



Incidence of important goat diseases and economic losses under field condition

RAKESH ROY¹, RUPASI TIWARI² and TRIVENI DUTT³

Indian Veterinary Research Institute, Izatnagar, Bareilly, Uttar Pradesh 243 122 India

Received: 15 January 2015; Accepted: 10 June 2015

Key words: Economic loss, Enterotoxaemia, Goat owners, Goat pox, Morbidity, Mortality, Peste des petits ruminants

Mortality and morbidity are the major concerns in goat farming. Mortality rate was the highest in 0–3 months age group followed by 3–12 months age group and was least among adult group (Sabapara and Despande, 2010). Diarrhea, disease and/ or internal parasite were responsible for death of kids (Debele *et al.* 2013). Venkataramanan *et al.* (2005) reported that total annual loss due to peste des petits ruminants (PPR) in India was ₹ 1.8 billion (US\$ 36 million) in which annual loss due to mortality was ₹ 1.5 billion, annual loss due to morbidity ₹ 200 million and annual indirect loss (export restriction etc.) was ₹ 100 million. Therefore, a study had been taken up to assess the incidence of important goat diseases as observed by the goat owners and economic losses due to some of the deadly disease of goat in field condition on recall basis so that the perceived economic losses due to these diseases could be assessed and proper strategy can be taken up to reduce the economic loss to the goat owners.

The study was purposively conducted in West Bengal

(WB) and Uttar Pradesh (UP) states which were selected on the basis of their high goat population in the country. North 24 Parganas district from WB and Mathura district from UP were randomly selected for the study. Again, two blocks from each district and 45 farmers from each block were randomly selected for data collection. Thus, 90 farmers were selected from each state. The climate of North 24 Parganas is tropical like the rest of the Gangetic West Bengal. Temperatures range in between 10°C in January and 41°C in May. The average rainfall is 1579 mm, received mostly during the monsoons from June to mid September. Relative humidity is in between 50% in March and 90% in July. The climate of Mathura is tropical extreme with very hot summers with temperatures rising beyond 44°C, and cold and foggy winters with temperature dipping to 5°C. The average rainfall is 593 mm, received mostly during the monsoons from July to September. Relative humidity is in between 20% in May and 80% in January.

The incidences of important diseases were analyzed as

Table 1. Incidence of important diseases in goats

Disease	West Bengal			Uttar Pradesh			Total		
	Occur (n=90)	Mob (n=647)	Mor (n=647)	Occur (n=2350)	Mob (n=2350)	Mor (n=2350)	Occur (n=180)	Mob (n=2997)	Mor (n=2997)
PPR	75(83.33)	285(44.05)	89(13.76)	67(74.44)	495(21.06)	377(16.04)	142(78.89)	780(26.03)	466(15.54)
GP	23(25.56)	97(14.99)	16(2.47)	28(31.11)	195(8.30)	73(3.11)	51(28.33)	292(9.74)	89(2.97)
HS	15(16.67)	53(8.19)	15(2.31)	13(14.44)	65(2.77)	32(1.36)	28(15.56)	118(3.94)	47(2.00)
FMD	12(13.33)	72(11.13)	00	12(13.33)	132(5.62)	5(0.21)	24(13.33)	204(6.80)	5(0.001)
KD	22(24.44)	47(7.26)	17(2.62)	37(41.11)	238(10.13)	190(8.09)	59(32.78)	285(9.50)	207(6.91)
Bloat	34(37.78)	69(10.66)	35(5.41)	24(26.67)	90(3.83)	52(2.21)	58(32.22)	159(5.30)	87(3.0)
ET	20(22.22)	31(4.79)	21(3.25)	37(41.11)	201(8.55)	80(3.40)	57(31.67)	232(7.74)	101(3.37)
Tetanus	12(13.33)	12(1.85)	12(1.85)	17(18.89)	50(2.13)	50(2.13)	29(16.11)	62(2.07)	62(2.07)
CE	11(12.22)	33(5.10)	0.00	15(16.67)	171(7.28)	21(0.89)	26(14.44)	204(6.81)	21(1.00)
Endoparasite	40(44.44)	147(22.72)	0.00	48(53.33)	987(42.00)	36(1.53)	88(48.89)	1134(37.83)	36(1.20)
Ectoparasite	28(31.11)	112(17.31)	0.00	45(50)	971(41.32)	0.00	73(40.56)	1083(36.14)	00

Occur, Occurrence; (n=no. of respondent); Mob, morbidity, (n= no. of animals); Mor, mortality, (n= no. of animals).

¹Subject Matter Specialist (Animal Science) (rakeshvetext@yahoo.co.in), Darjeeling Krishi Vigyan Kendra, UBKV, Kalimpong–734301, Darjeeling, West Bengal. ²Senior Scientist and In-charge (rtiwarirupasi@gmail.com), ATIC, ³Principal Scientist (triveniduttvri@gmail.com), LPM Division.

observed by goat owners for last two years. Data were collected through structured interview schedule from goat keepers between January to March 2013 with the help of a software developed by researcher itself on goat disease management namely Goat Health Management Information

System to identify the symptoms and problems observed in their flock. For probable confirmation of the disease a thorough study of the prevailing diseases were enquired from the veterinary officers who were posted in the study area. The total numbers of the goat possessed by the 90 respondents in WB and UP were 647 goats and 2350 goats, respectively, thus the total flock size for the study was 2997 goats. The mortality and morbidity rate of the goat against important diseases were assessed on the total flock size of the study. Loss due to mortality was calculated as assumed marketable price at the time of death. Loss due to morbidity was calculated as assumed weight loss and loss due to treatment on recall basis.

Table 1 shows the observed incidence of important diseases by goat owners. As per overall occurrence, morbidity and mortality were concerned, it was evident that peste des petits ruminants (PPR) had highest (78.89%) incidence as observed by goat owners. Tsegaye (2013) also reported that PPR was the leading goat disease followed by pastuerellosis across all agro-ecological regions. Endo-parasite infestation had second highest (48.89%) incidence followed by ecto-parasite (40.56%). Almost similar occurrence (varied from 28–33%) was observed for goat pox (GP), kid diarrhea (KD), bloat and enterotoxaemia (ET). The occurrences of foot and mouth disease (FMD), haemorrhagic septicaemia (HS), tetanus and contagious ecthyma (CE) were around 15% (Table 1). The occurrence of PPR, HS and bloat was higher in WB whereas the occurrence of GP, KD, ET, tetanus, CE, endo parasite and ecto parasite was higher in UP.

Table 1 further reveals that morbidity was found highest for endo parasite (48.89%) in goat followed by ecto parasite (36.14%) and PPR (26.03%). Almost similar morbidity (around 10%) was observed for goat pox and kid diarrhea. The morbidity rate of HS, FMD, bloat, ET and CE was around 3–7% (Table 1). The morbidity rate due to PPR, GP, HS, FMD and bloat was found higher in WB whereas due to KD, ET, tetanus, CE and endo parasite was higher in UP.

Mortality in goat was found highest due to PPR (15.54%) followed by KD (6.91%). Almost similar mortality (varied from 1–4%) was observed for GP, HS, bloat, ET, tetanus, CE and endo parasite (Table 1). Nearly similar trends were observed in mortality rate of goat due to major diseases in both the states, except KD and bloat. Mortality rate due to KD was higher in UP whereas mortality rate due to bloat was higher in WB. Singh and Prasad (2008) had reported that PPR accounted for the maximum incidence (32.3%) and deaths (41.5%), with case fatality rate of 21.5 percent, followed by FMD with incidence of 17.4 percent, deaths 1.8 percent and case fatality rate of 1.7 percent.

The economic losses due mortality, weight loss and expenses on treatment as perceived by the goat owners on recall basis are presented in table 2. The overall economic loss was highest due to PPR. Out of total loss of ₹ 14,26,699, WB accounted for ₹ 4,02,089 and UP for ₹ 10,24,610. Morbidity losses per goat due to PPR was

Table 2. Economic losses due to important diseases in goats

Disease	West Bengal										Uttar Pradesh												
	Goat (no.)			Economic Loss (₹)					Goat (no.)					Economic Loss (₹)					Overall loss (₹)				
	Mor	Mob	Mor	Mob		Total loss (c+d+e)	Mob/ goat (d+e)/b	Mor/ goat (c/a)		Mor	Mob		Total loss (k+l+m)	Mob/ goat (l+m)/j	Mor/ goat (k/i)	Economic loss (f+n) (d+e+l+m) (c+k)/ b+j	Mob/ goat (r)	Mor/ goat (s)					
				Wt. loss	Trt			Wt. loss	Trt														
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)					
PPR	89	285	295274	88920	11825	402089	375	3318	377	495	896529	105435	22646	1024610	259	2378	1426699	301	2558				
GP	16	97	48208	4550	2440	55198	72	3013	73	195	165929	24375	1915	19229	135	2273	74427	114	2406				
HS	15	53	39169	7950	3090	50209	208	2611	32	65	77282	9750	3645	90677	206	2415	140886	207	2477				
FMD	0	72	00	10800	250	11050	153	0	5	132	11365	16500	2597	30462	145	2273	41512	147	2273				
KD	17	47	8500	4700	2225	15425	147	500	190	238	95000	29750	5562	130312	148	500	145737	148	500				
ET	21	31	63273	3782	3990	71045	251	3013	80	201	181840	25125	2942	209907	139	2273	280952	154	2427				

Mor, mortality; Mob, morbidity; Wt., weight; Trt, treatment.

₹ 301 while it was ₹ 375 in WB and ₹ 259 in UP. Thambore and Sinha (2009) reported that total loss due to PPR disease was found to be ₹ 945 in goat.

The overall economic losses due to ET followed by KD and HS were also the major concern (Table 2) in the field. Morbidity losses per goat due to HS, ET, KD and FMD were calculated to be ₹ 207, ₹ 154, ₹ 148 and ₹ 147, respectively. In WB, total economic loss was highest due to PPR followed by ET, GP and HS. In UP also PPR caused highest loss followed by ET and KD. The result depicted that morbidity losses per goat in both states were highest due to PPR and lowest due to goat pox.

The result depicts that overall mortality losses per goat was highest due to PPR followed by HS, ET and GP. The result further reveals that mortality losses in both the states were highest due to PPR followed by ET, GP and HS (Table 2).

SUMMARY

A survey was conducted among the goat keepers of North 24 Parganas district of West Bengal and Mathura district of Uttar Pradesh to know the incidence of important goat diseases and the economic losses due to some of the important diseases in goat under field condition. Two blocks from each district and 45 farmers from each block were randomly selected for data collection. Thus, 90 farmers were selected from each state. The study showed that majority of the respondents observed PPR as major disease in their flock followed by endoparasite and ectoparasite infestation. Analysis of economic losses due to important diseases on recall basis showed that economic loss was highest due to

PPR followed by enterotoxaemia and kid diarrhea. Morbidity and mortality losses due to PPR were also found highest among important goat diseases and the mortality losses were calculated to be about ₹ 301 and ₹ 2,558 / goat respectively. Therefore, proper health programmes and management practices must be undertaken in advance to avoid such huge economic losses under field conditions.

REFERENCES

- Debele G, Duguma M, Hundessa F, Messele F, Kebede T and Negash M. 2013. Study on major causes of kid mortality in Adami Tulu Jido Kombolcha district of Oromia, Ethiopia. *Agriculture and Biology Journal of North America* **4** (2): 110–15.
- Sabapara G P and Deshpande S B. 2010. Mortality pattern in Surti goats under field condition. *Veterinary World* **3** (4): 165–66.
- Singh B and Prasad S. 2008. Modelling of economic losses due to some important diseases in goats in India. *Agricultural Economics Research Review* **21** (2): 297–302.
- Thambore N N and Sinha M K. 2009. Economic implication of peste des petits ruminants (PPR) disease in sheep and goats: A sample analysis of district Pune, Maharashtra. *Agricultural Economics Research Review* **22**: 319–22.
- Tsegaye D, Belay B and Haile A. 2013. Prevalence of major goat diseases and mortality of goat in Daro-Labu district of west Hararghe, eastern Ethiopia. *Journal of Scientific and Innovative Research* **2** (3): 665–72.
- Venkataramanan R, Bandyopadhyay S K and Oberoi M S. 2005. Present status and strategies for the control of transboundary and other economically important disease in India: a review. *Indian Journal of Animal Sciences* **75**: 456–64.