Original Article

GASTROINTESTINAL PARASITES OF CATTLE SLAUGHTERED IN ZANGO ABATTOIR TUDUN WADA, KADUNA SOUTH L.G.A. KADUNA STATE, NIGERIA

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ABSTRACT

The prevalence of gastrointestinal parasites in cattle is a significant aspect of livestock management, given the economic losses and public health implications these parasites pose. The aim of this research was to identify the gastrointestinal parasites of cattle slaughtered at Zango Abattoir Tudun Wada, Kaduna State. Two hundred (200) faecal samples were collected. Sedimentation and Flotation techniques were used to concentrate the eggs and the cysts/oocytes of the parasites. Structured questionnaire was used to get information on the health implications of the parasite infections on the cattle. Out of 200 cattle examined, 140 (70%) were found positive for one or more species of gastrointestinal parasites. Eleven parasites were identified namely *Haemonchus contortus* (10%), *Fasciola hepatica* (10%), *Trichuris trichiura* (5%), *Toxocara vitulorum* (10%). *Paramphistomum species* (2.5%), *Oesophagostomum radiatum* (13.5%), *Ostertagia spp* (2.5%), *Cooperia pectinita* (4%), *Moniezia expansa* (3%), *Carmyerius spatiosus*, (2.5%) and *Mecistocirrus digitatus* (6.5%) The prevalence of gastrointestinal parasites in relation to sex indicated that the female cattle had higher prevalence (80%) than the male counterpart (60%). It was also noted that adult cattle had more prevalence (93.8%) than the young ones (54.2%). A significant difference was observed in prevalence between the male (60%) and female (80%) cattle; young (54.20%) and the adult cattle (93.80%) (x^2,$p<0.05$) respectively. In terms of the prevalence of gastrointestinal parasites with respect to inhabitable sites, Abomasum had the highest prevalence (27%) while the Rumen had the least (7%).In terms of the health implications of gastrointestinal parasite infections on cattle, most of the respondents indicated that decreased milk production (30%) was the most common health implication caused by gastrointestinal parasite infections, followed by weight loss (20%), anaemia (18%), poor growth (14%), diarrhea/loss of appetite (10%) while mortality (8%) was the least. Creation of awareness on the health implications of gastrointestinal parasites on cattle was recommended.

Keywords: Cattle, Gastrointestinal parasites, Questionnaire and Prevalence.

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INTRODUCTION

The cattle industry plays a critical role in the economy of Nigeria, particularly in states like Kaduna, which has a significant cattle population. Cattle provide essential resources such as meat, milk, hides, and manure, making them vital to the livelihoods of pastoralists and farmers [2]. However, cattle productivity and health are often compromised by a range of diseases, among which gastrointestinal parasitism is of paramount importance. Gastrointestinal parasites are widespread among cattle populations, especially in regions with extensive grazing systems [3, 18, 21]. In Kaduna Metropolis, cattle are typically raised under traditional pastoral systems, which predispose them to high parasite burdens due to the unrestricted grazing in contaminated pastures [13]. Gastrointestinal parasites cause various health problems in cattle, including reduced growth rates, decreased milk production, poor reproductive performance, and in severe cases, death [4, 16, 17]. These parasites often lead to economic losses through reduced productivity and increased treatment costs. Moreover, infected cattle can act as reservoirs for zoonotic parasites, potentially transmitting diseases to human and other livestock.

Gastrointestinal parasites constitute a major health challenge for livestock in sub-Saharan Africa, where inadequate veterinary services, poor livestock management practices, and environmental conditions favour parasite transmission [5, 13]. In Nigeria, numerous studies have documented the prevalence of gastrointestinal parasites among cattle, revealing a significant burden of parasitism in various regions, including Kaduna [2]. The warm, humid climate of Kaduna Metropolis provides an ideal environment for the development and survival of parasite eggs and larvae, increasing the risk of infection among cattle.

In Kaduna Metropolis, where cattle are frequently grazed in communal pastures, the risk of parasite transmission is particularly high. The communal grazing system often results in heavy pasture contamination, exacerbating the spread of parasites among cattle herds [12, 21].

MATERIALS AND METHODS

Study Area

The study was conducted at Zango Abattoir Tudun Wada, Kaduna North Local Government Area of Kaduna State, Nigeria located on latitude 10° to 30°N and longitude 7° to 25°E. The average temperature ranges between 20°c to 37°c and the wet season spans from April to October with peak rainfall in August [2]

Sample collection

Faecal samples were collected from the rectum of selected cattle of varying ages (Young and Adult) and sexes in the study area. A total of 200 faecal samples were collected using specimen bottles with lid. The faecal samples were preserved in 10% formalin in a sterile labeled sample container indicating the Age and Sex of the cattle. The samples were transferred to Zoological Laboratory, Kaduna State University for analysis. Structured questionnaire was also used to obtain information on the health implications of gastrointestinal parasite infections on the cattle.

The floatation fluid used was saturated salt solution with mass concentration of 325.60g/dm3 of water. This technique is particularly useful for detecting nematode and cestode eggs.

Three (3g) of faecal material was mixed with 30ml of floatation solution.
The mixture was strained through a sieve into a beaker.
The strained mixture was poured into the test tube until it was filled to the top of the test tube. A cover slip was placed on the top of the test tube. The floatation was allowed to stand for 10 minutes after which the cover slip was removed carefully and placed on a slide. It was then examined under a microscope detection of the parasite eggs or cysts **[6]**.
Three (3g) of faecal material was mixed with 30ml of normal saline solution.
The mixture was strained through a sieve to remove larger debris into a beaker.
The mixture was transferred to a centrifuge tube and centrifuged for 10 minutes.
The supernatant (the liquid on top) was carefully poured off leaving the sediment at the bottom.
Normal saline was added to the mixture in the centrifuge tube and sedimentation was repeated again to wash away lighter impurities.
Three (3) drops of Lugol's iodine was added to the mixture and mixed thoroughly. A drop of the sediment was then transferred to a slide using a pipette after which the cover slip was carefully placed on the slide. It was then examined under a microscope for identification of eggs/cysts or oocysts **[6].**

RESULTS

Out of 200 cattle examined, 140 (70%) were infected with gastrointestinal parasites (Table1). Eleven species of gastrointestinal parasites were identified namely *Haemonchus contortus* (10%), *Fasciola hepatica* (10%), *Trichuris trichiura* (5%), *Toxocara vitulorum*(10%). *Paramphistomum species* (2.5%), *Oesophagostomum radiatum* (13.5%), *Ostertagia spp* (2.5%), *Cooperia pectinita* (4%), *Moniezia expansa* (3%), *Carmyerius spatiosus* (2.5%) and *Mecistocirrus digitatus* (6.5%). *Oesophagostomum radiatum* had the highest prevalence (Table1).

Table 1: Overall prevalence of gastrointestinal parasites and species identified from cattle slaughtered at Zango abattoir, Tudun Wada, Kaduna South L.G.A.

Number examined	Number infected (%)	Species identified	Number infected	Percentage (%)
200	140 (70)	*Fasciola hepatica*	20	10
		Carmyerius spatiosus	5	2.5
		Paramphistomum species	5	2.5
		Moniezia expansa	7	3.5
		Cooperia pectinita	8	4
		Haemonchus contortus	20	10
		Mecistocirrus digitatus	13	6.5
		Oesophagostomum radiatum	27	13.5
		Ostertagia spp	5	2.5
		Toxocara vitulorum	20	10
		Trichuris trichiura	10	5

Prevalence of gastrointestinal parasites with respect to sex and age of the cattle

The prevalence of gastrointestinal parasites with respect to sex showed that female cattle had higher prevalence (80%) than their male counterpart (60%). The difference in prevalence between male and female cattle was significant (x^2, P<0.05) (Table 2).

In terms of age related gastrointestinal parasite infection, the adult cattle had more prevalence (93.80%) than the young cattle (54.20%). The difference in prevalence between the adult and young cattle was significant (x^2, P<0.05) (Table 2).

Table2: Prevalence of gastrointestinal parasites of cattle slaughtered at Zango abattoir in relation to sex and age of the cattle

Sex	Number examined	Number infected	Percentage (%)
Male	100	60	60.00
Female	100	80	80.00
Age (years)			
Young (1-3)	120	65	54.20
Adult (4years and above)	80	75	93.80

The prevalence of gastrointestinal parasite infections with respect to inhabitable sites of the parasites

In terms of the prevalence of gastrointestinal parasite infections with respect to inhabitable sites of the parasites indicated that the Abomasum had the highest prevalence (27%), followed by the Large Intestine (26%) with the Rumen having the least prevalence (7%) (Table3)

Table 3: The prevalence of gastrointestinal parasite infections with respect to inhabitable sites of the parasites

Species	Reticulum	Rumen	Omasum	Abomasum	Small intestine	Large intestine	Liver
Fasciola hepatica	-	-	-	-	-	-	20
Carmyerius spatiosus	-	5	-	-	-	-	-
Paramphistomum species	-	5	-	-	-	-	-
Moniezia expansa	-	-	-	-	7	-	-
Cooperia pectinita	-	-	-	-	8	-	-
Haemonchus contortus	-	-	-	20	-	-	-
Mecistocirrus digitatus	-	-	-	13	-	-	-
Oesophagostomumradiatum	-	-	-	-	-	27	-
Ostertagia spp	-	-	-	5	-	-	-
Toxocara vitulorum	-	-	-	-	20	-	-
Trichuris trichiura	-	-	-	-	-	10	-
Total	0	10	0	38	35	37	20

RESULTS FROM QUESTIONNAIRE

Health implications of gastrointestinal parasite infections on Cattle

In terms of the health implications of gastrointestinal parasite infections on cattle, most of the respondents indicated that decreased milk production (30%) was the most common health implication caused by gastrointestinal parasite infection, followed by weight loss (20%) while mortality (8%) was the least (Table 4).

Table 4: Health implications of gastrointestinal parasite infections on cattle

Health implications	Number of respondents	Percentage
Decreased milk and meat production	15	30
Weight loss	10	20
Poor growth	7	14
Anaemia	9	18
Diarrhea/loss of appetite	5	10
Death of the animal	4	8
Total	50	100

DISCUSSION

High prevalence of gastrointestinal parasite infections was observed in this study. This may be attributed to the fact that the vegetation of the study area (grass vegetation) is easily contaminated with faeces containing the eggs, larvae, cysts and oocytes of the parasites. Furthermore, the method mostly adopted by pastoral farmers in Kaduna is open grazing which makes the cattle more prone to parasite infections.

The high prevalence observed in this study is in agreement with Abebe [1] who reported 68.93% overall prevalence in cattle from rural highlands of Ethiopia. Sirikanda [23] also reported high prevalence (96.0%) in cattle in Kalasin Province, Thailand. However, the result is not in agreement with Degefu [7] who reported a lower prevalence of 40.30% in Ethiopia. The variation in the findings might be due to the differences in geo-climatic conditions such as temperature, climate, vegetation etc. that may favor the survival of infective stages of the parasites. In Nigeria, the high prevalence observed in this study is in agreement with Oloyede [16] who reported higher prevalence (94.4%) of gastrointestinal parasites in cattle from Owo, Ondo State, Nigeria. However, Usman [26] reported slightly lower prevalence (66.07%) of gastrointestinal parasites in cattle slaughtered in Biu L.G.A. abattoirs, Borno State, Nigeria. Similarly, Obi [15] reported (57.6%) prevalence of gastrointestinal parasites in cattle from Aguata and Orumba South L.G.A. Southeastern Nigeria. Fasae and Fatade [9] reported a lower prevalence (29.38%) in cattle slaughtered at selected slaughter houses in Abeokuta and environs, Nigeria.

In sex related prevalence of gastrointestinal parasite infections, it was

observed that the females had higher. prevalence than the males and the difference was significant ($p<0.05$). The higher prevalence observed in female maybe due to lowered immunity in female due to gestation and lactation. This higher prevalence in female is in agreement with Hiko [10] who reported 75% prevalence in Females and 50% in males in Southern Ethiopia. It also concur Lofti [12] who reported 80% prevalence in female and 5% in male cattle from Bass Kabylie area of Bejaia province in Algeria. However this result does not concur with Huang [11] who reported a higher prevalence in male (67.50%) than in females (42.51%) in arid-zone breeds. Similarly, Dembelo [8] reported higher prevalence in male (67.9%) than the female (64.5%) in Southern Ethiopia..

In Nigeria, Obi et al reported higher prevalence (60.54%) in male cattle than their female counterpart (50.79%). Similarly, in sex related gastrointestinal parasite infections, the result of this present study does not concur with that of Fasae and Fatade [9]who reported less prevalence (25.32%) in female cattle than in male (33.33%) in Abeokuta, Ogun State, Nigeria.

In terms of age related prevalence of gastrointestinal parasite infections, the prevalence in adult cattle was higher than that of the young ones. The higher prevalence observed in adult cattle may be due to the fact that the adult ones begin to lose their immunity as old age sets in. The result is in agreement with Lofti [12] who reported higher prevalence in adult (80%) than the young ones (11%). In the same vein, Dembelo [8] reported higher prevalence in adult (77.8%) than the young (61.8%).

The prevalence of gastrointestinal parasite infections with respect to inhabitable sites of the parasites indicated that the abomasum had the highest number of parasites. This may be attributed to the fact that the abomasum provides a warm, moist and nutrient rich environment which is ideal for the survival and reproduction of these parasites.

In terms of health implications of gastrointestinal parasite infections on cattle, most of the respondents said that decreased milk and meat production was the most common health implication of gastrointestinal parasite infection on cattle. This could be attributed to the fact that decreased milk production is the most visible symptoms that can be easily recognized by these pastoral farmers. This is in agreement with Sutherland and Scott [25] who reported decreased milk production as the most common health implication of gastrointestinal parasite infection on cattle.

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