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Occurrence of Coccidiosis in Backyard Chickens Across Four Locations in Birshi Ward, Bauchi LGA, Nigeria

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Abstract

Coccidiosis, caused by *Eimeria* species a major constraint to backyard poultry production in developing countries, leading to significant economic losses and poor productivity. Despite its importance, location-specific prevalence data are limited in many regions, hindering effective control strategies. This cross-sectional study was conducted to determine the prevalence of coccidiosis in backyard chickens across four locations (Birshi, Gwalameji, Tsakani, and Bayara) of Birshi-Miri Ward. A total of 200 fecal samples (50 per location) were collected from randomly chickens and examined for *Eimeria* oocysts using the standard fecal floatation technique. Data were analyzed using descriptive the Chi-square test of independence. The overall prevalence of coccidiosis was 24.5% (200). Prevalence varied by location: Birshi (20.0%), Gwalameji (26.0%), Tsakani (20.0%), and Bayara (32.0%). In conclusion, coccid moderately prevalent (24.5%) in backyard chickens across the four studied locations, with no significant difference between locations. These findings highlight the need for routine surveillance, improved biosecurity, and targeted control measures to reduce the burden of ciosis in smallholder poultry systems.

Keywords: *Eimeria*, coccidiosis, backyard chickens, prevalence-

Introduction

Poultry production, particularly backyard or village chicken farming, plays a vital role in the livelihoods of rural households across sub-Saharan Africa, Asia, and other developing regions. Backyard chickens (*Gallus gallus domesticus*) are kept by an estimated 80% of rural families, providing a readily available source of high-quality protein, income generation, and socio-economic security (Wong *et al.,* 2024; Ochieng *et al*., 2022). Despite their importance,

the productivity of village chickens remains severely constrained by infectious diseases, with coccidiosis consistently identified as one of the most economically significant parasitic infections (Sharma *et al.,* 2023).

Coccidiosis is an enteric disease caused by apicomplexan protozoan parasites of the genus *Eimeria*. It is characterized by diarrhea, weight loss, poor feed conversion, reduced egg production, and high mortality, particularly in young chicks (Lillehoj and Lee, 2022). In commercial poultry, coccidiosis is managed through anticoccidial drugs and vaccination; however, in backyard systems, biosecurity is often minimal, and treatment is rarely administered, resulting in a persistent reservoir of infection (Fatoba and Adelek**e,** 2020). Globally, coccidiosis is estimated to cost the poultry industry over £10 billion annually (approximately $12.7 billion USD), with a substantial proportion of this loss borne by smallholder farmers in low- and middle-income countries (Blake *et al.,* 2020).

In sub-Saharan Africa, prevalence rates of coccidiosis in backyard chickens have been reported to range from 15% to 85%, depending on geographical location, season, management practices, and diagnostic methods (Nnadi and George, 2021). Recent surveys across the continent have reported varying prevalence rates: 32.7% in Nigeria (Suleiman *et al.*, 2021), 28.4% in Ethiopia (Tadesse et al., 2022), 35.1% in Kenya (Mwangi *et a*l., 2023), and 22.5% in Tanzania (Mushi *et a*l., 2021). These wide variations highlight the need for location-specific epidemiological data to inform targeted control strategies. Despite the high burden of coccidiosis in backyard poultry systems, there is a paucity of published data on its prevalence in the study area. Understanding the local epidemiology of coccidiosis is a prerequisite for designing effective prevention and control programs. Therefore, this study was conducted to determine the prevalence of coccidiosis in backyard chickens across four selected locations (Birshi, Gwalameji, Tsakani , and Bayara) in Birshi -Miri Ward of Bauchi Local Governent, Bauchi State..

METHODOLOGY

The study was conducted in four locations within Bauchi State, namely **Birshi, Gwalameji, Tsakani, and Bayara**. These locations represent a mix of rural and peri-urban settings typical of backyard poultry production systems in the region. The area is tropical wet and dry climate with mean annual temperatures of 25–35°C and annual rainfall of 800–1200 mm]. The predominant poultry management system is extensive scavenging, with birds allowed to roam freely during the day and housed in simple shelters at night.

Study Design and Sample Size

A **cross-sectional study** was conducted between aprril to August, 2026. A total of **200 backyard chickens** were sampled, with **50 birds** randomly selected from each of the four locations. Sample size was determined using the formula for cross-sectional studies described by Thrusfield (2018).. Birds were selected using a systematic random sampling method, with every third household keeping chickens enrolled until the required sample size per location was achieved.

Sample Collection

Approximately 2–5 grams of fresh fecal samples were collected from each bird by cloacal swab or by collecting freshly voided droppings from clean surfaces. Samples were placed in clean, labeled plastic containers and transported on ice packs to the National Veterinary research Institute, Vom, Bauchi laboratory for processing within 24 hours of collection.

Laboratory Analysis

Fecal samples were processed using the **standard flotation technique** as described by **Soulsby (1982)** . Briefly, approximately 1 gram of feces was mixed with 10 mL of saturated sodium chloride solution (specific gravity 1.20), strained through a tea strainer, and poured into a test tube. A coverslip was placed on top of the tube and left for 15–30 minutes to allow oocyst flotation. The coverslip was then carefully removed, placed on a glass slide, and examined microscopically at **100x and 400x magnification** for the presence of *Eimeria* oocysts. Samples were recorded as **positive** if at least one oocyst was observed, and **negative** if no oocysts were detected.

Data Analysis

Data were entered into **Microsoft Excel 2019** and analyzed using **SPSS version 26.0** (IBM Corp., Armonk, NY, USA). Prevalence was calculated as the proportion of positive samples divided by the total number of samples, expressed as a percentage.

Results and Discussion

The overall prevalence of coccidiosis in backyard chickens in the present study was **24.5%**. This finding is consistent with several recent reports from across Africa. **Mushi et al. (2021)** reported a prevalence of **22.5%** in free-range chickens in Tanzania, while **Tadesse et al. (2022)** recorded **28.4%** in Ethiopia. In Nigeria, **Suleiman et al. (2021)** found a prevalence of **32.7%**, which is slightly higher than the current finding. The moderate prevalence observed in this study may be attributed to the semi-intensive management system practiced in the study area, where chickens are partially confined and have limited access to contaminated soil compared to fully scavenging systems (**Ochieng et al., 2022**).

The highest prevalence was recorded in **Bayara (32.0%)** , followed by **Gwalameji (26.0%)** , while **Birshi (20.0%)** and **Tsakani (20.0%)** had the lowest rates. Although these differences were not statistically significant (p=0.47p=0.47), they may have practical implications. The higher prevalence in Bayara could be due to higher stocking density, poorer hygiene, or closer proximity of poultry to other livestock, all of which are known risk factors for cocc

Table 1: Prevalence of Coccidiosis in Backyard Chickens across Four Locations

Location	Number Sampled (n)	Positive (n)	Prevalence (%)	Negative (n)	Prevalence (%)
Birshi	50	10	20.0%	40	80.0%
Gwalameji	50	13	26.0%	37	74.0%
Tsakani	50	10	20.0%	40	80.0%
Bayara	50	16	32.0%	34	68.0%
Total	**200**	**49**	**24.5%**	**151**	**75.5%**

Conclusion and Recommendation

This study demonstrates that coccidiosis is moderately prevalent (24.5%**)** in backyard chickens across the four studied locations (Birshi, Gwalameji, Stakani, and Bayara). The prevalence ranged from **20.0% to 32.0%** , with Bayara recording the highest infection rate. However, no statistically significant difference was found between locations, indicating that coccidiosis infection is relatively uniformly distributed in the study area. These findings underscore the need for routine surveillance and targeted control measures in backyard poultry systems.

Although no single location emerged as a statistically significant hotspot, the consistent moderate prevalence across all four sites underscores an endemic situation requiring **population-level interventions** rather than site-specific measures. Priority should be given to improving general flock management and biosecurity, with targeted surveillance in areas like Bayara that showed the highest infection rate."

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