

Factors related occurrence of Haemonchosis of Goats in Rajshahi, Bangladesh

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ABSTRACT

The study was conducted on live and slaughtered goats in Rajshahi district during the period of March, 2011 to February, 2012 by coproscopy and necroscopy studies respectively. The aim of this study was to determine the factors such as age, sex and breed of the goat which influences the prevalence of haemonchosis. The information was collected from farmers through a questionnaire. A total of 720 goats examined, of which 416 goats were found positive for *Haemonchus* infection and the overall prevalence of haemonchosis in goat was 57.8%. The prevalence rate was found to be higher in young (< 2 yrs), 63.8% compared to older (>2 yrs), 41.5% goats. It was observed that in relation to sex the prevalence of haemonchosis was higher in female, 63.9% compared to male, 50.0% goats. Among the breed, the cross-bred goats were the maximum, 60.2% infection rate of haemonchosis than that of Black Bengal, 55.6% goats. The young stage and female goats are more prone to haemonchosis and statistically a significant difference ($P < 0.05$) was noted but there is no significant difference ($P > 0.05$) was found in breed of goats. The present study suggests that young aged and females goats were more susceptible but crossbred goats were slightly susceptible to haemonchosis and requires special attention for its control.

Key words: Haemonchosis, age, sex, breed and Goat.

INTRODUCTION

Bangladesh is a subtropical country with subsistence agro-based economy. The agriculture of Bangladesh is almost entirely based on livestock. Livestock play an important role in the national economy of Bangladesh. Goat is a very important species of livestock in Bangladesh. There are about 24.15 million goats are found in Bangladesh [1]. The landless and small farm holdings own the highest percentage of goats [2]. Goat rearing is an economically important aspect of the agriculture sector, as most of the people live in rural areas [3]. The goat population in Bangladesh faces a lot of obstacles in the development due to their parasitic infestation specially haemonchosis is an important and common parasitic disease in goats and causes reduced weight gain and often mortality. Parasitic helminthes are a major cause of losses in productivity and health problems of goats and are associated with huge economic losses specially in resource poor regions of the world [4]. Haemonchosis caused by *Haemonchus contortus* and *Haemonchus placei*, is one of the most economically deteriorating disease of sheep and goats in Pakistan [5]. Infestation by *Haemonchus contortus*, which inhabits the fourth stomach (abomasum) in sheep and goat, is very high (85%), mostly in young animals [6]. Haemonchosis causes anaemia, emaciation, and edema and gastric disturbances resulting principally from the loss of blood; heavy infection may be fatal. *H. contortus* are common blood feeders that cause low productivity, blood loss, and decrease in haemoglobin that can lead to death in heavily infected animals [7,8]. It has been estimated that each worm sucks about 0.05ml

of bloods by seepage or ingestion from lesions per day [9].

Nuruzzaman *et al* [10] were observed prevalence of abomasal nematodes in relation to age, sex and breed of the goats. There was no statistically significant difference observed the risk factor sex in relation to the prevalence of abomasal nematodes in Bangladesh. However, there was statistically significant difference ($p < .001$) observed among the risk factors (age and breed) in relation to the prevalence of *Haemonchus contortus*. Vlassoff *et al* [11] demonstrated that the effect of helminthes infection on production of particular livestock species depend mostly up on the age of the animals, the breed, the parasite species involved and the intensity of the worm populations within the host. Tesfaheywet [12] studied about the age and sex of the small ruminant affect the helminthosis in Ethiopia. Maqsood *et al* [5] was studied haemonchosis with reference to breed, sex and age of sheep and goats in Pakistan.

However, no report so far has been published on the prevalence of haemonchosis in the present study areas, where goats are important assets to the local farmers. Hence, it is imperative to investigate the level of the *Haemonchus* infection and the associated risk factors such as age, sex and breed that make goats susceptible to the wide range of *Haemonchus contortus* in an area, in order to devise effective control measure and monitor their outcome properly. Therefore, it is the objective of this study to determine the prevalence and severity of haemonchosis, establish the relationship between

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Table 1. Prevalence of haemonchosis in goats by Examination type, age, sex and breed.

Factor	No. examined	No. positive	Prevalence (%)	Chi-square test (χ^2) (P value)
Examination type				
Coprospecty	363	182	50.1	17.52(0.000)
Necrospecty	357	234	65.5	
Total	720	416		
Age groups				
Young(<2 yrs)	527	336	63.8	28.81(0.000)
Older(>2 yrs)	193	80	41.5	
Total	720			
Sex				
Male	316	158	50.0	13.97(0.000)
Female	404	258	63.9	
Total	720			
Breed				
Local	378	210	55.6	1.611(.116)
Cross-bred	342	206	60.2	
Total	720	416	57.8	

collected samples were labeled with age, sex and breed of goat. The date of collection, the number of total and infected animals was also recorded.

factors influencing haemonchosis in goats in study area.

MATERIALS AND METHODS

Study plan

A cross-sectional study was done to detect the occurrence of parasitic disease in goats in Rajshahi during the period of March, 2011 to February, 2012. Goats were randomly selected from the nearby villages, pastures, veterinary hospitals and abattoirs. A questionnaire was prepared including information viz. name and address of farmer, type of sample, age, sex, and breed of goats for achievement of the study. A total of 720 goats were selected for the present study from which 363 for coprospecty and 357 for necropsy studies in the Rajshahi district. To achieve the goal selected goats were grouped according to the age, sex and breed. Sex of the goats were divided into two groups; female (n=404) and male (n=316) goats. Goats were categorized into two age groups as young animals of < 2 years (n=527) and olders of > 2 years of age (n=193). The age of goats were determined from birth register and examined by teeth and cornual ring reading. On the basis of breed characteristics and ancestor history goats were grouped into Black Bengal/local (n=378) and crossbred (n=342).

Collection of sample

In the coprospecty studies, faecal samples were collected by a two-finger procedure directly from the rectum of selected goats. Faecal samples were collected in 10% formalin containing suitable airtight containers, such as screw-cap bottles and plastic bags. At necropsy studies, abomasii were collected after slaughtering and evisceration of the goat in nearby slaughter houses in the study area. All the

Examination procedure

The monthly collection of faecal samples and abomasum were brought to the laboratory at the Department of Animal Husbandry and Veterinary Science, University of Rajshahi for the identification of *Haemonchus spp.* Faecal samples were examined by direct smear, floatation and sedimentation techniques for the presence of *Haemonchus* eggs. *Haemonchus* eggs were identified by using low power microscope according to the keys and morphological characteristics [9].

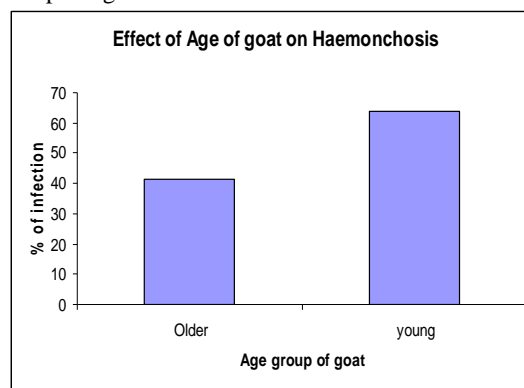


Fig-1; Effects of age of the goats in the percent of haemonchosis in the study area

Each abomasum was opened along the lesser curvature and the contents put in a plastic bucket. The mucosa was cleaned under running tap water and the washings drained into the bucket, and clean water was added to it to make the desired volume. After thorough stirring, the sedimented fluid was removed from the washings of the abomasum, into a container containing normal saline. The contents and washings of abomasii were inspected for the presence of mature and immature worms and

Haemonchus spp was identified based on the characteristics given by^[13].

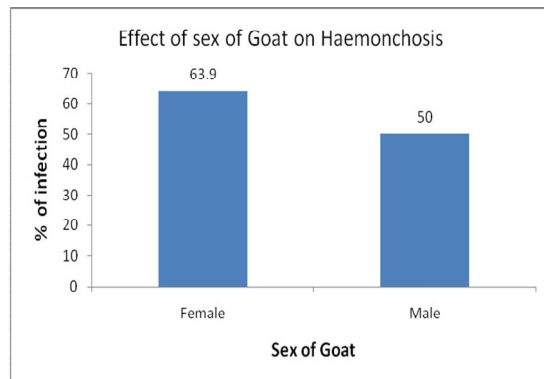


Fig-2; Effects of sex of the goats in the percent of haemonchosis in the study area

Data analysis

All the data that were collected (age, sex and breed) entered to MS excel sheet and analyzed by using SPSS version 19. Descriptive statistics was used to determine the prevalence of the haemonchosis and Chi-square test (χ^2) was used to look the significant difference between age, sex and breed of goats with haemonchosis. In all the analyses, confidence level was held at 95% and $P < 0.05$ were set for significance. for 24 hours.

RESULTS AND DISCUSSION

The prevalence of haemonchosis of goats was studied for the evaluation of factors (age, sex and breed of goats) responsible for the occurrence of this disease in the study area. Overall prevalence of haemonchosis was 57.8% (416 out of 720) in examined goats which is in agreement with the findings of Nuruzzaman *et al*^[10] who reported 58% prevalence of *Haemonchus contortus* of goats in Thakurgaon district, Bangladesh. Amrita *et al*^[14] was recorded as highest prevalence of *Haemonchus* in goats below one year of age and their overall prevalence rate was 45.13%, and Bersissa *et al*^[15] found 39.4% *Haemonchus contortus* infection in Ethiopia which are dissimilar to the present study. Although the exact cause of dissimilarity in the prevalence of *Haemonchus* infection of goat cannot be explained but it may be associated with genetic and inheritable effect and to some extent managerial factors like grazing habit, rearing system, deworming status and study area etc. Among the examination pattern, coproscopy study was recorded 50.0% infection rate in which 184 faecal samples were positive out of 363 samples examined in live goat. In the necropsy Study, out of 357 abomasii, 234 samples were positive for *Haemonchus* worms, which was 65.5% of the infection in Slaughtered goat (Table-1). This result is more closely related to the findings of

Shahiduzzaman^[16] 65.63% in slaughtered goat. Asif *et al*^[17] was found 75% (252/120) *Haemonchus* infection recovered from faecal sample of goat in Pakistan. This controversy is might be due to the presence of sick animals, managerial effect, lack of using anthelmintics in the study area.

The graphical representation on prevalence of haemonchosis in different age group of goat is presented in Fig -1. Prevalence was higher in young aged (63.8%) than adult aged goats. Maqsood *et al*^[5] was found that the prevalence of haemonchosis was higher in goats less than two years of age (47.8%) compared with those of above two years (33.3%). Nuruzzaman *et al*^[10] was found that age can affect the occurrence of parasites. He also reported the prevalence of abomasal nematodes in goats were significantly ($p < 0.01$) higher in young aged (84.61%) than adult aged (61.21%) goats. Youngs were 3.30 times more susceptible than adults. The previous study found that the prevalence decreased as the age increased. Tesfaheywet^[12] was found 64.52% gastro-intestinal helminths in young and 56.29% in adult goats. These results are also related to the findings of^[18, 19, 20, 21], those researchers reported that, prevalence of haemonchosis was higher in young goats due to the fact that with the advancement of age, vigor of the goats become better and they develop resistance against the parasitic diseases. The low level of parasitism reported in the adult animals is due to the development of significant immunity with the course of time^[3]. It was also explained that the more infection in young goats is because of their low resistance or greater susceptibility due to the fact that these goats have not been exposed earlier in the infection. During the first year of their life they fed, grazed and browse on grasslands, thus the first stage of their exposure to infection with parasites occurs. Gradually, as the exposure to parasitic infection increases, the immune system of host animals builds up specially against *Haemonchus spp* and age resistance develops.

The effect of sex of goats on prevalence of haemonchosis is shown in Fig-2. According to sex, prevalence of haemonchosis in female goats was 63.09% (258/404) and in male was 50.0% (158/306). Hassan *et al*^[22] gave almost similar findings, 57.49 % in female and 42.51% in male goat in the Chittagong, Bangladesh. Maqsood *et al*^[3] reported that the rate of haemonchosis was higher (74.6%) in females than males (59.1%). Shahiduzzaman *et al*^[16] reported that the infection rate of *Haemonchus* was significantly ($P < 0.05$) higher in females than the male goats. Raza *et al*^[23] studied that incidence in female goat was 31.09% and male goat was 29.91%. Saiful *et al*^[24], Qamar *et al*^[25] and Tesfaheywet^[12] was observed higher rates of nematode infection in female hosts compared with the males. Higher prevalence of haemonchosis in females compared with males might be due to lowered resistance of female goats on the part of their reproductive events and unbalanced diet against higher needs and hence

the females needs more nutrition for the nourishment of their kids they are voracious eaters by nature, which gives more chance of infective larvae than the males. Most of the researchers have observed higher rate of *Haemonchus* infection in female hosts compared with males; Maqsood *et al*^[5] Gauly *et al*^[26] studied that sex can influence the prevalence of helminthes. Vanimisetti *et al*^[27] have shown that, the females are stress during the pregnancy and lactation which helps for establishment of infection by the parasites. The present value of prevalence of haemonchosis is different from findings of Nuruzzaman *et al*^[10] observed that males was higher prevalence (65.22%) than female (51.85%) goats. Shahadat *et al*^[28] also reported the prevalence is higher in males than female goat. This was might be due to the study area, managemental effects, sample size, experimental design and deworming staus of the goats.

There was no statistically significant association between breed and prevalence of haemonchosis in goats (Table-1). The results showed that the prevalence of haemonchosis is higher in crossbred, 60.2% (206 out of 342) goats compared to local (Black Bengal), 55.6% (210 out of 378) bred of goat. Nuruzzaman *et al*^[1] observed that Black Bengal goats were comparatively higher (57.14%) prevalence than cross-bred (55.81%) goats in Thakurgaon district of Bangladesh. Those findings are almost similar to the present findings. This is due to the resistance of the Black Bengal goats against the *Haemonchus* infection. Goats which are browsers in their natural environment, the genetic pressure to develop resistance to *Haemonchus contortus* in the local breeds might be precluded. Genetic resistance operated mainly against worm establishment and that this was controlled by the immune response^[16].

CONCLUSION

The older aged, male goat and Black Bengal goats are slightly more resistant in prevalence of haemonchosis in Rajshahi district, Bangladesh. So, young aged, female and crossbred goats should be great care of management during grazing month on the pasture.

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