

Prevalence of gastrointestinal parasites of cattle in Abeokuta, Ogun State, Nigeria

Takeet, M. I^{1*}, Badru, O. B¹, Olubgbogi, E¹ and Abakpa, S. A. V.²

¹Department of Veterinary Microbiology and Parasitology, College of Veterinary Medicine, Federal University of Agriculture Abeokuta, Nigeria

² Department of Veterinary Medicine and Surgery, College of Veterinary Medicine, Federal University of Agriculture Abeokuta, Nigeria

*Corresponding author: takeetmi@funaab.edu.ng; takeetm@yahoo.com. Tel: +2348037872682

Target audience: The target audience includes the veterinarians, public health epidemiologists, animal health and production practitioners

Abstract

*This study assessed the prevalence of gastrointestinal parasites in cattle presented for slaughter in abattoirs and compared with that of Teaching and Research farm of Federal University of Agriculture, Abeokuta. Faeces were randomly collected from 205 cattle of less and greater than one year of age. Helminthes eggs and oocysts were detected by coproscopy and faecal egg load determined using McMaster technique. Result shows that prevalence of gastrointestinal parasites was 95.12%, helminthes had lower prevalence of 44.39% (91) compared to coccidial oocysts, 95.12% (195). Detected helminth eggs include *Haemonchus spp*, *Ascaris*, *Trichostrongylus spp*, *Paramphistomum spp*, *Moniezia spp* and *Fasciola spp*. Furthermore, study revealed prevalence of 32.68%, 11.22% and 0.49% for nematode, trematode and cestodes, respectively. Analysis revealed significant ($p < 0.05$) difference between the prevalence of nematodes and trematode as well as the mean faecal egg count of the cattle sampled in the abattoir and the University farm. In conclusion, gastrointestinal parasites are prevalent in cattle in the study area with *Eimeria spp* being most prevalent. Demonstration *Fasciola spp*, a zoonotic helminth, in the study area calls for serious public health concern and hence regular screening of gastrointestinal parasites should be carried out for effective monitoring and control.*

Key words: Cestodes; Eggs/Oocyst; Nematodes; Prevalence; Trematodes.

Description of Problem

Cattle are a major source of animal protein in Nigeria. It contributes more than seventy percent (70%) of total protein consumed. In Nigeria, majority of these cattle are in the hand of pastoralists who take their cattle on a free range grazing and thus exposing

them to various disease causing agents including parasitic helminthes and protozoans.

The gastrointestinal parasites mainly helminthes and some protozoans are responsible for clinical and subclinical diseases of livestock and this has been a major constraint to livestock production

in Nigeria (1). These gastrointestinal parasites have caused direct production loss to livestock and indirectly by retarding the growth, lowering productivity and increasing susceptibility of animals to other infections (2). Other indirect economic losses include lowered fertility, reduced work capacity, involuntary culling and treatment cost (3)

The common gastrointestinal parasites of cattle are the helminthes of the class nematode (*Haemonchus spp.*, *Ostertagia spp.*, *Capillaria spp.*, *Trichuris spp.*, *Strongyloides spp.*), trematodes (*Dicrocoelium spp.*, *Fasciola spp.*, *Amphistomes*) and cestodes (*Moniezia spp.*, *Taenia spp.*) (4). Protozoans parasites especially, coccidial parasites are the most commonly encountered in the ruminants. The most important coccidial of cattle include *Eimeria and cryptosporidium species* but *Toxoplasma* and *Haemonidia* species have also been reported. While infections due to coccidial parasites are of less importance in cattle, their capacity to act as a vector and carrier of cryptosporidium that are pathogenic to other domesticated animals and man has been a source of worry (5).

In Nigeria, moderate reports are available on the prevalence of gastrointestinal parasites of cattle (6; 7; 8). While most of these studies on gastrointestinal parasites of cattle focused mostly on helminthes, less attention is paid to other parasites that could be of great economic and zoonotic importance. Furthermore, there is no information on the prevalence of gastrointestinal parasites of cattle in

Ogun State.

Adequate knowledge about the dynamics and distribution of gastrointestinal parasites in Nigeria may help in the designing of therapeutic and epidemiological control of the diseases cause by the parasites. Therefore, this study was conducted to provide preliminary information on the prevalence of gastrointestinal parasites of cattle in Abeokuta, Ogun State.

Materials and Methods

Animals and sample collection:

Two hundred and five (205) cattle including White Fulani (140), Sokoto Gudali (16), N'Dama (7), Keteku (31) and Muturu (11) were randomly sampled from Federal University of Agriculture Teaching and Research Farm and Lafenwa abattoir. The animals were aged and grouped into < 1 year and > 1 year, using their dentition. Faecal samples were collected from the rectum of each animal into sterile universal bottles and transported in cold box to the laboratory for immediate analysis.

Sample analysis

Faecal samples collected were screened for helminthes eggs and other protozoan oocysts using simple floatation and sedimentation methods as described by (9). The Faecal egg/oocyst load was estimated using the McMaster egg counting technique.

Floatation method

About 50 ml of flotation fluid (specific gravity between 1.10 and 1.20) was added to 3g of faecal sample and mixed thoroughly. The faecal suspension was poured through a tea strainer into a container and the faecal suspension poured into test tube supported rack. The

test tube was gently topped off with the suspension leaving a convex meniscus at the top of the tube and coverslip was carefully placed on top of the test tube. After 15 minutes, the coverslip was carefully lifted with the drop of fluid adhering to it and placed on clean slide and viewed under x 10 and x 40 magnifications of light microscope.

Sedimentation technique

Sedimentation was conducted by mixing thoroughly about 3 g of faeces with 50mls of water. The faecal suspension was sieved into container and allowed to sediment for 5 minutes after which the supernatant was removed carefully and re-suspended in water. After 5 minutes, the supernatant was carefully discarded and the concentrate stained by adding one drop of 5% methylene blue. A drop of the sediment was placed on slide and cover with a cover-slip and viewed under the microscope under x10 and x40 magnification.

Statistical analysis

Data was presented using descriptive statistics and significance of prevalence

was carried out using chi-square test.

Results

Prevalence of gastrointestinal parasite in the sampled cattle

Table 1 indicated the prevalence of gastrointestinal parasites of cattle based on breeds of cattle sampled in Abeokuta, Nigeria. A total of 95.12 % (195) cattle were positive for one or more gastrointestinal parasites eggs. *Eimeria* oocysts had the highest prevalent percentage of 90.73% (186) followed by helminthes eggs of 47.5% (95). Among the helminthes eggs detected, nematode eggs had prevalent of (32.68%), cestode (2.50%) and trematode eggs (11.22%). Nematode egg prevalent was significantly higher ($p < 0.05$) than others. While the only cestode eggs encountered was *Moniezia spp*, the nematodes include *Haemonchus spp*, *Syngamus spp* and *Ascaris vitulorum* and, the trematode include *Fasciola*, *Paramphistomum* and *Schistosoma spp* (Figure 1a-d).

Table 1: Prevalence of gastrointestinal parasites of cattle based on breeds of cattle sampled in Abeokuta, Nigeria.

Breed of cattle sampled	Number of cattle sampled	Eimeria oocyst n(%)	Nematode n (%)	Trematode n (%)	Cestode n (%)
White Fulani	140	135(96.43)**	38(27.14)*	14(10.00)*	3(2.14)*
Sokoto Gudali	16	15(93.75)**	2(12.50)*	2(12.50)*	0(0)*
N'Dama	7	7(100.00)*	3(42.86)*	2(28.57)*	0(0)*
Keteku	31	27(87.10)*	18(58.06)*	3(9.68)*	1(3.23)*
Muturu	11	11(100.00)*	5(45.45)*	0(0)*	0(0)*

Note: Values with different superscript are significantly different ($p < 0.05$).

Prevalence of gastrointestinal parasites based on the breeds of cattle sampled in Abeokuta

White Fulani had highest prevalence of gastrointestinal parasites (Table 1) of 65.85%, 18.54%, 6.83% and 1.50% for

Eimeria, Nematode, Trematode and Cestode, respectively. This is followed by Keteku with *Eimeria* (13.85%), Nematode (26.87%), Trematode (13.04%), Cestode (1.00%) and the lowest prevalence of 11%, 5%, 0% and

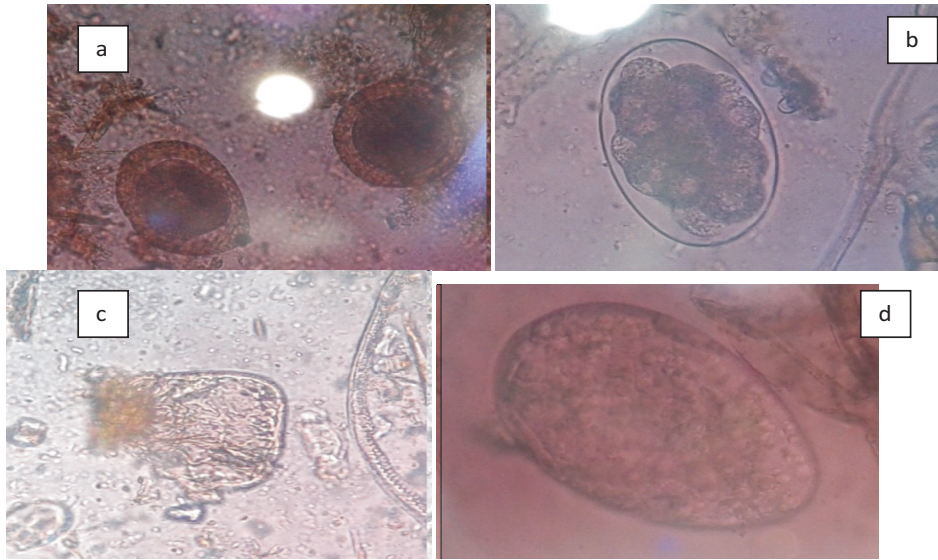


Figure 1. Picture of various helminthes eggs detected in sampled cattle; a, *Ascaris vitulorum* eggs; b, *Haemonchus spp* egg; c, *Moniezia spp* egg and d, *Fasciola spp* egg at x 40 magnification.

0% was recorded in Muturu for *Eimeria*, Nematode, Trematode and Cestode, respectively.

Prevalence of gastrointestinal parasites of cattle based on area and age group of cattle sampled in Abeokuta, Ogun State.

There was no significant different ($p > 0.05$) between the prevalence of gastrointestinal parasite from farm (92%) and abattoir (96%) as well as between the two age groups sampled.

But considering each group of helminthes eggs detected in the two age groups and the sampled areas, the prevalence of nematode was significantly higher ($p < 0.05$) in samples collected from farm and cattle of less than one year of age than abattoir and cattle of greater than one year of age, respectively. All the cestode eggs detected were from those cattle aged less than one year and 80% of them were detected from cattle sampled from abattoir (Table 2).

Table 2: Prevalence of gastrointestinal parasites of cattle based on sample collection area and age group of cattle sampled in Abeokuta.

Variables	Category	Number of cattle (%)	Eimeria oocyst (%)	Prevalence (%)		
				Nematode egg (%)	Trematode egg (%)	Cestode egg (%)
Age group	< 1 Year	07	5(71.43)*	5(71.43)**	0(0)	5(71.43)
	> 1 Year	198	190(95.96)*	62(31.31)*	23(11.62)	0(0.00)
Area sampled	Abattoir	120	116(96.67)*	20(16.67)*	12(10.00)	4(3.33)
	Farm	85	79(92.94)*	47(55.29)**	11(12.94)	1(1.18)

Note: Values with different superscript are significantly different ($p < 0.05$).

The mean faecal egg and oocyst count of the cattle sampled in the abattoir and the University farm were 11.76 ± 4.58 and 257.57 ± 27.93 for helminthic parasites from abattoir and University farm, respectively while that of oocyst were 960 ± 77.57 and 777.65 ± 69.80 for abattoir and farm respectively. The mean egg per gram of the faecal samples collected from farm was significantly different ($p < 0.05$) from those collected from abattoir (Table 3).

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Table 3: Mean \pm SEM Egg count per gram and oocyst count per gram of faecal sample collected from abattoir and farm in Abeokuta.

	Number of sample	Egg count per gram	Oocyst count per gram
Abattoir	120	$11.76 \pm 4.58^*$	$960.00 \pm 77.57^*$
Farm	85	$257.57 \pm 27.93^{**}$	$777.65 \pm 69.80^*$

Note: Values with different superscript are significantly different ($p < 0.05$).

Discussion

This study provides preliminary report on the prevalence of gastrointestinal parasites of cattle in Abeokuta, Ogun State.

The overall prevalence was 195 (95.12%) including helminths eggs and *Eimeria* oocysts. Higher prevalence of *Eimeria* oocyst than helminthes eggs in this study supports the findings of other researchers (10; 11) in Jos, Nigerian and Western Province of Cameroon. Though, there was no clinical

manifestation of coccidiosis in the cattle sampled, this could be an indication that adult cattle are generally resistant to coccidia infections and may support the report that *Eimeria* infection in adult cattle is self-limiting (12) or asymptomatic but act as reservoir for the younger animals which are more susceptible (13; 14). Furthermore, it could be an indication that *Eimeria spp* thrives well in wet season as the sampling was carried out during raining season, or no particular attention is paid

to the routine check for coccidial parasites in large animals. Similarly, the high prevalence percentage of gastrointestinal helminthes reported in this study also falls within the range (34.9% - 46.80%) reported by other authors (15; 16; 17) in Nigeria, though lower than the 62.1% prevalence reported by (18) and (19) in Port Harcourt and Sokoto, respectively. While the variation in results especially the lower prevalence recorded in one of the study area may be an indication that the management level is better, we are of the opinion that the prevalence is on the high side and may not be unconnected to free-range grazing management which increased their exposure to cyst, ova and larvae or the intermediate host of these gastrointestinal parasites on pastures (20). Abeokuta shares both rain forest and derived savannah vegetation with high moisture content and temperature which favor the growth and development of the helminthes and coccidial eggs or oocysts and larva stage of these parasites on pasture. The high prevalence of gastrointestinal parasites in White Fulani may be due to its predominant population while the low prevalence in N'Dama may be attributed to their hardy nature (21). N'Dama and Muturu are generally known to be trypano-resistant (22), hence, the immune component that confers resistance against trypanosomes may also protect the animals against worm infections, though this may need further investigation. Furthermore, the prevalence of trematode (*Fasciola spp*) eggs was low, this call for serious health concern as one larvae (sporocyst) from *Fasciola spp* egg may give rise to

hundreds of cercaria, the process known as paedogenesis, resulting in serious outbreak of fasciolosis.

Conclusion and application

- (1) Gastrointestinal parasites are prevalent in cattle in Abeokuta, Ogun State, Nigeria with *Eimeria spp* being more prevalent
- (2) Detection of trematodes, especially *Fasciola spp*, a zoonotic helminth, in the study area calls for serious public health concern and hence a concerted effort should be paid to the control and monitoring of gastrointestinal parasites.
- (3) This report provides preliminary information on gastrointestinal prevalence in cattle to the public health epidemiologists, veterinarians and farmers. This may have serious implication on the diagnosis, control and management of parasitic diseases in Ogun State,

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