



## **Prevalence of Gastrointestinal Parasitic Infestation of Calf at Sylhet Government Dairy Farm (SGDF), Bangladesh**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Author MHK designed the research methodology and wrote the whole entire manuscript. Author MMH was supervised the whole research work from the beginning to finish. Authors MMP, ABMTA, MMH and MMR were collected the data from the field to laboratory. Authors MSS and MORS were checked the spelling and grammatical errors. Author MMR was corresponded with the journal for publication of this manuscript, re-corrected all revised draft and also performed statistical analysis. All authors were read, check and finally approved the final manuscript.*

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## ABSTRACT

To investigate the prevalence of gastrointestinal parasitic infestation (GIT) of calves, 35 fecal samples were collected from District Dairy Farm, Sylhet of Bangladesh. Fecal samples of two different genotypes were examined for GIT parasites. The results of the fecal examination revealed that 57.14% calves were infected with some of the parasites. The highest prevalence of parasitic infestation was by *Oesophagostomum radiatum* (25.71%) followed by *Trichuris trichuris* (20.00%), *Toxocara vitulorum* (14.29%), *Haemonchus contortus* (11.43%), *Moniezia expansa* and *Fasciola gigantica* (8.57%) and infestation with *Trichostrongylus axei*, *Strongyloides papillosus*, *Moniezia benedeni* and *Bunostomum phlebotomum* was the lowest (2.86%). Prevalence of GIT parasitic infestation in Shahiwal and Holstein Frisian was 60% and 40% respectively. The prevalence GIT parasites in calves were high at above one year age (57.14 %) and lowest in below one year age (40.00%). The age and genotype of the calves and the locality of investigations might have influenced the prevalence of the parasitic infections.

**Keywords:** Calves; dairy; genotype; infestation; parasites; prevalence.

## 1. INTRODUCTION

Agriculture is considered as the key driver of economic growth in Bangladesh. The contribution of agriculture sector to Gross Domestic Product (GDP) in Bangladesh is 12.65%. Bangladesh is currently estimated to comprise 23.48 million cattle, 25.43 million goats and 3.20 million sheep [1]. The livestock sub-sector provides a significant contribution in terms of full filling the demand of daily requirement of animal proteins. In the fiscal year 2013-14, livestock contributed 1.78% to GDP in Bangladesh [1]. The government of Bangladesh has recently given priority in cattle rearing that encouraged the rural people to consider livestock keeping as commercial enterprise. Parasitism is thought to be a major cause that hindering the development of livestock population, in case of cattle malnutrition and parasitism is the main limiting factor [2]. For cattle production, one of essential phase is adequate calf raising. In that phase, parasitic infection presents a permanent source for calf health [3]. Helminth has been noted as a major constraint to ruminant's productivity on a clinical and subclinical level [4]. Parasitic diseases are also emphasized for their pathogenicity and economic importance in animals by the experts both from the government and non-governmental organizations. The parasites carried in gastrointestinal tract generate severe anaemia; decrease the productivity and growth disorders of the host, digestive disorders, even the death [5]. The parasites worms that have been registered in the gastrointestinal parasitic infestation (GIT) of ruminants are *Trichuris* sp. and *Oesophagostomum* sp. in colon, *Trichostrongylus* sp., *Cooperia* sp., *Nematodirus* sp., *Bunostomum* sp., *Strongyloides* sp.,

*Moniezia* sp., *Eimeria* sp. and *Cryptosporidium* sp. in small intestine, *Paramphistomum* sp. in rumen, *Haemonchus* sp., *Ostertagia* sp., and *Trichostrongylus* sp. in abomasums [6]. The prevalence of parasitic infection depends on ecology, geographical and climatic condition prevailing in Bangladesh [7]. The age, sex and season were highly enhancing the prevalent rate [8].

A large number of dairy farms have been established in government and private sector to meet up the requirement of milk and meat for the highly dense populated country. Sylhet government dairy farm is one of the oldest dairy farm in Bangladesh, established on 228.83 acres of land at alurtal in the Sylhet city in 1930 and this dairy farm was supposed to produce sufficient milk for nutrition of the people of the region, to breed hybrid cows and train youths in nursing cows using scientific technology. Scientific research information is not available regarding the epidemiology of gastrointestinal parasites of calf in Sylhet District dairy farm. Considering the above facts this study was undertaken to know the prevalence of gastrointestinal parasites of calves at District Dairy Farm, Sylhet.

## 2. MATERIALS AND METHODS

### 2.1 Home Territory

Sylhet district with an area of 3490.40 km<sup>2</sup>, is bounded by the Khasia-Jainta hills of India on the north, Maulvi Bazar district on the south, Kachhar and Karimganj districts of India on the east, Sunamganj and Habiganj districts on the west. The climate of Sylhet is humid subtropical with a predominantly hot and humid in summer and a relatively cool winter. Annual maximum

temperature is 33.2°C and minimum is 13.6°C; annual rainfall 3334 mm [9].

## 2.2 Selection Pattern

Total 35 calves fecal sample was collected from the mentioned area. At the time of collection of samples, calves age, sex, deworming history, body condition score, vaccination history, breed and season of the year were carefully enlisted. The age of the calf was determined from the official record book and examining the destination.

## 2.3 Sample Collection and Analysis

Fresh fecal samples were collected per-rectum using clean examination gloves, put into fecal pots, labeled and kept cool before transportation to the Laboratory, Department of Medicine, Sylhet Agricultural University where they were immediately examined or stored in refrigerator at 4°C for maximum 3-5 days. Three different types of qualitative tests, like direct smear, flotation, and sedimentation techniques were used to examine the fecal samples [10,11,12]. Sugar salt solution was used as flotation fluid. Information related to age, species, sex and managerial practices were recorded in a questionnaire at the time of sample collection. Identification of helminth eggs was done according to key described elsewhere [13,14]. The presence of coccidia oocysts was also recorded.

## 2.4 Statistical Analysis

All data were input in MS excel sheet. The prevalence was estimated with the help of SPSS version 20.0 [15].

## 3. RESULTS AND DISCUSSION

After fecal samples examination, it was revealed that a total number of 20 calves were infested with one or more species of gastrointestinal parasites out of 35 calves. The overall prevalence of gastrointestinal parasitic infestation was 57.14% (Fig. 1). The species of parasites were identified namely *Toxocara vitulorum*, *Haemonchus contortus*, *Moniezia expansa*, *Trichuris trichuris*, *Oesophagostomum radiatum*, *Trichostrongylus axei*, *Strongyloides papillosus*, *Moniezia benedeni*, *Fasciola gigantica* and *Bunostomum phlebotomum*. The highest prevalence of parasitic infestation was found in *O. radiatum* (25.71%) followed by *T. trichuris* (20%), *T. vitulorum* (14.29%), *H. contortus* (11.43%), *M. expansa* and *F. gigantica* (8.57%). The infestation of *T. axei*, *S. papillosus*, *M. benedeni* and *B. phlebotomum* was the lowest (2.86%). The prevalence of *O. radiatum* was higher in male (20%) but the prevalence of *T. vitulorum*, *O. radiatum* and *T. trichuris* was higher in Female (5.71%) (Fig. 2). The prevalence of *M. benedeni* was not prevalent in male calves and *T. axei*, *S. papillosus*, *F. gigantica* and *B. phlebotomum* was not prevalent in Female calves.

Age of the host had an effect on the prevalence of gastrointestinal helminths of calves. The prevalence of gastrointestinal parasites in calves was the highest in above one year age (57.14 %) and lowest in below one year age (40%) (Fig. 3). The prevalence of *T. trichuris* was higher (11.29%) and *M. benedeni*

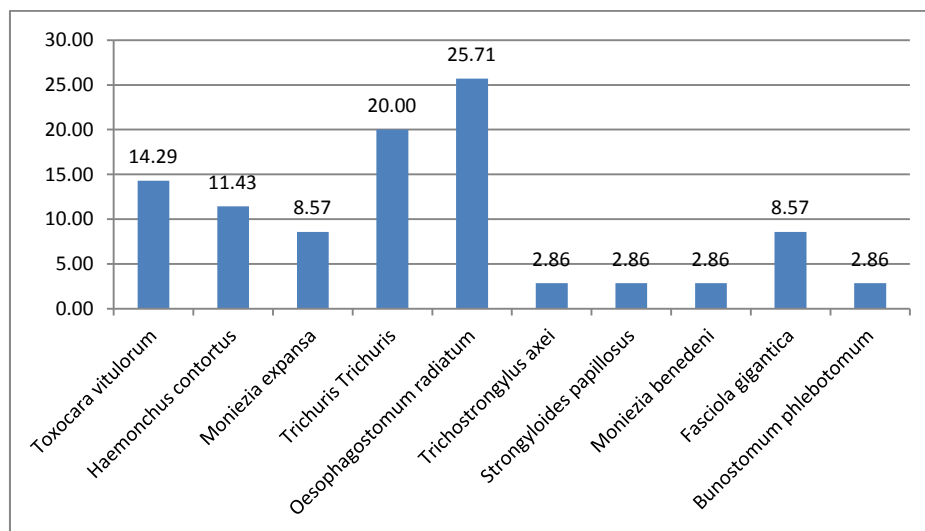
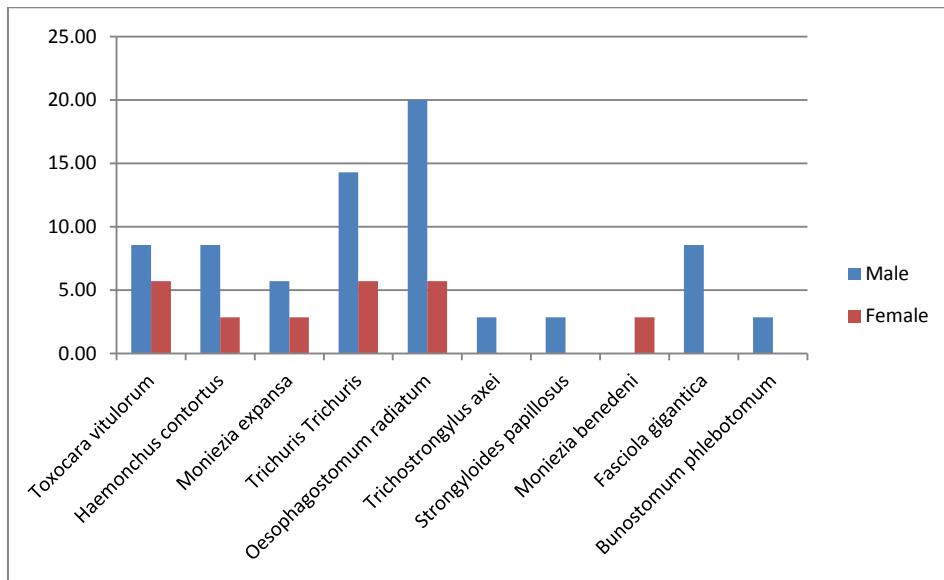
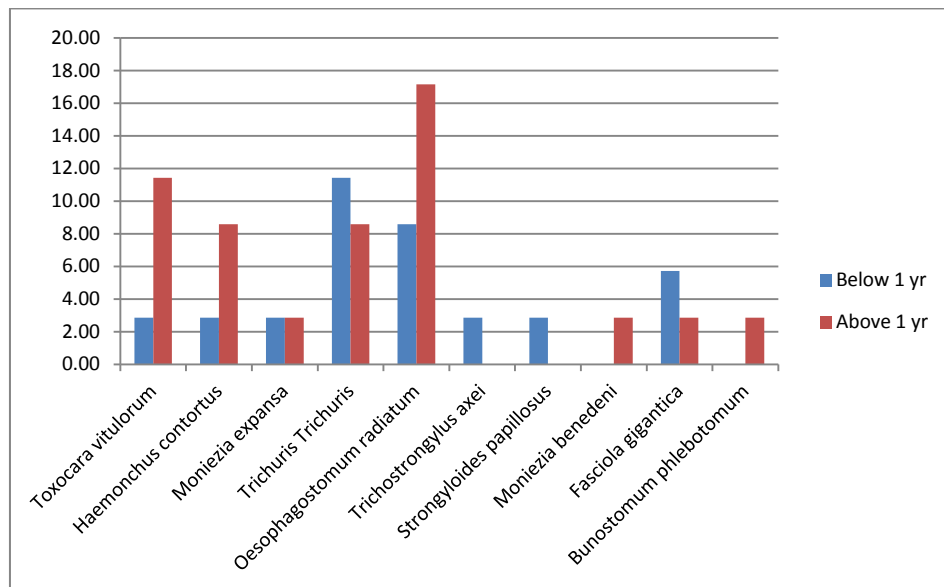


Fig. 1. Overall prevalence of gastro intestinal parasites of calves



**Fig. 2. Sex wise prevalence of gastro intestinal parasites of calves**

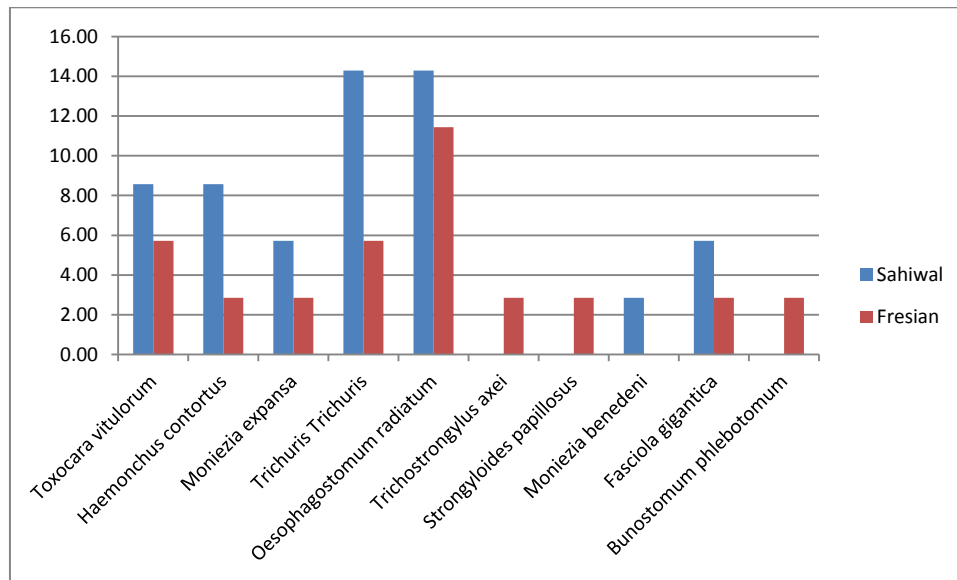


**Fig. 3. Age wise prevalence of gastro intestinal parasites of calves**

and *B. phlebotomum* was absent. In case of above one year old calves, the higher prevalence was found by *O. radiatum* (17.14%). No infestation was found in case of *T. axei* and *S. papillosus*. Breed had an effect on the prevalence of gastrointestinal helminths of calves. The prevalence of gastrointestinal parasites was highest in Sahiwal calves (60 %) and lowest in Holstein Friesian calves (40%). In case of Sahiwal calves, the prevalence of *T. trichuris* and *O. radiatum* was higher (14.29%), and *T. axei*, *S. papillosus* and *B. phlebotomum* was not prevalent. In case of Holstein Friesian

calves, the prevalence of *O. radiatum* (11.43%) was higher.

Aktaruzzaman et al. [16] reported that 76.9% prevalence of different parasites in cows and calves. Nath et al. [17] reported almost similar result, where prevalence of gastrointestinal parasites of indigenous, Sahiwal cross and Holstein Friesian cross calves was 46%, 52% and 62% respectively. Bhattacharyya and Ahmed [18] recorded the incidence of gastrointestinal helminths 65.2% of cattle in India. In contrast,



**Fig. 4. Breed wise prevalence of gastro intestinal parasites of calves**

Aktaruzzaman et al. [16] observed that parasitic infection was led by fascioliasis in crossbred cattle. Similarly, Sardar et al. [19] reported higher prevalence of *fascioliasis* (25%) and *paramphistomiasis* (45.3%) and similar infestation rate for *Strongyloides sp.* and *Trichuris sp.* in native cattle compared to the present study. Das et al. [20] reported that the parasitic infestation was 47.7% in Red Chittagong Cattle (RCC) in Bangladesh where fascioliasis, paramphistomiasis, monieziasis, balantidiasis were found in 5.8%, 47.7%, 1.9% and 40% respectively. Rahman et al. [8] reported that the overall prevalence of GI parasite of buffalo was 49.10% in Sylhet district and the prevalence of *Fasciola sp.*, *Paramphistomum sp.*, *Neoscaris sp.*, *Strongyloides sp.*, *Bunostomum sp.*, *Moniezia sp.* and *Eimeria sp.* were 32.02%, 19.78%, 8.38%, 9.24%, 10.53%, 5.59 and 14.40%. The variation in prevalence of parasites among different studies was found due to host variation, differences in geographic locations, climate and other environmental factors, feeding, management and genetic variation in host resistance. Factors such as level of host immunity, stage of parasite infection, other inherent park specific ecological factors (moisture, humidity, vegetation, soil, animal interaction) and the number of adult parasites in the GIT may be related to the broad and high level of GIT parasites eggs/oocysts [21].

The increase in prevalence of these parasites with the age has been reported by Alim et al. [22], Sardar et al. [19]. Findings of Fritsche et al.

[23] was not supported the present study. The prevalence of *Trichuris ssp.* (10%) and *Strongyloides sp.* (10%) in young calves and *Moniezia spp.* (4.6%) in yearlings was found by Rashed et al. [24]. In comparison to this study, Aktaruzzaman et al. [16] reported that the proportions of fascioliasis, paramphistomiasis, balantidiasis and haemonchosis were higher in cattle of more than two years of old compared to up to 1 year and >1 to 2 years of old. They also found that the proportions of monieziasis, trichuriasis and strongyloidosis were relatively higher in younger cattle (up to 1 year) than those in older age groups (>1 year to 2 years and > 2 years). Rashed et al. [24] found that the highest prevalence of *F. gigantica* was recorded in the adult cattle (6.45%). Nath et al. [17] stated that parasitic infestation were 46%, 52% and 62% in indigenous, Sahiwal cross and Holstein Frisian cross respectively.

#### 4. CONCLUSION

In this study, the overall prevalence of gastrointestinal parasites of calves and the variation in relation to their sex, age, and breed were investigated in District Dairy Farm, Sylhet. Prevalence of gastrointestinal parasites was found higher in different genotypes of calves. The age and genotype of the calves and the locality of investigations might have influenced the prevalence of the parasitic infections. Generally, the warm and humid conditions, which prevail in much of South-East Asia, provide a favourable condition for many gastro-intestinal

parasites. Inadequate stables and improper anthelmintic treatment might be the other contributing reasons.

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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