FACTORS AFFECTING MORTALITY PROTOTYPE IN MURRAH BUFFALOES: A REVIEW

Nitin Mohan Gupta[1],*, Madan Lal Mehra[2] and Puneet Malhotra[3]

ABSTRACT

The theme of investigation was the group of 1230 Murrah buffaloes at the dairy farm of GADVASU, Ludhiana. The research was conducted for the period of forty years 1971 to 2010, to make out the mortality prototype at this organized herd. An overall 1230 animals died because of various causes during these forty years, which accounted for overall mortality of 29.36% of total herd. Maximum mortality in different age groups of calves was due to affections of digestive system. Mortality up to one month of age was 52.35% indicating that almost half of the calves died during first month of age. The mortality rate declined to 11.95% up to three month of age in calves and mortality rate further declined to 5.44% up to six month of age. The mortality rate further declined to 4.88% of total mortality up to one year of age. The cumulative mortality up to one year of age was 74.62%, which indicated that two-third of the total mortality occurred up to one year of age. Out of all the lactations maximum mortality is found in first lactation and minimum mortality is observed in 10th and above lactation. Higher incidence of mortality was found to be in the month of August 13.5% while lowest mortality percentage is found in the month of October i.e. 3.52.

Keywords: mortality, buffalo, *Bubalus bubalis*, lactation

INTRODUCTION

In India, dairying is recognized as an instrument for social and economic development. The definition of mortality rate or death rate is a measure of the number of deaths of animals in a population, scaled to the size of that population, per unit of time. High mortality rates of productive animals from any farm will hamper the genetic gain per generation and hence the economics reduced greatly. The success of livestock industry depends on the superior health of the livestock that helps to amplify the productivity, whereas any compromise on health ground will smash the hope of livestock division. Mortality among dairy cattle results in financial loss, including the value of the lost cattle and milk production and cost of replacement and extra labor (Thomsen *et al*., 2006) In spite of innovation made in the

[1]Department of Animal Husbandry, Government of Madhya Pradesh, Madhya Pradesh, India, *E-mail: vetnitin@gmail.com
[2]Department of Livestock Farm Complex, Khalsa College of Veterinary and Animal Science, Amritsar, India
[3]Guru Angad Dev Veterinary and Animal Sciences University, Punjab, India

animal husbandry practices, clinical medicine and diagnostic techniques, the morbidity and mortality due to various causes continue to be higher resulting in great loss to animal owner.

Monitoring of disease-events provides information on the incidence of a variety of diseases at any farm where exact and entire recording of disease-events are existing (Williamson *et al*., 1978). Therefore familiarity of the incidence of clinical diseases in dairy herds allows to spot factors, where higher than expected incidence of diseases exits and assist in formulating the priorities for undertaking future breeding and preventive programmes. It is necessary to correlate the disease incidence to previous disease history, stage of lactation and age of animal moreover this can help in improving the future herd health programme (Stevenson, 2000).

The success of profitable dairy farm is directly associated with the number of productive and disease free animals present. Therefore, it is imperative to study the mortality prototype in organized dairy farm.

MATERIALS AND METHODS

The data pertaining to ancestry for the present investigation were collected from the history-cum-pedigree sheets, post mortem reports and computer database maintained at the Dairy Farm of Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana under the All India Co-ordinate Research Project on Buffalo Breeding. The data with respect to required traits were collected over a period of 40 years, i.e. from 1971 onwards to 2010 and pertained to 1230 animals.

The various causes of mortality were clubbed according to system of body involved and a code was given to each system (Table 1).

RESULTS AND DISCUSSION

An overall 1230 animals died because of various causes during these forty years, which account for overall mortality of 29.36% of total herd. This is in agreement with the findings of

Table 1. Codes for causes of mortality.

Code	Group title	Cause of mortality
A	Affections of digestive system	Enteritis, Tympany, Diarrhoea, Abomasitis, Impaction, Diaphragmatic hernia.
B	Affection of Respiratory system	Pneumonia, Hydatiosis, T.B.
C	Circulatory disturbances	Peritonitis, Toxemia, Septicemia, Pericarditis, Haemorrhages, Myocarditis, Cardiac failure
D	Unclassified conditions	NAD, Putrified, Metritis, Pyelonephritis, Hepatitis,

Unclassified conditions include NAD cases, lack of proper diagnosis and putrefied carcasses resulting from delayed post mortem of animals.

Reddy and Nagarcenkar (1989a) in Sahiwal herd, Singh and Parekh (1983) in HF/J × Gir crossbreds. Williamson *et al.* (1978); Higgins (1981) had reported mortality ranging from 1.0 to 2.94% in organized herds of exotic cattle. The reason of very low mortality rate might be due to better management and heavier culling practiced in these herds.

Age wise incidence of mortality

For studying the age at mortality, the animals were classified into four groups i.e. 0 to 30 days, 31 to 90 days, 91 to 180 days and 181 to 365 days depending upon the age at mortality (Table 2). Maximum mortality in different age groups of calves was due to affections of digestive system as earlier reported by Khan and Khan (1995) in Nili-Ravi buffalo calves.

Mortality up to one month of age

The mortality of 52.35% was recorded during the first 30 days postnatally i.e. from birth up to one month of age whereas Bhullar and Tiwana (1985) reported the mortality of 27.6% in female buffalo calves during first month of life. This could be due to poor resistance of calves towards various diseases due to low levels of antibodies/immunoglobulin in blood and calves require colostrum feeding which has high protein percentage. A large part of this has globin content especially gamma globulin, which contain antibodies. This helps the newborn to build up an antibody titer, produces passive immunity against many of the common calf hood diseases. Jana *et al.* (1997); Parekh and Singh (1981) also reported higher mortality in this age group.

Thus total mortality up to one month of age was 52.35% indicating that almost half of the calves died during first month of age. This mortality rate was higher than the findings of Tomar (1973); Sharma *et al.* (1975); Parekh and Singh (1981), requiring better calf management and proper colostrum feeding to reduce mortality in early age.

Table 2. Age wise distribution of mortality in buffaloes.

Disease code	Age (days) at the time of mortality				
	0-30	**31-90**	**91-180**	**181-365**	**Total**
	No. of animals	No. of animals	No. of animals	No. of animals	No. of animals
A	300	59	15	22	396
B	185	47	32	14	278
C	110	30	10	18	168
D	49	11	10	06	76
Total mortality	644	147	67	60	918
Total % mortality	52.35	11.95	5.44	4.88	74.62

Mortality up to three month of age

The mortality rate declined to 11.95% up to three month of age in calves. The declining trend in mortality with advancing age of calves reflects the development of resistance in calves for diseases due to increasing levels of immunoglobulins. The cumulative mortality upto 3 months of age was 64.3% which was higher in comparison to the findings of Tomar (1973); Jana *et al.* (1997) in dairy cattle.

Mortality up to six month of age

The mortality rate further declined to 5.44% up to six month of age. The cumulative mortality up to six month was 69.74%, which was higher than the findings of Batobyal *et al.* (1984); Marrof *et al.* (1987) in the herd of dairy cattle.

Mortality up to one year of age

The mortality rate further declined to 4.88% of total mortality up to one year of age. The cumulative mortality upto one year of age was 74.62%, which indicated that two- third of the total mortality occurred upto one year of age. Related conclusions were also observed by Mane *et al.* (2010); Rana *et al.* (2010) in Murrah buffalo calves.

Of course, the intensity of selection depends on sufficient young replacement heifers to maintain herd size. Therefore, the calf rearing programme should receive more attention.

Lactation number wise incidence of mortality of adult animals

Among lactating females, mortality was studied under 10 groups *viz.* females died in first lactation to tenth and above lactation which accounted for 22.4, 13.14, 16.35, 14.42, 11.54, 7.7, 6.1, 3.53, 2.54, and 2.24%, respectively (Table 3). Out of all the lactations maximum mortality is found in first lactation and minimum mortality is observed in 10th and above lactation, this is probably due to the fact that a very few animals can reach up to that lactation.

Table 3. Lactation number wise incidence of mortality in adult animals.

Lactation No.	% of total died
1	22.44
2	13.14
3	16.35
4	14.42
5	11.54
6	7.7
7	6.1
8	3.53
9	2.54
10 and above	2.24
Total died	**100.00**

Month wise incidence of mortality

Highest mortality rate of 13.5% occurred in the month of August (Table 3). Highest incidence of affections of digestive system (14.0%) occurred in the month of August followed by 10.11% in the month of April and incidence of affection of respiratory system was found to be highest in the month of August (15.38%) followed by 11.15% in both January and July while higher incidence of circulatory disturbances was found in August (12.76%) followed by 11.91% in January. Unclassified condition was found to be highest in the month of December (14.33%) followed by the month of November (14%). Higher incidence of mortality was found to be in the month of August this is due to higher number of animal died in that particular month and could be due to variation in the health management programme followed at the farm over different months (Table 4).

Prevention of mortality

In buffaloes decline in mortality rate is the first objective of successful dairy farm management, for this it is important to maintain mortality and morbidity records to categorize possible causes their prevention and control. If mortality is high, it is also important to carry out post-mortems and record the results. Prevention and control of livestock diseases explain the way to lower morbidity as well as mortality. Proper breeding and feeding management, hygienic conditions of farm, prevention against adverse weather conditions through housing modification and cooling, proper exercise of animals, movement restrictions and quarantines when new animals are added to the herd.

Table 4. Month wise incidence of mortality in Murrah buffalo.

Month	Disease code				Total	%
	A	**B**	**C**	**D**		
January	30	29	28	27	114	9.29
February	39	28	22	10	99	8.01
March	32	20	15	23	90	7.37
April	44	25	18	21	108	8.77
May	42	27	16	14	99	8.01
June	38	20	19	10	87	7.05
July	32	29	25	28	114	9.29
August	61	40	30	35	166	13.5
September	35	20	22	31	108	8.77
October	15	4	8	16	43	3.52
November	30	10	21	42	103	8.37
December	37	8	11	43	99	8.05
Total	**435**	**260**	**235**	**300**	**1230**	**100.00**

REFERENCES

Batobyal, A.K, R.N.S. Khanna, U.C. Jaiswal and S.C. Chopra. 1984. Studies on mortality in three-fourth crossbred calves. *Indian J. Anim. Res.*, **18**: 111-114.

Bhullar, M.S. and M.S. Tiwana. 1985. Factors affecting mortality among buffalo-calves. *Indian J. of Anim. Sci.*, **55**(7): 599-601.

Higgins, C.W. 1981. Survey of dairy cow wastage 1978/79. *Veterinary Bulletin*, **51**.

Jana, D.N., R.R. Mishra, D.N. Maitra and M.M. Saxena. 1997. Studies on mortality pattern *in* organized crossbred herd. *Indian J. Anim. Health*, **36**: 37-49.

Khan, A. and M.Z. Khan. 1995. Epidemological aspects of neonatal calf mortlity in the nili-ravi buffalo. *Pak. Vet. J.*, **15**(4): 163-168.

Mane, M.U., A.N. Kulkarni, S.B. Adangale, A.R. Deshmukh and R.M. Patil. 2010. Studies on mortality pattern in buffalo calves. *Asian J. Anim. Sci.*, **5**(1): 1-4.

Marrof, N.N., K.N. Tahir and R.A. Mahmoud. 1987. Factors affecting mortality rate among Friesian calves in Iraq. *Indian J. Anim. Sci.*, **57**: 647-650.

Parekh, H.K.B. and A. Singh. 1981. Mortality pattern in crossbreds of Gir with Friesian and Jersey sires. *Indian J. Anim. Sci.*, **51**: 419-424.

Rana, N., S. Khanna, A.A. Raut, S.R. Bhardwaj, A. Manuja, B. Manuja, A. Saini, S. Kakkar, K.L. Khurana and R.K. Sethi. 2010. Retrospective epidemiological analysis of mortality trends in neonatal and growing Murrah buffalo calves at an organized herd. *Indian J. Anim. Sci.*, **80**(10): 976-979.

Reddy, K.M. and R. Nagarcenkar. 1989a. Studies on disposal pattern in Sahiwal cows. *Indian J. Dairy Sci.*, **42**: 139-145.

Singh, A. and H.K.B. Parekh. 1983. Factors influencing the calf mortality in crossbred cattle. *Indian Vet. Med. J.*, **7**: 196-199.

Stevenson, MA. 2000. Disease incidence in dairy herds in the southern highlands district of New South Wales, Australia. *Prev. Vet. Med.*, **43**: 1-11.

Thomsen, P.T., A.M. Kjeldsen, J.T. Sorensen, H. Houe and A.K. Ersboll. 2006. Herd-level risk factors for the mortality of cows in Danish dairy herds. *Vet. Rec.*, **158**: 622-626.

Tomar, S.S. 1973. Influence of crossbreeding and other associated factors on calf losses. *Indian J. Anim. Health*, **12**: 135-138.

Williamson, N.B., R.M. Cannon, D.C. Blood and R.S. Morris. 1978. A health program for commercial dairy herds: 5. The occurrence of specific disease entities. *Aust. Vet. J.*, **54**: 252-257.