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# Comparative study of intestinal helminths and protozoa of cattle and goats in Abakaliki metropolis of Ebonyi State, Nigeria

***[1]Nwigwe Juliet O., [2]Njoku Oliver O., [1]Odikamnoro Oliver O. and [1]Uhuo A. Cosmas**

*[1]Department of Applied Biology, Ebonyi State University, Abakaliki, Ebonyi State, Nigeria*
*[2]Department of Biological Sciences, Federal University of Technology Owerri, Imo State (Futo)*

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**ABSTRACT**

*The comparative study of gut helminthes and protozoa of cattle and goats in Abakaliki metropolis was carried out between March and June 2009. Out of 569 samples collected from cattle, 50.79% were positive of gut helminthes which includes Fasciola spp Paramphistomum spp Trichostrongylus spp, Trichuris spp, Nematodirus spp and Coeperia spp, there was no significance difference obtained. Comparatively, 370 fecal samples were collected from goats, where 42.43% were positive for gut helminthes parasites except Paraphistomum spp, while 16.22% goats were positive for gut protozoan parasites (Eimeria spp), there was no significance difference for helminthes parasites of goats assesed. There were some incidence of mixed gut helminthes parasites in cattle and goats though there was no mixed trematode infection in goats. Also incidence of mixed gut helminth and protozoa parasites were noticed in cattle and goats, though there was no mixed Nematodirus and Eimeria parasites in cattle and no mixed Paramphistomum and Eimeria parasites in goats. From this result, trematodes were more dominant in cattle than in goats, while protozoa parasites were not much prevalent and may be attributed to good hygienic condition. While the moderately high prevalence of cattle and goats may be attributed to the season of the study.*

**Keywords:** Intestine, Helminthes, Protozoa, Cattle, Goats.

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## INTRODUTION

Parasitic infections affect millions of people and livestock worldwide causing health problem and economic hardship. Far from declining, many parasitic infections are decreasing throughout the world. Climatic changes induced through global warming have aided the spread of parasitic diseases, whilst starvation and the breakdown in sanitation that accompanies war have seen the re-emergence of others [Dunn, 1978]. Protozoa and helminthes parasites are among those parasites affecting people and livestock. In many areas of Africa, livestock rising is an important economic activity from which food (meat, milk, non-food commodities (manure, hides and skin, wools etc) and cash income are derived. Meat is one of the most important livestock products, although there could be loss of it due to the presence of helminthes & protozoa parasites. In 1975, meat accounted for about 47% of the gross value of total sub-Saharan Africa output [Addis Anteneh *et al* 1988]. The economic activities in which manures from diseased animals are used, is a source of spread of some helminths and protozoa parasites. According to [Jenness,1980], Devendra and Burns [1983], though milk is obtained from cattle, but goat milk has higher protein, energy, fat and amino acid contents. Goat is also known to be excellent source of calcium, phosphorus and chlorine, is therefore beneficent to infant and pregnant mothers. Furthermore [Manyenga, 1987] reported that milk production from goats as well as cattle can be reduced in nutrients due to the presence of parasites since some farmers are not hygiene conscious as regards their animal which is as a result of malnutrition and poor management. Also according

to [Onah and Chiejina, 1986], 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. Also [Okoli,2001] proves [Onah and Chiejina, 1986] that helminthes infection with *Fasciola spp* is common in Nigeria. As long as these diseased cattle and goats are slaughtered and consumed, the health of Nigerian individuals is at risk unless there is appropriate meat inspection. Also chemotherapy of this disease and control measures of these parasitic diseases should be of utmost importance. The aim of this study is to compare the intestinal helminthes and protozoa of cattle and goats in Abakaliki metropolis of Ebonyi State.

## MATERIALS AND METHODS

**The study area:** Abakaliki metropolis has areas where cattle and goats are slaughtered. Fecal matter from each slaughtered animal was received for a period of 4 months (March through June). Population was extended to ranches and pens where cattle and goats are being kept on arrival from the northern part of nigeria before slaughter.

**Sampling Technique:** - The fecal samples collected from cattle and goats for this study were grouped into two (male and female). Animals were dissected after killing, to expose the intestines thereby allowing fresh fecal samples to be collected both from the small and large intestines respectively. Each of these specimens were stored in different universal containers and labeled appropriately. Afterwards proceed to laboratory for analysis each day.

**Laboratory Analysis:-** Direct examination was used for this analysis. A smear was prepared with each specimen on a glass slide using normal saline and covering with a cover slip was examined microscopically for helminth eggs, cysts, oocysts, larvae. Using 10x and 40x objectively [Cheesbrough 2005]. Also trematode eggs and coccidia oocysts were examined using fecal concentration where specimen was emulsified in diethylether, centrifuged at low speed for sedimentation of eggs and coccidia oocysts, then the supernatant was discarded. Sediments were transferred to a slide and examined using 40X objective lens as documented by [Markell,1991].

## RESULTS

Out of 569 cattle examined, 289 (50.79% prevalence) were positive of helminth infection while 19(3.34%) were positive for protozoa infection. More so, 157 goats with prevalence rate of 42.43% of 370 goats examined were positive of the same helminth parasites while 60 goats (16.22%) were identified with protozoa parasite.

**Infection rate of helminth and protozoa in cattle and goats:-** This study showed that 54.13% prevalence of cattle were positive of helminth and protozoa where *Fasciola spp, Paraphistomum spp, Trichostrongylus spp, Trichuris spp, Nematodirus* and *Cooperia spp* were the helminth found in cattle but only *Eimeria spp* was the protozoa found while 58.65% prevalence of goats were examined to be with both helminth and protozoa parasites only *Paraphistomum* spp was not seen in goat, among other helminthes seen in cattle while other helminth parasites found in cattle were as well seen in goats. Also, *Eimeria* spp was the only protozoa parasite identified in goat.

Therefore the infection rate of helminth and protozoa in cattle and goats with regard to their sexes, show that there was significant different for the positive rate of helminthes and protozoa in cattle and goats at

($\alpha$=5%; $x^2$ = 0.93; df =1, P<0.05).

**Mixed helminth infection rate in cattle and goats**:-
From the analysis, there was mixed helminth infection in 77 cattle (13.53%) out of 289 cattle (50.79%) with helminth infection while 24 goats (6.49%) were positive with mixed helminth infection out of 157 goats (42.43%). It reveals that there was no mixed infection with *Paraphistomum spp* in goats as there was no *Praphistomum* parasite found in goats. There was also no mixed infection with Trichuris & *Cooperia spp* and *Nematodirus and Cooperia* spp in goats: While only *Trichostrongylus* and *Nematodrirus* parasites was not found to be mixed in cattle. The analysis also showed that mixed infection with *Paraphistomum* spp is more than other helminth parasites. From test of proportion, there was significant difference with mixed helminth infection of cattle ($\alpha$=5%; Zcal = 0.53; $Z_{\alpha/2}$ =1.96) and there was also significant different in goat with mixed helminth infection ($\alpha$=5%; Zcal= -0.87;$Z_{\alpha/2}$ = -1.96).

**Mixed helminth and protozoa infection in Cattle and goats:**
Out of 308 cattle (54.13%) positive for helminth and protozoa parasites 13 cattle (2.28%) were identified with mixed helminth and protozoa parasites, though out of those parasites, there was no mixed helminth and protozoa in *Nematodinis* and *Eimeria spp* respectively. Similarly, 14 goats (3.78%) were identified with mixed helminth and protozoa parasite out of 217 (58.65%) goats with helminth and protozoa parasites. There was no mixed infection in goat with *Paraphistomum* and *Eimeria spp*.

**Table i:Infection rate of helminthes and protozoa in cattle and goats**

| | Total no of animals sampled | *Fasciola spp* | *Paraphistomum spp* | *Trichostrongylus spp* | *Trichuris spp* | *Nematodirus spp* | *Cooperia spp* | *Eimeria spp* | Total |
|---|---|---|---|---|---|---|---|---|---|
| Cattle | 569 | 81 | 107 | 24 | 36 | 21 | 20 | 19 | 308 |
| %prev. | | 14.24 | 18.80 | 4.22 | 6.33 | 3.69 | 3.51 | 3.34 | 54.13 |
| Goats | 370 | 51 | - | 12 | 09 | 25 | 60 | 60 | 217 |
| %prev. | | 13.78 | - | 3.24 | 2.43 | 6.76 | 16.22 | 16.22 | 58.65 |

**Table ii: Mixed infection rate of helminthes and protozoa in cattle and goats.**

| | +ve cases of helminth & protozoa | *Fasciola & Eimeria* | *Paraphistomum & Eimeria* | *Trichostongylus & Eimeria* | *Trichuris & Eimeria* | *Nematodirus & Eimeria* | *Cooperia &Eimeria* | +ve cases of mixed helminth & protozoa infection |
|---|---|---|---|---|---|---|---|---|
| Cattle | 308 | 03 | 02 | 02 | 02 | - | 04 | 13 |
| %prev. | 54.13 | 0.53 | 0.35 | 0.35 | 0.35 | - | 0.7 | 2.28 |
| Goats | 217 | 02 | - | 02 | 01 | 06 | 03 | 14 |
| %prev. | 58.65 | 0.54 | - | 0.54 | 0.27 | 1.62 | 0.81 | 3.78 |

**Table iii: Infection rate of major classes of helminthes parasites of cattle and goats**

| | Number of animals sampled | Trematodes | Nematodes | +ve cases of the major classes |
|---|---|---|---|---|
| Cattle | 569 | 188 | 101 | 289 |
| %prevalence | | 33.04 | 17.75 | 50.79 |
| Goats | 370 | 51 | 106 | 157 |
| %prevalence | | 13.78 | 28.65 | 42.43 |

Comparatively, goats were more infected with 58.65% prevalence. From Table I above, than cattle which has 54.13% prevalence in helminth and protozoa infection rate. More so, Table II showed that mixed infection rate of helminth and protozoa were more in goat which had 14 infected (3.78% prevalence) while cattle had 13 infected (2.28% prevalence) with the mixed helminth and protozoa infection. There were more goats infected with *Nematodirus* and *Eimeria* parasites (6 goats, 1.62% prevalence) while there was no other mixed helminth and protozoa infection in cattle and goats with up to 5 infected with a particular mixed helminth and protozoa infection. From this analysis, there was no significant difference between cattle and goats examined for mixed helminth and protozoa infection. (Zcal= -2.29,α-0.14).

## DISCUSSION

From the analysis of this investigation, gastro intestinal helminth parasites like *Fasciola, Paraphistomum, Trichostrongylus, Trichuris, Nematodirus* and *Cooperia* are among the common helminth parasites of cattle and goats. This agrees with the findings of Raham and Mondal [1983], which states the major pathogenic gut helminth parasites recorded from their investigation were *Paraphistomes, Schistosomes, Strongyloides, Trichostrongylus, Haemonchus spp, Cooperia spp, Trichuris spp* among others.

Six species of helminth parasites were identified in cattle while five helminth parasites were identified in goats. The six species identified in cattle with their prevalence rate were *Fasciola spp*, (14.24%), *Paraphistomum spp(18.80%), Trichostrongylus spp* (4.22%), *Trichuris spp (6.33%), Nematodirus spp*(3.69%) and *Cooperia spp*(3.51%). There were statistical differences between their infection rates at α=5%, since P <0.05.

On the other hand, the five species of helminth parasites identified in goats were *Fasciola spp* (13.78% prevalence), *Trichostrongylus spp* (3.24%); *Trichuris spp (2.43%);Nematodirus spp (6.76%)* and *Cooperia spp* (16.22%).

Comparatively, trematode parasites were more dominant in cattle than goats while nematode parasites were relatively of high prevalence rates in goat than in cattle. From table III, the prevalence rate of trematode in cattle were 33.04% and 17.75% for nematode while in goats, the prevalence rate of trematodes were 13.78% and 28.65% in nematode. This shows that there was significant difference between the different classes of helminth parasites of cattle while there was no significant difference between the different classes of the same helminth parasites of goats. This agreed with Rolfe [1991] which states that trematodes where more dominant in cattle but less prevalent in goats, while Mollah *et al* [1996] documented that nematodes like *Nematodirus spp, Cooperia spp, Trichostrongylus spp* and *Haemonchus spp* were relatively dominant in goats and sheep. Symth [1996] states that nematode are among the successful parasites of animal because of their efficient life cycle ranging from the very simple to the extremely complicated stage. More so, 19 cattle were found to be infected with protozoa parasite specifically *Eimeria* spp. The prevalence rate in cattle was 3.34% while goat had 16.22% prevalence. There fore, 58.65% prevalence of goats were positive for helminthes and protozoa infection while 54.13% prevalence of cattle were positive for the same helminth and protozoa infection. Statistically, there was no significance difference between cattle and goats sampled for helminth and protozoa infection from table i. Furthermore, 13 cattle (4.22%) were found positive with mixed helminth and protozoa infection, while out of 217(58.65%) goats infected with helminth protozoa, 14 goats (6.45%) were positive with mixed helminth and protozoa infection, which was in accordance with Manson and Statham [1991] that increase rate of protozoa infection was as a result of overcrowding, therefore less prevalence is as a result of good sanitary condition.

Therefore, the mild infection in protozoa was due to the age of the animals while the high infection rate in helminth can be attributed to the fact that parasites are more dominant in rainy season, hence helminth parasites is said to be of high prevalence in cattle and goats than protozoa parasites, though not too outrageous because of the good sanitary condition. Forse [1999] stated that animals are exposed to massive helminth infection when they are maintained in an unhygienic, dark, congested and poorly kept ranches and also when fed with contaminated food and water.

## CONCLUSION

As the survey reveals moderately prevalence of helminth and low prevalence of protozoa, therefore grazing field should be kept free from contamination and awareness created on method of transmission of the disease. So that there will be no case of helminth and protozoa infection in the near future in Abakaliki Metropolis. Animal slaughter and meat inspection act should be implemented for disease free meat.

Fencing of grazing sites should be encouraged to prevent contact with intermediate host like snails. In case of trematodes infected cattle, cattle (animal) dung should be treated before usage as manure or should be discarded if not treated. More so, since cattle and goat are important source of meat, there is need that regular enlightenment program should be organized by veterinary health agencies of the proper keeping of the animal for both maximum productivity and safety of mankind. It should be accompanied with strategic prevention and control program for these parasites.

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