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SEASON WISE DISEASE INCIDENCE AND MORTALITY PATTERN OF BENGAL GOATS UNDER VILLAGE CONDITIONS IN NADIA DISTRICT OF WEST BENGAL

KEYWORDS: Bengal goats, seasonal effects, disease incidence, mortality pattern

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ABSTRACT *The present study was conducted in Nadia district of West Bengal during January, 2010 to December, 2013 with the specific objective to study on season wise disease incidence and mortality pattern of the Bengal goats under village conditions in Nadia district of West Bengal. The overall disease incidence of pre-weaning kids during pre-weaning stage was found to be 46.15%. The overall mortality pattern of pre-weaning kids during pre-weaning stage was found to be 9.71%. The overall disease incidence of adult Bengal goats was found to be 10.43%. The overall mortality pattern of adult Bengal goats was found to be 3.03%. Season wise incidence of stillbirth of Bengal goats during summer, monsoon and winter were 12.87%, 10.11% and 6.49% respectively. Mortality due to various diseases in pre-weaning kids and adults could be minimized by identifying the cause and giving proper treatment.*

INTRODUCTION

Goat is one of the earliest discoveries of mankind in pre-historic times as a ready and easy source of meat. Goats play a vital role in the economy of poor dwellers living in diverse climatic conditions of India. In rural areas goat keeping generates employment at the rate of 4.2% per annum (Dhara et al., 2008). Goats are considered as the fixed deposits for the poorest of the poor supplying fund as and when necessary by virtue of their ready market demand (Sahoo et al., 2004). India is rich in goat population (16.7% of world share) and its genetic biodiversity (FAO, 2010). There are 23 recognized breeds of goats in India (as per NBAGR, 2014). The effect of diseases on livestock productivity includes; reduced feed intake, change in digestion and metabolism, increases 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 season will be of immense help in health management to reduce mortality. Keeping in view of its association a study was conducted with the specific objective to study on disease incidence and mortality pattern of the Bengal goats in their home tract.

MATERIALS AND METHODS

The present work was done in Nadia district in the state of West Bengal during January, 2010 to December, 2013. The district Nadia is selected purposively. It lies between 22°52`30" and 24°05`40" parallels of North latitudes and 22°08`10" and 88°48`15" meridians of East Longitudes. It is bounded on the North and North-West by the district of Murshidabad. On the North-East and East it is bounded by the districts of Rajshahi and Kushthia of Bangladesh. In the South and South-East, the district is bounded by the district of North 24 Parganas. Five villages of each of the two blocks have been considered for this study, viz., Mollabelia, Panpur, Kurumbelia, Nischintapur and Madhpur villages of Haringhata block and Gopalpur, Betnakutirpara, Muchiphulbari, Itabaria and Dhakuria villages of Hanskhali block. From each of the selected villages, 25 respondents have been selected randomly. In this way 250 respondents have been selected from 10 villages of the two blocks which have been constituted the sample of the present study. The climate of Nadia district is characterized by an oppressive hot summer, high humidity all the year round and well distributed rainfall (annual average rainfall 1419 mm). Average daily maximum temperature is 31.8°C, and minimum temperature is 21.3°C during the period of study. Humidity is high throughout the year, average being 61.5% (minimum) to 92.9% (maximum). The study area is located in hot-humid zone having three distinct seasons, *viz*., summer (March to June), monsoon (July to October) and winter (November to February). The average environmental variables of Nadia district during the period of study is given at Table 1.

'Table 1 about here'

A pilot study has been carried out, and accordingly a structured interview schedule has been constructed. The data has been collected through face-to-face interview and by direct observation method. This experiment was designed to collect information of goat flock and data pertaining to the occurrence of disease, mortality pattern of pre-weaning kids and adult goats. Morbidity was on the basis of observed clinical signs, owner's statement and some laboratory examinations. Suspected causes of mortality were clarified by taking history, clinical signs before death where showed, owner's statement, post-mortem examination and in some cases by laboratory tests. The incidence of still birth of Bengal goats was also recorded. Pre-weaning kid mortality was recorded after kidding till weaning up to 3 months of age. A total of 527 adult goats aged above 6 months of both sexes including castrated ones were considered for determining adult goat mortality. Data were analyzed following the standard statistical methods (Snedecor and Cochran, 1967).

RESULTS AND DISCUSSION

Disease incidence of pre-weaning kids

Season wise disease incidence of pre-weaning kids is presented in Table 2.

'Table 2 about here'

Disease incidence under field condition following extensive or semi intensive management system in Bengal goat kids was found to be more in winter (50.68%), followed by monsoon (45.45%) and summer (43.29%). The overall dis-

Volume : 5 | Issue : 1 | Jan 2015 | ISSN - 2249-555X

ease incidence of pre-weaning kids during pre-weaning stage was found to be 46.15% (Table 2). Ershaduzzaman et al. (2007) reported that overall incidence of diarrhoea ranked the highest portion among the infectious causes in Black Bengal kids. Incidence of contagious ecthyma and conjunctivitis were also observed in kids. Dohare et al. (2013) reported that incidence of diarrhoea and pneumonia was highest in 0-3 month of age in goats under village conditions of Madhya Pradesh.

Mortality pattern of pre-weaning kids

Season wise mortality pattern of pre-weaning kids is presented in Table 3.

'Table 3 about here'

Mortality under field condition following extensive or semi intensive management system in Bengal goat kids was found to be more in winter (15.06%), followed by monsoon (9.09%) and summer (6.18%). The overall mortality pattern of pre-weaning kids during pre-weaning stage was found to be 9.71% (Table 3). Ali et al. (1975) observed that the highest mortality was observed in kids during the first 30 days of life; this was also influenced by weather (overall 46% against 69% during the rainy season). Singh (1987) observed that the kid mortality was highest in the rainy season (52.20%), and was higher in the 1st week of life (22.80%) than in weeks 2-24. Lodh et al. (1993) found that the mortality was highest among kids aged 0-30 days (51.44%). However, Alam et al. (2007) observed that the pre-weaning mortality and disease susceptibility scores were higher ($p<0.01$) in Black goats than in White goats in Bangladesh. Kashem et al. (2011) reported that the seasons had special influences on mortality of kids (64.19%) where the highest mortality rate was 25.93% in rainy season. PPR had the highest mortality rate (25.00% in kids) followed by pneumonia (21.15%). Al Noman et al. (2011) reported that the mortality rate of the growing kids in season-I (March to June), season-II (July to October), season-III (November to February) were 14.7%, 40.6% and 19.4%. PPR and bronchopneumonia were found higher in season-III than other seasons whereas diarrhoea in season-I and coccidiosis in season-II were higher. Sabapara and Deshpande (2010) reported that average mortality in Surti goats in field condition was 11.75% at 0-3 month of age. Bobde and Barbind (2002) reported that Frequency of pneumonia was found significantly more compared to other causes in Beetal X Osmanabadi kids. In seasonal outbreaks enteritis was more in rainy season compared to other seasons. Differences in year-wise distribution of causes of mortality were also significant.

Disease incidence of adult Bengal goats

Season wise disease incidence of adult Bengal goats is presented in Table 4.

'Table 4 about here'

Disease incidence under field condition following extensive or semi intensive management system in adult Bengal goats was found to be more in monsoon (11.69%), followed by summer (10.05%) and winter (9.58%). The overall disease incidence of adult Bengal goats was found to be 10.43% (Table 4). Ershaduzzaman et al. (2007) reported that overall incidence of diarrhoea ranked the highest portion among the infectious causes in adult Black Bengal goats. Ershaduzzaman et al. (2007) reported that overall incidence of diarrhoea ranked the highest portion among the infectious causes in adult Black Bengal goats. Incidence of contagious ecthyma was also observed in newly introduced adult female. Dohare et al. (2013) reported that incidence of diarrhoea and pneumonia was lowest in above 6 month of age and the overall morbidity rate was 20.58% in goats under village conditions of Madhya Pradesh. Overall morbidity and mortality of adult goats were 74.40% and 17.26% respectively. Kashem et al. (2011) reported that the morbidity of adult goats distributed for herd size 1, 2 and 3 were 66.67%, 85.42%, and 70.83%, respectively. Morbidity rates of adult goats in two households respectively were 33.93% and 40.47%, and mortality rates were 6.55% and 10.71% respectively. Nath et al. (2014) reported that the occurrence of various infectious diseases was higher in rainy season (36.43%) followed by winter season (34.94%) and summer season (28.62%). Female goat was found to be more susceptible (64.22%) than the male animal (35.77%).

Mortality pattern of adult Bengal goats

Season wise mortality pattern of adult Bengal goats is presented in Table 5.

'Table 5 about here'

Mortality under field condition following extensive or semi intensive management system in adult Bengal goats was found to be more in winter (3.59%), followed by monsoon (2.92%) and summer (2.64%). The overall mortality pattern of adult Bengal goats was found to be 3.03% (Table 5). Nandi et al. (2011) reported that under field condition goat mortality rate was 9.6%, which corroborated with the findings of the present study. Higher mortality in adult goats was recorded by earlier workers (Ershaduzzaman et al, 2007; Rahman et al. 1975). The major diseases instrumental in causing deaths in the present study were diarrhoea, dystocia, predator attack and mechanical injuries. Ershaduzzaman et al. (2007) reported that most of the goats were died due to suspected enterotoxaemia, predator attack and diarrhoea. Dohare et al. (2013) reported that the overall mortality rate was 10.20% in goats under village conditions of Madhya Pradesh. Kashem et al. (2011) reported that mortality rates of adult goats in two households were 6.55% and 10.71% respectively. Kashem et al. (2011) reported that the seasons had special influences on mortality of adult goats (35.81%) where the highest mortality rate was 22.22% in rainy season. PPR had the highest mortality rates (37.93% in adults) followed by pneumonia (24.14%). Al Noman et al. (2011) reported that the male and female goats were accounted as 46.72% and 46.87% due to PPR, 20.56% and 15.63% due to pneumonia, 14.02% and 20.83% due to diarrhoea, 6.54% and 5.2% due to coccidiosis respectively. Sabapara and Deshpande (2010) reported that average mortality in Surti goats in field condition was 8.09% and 6.04% at 3-12 month and adult age groups respectively. The major causes of mortality were recorded as enteritis (38.24 %) and pneumonia (38.24%). Poonia and Malik (2012) reported that the overall incidence of pneumonia was (56.06%) followed by enteritis (18.63%), pneumoenteritis (11.75%), helminthosis (4.34%), hepatitis (1.08%), toxaemia (1.45%), coccidiosis (1.81%) and colibacillosis (0.72%) in Beetal goats.

Season wise incidence of still birth of Bengal goats

Season wise incidence of stillbirth of Bengal goats is presented in Table 6.

'Table 6 about here'

From the table it is revealed that season wise incidence of still birth of Bengal goats during the summer, monsoon and winter were 12.87%, 10.11% and 6.49% respectively. Singh et al. (1987) found that the stillbirths ranged from 0.95 to 6.41%. Kanaujia et al. (1986) reported that the inci-

Volume : 5 | Issue : 1 | Jan 2015 | ISSN - 2249-555X

dence of stillbirths was 2.86%, which is lower than the present findings.

CONCLUSION

On the basis of results of current study, it can be concluded that diarrhea, pneumonia, goat pox, ectoparasites, anorexia and others are causes more mortality in Bengal goats in the three distinct seasons, viz., summer, monsoon and winter, so improved hygiene and good managemental practices should be taken in three seasons to reduce the occurrence of diseases. Mortality was associated with age groups, suggesting that more care and attention need to be paid in pre-weaning kids in three seasons. Mortality due to various diseases in pre-weaning kids and adults could be minimized by identifying the cause and giving proper treatment.

Table 1. Average weather report of Nadia district of West Bengal during the period of study (January, 2010 to December, 2013)

Month	Temperature ^{0}C		Relative Humidity (%)		Rainfall (mm)
	Maximum	Minimum	Maximum	Minimum	
January	24.15	10.45	94.65	51.75	14.72
February	29.32	14.1	92.5	44.72	7.25
March	35.16	20.46	89.8	39.43	20.83
April	36.42	24.60	88.59	48.00	63.97
May	35.35	25.83	90.59	62.89	119.65
June	34.27	26.83	92.46	73.1	209.27
July	33.03	26.70	95.06	78.53	245.22
August	32.53	26.53	96.89	80.56	333.6
September	32.77	25.92	95.89	77.59	269.0
October	32.87	23.91	94.95	67.8	113.65
November	30.09	17.93	90.5	55.6	14.72
December	25.94	12.53	92.85	57.8	6.7
Annual	31.82	21.31	92.89	61.48	1418.58

Table 2. Season wise disease incidence of pre-weaning kids of Bengal goats

Seasons	No. of observation	Diseases						Total no. affected	Incidence (%)
		Diarrhoea	Pneumonia	Goat pox	Ectoparasites	Anorexia	Others		
Summer	97	7	5	9	4	11	6	42	43.29
Monsoon	77	9	8	0	7	3	8	35	45.45
Winter	73	3	11	3	9	4	7	37	50.68
Overall	247	19	24	12	20	18	21	114	46.15

Table 3. Season wise mortality pattern of pre-weaning kids of Bengal goats

Seasons	No. of observation	Diseases						Total no. affected	Incidence (%)
		Diarrhoea	Pneumonia	Goat pox	Ectoparasites	Anorexia	Others		
Summer	97	1	1	2	0	1	1	6	6.18
Monsoon	77	2	1	0	1	2	1	7	9.09
Winter	73	1	2	1	0	3	4	11	15.06
Overall	247	4	4	3	1	6	6	24	9.71

Table 4. Season wise disease incidence of adult Bengal goats

Seasons	No. of observation	Diseases						Total no. affected	Incidence (%)
		Diarrhoea	Pneumonia	Goat pox	Ectoparasites	Anorexia	Others		
Summer	189	2	4	3	5	3	2	19	10.05
Monsoon	171	3	9	0	3	2	3	20	11.69
Winter	167	2	4	3	2	3	2	16	9.58
Overall	527	7	17	6	10	8	7	55	10.43

Table 5. Season wise mortality pattern of adult Bengal goats

Seasons	No. of observation	Diseases						Total no. died	Mortality rate (%)
		Diarrhoea	Pneumonia	Goat pox	Ectoparasites	Anorexia	Others		
Summer	189	1	0	1	0	2	1	5	2.64
Monsoon	171	2	1	0	1	0	1	5	2.92
Winter	167	1	2	1	0	1	1	6	3.59
Overall	527	4	3	2	1	3	3	16	3.03

Table 6. Season wise incidence of still birth of Bengal goats

Variables	Seasons		
	Summer	Monsoon	Winter
Total number of kids born	101	89	77
Incidence of stillbirth	13 (12.87)	9 (10.11)	5 (6.49)

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