



PREVALENCE OF GASTROINTESTINAL HELMINTHS AMONG SLAUGHTERED CATTLE AT JALINGO ABATTOIR, TARABA STATE, NIGERIA

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ABSTRACT

A cross sectional study was conducted from October 2024 to January 2025, on 400 cattle at Jalingo modern abattoir, Taraba State Nigeria, based on post mortem examination on prevalence of gastrointestinal helminths and heamoparasite among slaughtered cattle's at Jalingo abattoir. A total of 400 cattle were examined and, the total number of infected was 126 and the overall prevalence rate of 31.5% from 1. White Fulani, 2. Adamawa Gudali, 3. Red bororo and 4. Sokoto Gudali breeds. The highest prevalence rate (35.96%) was recorded in White fulani, followed by Sokoto gudali (20%) then 15.79%, 6.98% for Red bororo and Adamawa Gudali, respectively. Prevalence rate for the males was 22.62% and 33.86% for females whereas 33.23%, 29.58% and 22.72% were recorded for age group 1-2, 3-4 and >5 years respectively. The result showed no significant difference ($P>0.05$) on prevalence of infection between breed, sex and age. Also according to sex, out of 316 female examined 107(33.86%) were infected and out of 84 male examined 19(22.62%) were infected. Statistically, there was no significant difference ($P>0.05$) exist among male and female. According to the age out of 400 cattle examined 126 (31.5%) were infected. There was no statistical significant ($P>0.05$) between age group. Result showed gastrointestinal helminths is prevalence in Jalingo modern abattoir, hence public health significance of gastrointestinal helminths in cattle affecting humans and animals, most of these parasites are zoonotic, condemnation of carcasses there is need to embark on control and eradication of affected cattle and the general public should be enlightening on the helminths and meat inspection/sanitary condition should be improved.

Keywords: Gastrointestinal, Cattle, Abattoir, Helminths, Prevalence

INTRODUCTION

Ruminants such as cattle, goat and sheep represent an important source of animal protein in many countries of the world, supplying a good percentage of the daily meat and dairy products in cities and villages. Apart from being the source of animal protein, their wastes are also very important in agriculture (Nwosu *et al.*, 2007).

Meat is one of the most important livestock products, although there could be losses due to various diseases including helminth infections. The quantity of meat and revenue obtained from domestic livestock is far below the national demand due to factors such as death and ill health with associated reduced productivity and increased cost of treatment (Hossain *et al.*, 2011; Bolajoke *et al.*, 2011; Ozung *et al.*, 2011).

In many parts of the world, cattle production is a profitable enterprise because of the high demand for dietary animal protein (Anaeto *et al.*, 2009). All ages of cattle are affected by a diverse set of intestinal parasites. Helminths can cause low productivity by disrupting metabolic functions, which results in stunted growth, insufficient weight gain, poor feed utilization and assimilation, malnutrition, depressed appetite, loss in body weight, emaciation and increased susceptibility to other pathogens. Protozoa infections are more relevant in young animals, with clinical consequences for highly infested animals (Marskole *et al.*, 2016). Although there are many species of worm parasites harbored in the gastrointestinal and respiratory tracts of cattle, only a few target species are clinically and economically important. These include the brown stomach worm *Ostertagia* the coccidian *Eimeria bovis* and the lungworm *Dictyocaulus*. Clinically, the parasites of the stomach and intestine cause anemia, scouring, depression and even death, but clinical parasitism occurs infrequently. The effects of parasitism usually are insidious and subclinical, such as indigestion and poor feed conversion, less than expected weight gain and (for brood cows) decreased milk production (Nwosu *et al.*, 2007).



Parasitic infections particularly gastrointestinal helminths pose a serious health threat and negatively impacts livestock production via its associated morbidity, mortality, treatment and control costs. The incidence and severity of gastrointestinal parasites are influenced by the climate, number of infective eggs and larva in environments; pasture management, presence of intermediate host, vectors, grazing habits and nutritional status (Adedipe *et al.*, 2014). Gastrointestinal helminths are ubiquitous parasitic agents of livestock especially ruminants and are known to limit cattle production in many areas and countries (Keyyuet *et al.*, 2005; Hesterberg *et al.*, 2007).

Mortality of animals due to parasitic diseases may not be alarming at times but their indirect effects on livestock productivity and their zoonotic impact on human health are considerably greater (Ekong *et al.*, 2006). Indirect losses associated with helminths infections include the reduction in productive potential such as decreased growth rate, weight loss, diarrhea, anorexia, and sometimes anaemia (Swai *et al.*, 2006).

MATERIALS AND METHOD

Study Area

The study was conducted in Jalingo, the capital city of Taraba State, north-eastern Nigeria. Jalingo is located between latitudes 8°47' to 9°01'N and longitudes 11°09' to 11°30'E. To the north it is bounded by Lau Local Government Area and to the east by Yorro Local Government Area, to the south and west by Ardo Kola Local Government Area. It has an overall land area of about 195 km² with a population of 140,318, people according to the 2006 population census, with a projected growth rate of 3% (Shawulu *et al.*, 2008). In 2014, the projected population was 165,774 (Oruonye, 2014). The state is bordered to the west by Gombe and Plateau States, south-west by Benue State, north-east by Adamawa state. The climate is suitable for both animals and crop production. It is characterized by two distinct seasons: Dry and Wet. The wet season usually start from April to end in October while the dry season is from November to March. April is the hottest month of the year with a mean maximum temperature of about 28o E. The average yearly rainfall is about 1,350mm, the mean monthly hour of sunshine is highest in December and lowest in August and the mean relative humidity is highest in August and lowest in February (Taraba ADP, 2004).

Study Animals

The study animals comprised White Fulani, Red Bororo, Adamawa gudali and Sokoto gudali slaughtered at Jalingo modern abattoir. On average about 50 cattle were slaughtered per day. The majority of cattle slaughtered at the Jalingo modern abattoir were White Fulani Cattle. The abattoir has an average daily slaughter of 50-70 cattle (Oruonye, 2005).

Sample Size Determination

A total of 400 slaughtered cattle were inspected from October 2024 to January 2025. The total sample size was calculated based on the predetermination of the following parameters: a 95% level of confidence, 5% desired level of precision and 50% expected prevalence according to Thrustfield (2005) and purposive sampling method was used.

Study Design

A cross-sectional study design was used from October 2024 to January 2025 to determine the prevalence of gastrointestinal helminths of ruminants (cattle) based on the laboratory analysis of faecal samples for the presence of nematode eggs. A random sampling technique was employed to select the study animals. Age, sex and breed were considered for the occurrence of major gastrointestinal nematodes in cattle.

Faecal Sample Collection and Examination

About 5 grams of faecal samples were collected directly from the rectum of each animal during post mortem Examination at the Abattoir. The samples were placed into sampling polythene bags and were transported to parasitology laboratory, of the College of Agriculture, Science and Technology Jalingo for analysis.

Faecal egg counts were done using MC Master (mac master slide) Technique and parasite stage identification using standard parasitological techniques floatation method.



The presence of parasite stages eggs or larvae of helminthes was identified as described by Foreyt (2001) and Arora and Arora (2005) using 10× and 40× magnifications. Saturated salt solution has a higher specific gravity than the organism to be floated so that the organism rise to the top and the debris sink to the bottom (CDC, 2013).

Statistical Analysis

The proportions obtained in the study were compared using Chi-Square test and (SAS, 2012). A p-value of <0.05 was considered as significant.

$$\% \text{ Prevalence} = \frac{\text{Number of organisms of host species infected}}{\text{Number of organisms examined}} \times \frac{100}{1}$$

RESULTS

Breed Distribution based on Prevalence of Gastrointestinal Helminths among Slaughtered Cattle at Jalingo Abattoir

The breed distribution prevalence of gastrointestinal helminths among slaughtered cattle at Jalingo Abattoir, Indicated that the total number of White Fulani is 328, number of infected cattle is 118, Red bororois 19 with number of infected cattle as 3, Sokoto gudaliis 10 with the number of infected cattle as 2, while Adamawa gudaliis 43 with the number of infected cattle as 3 and with the prevalence of 35.96%, 15.79%, 20% and 6.98%, respectively. The total number of cattle examined was 400, the total number of infected was 126 and the overall prevalence of 31.5%.

Table 1: Breed Distribution based on Prevalence of Gastrointestinal Helminths among Slaughtered Cattle at Jalingo Abattoir

Breed	No. Examined	No. infected	Prevalence (%)
White Fulani	328	118	35.96
Red Bororo	19	3	15.79
Sokoto Gudali	10	2	20
Adamawa Gudali	43	3	6.98
Total	400	126	31.6

Sex Distribution based on Prevalence of Gastrointestinal Helminths among Slaughtered Cattle at Jalingo Abattoir

The different sex prevalence of gastrointestinal Helminths among slaughtered cattle at Jalingo abattoir, the total number of male examined was 84 with 22.62% and female 316 with 33.86% making the overall total of 400 cattle examined, 19 infected males and 107 infected females and the total prevalence was 31.5%.

Table 2: Sex Distribution based on Prevalence of Gastrointestinal Helminths among Slaughtered Cattle at Jalingo Abattoir

Sex	No. Examined	No. infected	Prevalence (%)
Male	84	19	22.62
Female	316	107	33.86
Total	400	126	31.5

Age Distribution based on Prevalence of Gastrointestinal Helminths among Slaughtered Cattle at Jalingo Abattoir

The different ages of examined cattle with gastrointestinal helminths with 1-2 having higher prevalence of 36.23% than the age groups of 3-4 years 29.56% and 5 years and above with 22.72%.

Table 3: Age Distribution based on Prevalence of Gastrointestinal Helminths among Slaughtered Cattle at Jalingo Abattoir

Age	No. Examined	No. Infected	Prevalence (%)
1-2	138	50	33.23
3-4	240	71	29.58
>5	22	5	22.72
Total	400	126	31.5

Mixed Breed Infection with Gastrointestinal Helminths in Cattle

The infection of cattle with mixed breed gastrointestinal helminths out of 400 cattle examined in the study area 126 was infected with gastrointestinal helminths. Among the infected cattle, 109 had single-species infections, while 17 had mixed-species infections.

Table 4: Mixed Breed Infection with Gastrointestinal Helminths in Cattle

Breed	No. Examined	No. Infected	Single Infection	No. Mixed Infection
White Fulani	328	118(35.98%)	102(31.10%)	16(4.88%)
Sokoto Gudali	10	2(20.00%)	2(20.00%)	-
Red bororo	19	3(15.79%)	3(15.79%)	-
Adamawa gudali	43	3(6.98%)	2(4.65%)	1(2.33%)
Total	400	126(31.5%)	109(86.5%)	17(13.5%)

Mixed Sex Infection with Gastrointestinal Helminths in Cattle

The infection of cattle with mixed sex gastrointestinal helminths in the study area, a total of 400 cattle was examined for gastrointestinal helminth infections. 125(31.5%) were infected, with 109 (86.5% of infected) harbouring single-species infections and 17(13.5% of infected) exhibiting mixed-species infections.

Table 5: Mixed Sex Infection with Gastrointestinal Helminths in Cattle

Sex	No. Examined	No. Infected	Single Infection	No. Mixed Infection
Male	84	19(22.62%)	16(19.05%)	3(3.57%)
Female	316	107(33.86%)	93(29.43%)	14(4.43%)
Total	400	126(31.5%)	109(86.5%)	17(13.5%)

Mixed Age Infection with Gastrointestinal Helminths in Cattle

The infection of cattle with mixed age gastrointestinal helminths of 400 total numbers examined, 126 total number of infected, 109 total number of single infected and 17 for total number of mixed infected cattle in the study area.

Table 6: Mixed Age Infection with Gastrointestinal Helminths in Cattle

Age	No. Examined	No. Infected	Single Infection	No. Mixed Infection
1-2	138	50(36.23%)	45(32.61%)	5(3.62%)
3-4	240	71(29.58%)	62(25.83%)	9(3.75%)
>5	22	5(22.73%)	2(9.09%)	3(13.64%)
Total	400	126(31.5%)	109(86.5%)	17(13.5%)

DISCUSSION

Prevalence of Gastrointestinal Helminths of Cattle Slaughtered at Jalingo Abattoir

The findings of this study show the Breed Distribution Prevalence of Gastrointestinal Helminths among Slaughtered Cattle at Jalingo Abattoir. It Indicated that the total number of cattle examined to be 400, the total number of infected to be 126 and the overall prevalence of 31.5%. 328 White Fulani examined had 118 infected with a prevalence rate of 35.96%, 19 Red Bororo were examined with 3 infected and 15.79% prevalence rate, 10 Sokoto Gudali were examined with 2 infected and 20.0% prevalence rate, 43 Adamawa Gudali were examined with 3 infected and 6.98



prevalence rate of the cattle screened had helminth infection. Thus, the results of the current study demonstrate that helminths infections were highly prevalent in cattle of the study area. The high prevalence of this study (31.5%) showed that the cattle probably had frequent exposure to the same communal grazing land that causes contamination of pasture. These agree with the findings of 26.3% (Darsema, 2009) in Western Amhara region, Ethiopia who reported a prevalence rate of 41.2%. In addition, Keyyu *et al.* (2006) reported an overall prevalence of 44.4% and 37.0% for large- and small-scale dairy cattle respectively in Tanzania.

Breed Distribution base on Prevalence of Gastrointestinal Helminths among Slaughtered Cattle at Jalingo Abattoir

White Fulani were examined, with 118 infected with a prevalence rate of 35.96%, Red Bororo were examined with 3 infected with 15.79% prevalence rate, Sokoto Gudali were examined with 2 infected with 20.0% prevalence rate, Adamawa Gudali were examined with 3 infected and 6.98 prevalence rate of the cattle screened had helminth infection, thus providing valuable information on the burden of helminths among breeds of cattle in Nigeria since animals slaughtered in this abattoir are representative of cattle in the country.

Sex Distribution base on Prevalence of Gastrointestinal Helminths among Slaughtered Cattle at Jalingo Abattoir

The present study revealed that sex of the studied animal did not show significant association with the prevalence of the parasite burden, this is more probably due to an equal opportunity for infection when they are exposed to the parasites in the communal grazing pasture. The absence of association between sexes agrees with that of Nigatu (2008). However, the findings showed that females were more infected than their counterparts.

Age Distribution base on Prevalence of Gastrointestinal Helminths among Slaughtered Cattle at Jalingo Abattoir

This finding, showed at age 1-2 young cattle (33.33%) have the higher prevalence rate, 3-4 adult cattle (29.58%) and >5 older (22.72%). This finding confirms the finding of Gonzalez *et al.*, (2016) who reported 48% infected with gastrointestinal parasites in younger cattle and that younger cattle were more susceptible due to their underdeveloped immune systems and less frequent exposure to low parasite burden.

Mixed Infection with Gastrointestinal Helminths in Cattle

Single helminths infections of the ruminants with a prevalence of (27.25%) is in contrast with the findings of Agumah *et al.* (2015), Adedipe *et al.* (2014), Usman *et al.* (2016), Ardo and Bitrus (2015). In addition, multiple infections had a prevalence of 4.25%. Mixed infection was characterized by the presence of two or more helminths. The phenomenon of mixed infection has been suggested to be an important cause of morbidity and reduced production in livestock (kumsa, 2011). Furthermore, the immune suppression of the host immune system by mixed infections increases host susceptibility to other diseases or parasites (Wang *et al.*, 2006). Multiple helminths infections were in agreement with the findings of Adedipe *et al.* (2014) and Josiah (2014). This could be as a result of the poor hygiene practices.

CONCLUSION AND RECOMMENDATION

From the study, it was concluded that gastrointestinal helminths infections is prevalent in the study area and Nigeria at large which posed a direct threat to animal health and thereby causing huge economic loss to the economy. Due to the public health significance of gastrointestinal helminths in cattle affecting humans and animals, most of these parasites are zoonotic, condemnation of carcasses there is need to embark on control and eradication of affected cattle and the general public should be enlightening on the helminths.

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