

Retrospective Study of Disease Incidence and Health Disorders of Murrah Buffaloes in Organized Herd

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ABSTRACT

Retrospective data analysis of disease incidence and health disorders is helpful in effective future management of the farm to reduce disease prevalence and improve the economic benefit. Twelve years (April 2003 to March 2015) data from IVRI Cattle and Buffalo farm was collected to study prevalence (%) of various diseases and health disorders in the Murrah buffaloes. The prevalence (%) of digestive, respiratory and reproductive diseases/calving associated disorders, nutritional and metabolic, specific, surgical cases, miscellaneous diseases was calculated using Chi square test. In the herd there was overall 37.82 per cent disease prevalence in 12 years. Maximum prevalence of disease was in 2004-05 (51.74%) and minimum in 2006-07 (25.99%). Overall incidence of digestive, respiratory, nutritional & metabolic, parasitic, specific diseases, surgical cases and miscellaneous diseases & health disorders in twelve years were 21.97 per cent, 0.90 per cent, 5.93 per cent, 2.83 per cent, 5.96 per cent, 14.05 per cent and 4.39 per cent, respectively. Overall prevalence of reproductive disease and calving associated abnormalities was 4.48 per cent and 11.46 per cent as well as their prevalence was maximum in 2012-13 (7.89% & 21.82%) and minimum in 2005-06 (0.64% & 1.61%). Average abortion (%) in 12 year was 4.20 per cent and it was maximum (9.30%) during 2003-04 and minimum (1.47%) during 2010-11. From the present study, it is concluded that a number of diseases and health disorders with various percentages have been occurring in an organized herd and this report may help to prioritize any control measures against major disease conditions reported in this study.

Key words: Disease; Health disorders; Murrah Buffalo; Organized herd; Prevalence;

Buffalo is the backbone of milk production in India and holding more than 55 per cent of the world buffalo population as well as contributes 17 per cent of world milk production and 48 per cent of Asian milk production (*Food and Agriculture Organization, 2012*). Although, the buffalo population in India is only half that of the cattle population, buffaloes produce 51.17 per cent of total milk production of India (*BAHS, 2012*). The buffalo (*Bubalus bubalis*) is the world second most important milk producing animal (*McDowell et al., 1995; Bhatti et al., 2009*). India is regarded as a treasure house of world's best buffalo germplasm. Among the various buffalo breeds in India, Murrah is the important milch breed with superior genetic potential for milk production and constitutes around 19.5

per cent of total buffalo population in the country (*FAO, 2012*). Murrah buffalo produces good quantity of milk and it is now well established that it represents a unique breed in terms of feed conversion ability with low grade feeds, ability to sustain under adverse climatic conditions, resistance to diseases and production of high value milk containing a higher fat percent. Therefore, keeping in view the economic importance of Murrah buffalo to Indian dairy sector, a retrospective study of disease incidences and health disorders of Murrah buffaloes was conducted at an organized farm.

METHODOLOGY

The present study was conducted on Murrah buffaloes, maintained at Cattle and Buffalo farm,

ICAR-Indian Veterinary Research Institute (IVRI). Twelve years (April 2003 to March 2015) data of disease incidence and reproductive problems were recorded. The farm is situated at 28.22° N latitude, 79.22° E longitude and at an altitude of 568 feet above mean sea level. The extreme climatic condition exist in this region *i.e.*, summer is very hot (above 45°C) and winter is very cold (below 5°C). The humidity has been observed to be quite high during monsoon. The total rainfall ranged from 90 to 120 cm. The animals were reared under loose housing system. All the animals were stall fed and categorized and grouped according to age and level of milk production. The nutritional requirements were met through a balanced combination of green and dry fodder along with concentrate mixture. Disease incidence, total number of cases for a particular disease occurring in a year, number of the animal and the date of incidence was collected from the disease case register. From the date of incidence, the season of the incidence was identified. The date of birth and sex of animals were recorded from calving register. Comparing the date of incidence with the date of birth of animal, age of the animal was calculated. Age group, sex, season and parity of milch animal specific prevalence were calculated for each disease. Herd strength was calculated as closing balance on 31st March of every year. During the study period in each year, if the same animal suffered in different age group or season or by different disease and health disorder then it was treated as a new case but in calculation of overall prevalence it was considered only once. Health status was assessed by morbidity and mortality. Further, morbidity was measured by two approaches *i.e.* incidence of disease (occurrence of new disease in total risk population) and prevalence. But for better presentation of data prevalence (%) of disease has been used as epidemiological tool for morbidity (%) calculation.

Category of disease prevalence: The prevalence (%) for digestive diseases, respiratory diseases, reproductive diseases, nutritional and metabolic diseases, specific diseases, surgical cases, miscellaneous diseases was calculated as:

$$\text{Prevalence (\%)} = \frac{\text{TNC}}{\text{TNA}} \times 100$$

$$\text{CAA (\%)} = \frac{\text{TNAA}}{\text{TNC}} \times 100$$

$$\text{Abortion (\%)} = \frac{\text{TA}}{\text{TNC}} \times 100$$

TNC=Total no. of cases during the period

TNA=Total no. of animals at risk of developing disease

CAA=Calving associated abnormalities\

TNAA=otal no. of calving associated abnormalities

TNC= Total no. of calving

TA=Total no. of abortion during that period

Statistical analysis: The data was analyzed using statistical SPSS program version 17. In order to test the categorical data for different disease and health disorder prevalence year wise, Chi-square analysis was used.

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

RESULTS AND DISCUSSION

Disease prevalence : The overall disease prevalence in buffaloes has been presented in Table 1. Overall prevalence of diseases in twelve year was 37.82 per cent. In similar line *Chaudhary et al. (2013)* reported that the morbidity rate in bovine was 31.22 per cent in Himachal Pradesh. On contrary *Sharma and Verma (2011)* reported that 15 per cent morbidity in cattle in field condition in Agra, UP. These differences may be due to differences in region of study, species of animal, proper and scientific recording of data and inclusion of several minor forms of disease.

Year wise prevalence (%) of diseases and various health disorders: The year wise disease prevalence and various health disorders in buffaloes has been presented in Table 2. Overall prevalence of digestive diseases in 12 year was 21.97 per cent. Prevalence of digestive diseases ranged from 11.95 (2003-04) to 29.28 per cent (2013-14). This range of prevalence is very well in the acceptable limit in the organized farm. The average prevalence of digestive disease for the 12 years revealed in the present study is similar to earlier studies (*Rathore, 1998*). These differences may be due to scientific method of rearing, regular deworming, feeding of balanced ration and green fodder throughout the year. Overall prevalence of nutritional and metabolic diseases was 5.93 per cent and it was higher during 2005-06 (12.70%) and minimum in 2003-04 (1.33%). The prevalence of specific diseases (FMD, mastitis, and eye infection) in 12 year was 5.96 per cent. The higher (22.58%) prevalence in 2009-10 was mainly due to outbreak of FMD. During the rest of years it was

Table 1. Year wise overall prevalence (%) of diseases and various health disorders

Year	Population	Prevalence (%)	χ^2 cal
2003-04	226	32.30 (73)	1.28
2004-05	201	51.74 (104)	6.26*
2005-06	244	37.30 (91)	0.01
2006-07	277	25.99 (72)	7.24**
2007-08	280	35.36 (99)	0.3
2008-09	286	32.87 (94)	1.28
2009-10	279	41.22 (115)	0.55
2010-11	301	39.20 (118)	0.09
2011-12	247	34.41 (85)	0.52
2012-13	203	46.80 (95)	2.73
2013-14	222	44.59 (99)	1.72
2014-15	238	38.24 (91)	0.01
Total	3004	37.82 (1136)	

Table 3. Year wise prevalence (%) of reproductive diseases/calving associated disorders

Year	Population	Reproductive	χ^2 cal
2003-04	170	2.94 (5)	0.41
2004-05	171	10.53 (6)	0.08
2005-06	180	0.56 (1)	5.2*
2006-07	219	1.37 (3)	3.5
2007-08	201	4.48 (9)	0.11
2008-09	204	7.84 (7)	0.13
2009-10	206	11.17 (11)	0.83
2010-11	210	7.62 (9)	0.04
2011-12	184	5.98 (11)	1.58
2012-13	142	8.45 (12)	5.8*
2013-14	150	5.33 (8)	0.61
2014-15	158	6.96 (5)	0.23
Total	2195	6.06 (87)	

Table 2. Year wise prevalence (%) of diseases and various health disorders

Year	Population	Digestive	Respiratory	Nutritional & Metabolic	Parasitic	Specific	Surgical	Miscellaneous
2003-04	226	11.95 (27)	1.33(3)	1.33(3)	7.52 (17)	4.87 (11)	7.96 (18)	4.87(11)
2004-05	201	28.36 (57)	1.49(3)	11.94 (24)	10.95 (22)	2.99(6)	16.92 (34)	14.43(29)
2005-06	244	20.49 (50)	0.41(1)	12.70 (31)	0.00(0)	5.74 (14)	12.30 (30)	2.87(7)
2006-07	277	18.77 (52)	0.00(0)	1.81(5)	0.00(0)	2.53(7)	11.55 (32)	3.61(10)
2007-08	280	20.00 (56)	1.43(4)	2.86(8)	0.00(0)	4.29 (12)	17.50 (49)	6.43(18)
2008-09	286	18.53 (53)	2.10(6)	8.04 (23)	1.75(5)	1.75(5)	8.04 (23)	2.45(7)
2009-10	279	22.58 (63)	1.43(4)	4.66 (13)	1.79(5)	22.58 (63)	7.89 (22)	1.08(3)
2010-11	301	20.93 (63)	0.66(2)	6.31 (19)	0.33(1)	4.98 (15)	21.59 (65)	4.32(13)
2011-12	247	21.86 (54)	0.00(0)	7.29 (18)	6.07 (15)	4.05 (10)	12.55(31)	2.83(7)
2012-13	203	26.60 (54)	1.97(4)	4.93 (10)	0.49(1)	3.94(8)	22.17 (45)	4.93(10)
2013-14	222	29.28 (65)	0.00(0)	5.86 (13)	3.15(7)	7.21 (16)	14.86 (33)	3.60(8)
2014-15	238	27.73 (66)	0.00(0)	4.62 (11)	5.04 (12)	5.04 (12)	16.81 (40)	3.78(9)
Overall	3004	21.97 (660)	0.90(27)	5.93 (178)	2.83 (85)	5.96 (179)	14.05 (422)	4.39(132)

Note=Value given in parenthesis (in all tables) is the No. of animal affected with respective disease/health disorder

consistently around <5 per cent indicating good preventive measures in the farm. Prevalence of surgical cases in 12 year was 14.05 per cent and it was higher during 2012-13 (22.17%) and minimum in 2009-10 (7.89%). Relative higher prevalence of surgical case in both 2010-11 and 2012-13 could be due to more incidences of post FMD complications. The variability in prevalence of surgical cases may be due to managerial factors in the floor. In IVRI farm, the floor of both open and closed paddock are brick on edge type and milking room with cemented floor will further increases the chances of laminitis and other surgical problems (Javaid *et al.*, 2009).

Year wise prevalence of reproductive diseases / calving associated disorders: The year wise prevalence of reproductive/calving associated disorders in buffaloes has been presented in Table 3. Overall prevalence of reproductive diseases/calving associated disorders was 4.48 per cent. Prevalence was highest in 2012-13 (7.89%) and lowest in 2005-06 (0.64%) which was significantly ($p < 0.05$) lower than other years. The present findings are in agreement with Azawi (2010). Average calving associated abnormalities (%) in 12 year was 11.46 per cent and it was maximum (21.82%) during 2012-13 and minimum (1.61%) during 2005-06. Abortion/ unseen abortion (%) in 12 years was

4.2 per cent and it was maximum (9.30%) during 2003-04 and minimum (1.47%) in 2010-11. Similar results were reported by *Ramalingam et al. (1990)* in cross bred cattle in Tamilnadu in 10 years (1978-87) of study.

CONCLUSION

It is concluded that a number of diseases and health

disorders with various percentages were reported out of which digestive problems and surgical cases were higher than any other categories of diseases.

Further, this report could be helpful to deciding action plans in view of controlling major diseases occurring across the seasons at organized as well as farmers field.

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