Original Research Article

PREVALENCE OF BOVINE FASCIOLIASIS AT THE GWAGWALADA ABATTOIR, FEDERAL CAPITAL TERRITORY (F.C.T.), NIGERIA: A ONE YEAR RETROSPECTIVE STUDY

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ABSTRACT

Bovine fascioliasis is a zoonotic disease caused by *Fasciola spp*. that has a significant effect on animal health, food safety, and public health. This retrospective study investigated the prevalence of bovine fascioliasis in cattle slaughtered at the Gwagwalada Abattoir, Abuja, from April 2024 to March 2025 based on abattoir records. Data on monthly, sex and seasonal distribution were analysed using descriptive statistics and Chi-square test of independence with the p value set at less than 0.1. A total of 4225 cattle were slaughtered and the overall prevalence of bovine fascioliasis was 1.09% (46/4225) for the duration of this study. Monthly prevalence ranged from 0% to 3.7%, with the highest infection rate recorded in April 2024. Females (67.4%) showed a higher prevalence than males (32.6%) which was statistically significant (χ^2 = 7.10, df = 1, p =0.008). Seasonal analysis revealed higher prevalence during the rainy season (87%) than during the dry season (13%), which was also significant (χ^2 =7.64, df = 1, p=0.006). These findings highlight the endemicity of bovine fascioliasis in the region and the need for seasonal surveillance, strategic deworming, and public health awareness as part of One Health interventions to mitigate its spread.

Keywords: Abattoir, Abuja, Bovine Fascioliasis, Gwagwalada, One Health, Zoonoses

INTRODUCTION

Bovine Fascioliasis is one of the neglected tropical diseases (NTD), economically important in domestic farm animals, especially with sheep and cattle (WHO *et al.*, 2021). Bovine fascioliasis (BF) is an important parasitic infectious disease of cattle caused by two main species of zoonotic trematodes; *Fasciola gigantica*, and *Fasciola hepatica*, commonly referred to as liver flukes. The disease occurs in animals and humans chiefly through the ingestion of contaminated water or plants harbouring *metacercaria* (Rana *et al.*, 2014). Transmission by consuming raw liver dishes prepared from fresh livers infected with immature *Fasciola spp*. is also possible (Taira *et al.*, 1997). In humans, major symptoms include intestinal discomfort, painful liver regions and anaemia (Urquhart *et al.*, 1996; Kassai, 1999). It is also characterised by destruction of liver tissues and the bile duct. This causes inflammatory responses leading to hepatomegaly or cirrhotic liver accompanied by diarrhoea and anaemia (Nguyen *et al*., 2017; Bogitsh *et al*., 2018). Fascioliasis is now recognized as an emerging human disease (WHO *et al.*, 2021) with an estimated 2.4 million people infected with *Fasciola spp*. and 180 million are at risk of infection in 70 countries worldwide (Chávez-Ruvalcaba *et al.*, 2021). The disease leads to significant economic losses in cattle through liver condemnation, reduced productivity, and decreased market value (Karshima *et al.*, 2016; Elelu *et al*., 2019). Liver damage due to immature F. gigantica may also predispose the animals to Black disease caused by Clostridium novyi, thus increasing

the mortality rate (Phiri, 2006). The distribution of BF depends on the presence of suitable aquatic snail species such as *Lymnaea truncatula* and *Lymnaea natalensis*, which serve as intermediate hosts (Boray, 2007)

Despite being a known zoonosis, BF remains underreported in Nigeria. This is largely due to critical gaps in standardizing diagnostic techniques and surveillance which underscores the necessity for improved diagnostic tools and integrated management practices to alleviate the effects of this parasitic disease. The paucity of detailed data on its prevalence and distribution hampers effective zoonotic disease control strategies. Given its zoonotic potential, there is an urgent need for region-specific and evidence-based control strategies for fasciolosis in the country (Agbajelola & Agbajelola, 2025).

Abattoir surveillance has been used in many countries as an important strategy for detection of disease cases and provides essential information that can be utilized for research and disease control purposes (Phiri, 2006). Data collected from the abattoir can be used in tracing the disease back to the source in order to detect disease outbreaks and plan control programmes. Such processes have been used in the past to determine the prevalence of infectious and parasitic diseases in Nigeria (Alawa *et al.*, 2011).Thus, this study determined the prevalence of BF at the Gwagwalada abattoir from April 2024 to March 2025 in order to provide baseline data to inform and improve meat inspection protocols, public health interventions and aid in policymaking aimed at improving food safety in the F.C.T and Nigeria at large.
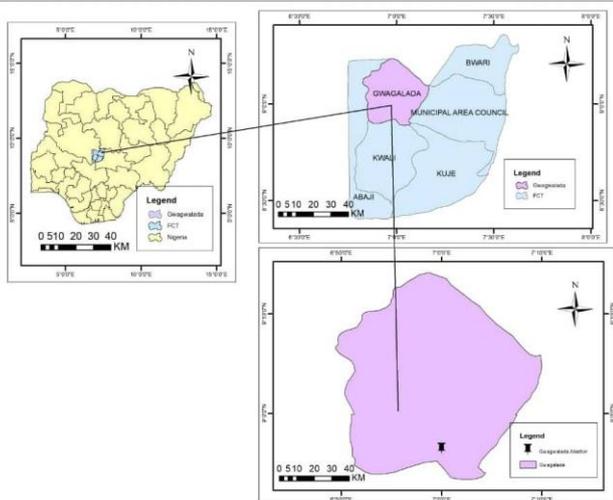
MATERIALS AND METHODS
STUDY AREA

FIGURE I: Map of the Federal Capital Territory, Nigeria Showing the Study Area of Gwagwalada Area Council

The study was conducted in the Gwagwalada abattoir located in Gwagwalada Area Council, one of the 6 area councils in the FCT Abuja (Figure I), between the months of April 2024-

March 2025. The Gwagwalada Area Council falls within latitude 8°56' 29" North and longitude 7°5' 31" and 7° 39' East and has a land area of 1043 km2. Gwagwalada town has a hot, humid tropical climate that experiences both dry and rainy seasons. Its major elements have regimes that are intermediate from those of the Southern and Northern regions of the country (Abdullahi *et al.*, 2012). The average annual temperature in this region is between 30 and 37 °C, with March being the hottest month. The average annual rainfall in this region is about 1,650 mm.

STUDY DESIGN

A retrospective cross-sectional approach was used for this study. Post-mortem meat inspection records from the Gwagwalada abattoir were examined for cases of fascioliasis within the period of April 2024 to March 2025. All cattle slaughtered during this time were examined by veterinarians for liver lesions characteristic of fascioliasis using a combination of visual inspection, palpation, and targeted incision of the liver parenchyma, bile ducts, and gallbladder. Gross pathological lesions suggestive of infection, such as fibrosis, an irregular or thickened capsule, and a pale appearance at the edges, were noted.

Statistical analysis

Data collected included the number of animals slaughtered monthly, the number of BF-positive cases, and the sex of infected animals. Descriptive analysis was used to interpret seasonal and sex-based distributions. Prevalence was calculated as the number of positive cases all over the total population of animals inspected during the entire study period. Chi-square (χ^2) tests were used to assess associations between BF prevalence and categorical variables (sex and season) at a 5% significance level using SPSS version 25. A p-value < 0.05 was considered statistically significant.

RESULTS

A total of 4,225 cattle were slaughtered at the Gwagwalada abattoir between April 2024 and March 2025. 46 cases of BF were identified and recorded, giving an overall prevalence of 1.09% as shown in Table I. Table II shows that 33 cases (67.4%) occurred in females and 13 cases (32.6%) in males. Female-dominated infections were observed from April–August, 2024, with male-only infections from September 2024 onwards. BF cases recorded a higher prevalence of 87% recorded during the rainy season (April–October 2024) than during the dry season (November 2024-March 2025) which had a prevalence of 13% as shown in Table III. Monthly distribution revealed fluctuating occurrences of BF cases recorded from April 2024 through February 2025 with a peak prevalence in April 2024 of 3.77% and the lowest in October 2024 (0.27%). No cases were detected in November 2024 and March 2025.

Table I: Monthly Distribution of Bovine Fascioliasis Cases in Cattle Slaughtered at Gwagwalada Abattoir (April 2024 – March 2025)

Month	No. of Cases	Total Cattle Slaughtered	Prevalence (%)
April 2024	9	239	3.77
May 2024	5	398	1.26
June 2024	5	328	1.52
July 2024	11	497	2.21
August 2024	5	294	1.70
September 2024	4	341	1.17
October 2024	1	371	0.27
November 2024	0	476	0.00
December 2024	2	245	0.82
January 2025	3	367	0.82
February 2025	1	330	0.30
March 2025	0	339	0.00
Total	**46**	**4,225**	**1.09%**

Table II: Sex Distribution of Bovine Fascioliasis Cases in Cattle Slaughtered at Gwagwalada Abattoir (April 2024 – March 2025)

Sex	Total Examined	No. of Cases	Prevalence (%)	Chi-Square (χ^2)
Male	2208	15	32.6	
Female	2017	31	67.4	
Total	**4225**	**46**	**100.0%**	**7.10**

df = 1, p =0.008, 95% Confidence Interval= 0.80% – 1.43%

DISCUSSION

The 1.09% prevalence of BF cases recorded between April 2024 to March 2025 in the Gwagwalada abattoir shows the infection is consistently present in Gwagwalada which is significantly lower than the 47% prevalence reported by Ogbaje *et al.* (2024) in a study carried out across the six area councils of the F.C.T from May 2022 to April 2023, where a total of 584 cattle were sampled. This significant difference is most likely due to the different diagnostic techniques used in the two studies. Higher prevalences have been recorded in studies where laboratory confirmatory examinations are carried out on a varied pool of samples including bile and faecal samples (Adang *et al.*, 2015; Ogbaje *et al.*, 2024). This highlights the necessity of improved diagnostic techniques and tools in abattoirs to aid in the confirmation of suspected infections detected during routine meat inspection. The low prevalence may also reflect improved animal management.

Table III: Seasonal Distribution of Fascioliasis in Cattle Slaughtered at Gwagwalada Abattoir (April 2024 – March 2025)

Season	Total Cases	Total Cattle Slaughtered	Prevalence (%)	Chi-Square (χ^2)
Rainy Season (April – October 2024)	40	2868	**87.0**	
Dry Season (November 2024 – March 2025)	6	1357	**13.0**	
	46	**4,225**	**100.0**	**7.64**

df = 1, p =0.006, 95% Confidence Interval= 0.80% – 1.43%.

Several other studies across Nigeria have also recorded varied prevalence. A retrospective study carried out in the Ibadan Municipal abattoir, Ibadan, Oyo State, Nigeria, between 1994 and 2004 by Oladele-Bukola and Odetokun (2014) had a prevalence of 2.31% which is slightly above what was observed in this study. However, Isah (2019) reported a prevalence of 40.5% in cattle, and small ruminant slaughtered at abattoir in Bauchi state, Nigeria while studies on the prevalence of fasciolosis in cattle at slaughterhouses in Zamfara reported an overall prevalence of 15% by Ahmad *et al.* (2020) which are all significantly higher the prevalence recorded in this study. Differences in prevalence may also be attributable to a number of factors including differences in livestock management and livestock movements, diagnostic techniques and samples examined and access to water sources (Jean-Richard *et al.*, 2014; Yatswako & Alhaji, 2017).

Across the twelve-month period, BF was detected in several months with varying intensities, demonstrating a seasonal fluctuation in infection rates. The overall trend revealed higher infection rates during the wet months, particularly between April and August 2024, and a gradual decline towards the dry months, culminating in an absence of cases in

March 2025. This pattern aligns with previous reports that associate increased fascioliasis prevalence with rainy seasons, when intermediate snail hosts of *Fasciola species* proliferate and environmental moisture supports metacercarial survival on pasture. There is also an increase in animal exposure to contaminated water sources. (Adedokun *et al.*, 2008).

Seasonal analysis showed significantly higher infection rates during the rainy season consistent with findings from previous Nigerian studies by Ahmad *et al.* (2020) in Zamfara State, Isah (2019) in northern Bauchi State, and Yatswako and Alhaji (2017). This also agrees with the report of Damwesh and Ardo (2012), who discovered a similar high frequency of BF during the rainy season in the state of Adamawa, North-eastern Nigeria. The complete absence of BF cases in March 2025 may reflect the seasonal die-off of intermediate hosts and reduced contamination of grazing fields. This underscores the seasonal nature of the disease and the importance of integrating seasonal risk assessments into abattoir-based surveillance and control programs. Oladele-Bukola and Odetokun (2014) and Ejeh *et al.* (2015) however found that the average prevalence of BF cases was higher in Ibadan and Makurdi towns respectively during the dry season (2.58% and 21.16%) of that year than during the rainy season (2.07% and 12.99%) respectively.

Sex-related differences in infection were evident in this study indicating sex as a significant risk factor. Female cattle accounted for most cases in the early months (April–August 2024), while male cattle predominated during the later months (September 2024–February 2025). Previous studies in Nigeria and other African settings have reported variable sex predispositions, with females often showing higher prevalence due to prolonged exposure to pastures and physiological stress associated with reproduction (Ardo *et al.*, 2013; Hassan *et al.*, 2025). Female cattle are often kept longer for breeding and milk production, which increases their duration of exposure to infective *Fasciola metacercaria* on contaminated pastures. In contrast, males are usually slaughtered at a younger age, limiting their cumulative risk of infection. Physiological stress during pregnancy and lactation may also reduce immunity, making females more susceptible to parasitic infections. Environmental and management factors, such as grazing patterns and water access, further contribute to this difference.

The findings in this study further suggest that both sexes are susceptible when ecological and husbandry factors favour parasite transmission. The shift from female to male infections over time could reflect changes in herd demographics, market demands, or management practices. These findings have direct implications for food safety and zoonosis prevention, underscoring the importance of sustained veterinary-public health collaboration.

It is important to note that this study relied solely on gross pathological inspection, which may under-detect early or less advanced cases of BF. The absence of laboratory confirmation may also result in misclassification or underestimation of the true prevalence.

CONCLUSION
Bovine fascioliasis persists as a public health and livestock concern in Gwagwalada, with clear seasonal and sex-related patterns. Although prevalence was relatively low, the zoonotic nature of *Fasciola spp.* warrants sustained attention. Higher infection rates during the rainy season and among female cattle underscore the need for targeted interventions, including strategic deworming, improved grazing and water-source management, and snail control. Strengthening meat inspection, enhancing abattoir surveillance, and promoting food safety awareness will help limit transmission. Furthermore, incorporating molecular diagnostics and expanding surveillance will improve detection and understanding of disease trends. A One Health approach integrating veterinary, environmental, and public health strategies is essential to safeguard animal productivity and reduce human health risks.

CONFLICT OF INTEREST
The authors declare no conflict of interest.

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