

# Influence of age, sex and season on morbidity and mortality pattern in goats under village conditions of Madhya Pradesh

Amit Kumar Dohare, B. Singh, Yogesh Bangar, Shiv Prasad, Dinesh Kumar and Girraj Shakya

Indian Veterinary Research Institute,  
Izatnagar - 243122, Dist. Bareilly (UP), India

Corresponding author: Amit Kumar Dohare, email: dr.doharevet@gmail.com  
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## Abstract

**Aim:** To study factors affecting morbidity and mortality pattern in goats in Chambal division of Madhya Pradesh under village conditions.

**Materials and Methods:** The sampling scheme adopted during study was stratified three stage random sampling and data on 549 goats were recorded.

**Results:** The overall morbidity and mortality rate was 20.58% and 10.20% respectively. Proportional mortality due to diarrhoea was highest (35.71%) followed by pneumonia (28.57%) and miscellaneous causes (12.5%). Pattern of morbidity in male and female was almost similar. Age of goats was the most important factor and accounted for 39.29%, 28.57% and 32.14% mortality in 0-3 month, 6-9 month and above 9 months, respectively. The effect of season on goat mortality was significant ( $p < 0.05$ ). The incidence of mortality were 41.07%, 37.5% and 21.43% in winter, rainy and summer season respectively.

**Conclusion:** In goats mortality was significantly influenced by age groups and suggesting that more care and attention need to be paid in kids 0-3 months age irrespective of season. Mortality due to various diseases in kids and adults could be minimized by identifying the cause and giving proper treatment.

**Key words:** goat, morbidity, mortality, village conditions

## Introduction

Goat is one of the most important livestock species in India, which provide food and nutritional security to millions of marginal and small farmers and agricultural labourers [1]. India has 140.54 million goats which provide 4.59 million tonnes milk and 0.85 million tonnes meat [2]. Goats have short generation interval, high prolificacy, capacity to survive on sparse vegetation and easy adaptation to a wide range of climatic conditions [3].

The effect of diseases on livestock productivity includes; reduced feed intake, change in digestion and metabolism, increased morbidity and mortality, decreased rates of reproduction, weight gain and milk production. Morbidity and mortality greatly affects the economic returns from goat husbandry. Knowledge of disease pattern in different age groups and seasons will be of immense help in health management to reduce mortality. Keeping these aspects in view, the present study was undertaken to ascertain factors affecting morbidity and mortality pattern in goats under village conditions in Chambal division of Madhya Pradesh, India.

## Materials and Methods

The Chambal division was selected for study, it consists of three districts Morena, Bhind and Sheopur. This division was divided into three strata taking each district as stratum and two blocks from each district was selected. From each block three villages were selected and ten goat owners were selected randomly from each village during period of one year (January 2010 to December 2010). Hence ultimate sample comprises 180 livestock owners. The stratified three stage random sampling was adopted for the selection of respondents. The calendar year was divided into 3 seasons: March-June (summer), July-October (Rainy) and November-February (winter). The time period from birth to death was divided into three age groups kids (0-3 months), Youngstocks (3-6 months) and adults (>6 months).

**Statistical analysis:** The data were analyzed by applying Chi-square test using SPSS 11.0 software.

## Result and Discussion

**Factors affecting morbidity pattern:** The overall morbidity rate was 20.58%. As presented in table 1, the overall incidence of diarrhoea was 32.74% followed by pneumonia (25.60%), ectoparasites (12.39%), goat pox (11.50%) and anorexia (9.73%). The miscellaneous group accounted for 7.96% morbidity and

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Table-1. Morbidity pattern (%) in goats

Cause	Age (months)			Sex		Season			Total
	0-3	3-6	>6	Male	Female	Winter	Summer	Rainy	
Diarrhoea	39.47 (15)	33.33 (11)	26.19 (11)	35.09 (20)	30.36 (17)	12.20 (5)	50.00 (14)	40.91 (18)	32.74 (37)
Pneumonia	31.58 (12)	27.27 (9)	19.05 (8)	28.07 (16)	23.21 (13)	46.34 (19)	7.14 (2)	18.18 (8)	25.66 (29)
Ectoparasite	10.53 (4)	9.09 (3)	16.67 (7)	10.53 (6)	14.29 (8)	9.76 (4)	3.57 (1)	20.45 (9)	12.39 (14)
Goat pox	2.63 (1)	9.09 (3)	21.43 (9)	12.28 (7)	10.71 (6)	19.51 (8)	3.57 (1)	9.09 (4)	11.50 (13)
Anorexia	10.53 (4)	12.12 (4)	7.14 (3)	5.26 (3)	14.29 (8)	7.32 (3)	21.43 (6)	4.55 (2)	9.73 (11)
Miscellaneous	5.26 (2)	9.09 (3)	9.52 (4)	8.77 (5)	7.14 (4)	4.88 (2)	14.29 (4)	6.82 (3)	7.96 (9)
Total cases	38	33	42	57	56	41	28	44	113
<sup>2</sup> value		20.76*		3.29 <sup>NS</sup>			35.96**		

Figure in parentheses are number of observations, NS= Non-significant, \*Significant at 5% level of significance, \*\*Significant at 1% level of significance

Table-2. Mortality pattern (%) in goats

Cause	Age (months)			Sex		Season			Total
	0-3	3-6	>6	Male	Female	Winter	Summer	Rainy	
Diarrhoea	40.91 (9)	37.50 (6)	27.78 (5)	34.62 (9)	36.67 (11)	13.04 (3)	66.67 (8)	42.86 (9)	35.71 (20)
Pneumonia	31.82 (7)	31.25 (5)	22.22 (4)	26.92 (7)	30.00 (9)	52.17 (12)	8.33 (1)	14.29 (3)	28.57 (16)
Ectoparasite	9.09 (2)	12.50 (2)	16.67 (3)	15.38 (4)	10.00 (3)	8.70 (2)	-	23.81 (5)	12.50 (7)
Goat pox	4.55 (1)	12.50 (2)	11.11 (2)	11.54 (3)	6.67 (2)	13.04 (3)	-	9.52 (2)	8.93 (5)
Anorexia	9.09 (2)	6.25 (1)	5.56 (1)	3.85 (1)	10.00 (3)	8.70 (2)	8.33 (1)	4.76 (1)	7.14 (4)
Miscellaneous	4.55 (1)	-	16.67 (3)	7.69 (2)	6.67 (2)	4.35 (1)	16.67 (2)	4.76 (1)	7.14 (4)
Total died	22	16	18	26	30	23	12	21	56
<sup>2</sup> value		18.84*		1.52 <sup>NS</sup>			22.18*		

Figure in parentheses are number of observations, NS= Non-significant, \*Significant at 5% level of significance

comprising of retention of urine, tympany, pyometra and dog bite.

The interaction between age and cause exhibited that incidence of diarrhoea and pneumonia was highest in 0-3 month and lowest in above 6 months age. The incidence of goat pox was highest (21.43%) in above 6 months age and lowest (2.63%) in 0-3 month age similar findings were reported by Nandi *et al.* [4]. The difference in morbidity in different age groups were found significant ( $p < 0.05$ ). Pattern of morbidity was higher in above 6 months age (37.17%) than 0-3 months (33.63%) followed by 3-6 months age group (29.20%).

The chi-square analysis showed that there was no significant difference ( $p > 0.05$ ) between sex groups on morbidity pattern. However, male showed higher morbidity due to diarrhoea (35.09%) and pneumonia (28.07%). Whereas, female showed higher morbidity due to anorexia and ectoparasites (14.29%) each as compared to their counterpart.

The analysis of morbidity pattern revealed that season had significant effect ( $p < 0.01$ ) and it was found that incidence of pneumonia was higher in rainy (38.94%) than winter (36.28%) followed by summer season (24.78%). The incidence of diarrhoea was more in summer (50%) and rainy (40%) as compared to winter (12.2%). Morbidity due to pneumonia was higher in winter (46.34%) than rainy (18.18%) followed summer season (7.14%).

Factors affecting mortality pattern: The overall mortality rate was 10.20%. Sabapara and Deshpande [5] also recorded that overall mortality was 8.42% in goats under field conditions. As presented in Table-2, mortality due to diarrhoea (35.71%) was more

prominent followed by pneumonia (28.57%) and miscellaneous causes (12.5%). Similar observations were reported by Poonia and Malik [6].

The chi-square analysis showed that there was significant difference ( $p < 0.05$ ) among different age groups on mortality pattern. Mortality was highest (39.29%) in 0-3 months of age, then after decline in mortality was observed. This might be due to less immunity in kids, which leads to disease and ultimately mortality. This finding was in agreement with Singh *et al.* [7]. Mortality in 0-3 months age group was mainly due to diarrhoea (40.91%) followed by pneumonia (31.82%). Bobde and Barbind [8] and Soundarjan *et al.* [9] have reported high mortality in kids due to enteritis followed by pneumonia. Similar results were observed by Chowdhary *et al.* [10], where they found that 42.39% of kids died due to pneumonia followed by diarrhoea (32.61%).

Female showed more mortality due to diseases than male, which is 53.57% and 46.43% respectively. Male kids had better rate of survival than females. Similar findings were observed by Debele *et al.* [11]. Results indicate that the sex groups had no significant effect ( $p > 0.05$ ) on mortality pattern. Mortality due to pneumonia was higher in female (30%) than male (26.92%), whereas male showed higher mortality due to miscellaneous causes.

The death of goats was highest (41.07%) in winter and lowest (21.43%) in summer season. Mortality due to pneumonia was higher in winter (52.17%) than rainy (14.29%) followed by summer season (8.33%). The effect of season on goat mortality was significant ( $p < 0.05$ ). These results were closely in agreement with the findings of Mittal [12], Mazumdar *et al.* [13] and Lodh *et al.* [14] whereas, Kasem *et al.* [15] found

higher mortality in rainy season. Maximum mortality in winter might be due to cold stress.

#### Conclusion

On the basis of results of current study, it was revealed that diarrhoea and pneumonia are major causes of morbidity, so improved hygiene and good managemental practices should be taken to reduce the occurrence of diseases. Morbidity and mortality was significantly associated with age groups, suggesting that more care and attention need to be paid in kids of 0-3 months age irrespective of season. Mortality due to various diseases in kids and adults could be minimized by identifying the cause and giving proper treatment.

#### Authors' contribution

AD and BS designed the study. AD conducted study and analyzed the data. SP and DK contributed in study, drafted and revised the manuscript. YB and GS compiled and analysed the data. All authors read and approved the final manuscript.

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#### Competing interests

Authors declare that they have no competing interest.

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