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PREVALENCE OF GASTROINTESTINAL PARASITES OF CATTLE IN SELECTED ABATTOIRS WITHIN ZARIA AND SABON GARI LOCAL GOVERMENMENT AREAS, KADUNA STATE, NIGERIA

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Abstract

Gastro-intestinal (GI) parasitic infections are among the major constraints to ruminant production in Nigeria. Insidious productivity losses through reduced feed intake and decreased efficiency in feed utilization, associated with subclinical or chronic conditions of parasitic infections, are often the cause of large economic loss. The aim of this study was to determine the prevalence of gastrointestinal parasites of cattle in some selected abattoirs in Zaria and Sabon-Gari Local Government areas of Kaduna State. A total of fifty (50) faecal samples; 25 samples from each abattoir, were collected and examined microscopically for the presence of gastro-intestinal parasites of cattle. Nineteen (76%) out of the 25 samples collected at Zangon –shanu abattoir had gastrointestinal parasites, while16 (64%) of samples collected from Tudun-wada abattoir were positive with gastrointestinal parasites. The overall prevalence obtained in the study was 70%. 'This study revealed the presence of Strongyle, *Trichuris* spp, *Paramphistomum* spp, *Fasciola* spp, *Coccidia* spp and *Monezia* spp gastrointestinal parasites of cattle in the two abattoirs within the study area. Adoption of good management practices, periodical deworming and treatment with anthelminthic drugs, and public enlightenment on the zoonotic importance of helminth parasites is essential were recommended.

Keywords: Gastrointestinal, Parasite, Zoonotic, Anthelminthic, Cattle

Introduction

The livestock industry remains a crucial sub-sector of the Nigerian economy accounting for billions of Naira (Babagana *et al*., 2016). Cattle, which is the most prominent amongst Nigerian livestock is estimated to be more than 19 million (Lawal-Adebowale, 2012)

and are largely concentrated in the northern parts of the country. The gains accruing from cattle production in Nigeria cannot be overstated as cattle constitutes important sources of animal protein, raw materials, income, farm power, employment and organic manure. In some parts of Nigeria, ownership of cattle reflects wealth and status/class. However, the productivity and income generation from cattle production has continued to dwindle due to several reasons including parasitic infections (Marskole *et al*., 2016).

Parasitic infections are one of the major constraints to the production of ruminants in tropical
and subtropical countries including Nigeria (Aunpromma and Papirom, 2006). Gastrointestinal (GI) parasites inhabit the digestive tract of cattle, which leads to considerable economic loss as a consequence of inappetence, anemia, diarrhoea, poor growth, reduced weight gain, impaired reproductive performance, condemnation of affected organs, and mortality in infected animals (Marskole *et al*., 2016). Gastrointestinal parasitism in cattle is caused by protozoa and helminths. Normally, Gastrointestinal parasitism in ruminants is present throughout the year, with a higher prevalence rate during the rainy season (Marskole et al., 2016). The climatic conditions such as temperature and humidity are primary factors related to the growth, development, and survival of various parasites, including eggs, larvae, cysts, and oocysts or their intermediate hosts. The estimated mortality rate is about 10% or may exceed 40%, particularly in young animals, while weight loss of 6-12 kg/year per animal may occur (Chavhan et al., 2008).

Parasitic infections, particularly gastrointestinal parasites, pose a serious health threat and negatively impact livestock production via its associated morbidity, mortality, treatment and control costs (Nwosu *et al*., 2007). Also, most of these parasitic infections are zoonotic and thus could pose a deleterious threat to public health. It is of great importance to identify GI parasite infecting cattle in the study area and recommend control measures.

Gastrointestinal parasites are ubiquitously distributed, and prevalence studies have been variously carried out in different geographical regions of Nigeria (Karaye *et al*., 2018). However, a paucity of information exists on the prevalence of gastrointestinal parasites of cattle in Zaria. Adequate knowledge about the dynamics and distribution of gastrointestinal parasites in Zaria may help in the designing of therapeutic and epidemiological control of the diseases caused by the parasites. Therefore, this study provides vital information on the prevalence of gastrointestinal parasites of cattle in Zaria.

Materials And Methods

Study Area

The study was conducted in Zaria and Sabon-Gari Local Government areas of Kaduna State. Faecal samples were collected from Tudun Wada abattoir in Zaria Local Government Area and Zangon Shanu abattoir in Sabon-Gari Local Government Area.

Sample Size

A total of fifty (50) faecal samples; 25 samples from each abattoir, were collected for the study.

Collection of Faecal Samples

Faecal samples were collected from the rectum of each animal prior to slaughter and transferred into sterile universal bottles and transported in cold box to the Parasitology/ Entomology Department, Faculty of Veterinary Medicine A.B.U. Zaria laboratory for immediate analysis. The

collection was done in the early hours of the morning; because it was about that time faeces were freshly passed out for the first time in the morning, and which is known to contain heavy eggs of the parasite. Visual observation of the external genitalia was used to differentiate between a male and a female.

Identification of Parasite Eggs/Cysts

Identification of gastrointestinal parasites was done by identifying their eggs recovered from faecal material using parasitological techniques. In this research, test tube floatation method was used to identify the eggs of parasites in the laboratory. By using the book of Foreyt (2001), and other published articles, and also from internet sources, eggs were identified on the basis of morphological characters (shape and size).

Test Tube Floatation Method.

Three grams (3g) of faecal sample was measured with a calibrated teaspoon and transferred into a container. Fifty (50) ml of floatation fluid (450 g Magnesium Sulfate with SG 1.20,1,000 ml tap water) was poured into the container. The faecal sample and floatation fluid were mixed by stirring thoroughly with fork. The mixture was centrifuged using a centrifuge machine. The suspension was then poured through a strainer into a second container. The faecal suspension was poured into a test tube and placed in a test tube rack. The test tube was gently topped off with the suspension leaving a convex meniscus at the top of the tube. A coverslip was then placed carefully on top of the test tube and left to stand for 20 minutes. The coverslip was carefully lifted off the test tube together with the drop of fluid adhering to it and placed on a clean slide. This was followed by microscopic examination using high power objective and x100 objective.

Data Analysis

The data obtained from this study were analyzed descriptively and the results presented in percentages. The prevalence of parasites was determined using the following equation:

Prevalence (%) = a/b x 100

Where “a” = Number of individuals having a disease at a particular time; “b” = Number of individuals in the population currently at risk (Thrusfield, 2005).

Results

Table 1 shows the prevalence of gastrointestinal parasites of cattle at Zangon-shanu and Tudun-wada abattoirs. Nineteen (76%) out of the 25 samples collected at Zangon –shanu abattoir had gastrointestinal parasites, while16 (64%) of samples collected from Tudun-wada abattoir were positive with gastrointestinal parasites. The overall prevalence obtained in the study was 70%. Some of the gastrointestinal parasite eggs identified from slaughtered cattle are shown in figure 1.

Table 1. Prevalence of gastrointestinal parasites of cattle at Zangon-shanu and Tudun-Wada abattoirs.

Abattoirs	Number of cattle	Number of cattle with parasites	Prevalence (%)
Zangon-Shanu	25	19	76
Tudun-Wada	25	16	64
Total	50	35	70

Table 2 shows the species prevalence of gastrointestinal parasites of cattle at Zangon-shanu abattoir. The tables show that Strongyle eggs had the highest number 13 (52%) followed by Coccidia oocyst 13 (52%). *Fasciola* eggs had the lowest number 3 with (12%) and *Paramphistomum* eggs 2 with (8%) which had the least number

Table 2. Prevalence of gastrointestinal parasites of cattle at Zangon-Shanu abattoir

Parasites	No. examined (n) n=25	No. of parasites	Prevalence (%)
Strongyle eggs		13	52
Coccidia oocyst		13	52
Paramphistomum eggs		2	8
Fasciola eggs		3	12

The prevalence of gastrointestinal parasites of cattle at Tudun-wada abattoir is shown in Table 3. Strongyle eggs had the highest number 13 (52%) followed by Coccidia oocyst 8 (32%) and *Paramphistomum* eggs 2 (8%) and *Trichuris* eggs 2 (8%) while *Fasciola* eggs 1(4%) and Moniezia eggs 1(4%) which had the least prevalence.

Table 3 Prevalence of gastrointestinal parasites of cattle at Tudun-wada abattoir

Parasites	Number of animals (n) =25	Number of parasites present	Prevalence (%)
Strongyle eggs		13	52
Coccidia oocyst		8	32
Paramphistomum eggs		2	8
Fasciola egg		1	4
Trichuris eggs		2	8
Moniezia egg		1	4

Table 4 shows the prevalence of gastrointestinal parasites of cattle in relation to sex of cattle. Males had a higher prevalence (77.5%) of gastrointestinal parasites compared to the females with 40% in the study area.

Table 4 Prevalence of gastrointestinal parasites of cattle in relation to sex of cattle

Sex of cattle	Number examined	Number of cattle with parasites	Prevalence %
Male	40	31	77.5
Female	10	4	40
Total	50	35	70

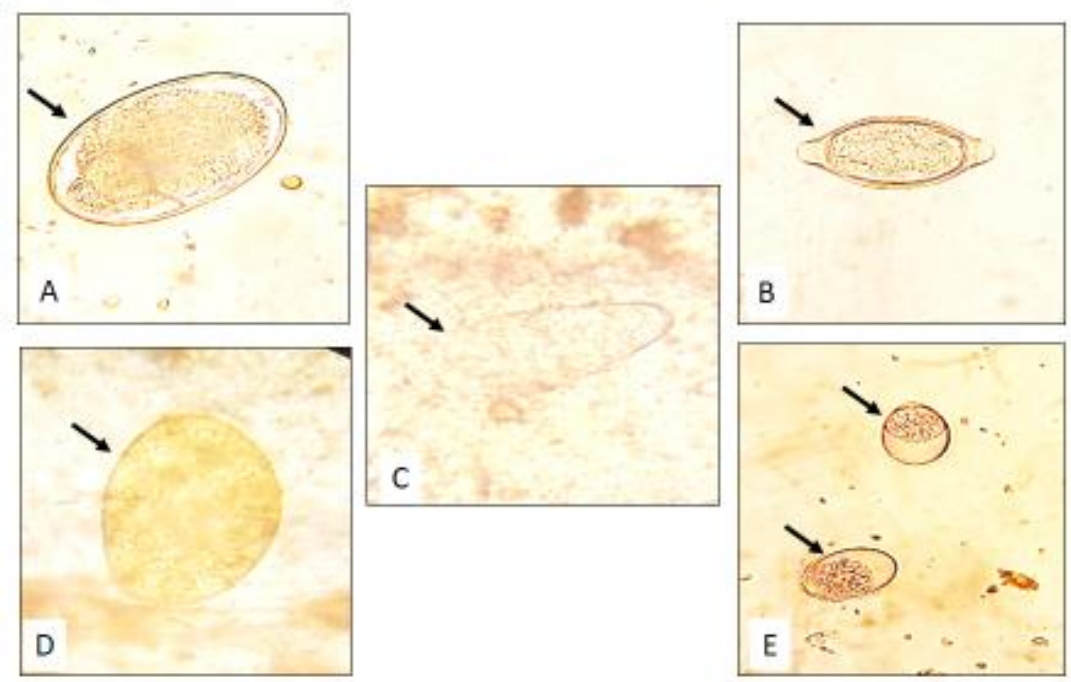


Figure 1: Gastrointestinal parasite eggs identified from slaughtered cattle. [A] Strongyle egg, [B] *Trichuris* egg, [C] *Paramphistomum* egg, [D] *Fasciola* egg, [E] Coccidia oocysts

Discussion

Gastrointestinal parasites cause severe infection to domestic animals worldwide, and are more problematic in developing countries, especially those related to climate, nutrition, and poor sanitation, including Nigeria (Obi et al. 2020). They affect fertility, work capacity, involuntary culling, reduction in food intake weight and milk and higher mortality rate. The prevalence obtained in this study indicates that gastrointestinal helminth parasites are endemic in cattle within the study area. A total of 35 out of the 50 cattle sampled from the two abattoirs in this study had gastrointestinal parasites, resulting in a total prevalence of 70%. This shows that majority of cattle were infected with GI parasites. This prevalence of 70% this is very high compared to the 3% prevalence reported by Ameen *et al*. (2015) in Ogbomosho, Oyo State Nigeria and 57.6% reported by Obi *et al*. (2020) in Anambra State, South-East Nigeria. However, the 70% prevalence is low compared to the 95.5% in Southern Ghana (Squire *et al*. 2013). The differences in the gastrointestinal helminth parasite prevalence could be due to the seasonal differences, climatic conditions of the different locations, livestock management system, diagnostic method utilized, and number of samples examined, frequency of anthelmintic treatment, and availability of vectors/intermediate hosts amongst other factors.

The gastrointestinal parasites of cattle identified in this study were Strongyle, *Trichuris* spp, *Paramphistomum* spp, *Fasciola* spp, Coccidia and *Moniezia* spp. Similar findings have been reported in many parts of Nigeria and Africa by several authors (Oluwole *et al*., 2016; Bisimwa *et al*., 2014). Their occurrence in cattle is usually not without huge impacts on livestock productivity as they can induce reduction in body weight, reduced productivity, impaired reproductive performance, condemnation of most organs

at slaughter, mortality and economic losses. More so, the findings of *Strongyle* and *Fasciola* ova; considering their zoonotic nature (Karshima, 2018), are of significant public health importance.

Based on sex, the overall prevalence of gastrointestinal helminth parasites was high in males (85.72%) compared to females (14.28%). This finding is in agreement with that of Yuguda *et al*. (2018) in Bauchi State of Nigeria and Bisimwa *et al*. (2014) in South Kivu Province of Congo. However, findings of Moussouni *et al*. (2017) in Bass Kabylie, Bejaia Province of Algeria, of female cattle having higher prevalence rates contrasted with this current study. The high prevalence rates observed in males could be attributed to the fact that more males were sampled than the females and also to the aggressive feeding habit of the male cattle.

Conclusion

'This study revealed that cattle in Zaria and Sabon-Gari Local Government areas of Kaduna State are affected by a variety of GI parasites, including zoonotic parasites. This shows that gastrointestinal parasites are prevalent in cattle in Zaria, Kaduna State, Nigeria, with Strongyle being more prevalent. Detection of trematodes, especially *Fasciola* spp, a zoonotic helminth, in the study area calls for serious public health concern and hence concerted effort should be paid to the control and monitoring of gastrointestinal parasites. 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 Kaduna State.

References

Ameen, S.A., Adedokun, R.A.M. and Akinola, S.O. (2015) Prevalence of gastro-intestinal parasites of cattle in Ogbomoso, Oyo State. *International Journal of Applied Agriculture and Apiculture Research,* 11(1–2):22–26.

Aunpromma, S. and Papirom, P. (2006). Survey of internal parasites of adult native cattle from Amphur Sahasakhan Kalasin province. KKU. *The Veterinary. Journal*, 56(2): 23-31.

Babagana, M., Gimba, B., Yusuf, I. (2016). Introducing probabilistic models for redundant system reliability. *Operations Research and Decisions*, 26 (1):5–18.

Bisimwa, N.P., Lugano, R.M., Bwihangane, B.A., Wasso, S.D., Kinimi, E., Banswe, G., Bajope, B. (2014). Prevalence of gastro-intestinal helminth in slaughtered cattle in Walungu Territory, South Kivu Province, eastern democratic Republic of Congo. *Austin Journal of Veterinary Science & Animal Husbandry,* 5(1):1039.

Foreyt, W.J. (2001). *Veterinary parasitology reference manual* 5th edn. Ames, IA: Iowa State
University Press.

Karaye, P.G., Ola-Fadunsin, S.D., Dogo, G.A. (2018). Diversity of gastrointestinal parasites affecting some domestic animals in Plateau State, North Central Nigeria. *Scientific World Journal.* 13(1):82–86.

Karshima, S.N. (2018). Helminths of zoonotic importance in slaughtered food animals in Nigeria: a systematic review and meta-analysis. *Journal of Helminthology*.https://doi.org/ 10.1017/S0022149X18 000 196.

Lawal-Adebowale, O.A. (2012) Dynamics of ruminant livestock management in the context of Nigerian. *Agric Syst*, 4:61–80.

Marskole, P., Verma, Y., Dixit, A.K., Swamy, M. (2016) Prevalence and burden of gastrointestinal parasites in cattle and buffaloes in Jabalpur, India. *Veterinary World*, 9(11):1214–1217.

Nwosu, C.O., Madu, P.P., Richards, W.S. (2007). Prevalence and seasonal changes in the population of gastrointestinal nematodes of small ruminants in the semi-arid zone of northeastern Nigeria. *Veterinary Parasitology*, 144(1–2):118–124.

Obi, C.F., Akata, M.C. and Ezubelu, O.J. (2020) Prevalence of gastrointestinal helminth parasites of trade cattle in Aguata and Orumba South Local Government Areas, Southeastern Nigeria. *J. Parasit. Dis*., 44(3): 546-552.

Oluwole, A.S., Adeniran, A.A., Mogaji, H.O., Shittu, E.O., Alabi, O.M., Odoemene, S., Ekpo, U.F. (2016). Survey of gastrointestinal parasites among nomadic cattle herds in Eruwa, Oyo State, Southwestern Nigeria. *Annual Research & Review in Biology*, 10(6):1–7.

Squire, S. A., Amafu-Dey, H., and Beyuo, J. (2013). Epidemiology of gastrointestinal parasites of cattle from selected locations in Southern Ghana. Livestock *Reserch for Rural Development*, 25(7), 117.

Thrusfield, M. (2005) Veterinary Epidemiology. 3rd ed. Black-Well Publishing, Sussex, United Kingdom. p183.

Yuguda, A.U., Samaila, A.B. and Panda, S.M. (2018). Gastrointestinal helminth of slaughtered cattle in Bauchi Central Abattoir, Bauchi State, Nigeria. *GSC Biological and Pharmaceutical Sciences*, 4(02):58–65.