



Occurrence of Coccidiosis in Broiler Chickens in Different Farms at Sylhet Region of Bangladesh

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Abstract | Broiler farming is dealing with a series of difficulties owing to various infectious and non-infectious diseases. The present study was designed to monitor the prevalence of coccidiosis in broiler chicken at randomly selected broiler poultry farms in Sylhet, Bangladesh. The study encompasses faecal examination and identification of *Eimeria* oocyst by microscopic examination. A Faecal flotation technique and McMaster technique were implemented on 384 faecal specimens and around 316 cases were positive for *Eimeria* oocyst giving the overall prevalence of 82.29%. In supplement, this study confirms that the prevalence of coccidiosis mainly in subclinical form is yet an immense burden in broiler farms, and bio-security measurement should be administered in every farm.

Keywords | Broiler chicken, Coccidiosis, Prevalence, Risk factors, Sylhet region, Bangladesh

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INTRODUCTION

In recent times, poultry farming specially broiler production experiences one of the most compelling industries in agriculture sector of Bangladesh (Ali and Hossain, 2010). Despite prevailing favorable agro-climatic conditions, the flourishing poultry industry is noticing a set of troubles due to diverse infectious and noninfectious diseases (Islam *et al.*, 2009). Among these infectious diseases, coccidiosis is regarded as one of the major hazards for commercial broiler farming. It is one of the prevailing diseases in poultry, which is liable for major economic losses worldwide (Razmi and Khalideri, 2000). Coccidiosis appears particularly after ingestion of sporulated oocysts in vulnerable hosts. Both clinically affected and healed birds shed oocysts in their poops, which contaminate feed, dust, water, litter, and soil.

Coccidiosis is caused by various species of *Eimeria*, an

Apicomplexa protozoan parasite and occurs in the epithelial cells of the intestine. Most *Eimeria* spp. affect birds between 3 and 18 weeks of age and can cause high mortality in young chicks. To take preventive measures against coccidiosis it is necessary to understand the prevalence rate of coccidia in a certain area in each population. The present study is conducted to understand the rate of prevalence of coccidia in broiler chickens through coprological examination.

MATERIALS AND METHODS

STUDY AREA AND PERIOD

This study was conducted in and around Sylhet Metropolitan city of Bangladesh. All the research works were performed in the laboratory of Dept. of Parasitology, Faculty of Veterinary, Animal and Biomedical Sciences, Sylhet Agricultural University, Bangladesh during the period from July 2018 to April 2019.

STUDY DESIGN, POPULATION, AND SAMPLE SIZE DETERMINATION

Simple random sampling method was used to select the broiler chickens from the target population of selected farms. The minimum sample size (N= 384) required for this study was determined by using the sample determination formula as described by (Thrusfield, 2005).

COLLECTION OF SAMPLES AND COPROLOGICAL EXAMINATION

Each of the birds faecal samples was collected with a spatula from freshly voided faces into sampling bottles with proper identification and then immediately put in a cool box. One fresh dropping every two to five places was collected depending on the size of the tube. Each tube was then properly capped, labelled and the contents were thoroughly mixed by vigorous shaking to break the faecal clumps. The samples thus collected were labelled, transported to the laboratory, and refrigerated at 4 °C until further process.

EXAMINATION OF FAECAL SAMPLE

The presence of oocyst in the faecal samples were examined by the flotation method using saturated solution of salt and a modified McMaster technique as described by Sharma *et al.* (2015). The faecal sample diluted with saturated salt solution was taken for the identification of oocysts. A sample was transferred from the centre level of the beaker into a 2-chambered McMaster chamber (FEC Source, U.S.A) and unsporulated oocysts were identified based on morphology described by Soulsby (1982) with the help of a compound photo microscope (Model No: MD82ES10, Omax, USA) at 10X objective.

STATISTICAL ANALYSIS

The prevalence was calculated for all data by using the following formula:

$$\text{Prevalence rate (\%)} = \frac{\text{number of infected individuals (n)}}{\text{Total number of sampled individuals (N)}} \times 100$$

RESULTS AND DISCUSSION

Coccidiosis, together with related illnesses and intestinal worms, poses serious economic risks to the global chicken business. The economic impact of coccidiosis is multifaceted due to poor management practices and its high prevalence in hot, humid climates (Rashid *et al.*, 2019). Since they have a direct life cycle, ascarid worms continue to be a serious issue for poultry flocks. Therefore, regular monitoring of the prevalence rate of coccidiosis is vital for the best selection of control and prevention strategies. In our study out of total 384 samples examined; 316 samples were found positive for Eimeria protozoan parasites (Figure 1) giving

a prevalence rate of 82.29 %.

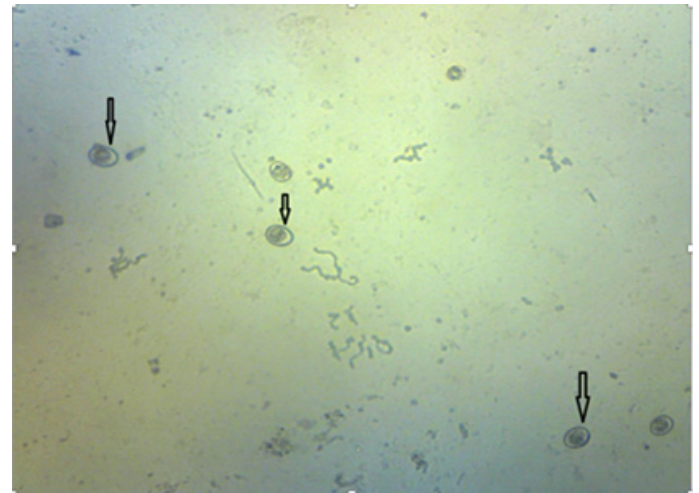


Figure 1: Unsporulated oocyst of *Eimeria* spp.

The findings of this study were in line with those in reported in Iran by Shirad *et al.* (2011) and in Romania (Györke *et al.*, 2013) who reported prevalence rate of 75% and 72.16%, respectively in intensive farming condition.

The results, however, are higher than the prevalence rates of coccidiosis that have been found in South Ethiopia, Pakistan, Nigeria, India, Turkey, and Algeria of 20.10%, 23.8%, 35.2%, 39.58%, 54.3%, and 63.26%, respectively (Lawal *et al.*, 2016; Lee *et al.*, 2010; Karaer *et al.*, 2012; Mokhtar and Yagoob, 2016; Negash *et al.*, 2015; Sharma *et al.*, 2015; Yousaf *et al.*, 2018).

Differences in prevalence from earlier research can be explained by a variety of factors, such as the kind of controls utilized, the timing of the sample, animal husbandry, and geographic variation (Haug *et al.*, 2008). The higher prevalence of coccidiosis in broilers in our research area may be brought on by increased production stress and prolonged litter contamination, which can provide coccidian oocysts the chance to sporulate and re-infect the birds. The greater incidence rate in adult broilers may be brought on by their crowded behaviour, cramped surroundings, build-up of oocytes, and wetting of the litter with watery droppings.

CONCLUSIONS AND RECOMMENDATIONS

Coccidiosis still a constraint of the poultry industry. Especially the subclinical form of coccidiosis has most significant economic effects due to impaired growth rate and feed conversion. Disease of broiler chickens has many additional direct and indirect impacts on human nutrition, community development, and socio-cultural and in the reduction in farm income, contributing to food insecurity and poor nutrition. The main limitations of our research

are that we were not able to identify the individual species of *Eimeria* protozoa. Further study is recommended to identify the sporulated oocyst of *Eimeria*.

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NOVELTY STATEMENT

This research has determined the prevalence rate of *Coccidiosis* in Broiler Chickens in Different Farms at Sylhet which is unique.

AUTHOR'S CONTRIBUTION

Real Datta, Apurbo Kumar Mondal, Md. Kazi Mehetazul Islam, Md. Jamal Uddin Bhuiyan: Prepared the experimental design, wrote, and revised the article, and managed the research.

Poritosh Ranjon Talukder, Eva Saha: Performed the experiments.

Md- Tariqul Islam: Analyzed the data.

CONFLICT OF INTEREST

The authors have declared no conflict of interest.

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