

Prevalence of Parasitic Helminthes from Feecal Samples of Cattle at Various Abattoirs in Abraka, Delta State, Nigeria

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Abstract

Occurrence of parasitic helminthes from feecal samples of cattle at various abattoirs in Abraka, Delta State, Nigeria was investigated. Visits were made to different abattoirs weekly for collection feecal samples as early as 6:00 am when the cattle are set for slaughter. The feecal specimen were collected directly from the rectum of slaughtered cattle using hand gloves on sample bottles for laboratory analysis using feecal floatation and direct smear methods. Status of the cattle was recorded as emaciated and moderate via visual examination. Each of the samples was clearly labeled with the animal's sex, date of collection and place of collection. A total of 121 samples were collected from 4 abattoir/slaughter slab within Abraka. From the samples collected and examined, 61(50.4%) were positive to helminthes parasites which include *Trichostrongyle* sp., *Trichuris* sp., *Taenia* sp., *Ascaris lumbricoides*, *Fasciola* sp., *Strongyloides* sp. and *Bonustonum* sp. There were some incidences of mixed helminthes parasites in the feecal samples analyzed. From the study, *Fasciola* sp. and *Strongyloides* sp. were the most prevalent with 37.7% and 22.9% respectively. Based on the findings, there is clear evidence on high level of intestinal parasitic infectious helminthes in cattle slaughtered in the area. Hence, there is need to introduce improved preventive measures in controlling these helminthes in order to protect the entire cattle population against parasitic infection and poor health status.

Keywords: Parasitic helminthes; Feecal samples; Cattle; Abattoirs; Preventive measures

Introduction

Cattle has a wide range of distribution in Nigeria and is reared in most part of the country, because it serves as the major animal protein source consumed by the people [1]. Cattle are the single most important livestock species in Nigeria in terms of supply of animal protein, value and biomass. They provide meat and milk, hide, bones, blood, horns and draught-usage; and are of great genetic diversity being adapted to stressful environmental conditions of poor nutrition, inclement weather and a myriad of diseases [1]. Ruminant livestock in Nigeria are numerous and they provide substantial quantities of animal protein [2]. These livestock production are based on age-old husbandry systems requiring modification in order to meet the needs of consumers as well as animal health. Livestock production system In Nigeria, including cattle, goats and sheep are predominantly traditional or village systems [3]; nomadic or pastoral systems; mixed farming and the peri-urban and modern ruminant livestock husbandry. In general production and management systems vary from free range in less populated areas to year round confinement and cut and carry feeding of grass and browse in densely populated areas.

Despite its usefulness to man, cattle may be infected with pathogens that are dangerous to man and other domestic animals. Such are parasites which include helminthes of Gastrointestinal Tract (GIT). Helminth parasites come in three major classifications namely Cestodes (tapeworms), Nematodes (round worms) and Trematodes (flukes) [4]. The helminth infections are mostly caused by Nematodes (such as *Ostertagia* sp., *Capillaria* sp., *Trichuris* sp., *Strongyloides* sp.),

Cestodes (such as *Moniezia* sp., *Taenia* sp.) and Trematodes (such as *Dicrocoelium* sp., *Fasciola gigantica*, Amphistomes) [5].

Meat is one of the most important livestock products, although there could be loss of it due to the presence of helminthes and protozoa parasites. In 1975, meat accounted for about 47% of the gross value of total sub-Saharan Africa output [6]. The economic activities in which manures from diseased animals are used, is a source of spread of some helminths and protozoa parasites. Also according to Onah and Chiejina, because of the absence well-established veterinary diagnostic services, abattoir statistics have become the single most important source of data on disease of food animals in Nigeria [7].

In many of the developing countries the most prevalent and important helminths are those of the soil transmitted nematodes. Chronic gut infection in humans commonly results from nematodes, particularly that of *Ascaris lumbricoides*, *Trichuris trichiura* and hookworms. For instance, it was found that helminthiasis is the second most common cause of outpatient morbidity next to malaria where Children are the most affected group and serve both as source of infection and as victims, thus contributing to transmission of most parasitic infections within the community [8]. Epidemiological studies of diarrhoea have been reported from several African countries including South Africa, Gabon, Egypt and Kenya. It ranks second only to respiratory diseases and is a major cause of morbidity among notifiable diseases in some part of the world.

Ekundayo et al. reported that the prevalence of STH infections in Nigeria between 1977 and 2006 ranges between 1.5% to 88.5% with *Ascaris lumbricoides*, hookworms (*Necator americanus* and *Ancylostoma duodenale*), and *Trichuris trichiuria* species as the commonest agents [9]. Prevalence parameters varied for individual

parasites and for rural and urban communities. The high prevalence of STH infections has been closely related with illiteracy, poverty, poor environmental hygiene and impoverished health sector [9]. Nonetheless, the predominant STH found among the respondents was *Ascaris lumbricoides* and is in line with previous findings in Nigeria [10]. This however, differs from other studies where hookworm was found to be of highest prevalence [11,12]. The high prevalence of *Ascaris lumbricoides* is due to the direct mode of infection and the high resistance of the infective ova to desiccation which enhances longevity and promotes infectivity.

The significance of helminthiasis has been recognized by livestock farmers' right from the earliest of times and various methods have been employed by them to control helminths in their animals including the use of medicinal plants and herbs and different grazing techniques (Bukhari and Sanyal). For example, the Fulani herdsmen in Nigeria start treating calves against helminths with medicinal plant as early as within a week of birth (Ibrahim et al.) because they recognize the importance of helminths in calves of less than a year old. The major control method employed against helminth parasites in developing countries as elsewhere is the use of chemotherapy Aragaw et al., Sargison. Based on the socio-economic importance associated with the rearing and consumption of cattle both locally and globally, this study was therefore established to study the prevalence of parasitic helminthes from faecal samples of cattle at various abattoirs in Abraka, Delta State, Nigeria. With the aim of identifying the intestinal helminthes causing infections in cattle slaughtered in Abraka.

Materials and Methods

Description of study area

This study was conducted in Abraka, Delta State, Nigeria. Abraka is situated between latitude 50 45' and 50 50' N and longitude 60 and 60 15' E is located in Ethiope, East Local Government area and is an agglomeration of several communities that are aligned linearly along the New and Old Sapele-Agbor highway. These communities include from the west, Oria, Ajalomi, Abraka PO, Ekrejeta, Urhuoka and Umeghe. Ajalomi, Abraka PO, Ekrejeta and Urhuoka have grown in size and are now conjoined to form what is loosely referred to as Abraka Urban.

The Abraka area is a typical coastal plain terrain, monotonously lowland and flat with a gentle slope towards the Ethiope River. The climate is equatorial, hot (23° to 37°C) and humid (relative humidity, 50 to 70%). There is a dry season from about November to February, and a wet season that begins in March, peaks in July and October. With annual mean rainfall of 3317.8 mm. Vegetation is rainforest, most of which has been decimated and replaced with farmlands and secondary forest. However, lush, dense and swamp primary forest flanks the river banks.

Sample collection

Visits were made to the abattoir weekly for sample collection during the study period as early as 6:00 am when the animals are usually taken to the abattoir. The specimen collected were identified and labelled as male or female (Bearer et al.). Also the status of the cattle was recorded as emaciated and moderate. This was carried out via visual examination. Fresh faecal materials were collected directly from the rectum of the slaughtered animals using a pair of hand gloves. Each of the samples was clearly labeled with the animal's sex, date of collection

and place of collection. The samples were placed in clean labelled bottles and transferred to the parasitological laboratory, Department of Animal and Environmental, Delta State University, Abraka, Delta State, Nigeria, for analysis. The samples were collected between October 2014 and February 2015.

Laboratory procedures

The simple faecal floatation and direct faecal smear methods were used for identifying the helminth eggs [13].

Faecal floatation method

Approximately 5g of faeces were placed in a beaker, then 50 ml of water was poured into it and the content mixed thoroughly using a stirring rod. The faecal suspension was strained by pouring it through a tea strainer into another beaker which was left to stand for 10 min and decanted. The bottom sediment was transferred into a test tube and re-suspended with the floatation fluid to the brim. Finally, the test tube was covered with a cover slip and the cover slip mounted on a microscopic slide for examination [13].

Direct faecal smear

In the direct faecal smear, watery stools were smeared on a slide and viewed under the microscope while the formed stool was dissolved using distilled water, and then smeared on a slide viewed under the microscope [13].

Statistical analysis

The data obtained were tabulated for easy assessment, with the table showing the total number of cattle examined their sexes, number of parasites recovered and their percentages. Graphpad InStat version 3 statistical software was used in analyzing the data obtained. The significance of association between variables was tested using Analysis of Variation (ANOVA) and the relationship between intestinal helminthes infection and prevalence was correlated. The level of significance of each test was set at 0.05.

Results

The study screened a total of 121 faecal matter obtained from cattle in the various abattoirs in Abraka for helminthes parasites. In the 121 samples which were collected and screened, 61 samples accounting for 50.4% of the total population examined were positive to helminthes. Male had prevalence rate of 39 (63.93%) while female had prevalence rate of 22 (36.06%) of helminthes infections. The level of prevalence of helminthes infections in cattle with emaciated body condition was 23 (37.70%) while those with moderate body conditions had percentage prevalence rate of 38 (62.29%) Table 1. In terms of body condition, male had percentage prevalence of 9 (39.13%) for emaciated cattle and percentage prevalence of 22 (57.89%) for moderate cattle while female had percentage prevalence of 14 (60.86%) for emaciated cattle and 16 (42.10%) for moderate cattle Figure 1. The result showed that female had higher percentage of emaciated cattle while male had higher percentage of moderate cattle.

From the study, seven intestinal parasitic helminthes were encountered which include *Trichostrongyle* sp. 12(19.7%), *Trichuris* sp. 13(21.3%), *Taenia* sp. 8(13.1%), *Ascaris lumbricoides* 12(19.7%), *Fasciola* sp. 23(37.7%), *Strongyloides* sp. 14(22.9%) and *Bonustonum* sp. 13(21.3%). There were some incidences of mixed helminthes

parasites in the faecal samples analyzed. From the study, *Fasciola* sp. and *Strongyloides* sp. were the most prevalent with 37.7% and 22.9% respectively Figure 2. Mixed infection of helminthes such as

Trichostrongyle sp. and *Taenia* sp., *Ascaris lumbricoides* and *Taenia* sp. as well as *Trichuris* sp., *Trichostrongyle* sp. and *Fasciola* sp. was recorded in the different faecal samples analyzed.

Sex	Emaciated		Moderate	
	%Prevalence	Positive	% Prevalence	Positive
Male	39 (63.93)	9	39.13	22
Female	22 (36.06%)	14	60.86	16
Total	61 (50.4)	23	37.7	38

Table 1: Prevalence of helminthes parasites in relation to sex and body condition.

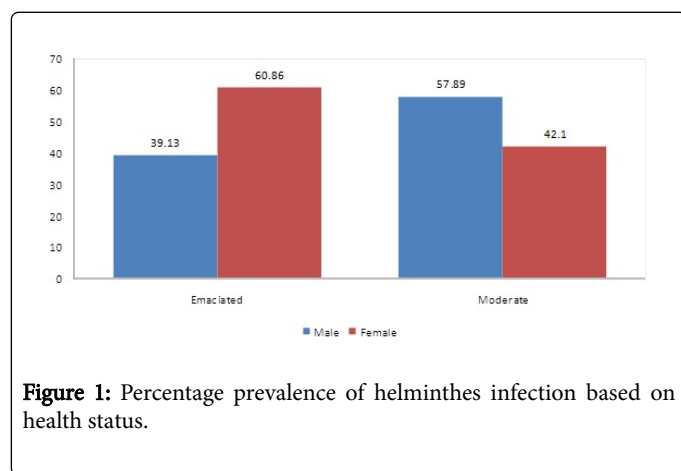


Figure 1: Percentage prevalence of helminthes infection based on health status.

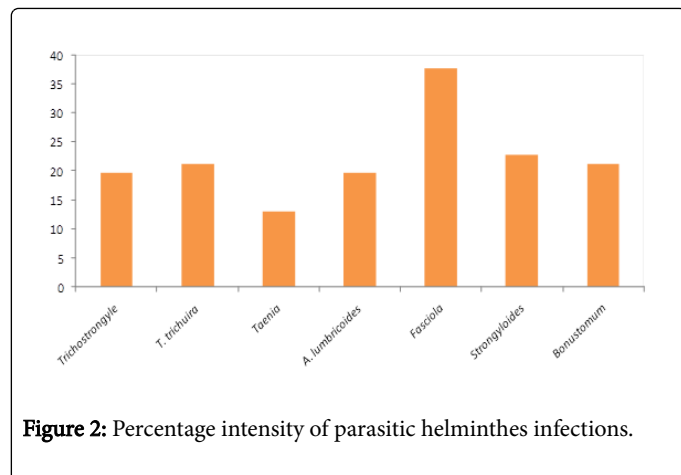


Figure 2: Percentage intensity of parasitic helminthes infections.

Discussion

Helminthes parasites are potential health hazards to livestock population and produce enormous economic loss. Trematode parasites like *Fasciola*, *Paraphistome* and *Schistosoma* have indirect life cycle using snails as their intermediate hosts. Nematode parasites such as the *Strongyloides*, *Ascaris* and *Trichuria* have direct lifecycle and cattle become infested by ingesting infective larvae with grass [14]. From the above results, nematodes dominated in the overall helminthes infections in cattle at the different abattoirs in Abraka as many of them do not require an intermediate host for completion of their life cycle.

The most prevalent parasitic helminthes in this study is the Trematode *Fasciola* sp. This is similar to the report of Chowdhury et al., Nwigwe et al., Nnabuife et al. and who reported high prevalence of *Fasciola* sp. in their study area [14-16]. Other studies with similar high prevalence include those of Elele et al., Telila et al., Olubukola et al. [17-19]. They also reported the occurrence of helminthes species such as *Paraphistomum* sp., *Trichostrongylus* sp., *T. trichuria*, *Nematodirus* sp., *Cooperia* sp. and *Eimeria* sp. Nwigwe et al., Olubukola et al. reported the occurrence of *Strongyloides* sp., *Toxocara* sp., *Nematodirus* sp., *Fasciola* sp., *Dicrocoelium* sp. and *Moniezia* sp. [15,19].

Variations also exist in the rate of prevalence of different helminthes in this study. Such a regional variation in the record of various species has been widely reported. A variety of factors like age, sex and breed of the host, grazing habits, level of education and economic capacity of the farmers, standard of management and anthelmintic used can influence the prevalence of helminthes [20]. The most prevalent nematode recovered in this study was *Strongyloides*. The higher and most occurring nature of nematode prevalence could be due to the fact that this nematode has a relatively short generation interval and ability to take the advantage of favorable environmental conditions [21].

Conclusions

Based on the findings, there is clear evidence on high level of intestinal parasitic infectious helminthes in cattle slaughtered in the area. Hence, there is need to introduce improved preventive measures in controlling these helminthes in order to protect the entire cattle population against parasitic infection and poor health status. There is also need to ensure adequate control of these helminthes infections as their entry into human host via any means could lead to severe parasitic infections.

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