

A COMPARATIVE ANALYSIS OF THE GASTRO-INTESTINAL HELMINTH PARASITES OF CATTLE IN AWKA AND OBOSI ABATTOIRS IN ANAMBRA STATE, SOUTHEASTERN NIGERIA.

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Abstract: -

A comparative study was carried out on the prevalence of gastro-intestinal helminthes of cattle in Awka and Obosi abattoirs in Anambra State, between August and September, 2014. Fresh faecal specimens were collected from the rectum of 120 freshly slaughtered cattle using universal specimen containers. Parasitological examination of the faeces was done using direct smear and formal-ether concentration techniques. Out of 120 faecal specimens examined, 53(44.2%) of the cattle harboured gastro-intestinal helminth parasites. The prevalence of the intestinal parasites was higher in Obosi abattoir 33(55.0%) than in Awka abattoir 20(33.3%). The highest intestinal parasite encountered was nematode infection (26.7% in Awka; 31.7% in Obosi) and the least was cestode (15.0% in Awka; 21.7% in Obosi). Among the nematodes, *Haemonchus contortus* was common (10% in Awka; 11.7% in Obosi). Mixed infection recorded were 13.3% in Awka and 18.3% in Obosi abattoirs. White Fulani species had the highest infection rate in both Awka 10(16.7%) and Obosi abattoirs 14(23.4%) while the Red Fulani had the least prevalence in Awka 3(5.0%) and Bokolo species 8(13.4%) in Obosi. Prevalence according to gender showed that females (20.0% in Awka; 28.3% in Obosi) were more infected than the males (13.3% in Awka; 26.7% in Obosi). The prevalence of gastro-intestinal parasites was observed to be statistically significant with gender ($P>0.05$) but not with different breeds ($P<0.05$). Good management practices in cattle rearing will help to reduce intestinal parasites of cattle.

Keywords: Comparative, gastro-intestinal, helminthes, infection, cattle, abattoir, Awka, Obosi,



I. INTRODUCTION

Livestock production constitutes a very important component of the agricultural economy of developing countries, a contribution that goes beyond direct food production to include multipurpose uses, such as skins, fibre, fertilizer and fuel, as well as capital accumulation [1]. Furthermore, livestock are closely linked to the social and cultural lives of several million resource-poor farmers for whom animal ownership ensures varying degrees of sustainable farming and economic stability [2]. Cattle are distributed in many parts of the world including Nigeria and the distribution is in such a way that up to ten cattle is kept per household in the Northern part of Nigeria [3]. Cattle are slaughtered on daily basis in all abattoirs in Nigeria, where they are sold as beef to the public. This accounts for upto 70% of the total meat consumed in the country [4].

Apart from these advantages, cattle are infected with gastrointestinal parasites especially helminthes [5]. Gastrointestinal helminth infections are recognized as a major constraint to livestock production throughout the tropics and elsewhere [6]. Intestinal helminthes are worldwide problem for both small and large scale cattle farmers but its impact is greater in sub-Saharan Africa and Nigeria in particular. This is due to availability of diversified host and parasites species [7].

The gastro-intestinal helminthes populate the gastro-intestinal tracts of cattle and other associated organs of GIT. The parasites live in the host, receiving nourishment and protection while causing acute and chronic infections, disrupting the host nutrient absorption, causing reduced weight gain, reduced food conversion, abortion, infertility, reduced meat and milk production, weakness and diseases [8]. However, the effect of helminth infections is determined by a combination of factors, of which the varying susceptibility of the host species, the pathogenicity of the parasite species, the host/parasite interaction, and the infective dose are the most important [9].

Knowledge of the intestinal helminthes parasites of animals is of great value particularly in the field of veterinary medicine, animal parasitology and zoonoses. The negative impact of helminth infection on livestock productivity in Nigeria has been established in the reports of [10,11,12,13, 14].

The most important predisposing factors of helminth infections are grazing habits (feeding on contaminated pastures and feeding or drinking from a contaminated water source), climate, nutritional deficiency, pasture management, immunological status, vector or presence of intermediate host and the number of infective larvae and eggs in the environment [15]. The helminth infection of ruminants are mostly caused by nematodes (*Ostertagia spp.*, *Capillaria spp.*, *Trichuri spp.*, *Strongyloide spp.*), cestodes (*Moniezia spp.*, *Taenia spp.*) and Trematode (*Dicrocoelium spp.*, *Fasciola gigantica*, *Amphistomes*) [16, 17]. The objective of this research is to investigate the gastrointestinal helminthes of cattle in the two selected abattoirs in Anambra State. The result of this study will enhance diagnosis for planning control measures of helminth infections in cattle.

II. MATERIALS AND METHODS A. Study area

This study was carried out at the two selected abattoirs in Anambra State (Awka and Obosi abattoirs). Awka abattoir is located in Awka which is the capital city of Anambra State while Obosi abattoir is located in a semiurban community of Obosi. Cattle slaughtered in these abattoirs are mostly sourced from different cattle rearing regions of Nigeria (mainly Northern Nigeria). Due to their location and large number of animals slaughtered, these abattoirs serve as major sources of meat consumed in Anambra State, a state with a population of about 4.2 million people [18]. The indiscriminate refuse disposal and poor drainage accounts for the poor sanitation and thus, enhance the dissemination of parasitic infection.

B. Faecal Sample Collection and Identification

Simple random sampling method was used in selecting cattle that were screened at antemortem. Fresh faecal samples were collected from the rectum of freshly slaughtered cattle into a well-labeled universal specimen container containing 10% formalin as preservative. For each animal screened, parameters such as the sex and breed were recorded. The specimen were transported to the laboratory of the Department of Parasitology and Entomology, Nnamdi Azikiwe University, Awka where they were examined for helminth egg using direct saline method and formal-ether sedimentation methods [19]. Eggs were identified on the basis of their morphological features as described by [20].

C. Data Analysis

Data were subjected to statistical analysis using percentages in determining the prevalence rates in the different breeds, sex, and location of the abattoirs. Chi square statistical test was used to compare and determine the significance of the prevalence in the two locations as well as the sex and breeds of the cattle.

III. RESULTS

Out of the 120 faecal specimens examined (60 cattle from each location), 53(44.2%) of the cattle were infected with gastro-intestinal helminth parasites. cattle were more infected in Awka abattoir 20(33.3%) than in Obosi abattoir 33(55.0%). The distribution of helminthes in different locations of the abattoirs is statistically significant ($P < 0.05$) [Table 1]. White Fulani had the highest prevalence [Awka = 10(16.7%; Obosi=14(23.3%)] while Red Fulani 3(5.0%) had the least in Awka and Bokolo8(13.3%) had the least in Obosi abattoir, although the result was not statistically significant ($P > 0.05$) [Table 2]. Intestinal nematodes were more common in both abattoirs [Awka; 16(26.7%), Obosi; 19(31.7%)] than other helminthes. *Haemonchus contortus* was the highest species of nematode encountered while *Trichuris globulosa* was the least (Figures 1-3).

Table 1: Prevalence of intestinal helminthes in different locations of the abattoirs.

Study area	Number positive (%)	Number negative (%)	TOTAL
Awka abattoir	20(33.3)	40(33.3)	60
Obosi abattoir	33(55.0)	27(45.0)	60
Total	53(44.2)	67(55.8)	120

$\chi^2_{cal} = 4.5 > \chi^2_{tab} = 3.84$ df:1 (P<0.05)

Table 2: Prevalence of intestinal helminthes in relation to the breeds (species) of the cattle

Cattle species	AwkaObosi			
	No. of cattle examined	No. positive (%)	No. of cattle examined	No positive (%)
White Fulani	23	10(16.7)	26	14(23.3)
Red Fulani	19	3(5.0)	20	11(18.3)
Bokolo	18	7(11.7)	14	8(13.3)
Total	60	20(33.3)	60	33(55.0)

$\chi^2_{cal} = 1.53 < \chi^2_{tab} = 5.991$ df:2 (P>0.05)

Table 3: Prevalence of intestinal helminthes in relation to gender of the cattle.

Gender of Cattle	Awka abattoir			Obosi abattoir		
	No. Examined	No. Positive	No. Negative	No. Examined	No. Positive	No. Negative
Male	35	8(13.3)	27(45.0)	28	16(26.7)	12(20.0)
Female	25	12(20.0)	13(21.7)	32	17(28.3)	15(25.0)
Total	60	20(33.3)	40(66.7)	60	33(55.0)	27(45.0)

$\chi^2_{cal} = 4.42 > \chi^2_{tab} = 3.84$ df:1 (P<0.05)

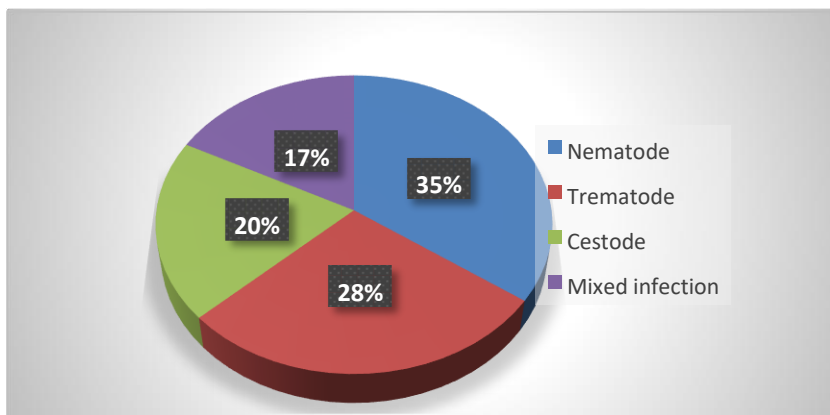


Figure 1: infection rate of major intestinal helminthes of the cattle

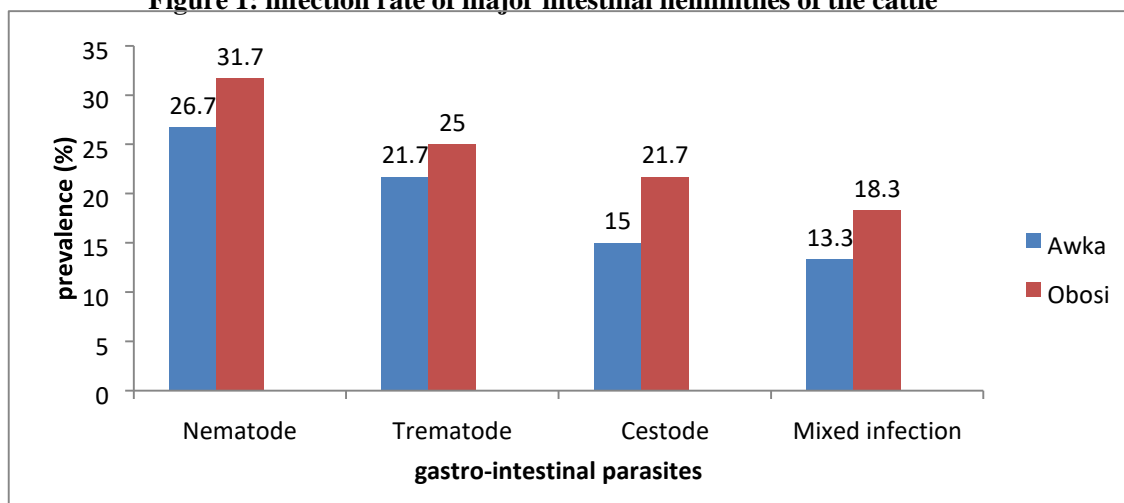


Figure 2: Distribution of different species of intestinal parasites in the different abattoirs.

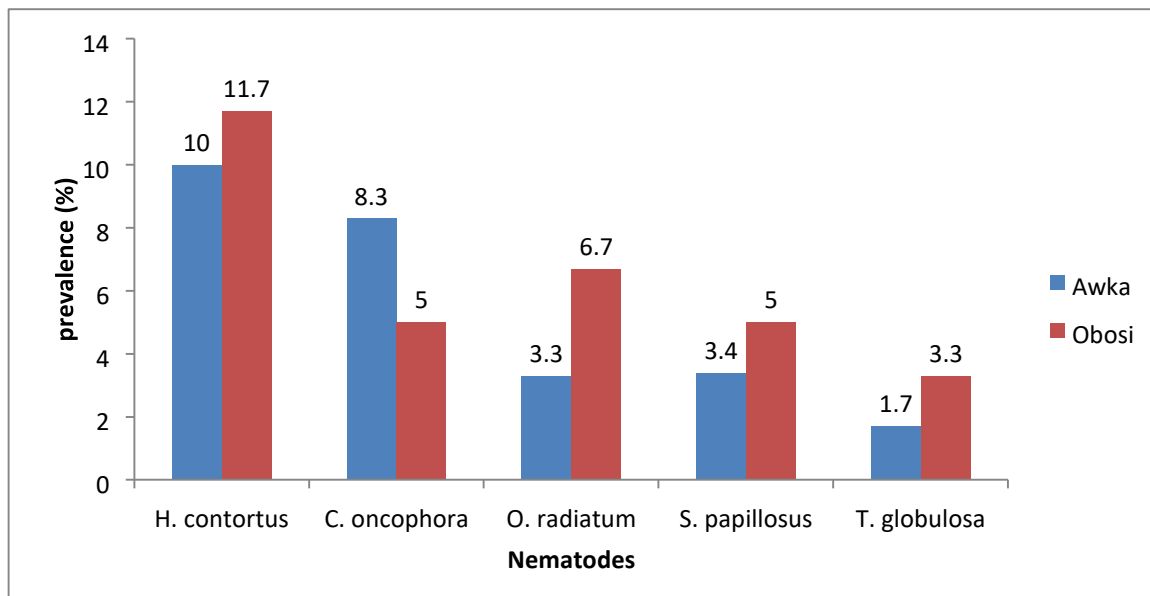


Figure 3: Different nematode species encountered in the study areas.

IV. DISCUSSION

The result of this research indicated infection of the cattle with gastro-intestinal helminth hence a prevalence rate of 53 (44.2%), thus providing valuable information on the burden of helminths among cattle not only in Anambra State but in Nigeria at large since animals slaughtered in these abattoirs are representative of cattle in the country. This result was lower than 47.4%, 50.8%, 46% and 62.1% reported by [13,14,21,22] in Benin, Abakaliki, Ibadan and Pot Harcourt respectively. The differences observed could be due to the periods or seasons in which the studies were conducted as well as the sources of cattle sampled in the various regions. It could also be attributed to the existence of favorable environmental factors necessary for the prolonged survival and development of infective larval stage of most helminths [23]. Furthermore, management system of animals could also be accountable for the difference in prevalence [24].

Since all animals examined were matured, it was not possible to establish age-prevalence relationship. White Fulani breed had the highest prevalence while Red Fulani and Bokolo had the least in Awka and Obosi abattoirs respectively. [25] included breed of animals among other risk factors associated with gastrointestinal parasites, although the statistical analysis from this survey showed that prevalence of the intestinal parasites was not dependent on the breed, ($P > 0.05$) but on the sex and location ($P < 0.05$). This could be as a result of poor sanitation and poor management practices among the cattle keepers. Awka abattoir being in the urban area has higher hygienic standard than the Obosi abattoir which is located in semi-urban area. There is presence of the slow moving Idemmili stream at the Obosi abattoir site where the carcasses of the cattle are washed into and the cattle are fed with the same water too thus contributing to higher infection of the intestinal helminthes in Obosi than Awka. The higher infection among the females could be as a result of reduced immunity attributed to the physiological changes like pregnancy and lactation stress in females.

Presence of mixed infection in this study poses a great risk to the cattle. Mixed infection has been suggested to be an important cause of morbidity and reduced production in livestock [26] Furthermore, the immuno suppression of the host immune system by mixed infections increases host susceptibility to other diseases or parasites [27].

The high prevalence of nematode especially *Haemonchus contortus* may be attributed to the non-use of anthelmintic drugs by livestock farmers or effect of anthelmintic resistance [28] or climate [29]. These parasites (*Haemonchus contortus*, *C. oncophora*, *O. radiatum*, *T. globulosa*), trematodes (*Fasciola gigantica* and *Paramphistomum spp.*) and cestodes (*Moniezia spp.*) recorded in this study were the common helminthes of cattle as recorded by [14] and [13] in Abakaliki and Benin respectively. Tropical climate provide a conducive atmosphere for the development of these parasites. Biologically, the highest health risk is found in helminth infections compared with other pathogens because helminthes especially nematodes persist for longer periods in the environment and the infective dose is small [29].

The present study was done during the warm period of the rainy season, though did not focus on the seasons, it has been established that the excretion of parasite eggs to environment by human or animals is high in warm seasons compared to cold seasons [30]. [31] stated that nematodes are among the most successful parasites of animals because of their efficient life cycle ranging from the very simple to the extremely complicated stage. Economically, parasitic infections have continued to be a major barrier to livestock. These intestinal parasites especially helminthes, pose a threat in the animal health and bring about a reduction in the quantity of much needed protein driven from animals. The regular use of anthelmintic drug is advocated even when the animals show no clinical signs of disease. Better breeding should be adopted and good nutritional status of animals maintained.

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