.

Animals: The buffaloes were identified by ear tag. Record of traits of buffalo was maintained in the farm. Buffalo calves were fed nearly 1.0 to 1.5 L colostrums daily followed by milk in gradually decreasing quantity up to 30 days before introduction of calf starter. Calves were being kept in individual pens for the first month. The pens were easy to keep clean, with shelter from direct sunlight, rain and drought. Fresh and clean water were being supplied to the calves at all times. Vaccination and administration of de-worming agents were being given timely. In spite of these careful measures a number of buffalo calves died every year. One hundred thirty one dead calves within one year of age were considered for calf mortality.

Data and statistical methods used: Information had been taken from the registrar of different reproductive traits maintained in the farm. The study was carried out from January 2003 to July 2003 at Buffalo Breeding and Development farm, Bagerhat and Biotechnology Discipline, Khulna University. Data were analyzed with the SPSS computer program and variability was analyzed with one way Analysis of Variance (ANOVA). A p-value 0.05 was considered significant.

Calf mortality: The percentage of calf died in a specific group from total death is called mortality rate. And the number of days those calves remain alive from their birth is called lifespan of dead calves. Higher mortality rate is a serious problem in river buffalo husbandry. Mortality in neonatal calves has mostly been attributed to infectious agents, i.e., rotavirus, coronavirus, enteropathogenic *Escherichia coli*, *Salmonella* species and cryptosporidium enteric flora of ruminants (Snodgrass *et al.*, 1986). Neonatal calf mortality in the first month of age may be up to 84% of the total mortality (Jenny *et al.*, 1981). The study investigated calf mortality in respect of breeds and sex.

RESULTS

Though the feeding and management of the farm were appeared well, heavy loss of young buffalo calves was a serious problem in the farm. In the study calf mortality and life span of those dead calves were studied on the basis of breeds and Sex. One hundred thirty one (131) dead calves of three breeds were considered for mortality study. Nili-Ravi, 75% Nili-Ravi cross and 50% Nili-Ravi cross breed showed 48.85% (64/131), 34.35% (45/131) and 16.79% (22/131), respectively (Table 1). Incidence of death occurred mostly in first month of their age. Among the breeds mortality rate in the period was highest in 75% Nili-Ravi cross (48.8%) next to this score 50% Nili-Ravi cross showed significant mortality rate (31.8%) and pure Nili-Ravi breed showed lowest mortality rate (26.5%). Though pure Nili-Ravi had lower mortality at first month of age overall mortality was higher in their first year of age. In early age immune system of a young calf is under development. Colostrum can provide passive immunity only against those diseases for which a dam possesses antibodies. Mortality was downward with aging with some up and down (Table 2). Death had committed at different time in early stage of life. The maximum life span of dead calves in three breeds were 717 days, 643 days and 603 days and mean life span with standard errors were 176.45±24.95, 182.59±44.95 and 146.91±24.71 in Nili-Ravi, 50% Nili-Ravi cross and 75% Nili-Ravi cross, respectively. The minimum life span (1 day) was found in all breeds (Table 3). The least square analysis of variance showed that the effect of breeds on life span of dead calves was insignificant (p>0.05) (Table 4). Sex of calf also affected the rate of

Table 1: Percentage of total mortality in different breeds

Breeds of calves	No. of observation	Mortality rate (%)
Nili-Ravi	64	48.85
50% Nili-Ravi×50% Indigenous	22	16.79
75% Nili-Ravi×25% Indigenous	45	34.35

Table 2: Percentage of mortality at different period in respect of breeds

Breeds of calves	No. of observation	Mortality rate (%)					
		Birth to 30 days	31-90 days	91-150 days	151-270 days	271-420 days	421-720 days
Nili-Ravi	64	26.5	25.0	9.50	15.60	7.80	15.60
50% Nili-Ravi×50% Indigenous	22	31.8	27.2	4.54	9.09	4.54	22.72
75% Nili-Ravi×25% Indigenous	45	48.8	6.6	11.11	8.88	20.00	6.66

Table 3: Average life span (days) of dead calves of Nili-Ravi and their crossbred

Breeds of calves	No. of observation (N)	Range			
		Mean	Std. Error	Minimum	Maximum
Nili-Ravi	64	176.45	24.95	1	717
50% Nili-Ravi×50% Indigenous	22	182.59	44.95	1	643
75% Nili-Ravi×25% Indigenous	45	146.91	24.71	1	603
Total	131	167.34	16.58	1	717

Table 4: Analysis of variance for life span of dead calves

Breeds of calves	Sum of squares	df	Mean square	F	Sig.
Between groups	29212.399	2	14606.200	0.402	0.670
Within groups	4654518.822	128	36363.428		
Total	4683731.221	130			

Table 5: Mortality rate (%) at different periods in male and female calves

Time period (days)	Male calves	Female calves
Birth to 30	28.00	42.85
31 to 90	18.66	19.64
91 to 150	13.33	3.57
151 to 270	17.33	5.35
271 to 420	10.66	12.50
421 to 720	12.00	16.07

mortality. Almost all cases female showed higher mortality rate than their male counterpart. 42.85% mortality at first month was appeared in female where as male showed lower rate 28% in the same period. Male calves faced higher mortality from three months to nine month of age (Table 5). Lowest mortality rate was found in female 3.57% from 91 to 150 days as compared to male calves (10.66%) in 271 to 720 days.

DISCUSSION

The buffalo calves were reported to have had intolerance to higher amounts of colostrum and to have developed diarrhea after feeding excess colostrum (Banerjee, 1998). Present study showed higher mortality than that found by Ford (1982). He observed calf losses due to starvation and Pneumonia occurred in first month of his trial. He divided the experimental animals in two groups. Mortality rate found in Group 1 and 2 were 25 and 10.5%, respectively. Excessive rainfall and damp weather in the coastal area increased rate of infectious disease which might be caused higher mortality. Sharma and Jain (1979) reported that 27.7% mortality in Murrah buffalo calves occurred from birth to 6 months of age very similar to 50% Nili-Ravi in first three to five months and pure Nili-Ravi in one month of age in our observation. Sometimes mortality in first six month increases from 30 to 100% (Wilkins, 1986) similar result observed in all breeds that majority of death occurred at first month. Better living condition may decrease the mortality rate to 4.1% in first year of life (Frank, 1985). Mortality at Punjab Government farms was reported as 7.08% (Khan and Khan, 1995). Lower calf mortality of a farm may be attributed to better

housing, feeding and other good management practices. Mortality 17.98% in some commercial dairy farms in peshawar city, Pakistan (Khan *et al.*, 2007) near to total mortality rate of 50% Nili-Ravi cross (16.79%) in the present study. Naval disinfection and removal of mucous from the mouth and nose may reduce mortality and morbidity rates in calves (Sangwan *et al.*, 1985). Patil *et al.* (1991) reported a higher mortality rate 33% in Surti male than our findings in male buffalo calves (28%) during first month of age. Pardhan and Panda (1994) reported a lower mortality rate (36.8%) in Murrah female buffalo calves as compare to 42.85% during first month of age. In the study farm male calve were stronger and they took more colostrum than female. Higher mortality in case of female calves in the study might be due to lower absorption of maternal serum immunoglobulins, required for the protection from different diseases during neonatal life (Simensen, 1985).

CONCLUSION

To some extent calf mortality found in all thee genetic groups. The calf mortality is not affected by any breed factor (p>0.05). Female buffalo calves are more vulnerable than their male counterpart. From the results it can be concluded that calf mortality of the farm may be affected by a number of factors other than breed factor.

ACKNOWLEDGMENTS

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