

MORTALITY PATTERN IN MUZAFFARNAGARI SHEEP AT ORGANIZED FARM

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ABSTRACT

The mortality pattern in Muzaffarnagari sheep maintained on Sheep and Goat farm at Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh was studied. Mortality data related to 14 years (1998- 2012) belonging to 67 Muzaffarnagari sheep from the postmortem report were used for the study. The average mortality in Muzaffarnagari sheep during the study period was 5.04%. Comparatively higher mortality rate was observed in rainy season (2.48%) followed by winter (1.66%) and summer season (0.90%). Among the different age groups mortality rate was more (2.33%) in 0-3 months age group lambs than >12 months adults (2.18%) and 3-12 months growers (0.53%). The mortality rate was higher (3.99%) in female animals as compared to male animals (1.05%). Further higher mortality was observed in animals having digestive disorders (1.80%), followed by miscellaneous and respiratory diseases (1.73% and 0.90%, respectively).

Keywords: *Mortality pattern, Muzaffarnagari sheep, Seasons, Sex.*

No. of Tables: 3

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INTRODUCTION

Sheep plays a significant role in Indian agricultural economy by providing livelihood support to millions of rural population. India has 71.56 million sheep population with annual growth rate 3.87%. There was total wool production of 44.7 million kg during eleventh five year plan (2011-12) in the country (Basic Animal Husbandry Statistics, 2012). The profitability of sheep farming is directly related with the mortality rate in the organized flock. There may be higher mortality due to poor management affecting the economic viability and production efficiency of sheep enterprise. Primary factors of death in sheep may also vary with change in environmental conditions, flock management, between sire progeny group (Mukasa-Mugerwaet *al.*, 2000) and sex (Mondalet *al.*, 2007). Further, disease regarded as the major factor to cause lamb mortalities and low productivity in sheep (Haughey, 1991). There is limited information available on the mortality patterns in sheep in organized farms. Therefore present investigation was conducted to study the mortality pattern in Muzaffarnagari sheep in association with season, age, sex and cause of death in aorganized farm.

MATERIALS AND METHODS

The mortality data of Muzaffarnagari sheep were taken from death and disposal register maintained at sheep and goat farm, IVRI for a period of 14 years (1998-99 to 2011-12). There were a total of 67 Muzaffarnagari sheep (14 males and 53 females) died during this period. The experimental animals were maintained in groups (95) under loose housing system and housed according to their age, sex, and

health status. Animals were fed on seasonal greenfodders and dry fodder along with required concentrate and ample amount of clean drinking water was provided round the clock. These animals were vaccinated for all the important diseases along with deworming and dipping. During mortality the post-mortem was carried out for proper disease diagnosis. For the statistical analysis, each year was divided into 3 seasons viz. hot dry (March-June), hot humid/rainy (July-October) and cold/winter (November-February) seasons. The whole life period of animal was divided into 3 age groups i.e. lamb (0-3 months), grower (3-12 months) and adult (>12 months). Based on the necropsy findings the causes of death were classified into 5 major classes viz digestive disorders (collibacillosis, gastroenteritis, enteritis, stomach rupture and ulcerative enteritis), respiratory disorders (pneumonia, suppuratives pneumonia and pulmonary congestion), parasitic disorders (moniziasis and haemonchosis), combined disorder (combination of any above disorders) and miscellaneous disorder (emaciation/debility, undiagnosed diseases and nonspecific diseases). The annual mortality was computed as the number of animals died, as a proportion to those at risk during the year.

Statistical analysis: The data in the present study was analyzed for the association of season, age, sex and cause of death with mortality rate by chi-square test using SPSS 11.0 statistical package.

RESULTS AND DISCUSSION

The overall average mortality rate was 5.04% (range 0.72%-18.64%). Out of 14 years, annual mortality of 6 years was

found below the overall mortality. The variability in climatic parameters, availability of feed and fodders and management practices were the probable reasons for variations in the mortality over the years. Due to this reason distinct trend was not evident in mortality over the years. The seasonal trend within a year had shown that highest mortality was in hot-humid (rainy season) followed by cold (winter season) in majority of the years with few exceptions (1998-99, 2001-02, 2002-03, 2005-06 and 2011-12). The highest mortality was observed in hot-humid seasons (2.48%), followed by winter and hot-dry season (1.66% and 0.90% respectively) Table 1 which corroborates the similar findings reported by Debele et al. (2011) and Kashem et al. (2011). The higher mortality in hot-humid or rainy season could be attributed to high worm load leading to diarrhea caused mostly by parasitic gastroenteritis. The incidence of pneumonia and weakness further caused neonatal death and higher mortality in rainy season (Palanivel and Gajendran, 2006).

Among different age groups highest mortality rate was found in younger animals of 0-3 months age (2.33%), followed by older individuals of >12 months and growing animals of 3-12 months age (2.18% and 0.53% respectively) (Table 2). Comparatively higher mortality in young ones was observed during hot-humid season (1.51%) than cold and hot-dry seasons (0.53% and 0.30% respectively). Mortality trend showed a reduction in the mortality rate as age advances; however in older individuals increased mortality was due to the poor immune status which makes them prone for the infections (Nash *et al.*, 1996).

The probable reason for higher mortality in neonates are improper nutrition during the pregnancy and the high worms load which reduce birth weight of lamb along with increased susceptibility to generalized bacterial (*Coliforms*) and viral infections. Comparatively greater number of female individuals (53) died than the males (14). The mortality in female was more during hot-humid season (1.88%) followed by winter and hot-dry season (1.35% and 0.75% respectively) Table 3. The lesser mortality rate in males was probably be due to culling and transfer of males to other divisions for research purpose and due to less number of males being maintained for breeding purpose at the farm.

The digestive disorders accounted for greatest mortality rates (1.80%) followed by miscellaneous and respiratory disorders (1.73% and 0.9% respectively) Table 4. Mortality due to the digestive disorders contributed more than 35% of overall mortality which is in accordance with Dohareet *al.*, (2013), who observed highest mortality (35.71%) due to diarrhoea in kids. The mortality percent due to digestive disorders was more in hot-humid season (17.91%) followed by cold (14.92%) and hot-dry seasons (2.98%) and corroborates earlier report (Bobde and Barbind, 2002). The next highest mortality rate was due to miscellaneous disorders followed by respiratory disorders (34.32% and 17.91%) which caused overall mortality of 5.04% in Muzaffarnagari sheep. The percentages of animals died due to other reasons were parasitic and combined disorders and contributed 8.95% and 2.98% respectively to the overall mortality. Greater mortality in hot-humid season could be due to higher worm load

during rainy season causing digestive tract infection resulting into diarrhoea and enteritis. In unshorn sheep the extra heat load causes more heat stress, compromises the immune status and makes them prone for further infections. Thus findings of the present investigation had shown that the mortality rate did not differ significantly between years, seasons, age, sex of animal and causes of mortality. Our findings are in agreement with those observed by Singh *et al.* (2004), who reported that the season and parity of kidding did not affect the mortality rate from birth to age at first kidding.

CONCLUSION

It is concluded that hot-humid season was one of important factor that lead to higher mortality in the lambs. Thus proper

hygiene and good management practices should be followed to prevent reduce the incidence of diseases. The neonatelambs (0-3 months group) being more prone to infections need additional care and attention during their early life. Based on PM report, digestive disorders ranked as major cause of mortality followed by miscellaneous and respiratory disorders suggesting that early identification of disease and proper treatment could be used to minimize the mortality in all age groups.

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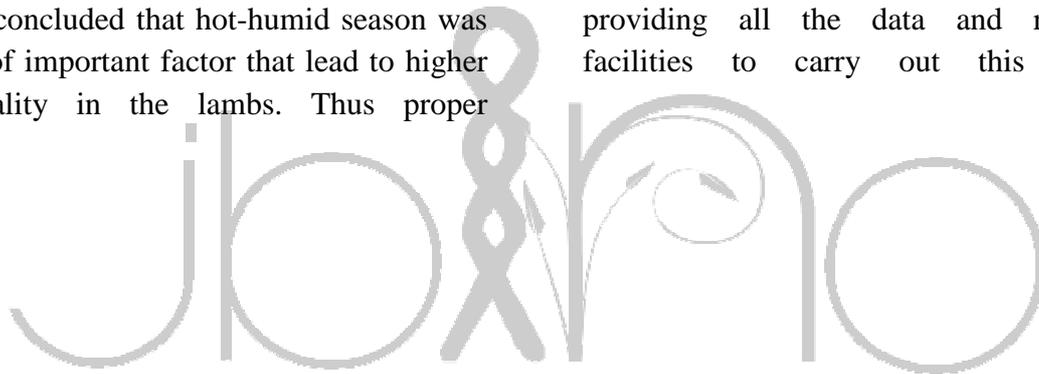


Table 1: Year- and season-wise mortality rate (%) in Muzaffarnagari sheep

Years	Seasons			Total	Total population
	Hot-dry	Hot-humid	Cold/Winter		
1998-99	1.78 (1)	0.00 (0)	5.36 (3)	7.14 (4)	56
1999-2000	5.08 (3)	8.47 (5)	5.08 (3)	18.64 (11)	59
2000-01	1.96 (1)	3.92 (2)	7.84 (4)	13.72 (7)	51
2001-02	0.00 (0)	3.23 (1)	3.23 (1)	6.46 (2)	31
2002-03	1.11 (1)	2.22 (2)	2.22 (2)	5.55 (5)	90
2003-04	0.00 (0)	5.26 (4)	1.32 (1)	6.58 (5)	76
2004-05	1.12 (1)	0.00 (0)	1.12 (1)	2.24 (2)	89
2005-06	1.78 (2)	1.78 (2)	0.90 (1)	4.46 (5)	112
2006-07	0.00 (0)	0.80 (1)	0.00 (0)	0.80 (1)	124
2007-08	0.69 (1)	2.76 (4)	0.69 (1)	4.14 (6)	145
2008-09	0.67 (1)	2.01 (3)	2.69 (4)	5.37 (8)	149
2009-10	0.00 (0)	6.06 (8)	0.76 (1)	6.82 (9)	132
2010-11	0.00 (0)	0.72 (1)	0.00 (0)	0.72 (1)	139
2011-12	1.33 (1)	0.00 (0)	0.00 (0)	1.33 (1)	75
Overall	0.90 (12)	2.48 (33)	1.66 (22)	5.04 (67)	1328

Values in parenthesis indicate number of animals died during each season in each year.

Table 2: Effect of Age- and season on mortality rate (%) in Muzaffarnagari sheep

Age (Months)	Seasons			Total
	Hot-dry	Hot-humid	Cold/Winter	
Lamb (0 to 3)	0.30 (4)	1.51 (20)	0.53 (7)	2.33 (31)
Grower (3 to 12)	0.00 (0)	0.30 (4)	0.22 (3)	0.53 (7)
Adult (> 12)	0.60 (8)	0.68 (9)	0.90 (12)	2.18 (29)
Overall	0.90 (12)	2.48 (33)	1.66 (22)	5.04 (67)

Values in parenthesis indicate number of animals died during each season in each age group.

Table 3: Effect of sex and season on mortality rate (%) in Muzaffarnagari sheep

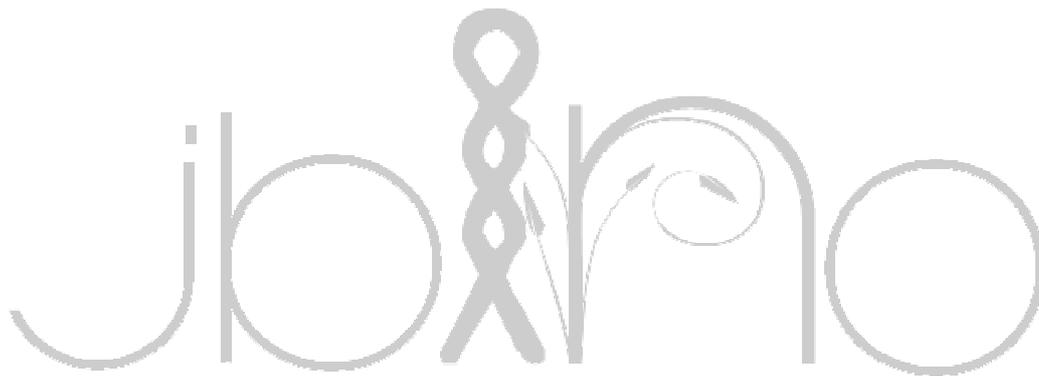
Sex of animals	Seasons			Total
	Hot-dry	Hot-humid	Cold/Winter	
Male	0.15 (2)	0.6 (8)	0.3 (4)	1.05 (14)
Female	0.75 (10)	1.88 (25)	1.35 (18)	3.99 (53)
Overall	0.90 (12)	2.48 (33)	1.66 (22)	5.04 (67)

Values in parenthesis indicate number of animals died during each season and in each sex group.

Table 4: Causes and season wise mortality rate (%) in Muzaffarnagari sheep

Causes of mortality	Seasons			Total
	Hot-dry	Hot-humid	Cold/Winter	
Digestive disorders	0.15 (2)	0.9 (12)	0.75 (10)	1.8 (24)
Respiratory disorders	0.22 (3)	0.46 (6)	0.22 (3)	0.9 (12)
Parasitic disorders	0.15 (2)	0.15 (2)	0.15 (2)	0.46 (6)
Combined disorders	0 (0)	0 (0)	0.15 (2)	0.15 (2)
Miscellaneous disorders	0.38 (5)	0.98 (13)	0.38 (5)	1.73 (23)
Overall	0.90 (12)	2.48 (33)	1.66 (22)	5.04 (67)

Values in parenthesis indicate number of animals died during each season and in each cause of mortality



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