



# INVESTIGATION ON THE INFECTIVITY RATE OF GASTROINTESTINAL HELMINTHS IN PRIVATE CATTLE FARMS IN DONGA LOCAL GOVERNMENT AREA OF TARABA STATE NIGERIA



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## Abstract:

This study was conducted to investigate the infectivity rate of gastrointestinal helminths in private cattle farms in Donga Local Government Area of Taraba State Nigeria. A total of 120 fecal samples were collected from six (6) different cattle farms in six (6) different wards namely: Akate ward, Asibiti ward, Suntai ward, Fada ward, Mararaba ward and Gyatta Aure ward. The samples collected were examined using simple floatation method for the presence of helminths eggs/ova. Out of 120 fecal samples examined 87(72.5%) were infected, 33(27.5%) were not infected. The highest infectivity rate of 16(80%) were found in Akate farm, and the least infectivity rate of 13(65%) were found in Suntai farm. The results showed no significant difference  $p > 0.05$  between the rate of infection and farm locations. The highest rate of infection of 53(86.89%) were found in female cattle, while male cattle had 34(57.63%) rates of infection. Male cattle had the highest rate of infection of *Hookworm* species with 17(50%), while female cattle had the highest rate of infection of *Fasciola gigantica* species with 22(41.51%). The results showed no significant difference  $p > 0.05$  between the rate of infection and sex of the cattle. The highest rate of infection of 19(76%) were found in cattle with age group 11 – 15 years, but the least rate of infection of 40(70.18%) were found in cattle age group 6 – 10 years. The results showed that there is significant difference  $p > 0.05$  between the rate of infection and age of the cattle. It can be concluded that the high infectivity rate of these parasites could be attributed to the number of larvae and eggs in the environment and grazing habits of these animals in which they may ingest either the cyst or ova of these parasites.

## Keywords: -

Gastrointestinal Helminths, Infectivity Rate, Investigation, Private Cattle Farms.

## Introduction

Cattle, the most prominent domesticated livestock in Nigeria, represent a valuable asset in both traditional and modern Agriculture. In Nigeria livestock farming play important roles in the livelihood of farmers; in addition, they provide meat, milk, skin, and draught power for farming (Arora, 2011). In Nigeria, the livestock sector contributes 5.2% of gross domestic products, while cattle production solely contributes 50% of the total meat. Meat is one of the most important livestock products, although there could be losses due to various diseases including helminths infection (Jones, 2019).

Gastrointestinal parasites are mostly helminths that usually invade the stomach and intestinal cavity of man and animals; they cause a great loss of the livestock and human population at large (Manu, 2000). Most helminths diseases such as taeniosis, fasciolosis, askinaviosis, coccidiosis, toxoplasmosis, and toxocarosis, etc; are caused by intestinal parasites such as nematodes e.g (*Ascaris lumbricoides*), trematodes e.g (liver flukes i.e *Fasciola spp*) and cestodes e.g (tape worms) which constitute a major factor that limits animal productivity (Jones, 2019). The significance of helminthiasis has been recognized by livestock farmers right from the earliest of time and various methods have been employed by them to control helminthiasis in their animals including the use of medicinal plants, herbs and different grazing techniques (Bukhari and Sanyal, 2011). The Fulani herdsmen in Nigeria start treating calves against helminths with medicinal plants as early as within a week of birth because

they know the danger posed by helminths infection in calves of less than a year old (Ibrahim, *et al.*, 1983).

Variation in locations and management practices has been suggested to be the possible reason for differences observed in the prevalence of helminths parasites in cattle (Chenyambuga and Mseleko, 2009), stated that animals are exposed to massive helminths infection when they are maintained in an unhygienic, dark, congested and poorly maintained ranches, quantity and quality of pasture, temperature, humidity, grazing behaviour of the cattle and also when fed with contaminated food and water. In addition, Richard *et al.*, (1990), observed that susceptibility to infestation is influenced by factor of age.

The most important predisposing factors of helminths infections are grazing habits, climate, nutritional deficiency, pasture management, immunology status, vectors, present of intermediate hosts, and number of larvae and eggs in the environment (Radostits, *et al.*, 1994). The effect of helminths infection is determined by combination of factors at which the varying susceptibility of host, the pathogenicity of the parasite species, the host/parasite interaction, and the infective dose are the most important (Jansen, 1992).

Gastrointestinal parasites in cattle are regarded as the major causes of gastro-enteritis, reduction in reproduction and loss in weight, watery diarrhea, hemorrhages and even death. It has been proved worldwide that helminths of ruminants and livestock have a worldwide distribution and even zoonotic importance (Gerald, 2010). This is because of their destructive effects on both man and cattle (Chelsea,

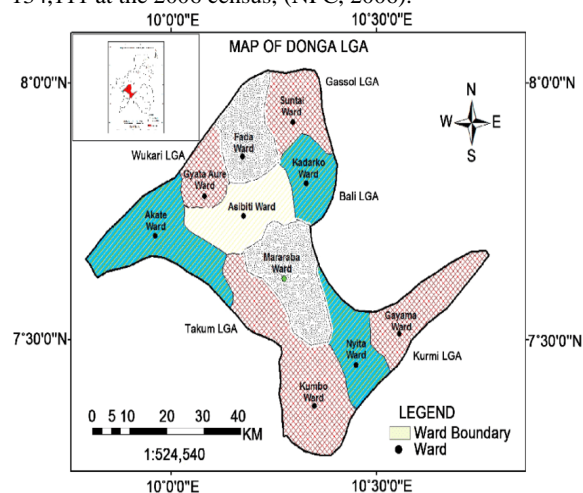
2021). This therefore, underscores the need to investigate this challenge so as to safeguard the health and well-being of these animals and humans in the study area (Raza, 2013).

Man has for long been rearing cattle for meat, milk and other activities; however, most of these animals were infected with parasitic diseases which may be fatal and can lead to low productivity and loss of weight of the animals and could result in serious hazards. Therefore, the investigation into the infectivity rate of such gastrointestinal parasites could be useful in controlling their spread among cattle and even in human population.

## Materials and Methods

### Study Area

The study was carried out in six (6) wards namely Akate ward, Asibiti ward, Suntai ward, Fada ward, Mararaba ward and Gyatta Aure ward of Donga Local Government Area Taraba State Nigeria. Donga Local Government is located at the Southern Guinea Savannah with co-ordinate latitude 74259.99"N and 1002'60.00"E, with annual precipitation of 1203mm, It has an average temperature of 32 degree Centigrade while the humidity level of Donga Local Government Area is at an average of 17%, and it has an area of 3,121kms (1,205sqm) and a population of 134,111 at the 2006 census, (NPC, 2006).



**Figure 1:** Map of Donga showing study Areas (Source:- [www.researchgate.net](http://www.researchgate.net))

### Materials and Reagents Use

The materials and reagents used in this research includes; Universal bottles, disposable gloves, faecal samples, cotton wool, cover slip, grease glass slide, Pasteur pipette, distilled water, saturated salt NaCl (table salt) and electric microscope are of standard quality and specifications.

### Study Sites

The study was conducted in six (6) different private cattle farms in six (6) different wards of Donga Local Government Area of Taraba State Nigeria namely: Akate ward, Asibiti ward, Suntai ward, Fada ward, Mararaba ward and Gyatta Aure ward. These sites were chosen

because of the numbers and different kinds of cattle in the farms.

### Sample Collection

A total of 120 samples were collected at random from six (6) different cattle farms. The faecal samples were collected from the cattle in respect of their sex and age using hands inserted inside gloves and immediately the samples collected were introduced into sterile sample bottles labeled with serial number, and it was taken to the Department of Biological Sciences Laboratory, Federal University Wukari Taraba State for microscopic examination of gastrointestinal parasites.

### Examination of Faecal Samples

Examinations of faecal samples were conducted for the presence of helminths eggs/ova by simple faecal floatation technique as described by (Cheesbrough, 2000). Approximately 3g of faecal sample was measured by weighing machine and placed in a sterile universal bottle, half filled with saturated salt solution, stirred thoroughly with an applicator stick, and it was sieved in to another container and filled up to the brim to avoid air bubbles, and a clean grease free slides were placed on the top of prepared sample in the container, allowed to stand for 15 minutes to allow the floating parasites to stick to the slides, the slides were picked and viewed under microscope using x10 and x40 objective lenses.

### Data Analysis

Data obtained from this research were subjected to descriptive statistical analysis using percentage in determining the rates of infection of the parasites in different farm locations, sex and age of the cattle. Rate of infection of the parasites in relation to farm locations, sex and age were analyzed using Chi-square statistical test at  $P = 0.05$  degree of freedom.

### Ethical considerations

A written approval was obtained from the Director Primary Health Care Donga Local Government Area. Before the commencement of the study, a familiarization tour was carried out to the cattle farms where the significance, relevance and objectives of the study were discussed with the owners of the farms for the success of the study and consent of the farmers were obtained before sample collection.

### Results and Discussions

The highest infectivity rate of 16(80%) were found in Akate farm, followed by Mararaba and Fada farms with 15(75%) respectively and the least infectivity rate of 13(65%) were found in Suntai Farm. The results showed no significance difference between the rate of infection and farm locations.  $\chi^2_{cal} = 9.3 < \chi^2_{tab} = 11.071$ ,  $P = 0.05$ .

**Table 1:** Infectivity rate of Helminths parasites according to farm locations

Wards	No. Examined	No. Infected	(%) Infected
Akate	20	16	80
Asibiti	20	14	70
Suntai	20	13	65
Fada	20	15	75
Mararaba	20	15	75
GyattaAure	20	14	70
Total	120	87	72.5

**Table 2:** Infectivity rate of helminths parasites according to sex

Sex	No. Examined	No. Infected	<i>Fasciola gigantica</i>	Hookworm	<i>Trichuris Trichuria</i>	(%) Infected
Female	61	53	22	18	13	86.89
Male	59	34	8	17	9	57.63
Total	120	87	40	44	32	72.5

$$x^2_{cal} = 2.745 < x^2_{tab} = 5.99, P = 0.05$$

The highest infectivity rate of 19(76%) were found in cattle with age group 11 – 15 years, followed by age group 1 – 5 years with 28(73.68%). But the least infectivity rate of 40(70.18%) were found in cattle age group 6 – 10 years. The results showed that there is significant difference between the rate of infection and age of the cattle.  $x^2_{cal} = 53.58 > x^2_{tab} = 2.745, P = 0.05$

**Table 3:** Infectivity rate of helminths parasites according to age of the cattle

Age (Years)	No. Examined	No. Infected	(%) Infected
1 – 5	38	28	73.68
6 – 10	57	40	70.18
11 - 15	25	19	76
Total	120	87	72.5

$$x^2_{cal} = 53.58 > x^2_{tab} = 2.745, P = 0.05$$

The findings of this research showed the highest infectivity rate according to farm locations is in Akatefarm with(80%) and least infectivity rate of (65%) were found in Suntai Farm. This result is higher as compared with the findings of Raham and Mandal, (2013) which reported (15.7%) rate of infection of helminths parasites, and states that the major pathogenic gut helminths parasites recorded from their investigation were paraphistomes, *Schistosomes*, *Strongloid*, *Hookworms*, *Fasciola gigantica*, *Trichostrongylus*, *Haemonchus*, *Trichuris Species* among others.

The study reveals the prevalence of gastrointestinal parasites infection in the study area to be (86.89%) in female cattle and (57.63%) in male cattle. This result is in line with the findings of (Fikru<sup>et al.</sup>, 2019) which reported (52.61%) in male and (42.54%) in female in Abakaliki metropolis of Ebonyi State. The high infectivity rate in this study area it could be due to the grazing pattern of the cattle. As a result of this most of the cattle were re-infected due to pasture contamination as they graze within a confined area for several months. The increase in helminths infection in this study area may be attributed to high level of contamination of grazing areas in raining season and climatic change (Temperature and rainfall) are the principal factors influencing the incidence of intestinal parasites and

$$x^2_{cal} = 9.3 < x^2_{tab} = 11.071, P = 0.05$$

The highest infectivity rate of 53(86.89%) were found in female cattle while male cattle had the infectivity rate of 34(57.63%), and the parasites with highest prevalence in male cattle is *Hookworm* species with 17(50%), while female cattle had the highest infectivity rate of *Fasciola gigantica* species with 22(41.51%). The results showed no significant differences between the rate of infection and sex of the cattle.  $x^2_{cal} = 2.745 < x^2_{tab} = 5.99, P = 0.05$ .

can be used to predict the outbreaks of endoparasitism (Gibbs, 2014).

The prevalence of gastrointestinal parasites according to age were found to be highest among the age group 11-15 years with infectivity rate of (76%) and the least infectivity rate were found in age group 6- 10 years with (70.18%) which is higher as compared with the findings of Symth (1996) which reported (42.76%) infectivity rate in age group 6-10 years and (19.82%) infectivity rate in age group 11- 15 years and states that helminths are among the successful parasites of animals because of their efficient life cycle ranging from the very simple to the extremely complicated stage.

The mild infection of helminths in this study area could be due to the age of the cattle while the high infection rate of helminths can be attributed to the fact that parasites are more dominant in rainy season, hence helminths parasites are said to be high prevalence in cattle. Forge (1999), stated that animals are exposed to massive helminths infection when they are maintained in an unhygienic, dark congested and poorly kept ranches and also when fed with contaminated food and water. From the analysis of this investigation three (3) species of gastrointestinal parasites were identified in the study areas, these include, *Trichuris Trichuria*, *Fasciola gigantica* and *Hookworm*. The high infectivity rate of helminths parasites obtained could be attributed to the existence of favourable environmental conditions necessary for the prolonged survival and development of infective larva stage of most helminths.

### Conclusion

The result of this study shows high infectivity rate of gastrointestinal helminths infection of both economic and Zoonotic important among the cattle in the private cattle farms in Donga Local Government Area of Taraba State Nigeria. This has the negative impact on both animal production and public health. The results showed that there is significant difference between the rate of infection and age of the cattle. The prevalence of these parasites could be attributed to the number of larvae and eggs in the environment and grazing habit of these animals in which

they may ingest either the cyst or ova of these parasites. Therefore, to mitigate these problems, adequate control can be done through intensive farming, sanitation, pasture management, routine de-worming of the animals and the etiology of these parasites should be understood quit enough to be able to reduce the threat posed on the animals and also the general public should be educated on the nature of zoonotic disease and how the rate of infection can be minimized.

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### Conflict of Interest

There were not any conflicts of interest between the authors from beginning of the study to the end. Everything went well as design and agrees on the proposal.

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