

Prevalence of Gastro-intestinal Nematodes Infection of Cattle in Bangladesh

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ABSTRACT

Objectives: This study was conducted in different regions of Bangladesh with the objectives of investigating the infection of gastro-intestinal nematodes in cattle.

Methods: To determine the prevalence of gastro-intestinal nematodes infection in cattle, the data were collected from different area. A total 5400 fecal samples from animals of different regions in Bangladesh were examined for gastro-intestinal nematodiasis.

Results: Out of 5400 fecal samples 4075 animals were found to be positive with various GI nematodes infection contributing a prevalence rate of 75.46%. The results revealed seven groups of nematodes were prevalent during the study period including *strongylids* spp (65.87%), *Trichuris* spp (8.76%), *Staphanofilaria* spp (5.70%), *Capillaria* spp (5.25%), *Strongyloides* spp (5.15%), *Thelazias* spp (5.08%) and *Ascaris* spp (4.32%). Among the regions, the infection was higher in animals brought to Central Veterinary Hospital (CVH), Dhaka and was calculated as 86.82%. On the other hand the lowest (67.22 %) prevalence was determined in Central Cattle Breeding and Dairy Farm (CCBDF), Savar. This study showed a higher level of prevalence (84.63%) in winter season followed by summer (84.63%).

Conclusion: Although a modern anthelmintics are being used worldwide to treat and control parasitism in cattle and other animals. But their information on their uses and effectiveness at the farmers are scanty. Most of the farmers are unaware of the extent of the loss caused by parasites in their animals. As a result animals are frequently suffered from malnutrition.

Keywords: Gastro-intestinal nematodes, cattle, prevalence,

Bangladesh.

INTRODUCTION

Bangladesh is an agricultural based country with a high population density and per capita income is very low. Livestock in Bangladesh is an essential component of crop cultivation and post-harvest operations. About 90% of livestock rearing is done by the landless and marginal farmers in rural areas for their income³. In Bangladesh, animals are kept at night in animal house and allowed them to graze and search their food on roadsides and other wastes lands. The economic importance of livestock depends on their production system and the production system is compounded by the deficiencies of feeding and breeding with further aggravates the effects of diseases and parasitic infections.

The livestock populations in Bangladesh are susceptible to infection by a large number of parasites and it can be stated that very few animals are entirely free from them. Gastrointestinal (GI) nematodes infection may be considered as one of the major constraints in cattle production in Bangladesh. The economic losses due to damage by these unwanted pests are undoubtedly one of the major problems for controlling the growing animal industry. Assessment of losses may be based on the direct and indirect production losses, cost of controlling parasites and the cost of damage done by these parasites. The geographical condition together with the lodging of water and low laying areas, poor husbandry practices and also chronic shortage of feed predisposes to rapid multiplication and dissemination of parasites in Bangladesh. The prevalence of different parasitic infections in cattle has been described from different areas of Bangladesh^{4,14} and has revealed that a wide variety of gastro-intestinal nematodes and liver flukes are widely prevalent in Bangladesh^{7,9}.

A large number of dairy farms have been established in government and private sector to meet up the requirement of milk and meat for highly dense populated country. Along with feed shortage parasitic infestations are causing main problems for proper development of dairy farms. But little study has been reported among this parasitism in cattle in Bangladesh. By considering the above situation the present study was carried out in dairy cattle of some selected areas to figure out the actual picture of gastro-intestinal nematodes infection in Bangladesh. Therefore, this study will provide an overall idea regarding the distribution of gastro-intestinal nematodes infection of the selected areas and will make consciousness to farmers for taking appropriate control measures of that parasitism.

MATERIALS AND METHODS**Study area and period of study**

To determine the prevalence of gastro-intestinal nematodes infection in cattle, the data were collected from different area such as Thana Veterinary Hospital, kotowali, Chittagong; Central Veterinary Hospital, Dhaka; Savar Dairy Farm Veterinary Hospital, Savar; Upazilla Veterinary Hospital, Sariakandi, Bogra and District Veterinary Hospital, Sylhet. The study was conducted during the period from October, 2009 to June, 2010.

Climatic conditions of the study areas

The climatic conditions of the selected study areas were more or less similar to the average condition of the country. The climate of Chittagong district is moderate in nature. The maximum temperature is 30.2⁰C in May followed by a

minimum temperature of 15⁰C in January. In Dhaka region, there is an average hot and humid weather with little rainfall. Sylhet is an area of high rainfall and high temperature. The Bogra is the hottest area among the study areas.

Collection of fecal samples

Fecal samples were collected directly from the rectum of each animal or from the pasture which were immediately defecated. About 10-15gm of fecal samples was collected. After collection, the samples were kept on ice and bring to the laboratory for further process. All fecal samples were collected in separate cups. To prevent potential cross contamination between fecal samples, separate disposable gloves were worn for each collected sample. Fecal samples collected in the field were kept refrigerated at 4⁰C until processed for further examination.

Examination and identification of parasites

After collection, the samples were immediately carried out to the laboratory and examined by direct smear method and sedimentation method to detect ova or larva of nematodes according to Soulsby¹⁸.

Direct smear method

A thin smear was prepared by spreading a small amount of feces in a grease free clean slide and then examined under microscope with low power objectives of 10X described by Soulsby¹⁸.

Sedimentation method

In this method, about 5-10 gm feces were mixed with 50-100 ml of water in cylinder and were allowed to sediment for 15-20 minutes. The supernatant was carefully discarded without disturbing the sediment. Finally smear was made with a small amount of the sediment on a grease free glass slide and was examined using 10X

eye-piece and 10X object. Some samples were considered negative after examination of three slides with no eggs or larvae segment were identified on the basis of morphological characteristics described by Soulsby¹⁸.

Ethics statement

The study will be conducted under the Faculty of Veterinary and Animal Science, Sylhet Agricultural University, Bangladesh. The handling of animals in the study well be performed in accordance with the current Bangladesh legislation (Cruelty to Animals Act 1920, Act No. I of 1920 of the Government of the People's Republic of Bangladesh). The specific experiments will be approved by the Ethics Committee of the Sylhet Agricultural University, Bangladesh.

Data analysis

Collected data were tabulated and analyzed by descriptive statistics such as average, percentage etc. using the software Microsoft Excel 2007.

RESULTS

Bangladesh is a storehouse of various parasites and the climatic conditions are favorable for multiplication and spreading of all types of parasites. The prevalence of gastro-intestinal nematodes and its infection in cattle of different regions in Bangladesh are presented in table 1 and 2. Out of 5400 fecal samples 4075 animals were found to be positive with various GI nematodes infection contributing a prevalence rate of 75.46%. Among the regions, the infection was higher in animals brought to Central Veterinary Hospital (CVH), Dhaka and was calculated as 86.82%. On the other hand the lowest (67.22 %) prevalence was determined in Central Cattle Breeding and Dairy Farm (CCBDF), Savar. The results also revealed that the higher (84.36%) number of cattle was

affected during September to October month. Alternatively, in the month of May and June there was lower (64.15%) infection in animals by gastro-intestinal nematodes. Among the parasites, *Strongylids* spp were more (65.87 %) prevalent and others were 8.76%, 5.70%, 5.25%, 5.15%, 5.08% and 4.32% of *Trichuris* spp, *Staphanofilarias* spp, *Capillarias* spp, *Strongyloides* spp, *Thelazias* spp and *Ascaris* spp respectively.

DISCUSSION

Infestation with endoparasites is caused mainly by nematodes¹⁰, trematodes and coccidian⁸. It was manifested that climate play an important role in the transmission of parasitic infections in animals¹¹. This study showed a higher level of prevalence (84.63%) in winter season followed by summer (84.63%). This observation is in agreement with the reports of other investigators^{5,17}. It might be due to hot humid climate in summer and low temperature in winter season provides unfavourable environment for the survival and development of parasitic larvae¹² which decreased the availability of infective larvae in the pasture¹¹. A similar study of the prevalence of gastro-intestinal parasites in cattle were also conducted in some specific region reporting the higher infection rate and was more in rainy season¹. Higher prevalence of parasitic infection in cattle and mainly in adults might be due to keeping them for a longer period of time in breeding and milk production purposes or supply inadequate feed against their high demand¹³. Moreover, stress like lactation, pregnancy, nutritional deficiency which might be accounted for higher prevalence in adult cattle¹⁵. The reasons for that are feeding and management of cattle in this country especially for the local breed. Actually the farmers do not give proper attention and care for feeding and management. It is recognized that parasitic infestation rate is

high in undernourished animals¹⁶. The variation between the present study and previous might be due to the differences among the geographical locations, climatic conditions of the study areas, method of study, sample size, genotype of animals etc. in this survey, we found seven types of gastro-intestinal nematodes in calves and adult cattle namely *Strongylids* spp, *Trichuris* spp, *Staphanofilarias* spp, *Capillarias* spp, *Strongyloides* spp, *Thelazias* spp and *Ascaris* spp. High prevalence was noted of strongylids and others with variable percentage. Bangladesh is a tropical country with hot humid environment. Most of the animals here reared in scavenging or semi-scavenging rearing system. In these types of rearing system animals grazed on the fields and possibly this type of management practice plays a vital role for high rate of parasitic infection in animals. For controlling the parasites, modern anthelmintic are being used worldwide to treat and control parasitism in cattle and other animals¹⁶. A number of drugs such as albendazole, fenbendazole, mebendazole, tetramisole hydrochloride, oxclozanide etc. are commercially available in the local market with different trade names. Experiments are carried out in Bangladesh to detect the efficacy of some commercially available anthelmintics² and efficacies varied ranging from 80-100% among them⁶. But their information on their uses and effectiveness at the farmers are scanty. Most of the farmers are unaware of the extent of the loss caused by parasites in their animals. As a result animals are frequently suffered from malnutrition.

CONCLUSION

Results of this study revealed the overall prevalence of gastro-intestinal nematodes infection in cattle in Bangladesh are very high. Although a number of drugs are commercially available in the local

market for the treatment against parasitism but most of the farmers are unaware and not properly treated their animals. Therefore, it is suggested that anthelmintic treatment on quarterly basis may be implemented to reduce the risk of re-infection as well as separate grazing practice can be adopted. Further studies are suggested which will help to take obligatory preventive and control measures against parasitism as well as maximize the production.

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Table 1: Prevalence of parasites in cattle during a period of September -2009 to August-2010 in Bangladesh

Gastrointestinal parasites	Prevalence (%)
<i>Strongylids</i> spp	65.87 %
<i>Ascaris</i> spp	4.32 %
<i>Strongyloid</i> spp	5.15 %
<i>Trichuris</i> spp	8.76 %
<i>Capillaria</i> spp	5.25 %
<i>Staphanofilaria</i> spp	5.70 %
<i>Thelazias</i> spp	5.08 %

Table 2:Prevalence of gastro-intestinal nematodes infection in cattle of different regions in Bangladesh

Study period	Study regions/study place											
	Bogra		Dhaka (CVH)*		Savar (CCBDF)*		Sylhet		Chittagong		Total	
	Animal Examined	Positive	Animal Examined	Positive	Animal Examined	Positive	Animal Examined	Positive	Animal Examined	Positive	Animal Examined	Positive
Sept-Oct'09	180	130 (72.22%)	160	153 (95.63%)	200	110 (55.00%)	200	193 (96.50%)	210	120 (57.14%)	950	706 (74.31%)
Oct-Nov'09	170	138 (81.18%)	200	157 (78.50%)	190	155 (81.58%)	190	165 (86.84%)	190	178 (93.68%)	940	793 (84.36%)
Jan-Feb'10	190	149 (98.42%)	150	139 (92.67)	140	126 (90.00%)	170	130 (76.47%)	170	150 (88.24%)	820	694 (84.63%)
Mar-Apr'10	210	150 (71.43%)	180	171 (95.00%)	180	155 (86.11%)	160	145 (90.63%)	200	120 (60.80%)	930	741 (79.67%)
May-Jun'10	150	88 (58.67%)	190	163 (85.79%)	200	90 (45.00%)	190	120 (63.16%)	160	110 (68.75%)	890	571 (64.15%)
Jul-Aug'10	160	90 (56.25%)	160	120 (75.00%)	170	90 (52.94%)	200	140 (75.00%)	180	130 (72.22%)	870	570 (65.51%)
Total	1060	745 (70.28%)	1040	903 (86.82%)	1080	726 (67.22%)	1090	893 (81.92%)	1110	808 (73.45%)	5400	4075 (75.46%)

*CVH = Central Veterinary Hospital; *CCBDF = Central Cattle Breeding and Dairy Farm