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Survey Of Common Gut Parasites Of Goat Slaughtered At Ankpa Abattoir, Kogi State, Nigeria, Implication For Public Health

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ABSTRACT:
The survey of common gut helminths of goat slaughtered at Ankpa abattoir in Ankpa L.G.A, Kogi State was carried out between August to November 2013 using Femol-ether concentration techniqueand microscopy respectively to determine the public health risk associated with goat meat consumption. Faecal samples of 248 goats were collected from Ankpa abattoir and screened in Biological Sciences Laboratory, Kogi State University, Anyigba. The result revealed that out of 62 samples of Adult males examined, 47(76%) were positive with nematode parasite. Out of 62 adult females examined, 49 (76%)were positive with nematode parasites. There is no significant difference between the rates of infection in male and female adults assessed (P>0.05). For 62 young male examined,53 were positive(85%)while for 62 young female examined,51 were positive (82%).The data analysis between male and female young goats showedno significant difference (P>0.05). Results revealed that most of the goats were infected with nematode's eggs/larvae (85%) of Strongyloides species, Oesophagostomum species, Trichostrongylus species, Haemonchus species, Ostertagia species, Bunostomum species, Gongylonema species, Giageria species, Ascaris species and Trichuris species followed by cestode eggs (14%) of Avitellina species, Taenia species and Trematode's eggs (1%) of Schistosoma bovis. The minor helminth like trematodes and cestodes were least manifested in the faecal samples analyzed which may be as a result of seasonal infestation and/or the system of management used (semi – intensive management system) in Ankpa.The whole outcome of the work revealed that goats slaughtered at Ankpa abattoir are not free from parasitic infections. Hence there is need for effective system management and treatment before consumption as this may pose a public health risk.

Keywords: Helminths infection, nematode, cestode, trematode and goats.

Introduction

Helminthiasis is one of the most important causes of mortality and morbidity in tropical and sub-tropical regions of the developing world, especially where adequate water and sanitations are lacking (De Silva *et al*., 2003; Amadi and Uttah, 2010).In Nigeria, it is alsoimportant killer disease of small ruminants and high morbidity in man;it is caused by nematodes, trematodes and cestodes (Larson, 1999 and Debela, 2002).The most pathogenic helminthes of goats commonly encountered in Nigeria includes *Haemochus contortus,Strongyloides papillosus,Trichostrongylus columbriforms,Oesophagostonum columbianum,Fasciolaspecies* and *Moniezia benedeni* (Aliu, 2001; Van wyk, Cabarat and Michael, 2004).In the southern part of Nigeria, Strongyloidosis is a constant feature of gastro-intestinal parasitism especially during the rainy

season (Van wyk and Bath 2002; Okoli, 2006).In most part of the World, goats are kept mainly for meat, milk and leather (Peacock, 1996 and Abubakar, 2002). Goats are often the main supply of diary meat in Ankpa local Government Area, Kogi State of Nigeria, particularly the indigenous breeds, West African Dwarf (Oni, 2002). Goats although representing an important source of animal protein in Ankpa, seem to have benefited little from the veterinary care and production improvement. Goats are also hampered by infections and parasitic diseases coupled with inadequate management (Tembely, *et al*., 1997; Torina, *et al*., 2004; Dauda, 2004). The most important cestode parasites of small ruminant both in terms of public health and veterinary medicine belong to the family Taeniidae. These include cystic or larval stages of *Echinococcus granulosus, Taenia hydatigena, T.ovis* and *T. multiceps* (Urquhart *et al*., 1996). All trematode species that are parasitic in small ruminants belong to the sub class *Digenea* and the most important species in Africa are Liber flukes, *Fasciola hepatica, F. gigantica* and *Dicrocoelium* species and rumen flukes (paramphistomes) *paramphistomum* species (Anon 1994; Hansen and Perry, 1999).The Nemathelminthes (nematodes) include several superfamilies of veterinary importance; these areTrichostrongyloidea, Stronglyloidea, metastrongyloidea, Ancytostomatoidea, Rhabditoidea, Trichuroidea, Filarioidea, Oxyruoidea, Anscaridoidea and spiruroidea (Githigia *et al*., 2001; Anon 1994;Hansen and Perry, 1994). The most common Gut helminthes of goats are usually acquired by the ingestion of the infected eggs or larvae or by its penetration through the skin (Githigia *et al*., 2001 Nwoke *et al*., 2013). Gut nematodes of goats are round worms living in the abomasums, small intestine and large intestine of goats. Infection usually occurs primarily through contaminated feed and water, enhanced by poor hygiene (Gatongi, 1996 and Zajac 2006). Most goats infected have been shown to be asymptomatic or produce only mild symptoms, as a result they are often over looked till serious complication or chronic clinical symptoms occurs (Kassi, 1999; Zajac 2006). Some of the symptoms associated with gut heliminth parasites are anaemia, diarrhoea, loss of weight, oedaema, recumbency, destruction of liver parenchyma dead liver tissue and general condemnation of the liver of slaughtered animals, spleenomegaly, unthriftiness, emaciation and even death of the animal (Perry and Randolph, 1999; Abubakar 2002). In poorly managed system of goat keeping, or where infection is massive, these parasites enhance all other ailments both intestinal and others making them acute and lethal (Modal, 2000). Gut worms in goat cause economic and nutritional hardship in poor farming communities and livestock operations, which are meaningless without sound knowledge of the animal care, prevention and eradication of diseases.Majority of the animals do have faecal worm parasites egg counts of below 500 eggs/grain feaces. A high proportion of small ruminants shed strongyle eggs during the post parturient period. Fakae (1990) studied the epidemiology of helminthosis in small ruminants under the traditional system in eastern Nigeria. The epidemiology of helminth infections in West African dwarf goats under the traditional husbandry system is prevailing in the derived savanna area of eastern Nigeria. The paucity of information on the prevalence of helminthes infection amongst the study population in the study area was the driving force behind this study. The common practice of goat rearing and consumption without considering the risk associated factors are also the reason for this which is mindless in the area of this study.

Material and methods

Study Area

The present study was conducted in Ankpa town in Ankpa Local Government Area of Kogi State, Nigeria. Ankpa LGA has an area of 1, 200km^2 and a population of 267, 353 at the 2006 census (The world-Gazetteer, 2007). Ankpa is one of the major metropolitan cities of Kogi State where there are healthy commercial activities and major stoppage point of many commercial drivers who decelerate for meals and lodgement. It has a large market which draws people from far and near to trade. Goats are among the commonest goods found in Ankpa main market. Majority of the Ankpa residents are subsistence farmers and traders with animal rearing which serves as income supplement with few civil servants. It can

multiply very fast and it also serves as source of income to the farmers.The area is characterized with two seasons, the dry season and rainy season. This study was conducted during the rainy season. A total of 248 faecal samples were collected from goats within the study area and used in this study.

Sample Collection

Faeces wereaseptically collected from the rectum of the goats that are brought for slaughter. The faeces were put in a separate polythene bags which were masked with a tape. Each bag was properly labeled and the sex of each goat was also noted. The samples were transported immediately to Kogi State University Laboratory for examination of the life cycle stages of eggs, larvae, cyst and ova. Firstly,The faecal samples were examined macroscopically so as to note the physical appearances, consistencies and colour of the samples.

Parasitological Analysis using Formol-ether concentration technique

Parasite concentration technique (Formol-ether concentration technique) as described by Chessbrough (2006) was used in this study. A gram of the faeces was transferred into a test tube containing 4ml of 10% formol water. An additional 4ml of formol water was added into the test tube and the contents of the tube were carefully mixed by shaking. The mixture was sieved into a beaker and the suspension was transferred into a centrifuge tube. 4ml of diethyl ether was added to the suspension, the tube was corked and the contents mixed carefully for a minute using vortex mixer. The stopper was gradually removed; the mixture was centrifuged at 3000rpm for 60 seconds. The formol water, faecal debris and ether layer were discarded and the sediment transferred to a clean, grease-free glass slide for further parasitological study (microscopic identification of the parasites present).

Parasites present in the slide were identified based on morphological characteristics and standard techniques as described by Center for Disease Control (2007).

Data analysis

The data obtained in the present study was presented with simple frequency distribution tables and chart. The data was analyzed using percentages prevalence as the percentage of infected goats among the total number of goats examined.

Results

The study revealed an overall prevalence of gut helminth infections of goats slaughtered at Ankpa abattoir, 73.8% (Table 1). Of the population sampled (N = 248; 136 adult goats & 112 young goats), the adult goatsaccounted for 38.7% and young goats35.1% (Table 1). A total of 96 adult goats and 87 young goats were positive for parasites. The percentages of infections were high for both adults and young goats (Table I). Statistical analysis showed no significant difference between the infection rates in both sexes ($P > 0.05$).

The results of Table 2: showed the sex distribution of gut helminth parasites of goats slaughtered in Ankpa L.G.A. out of total population sampled (N = 248; 131 adult goats & 117 young goats), the infected adult male and female goatsaccounted for 34.4% and 38.9% respectively. While young male and female goats accounted for32.5% and 41.9% respectively (Table 2). A total of 60 and 71 adult male and female goats were examined respectively. While young male and female goats accounted for62 *and* 55respectively. The results of presented study also showed that the infected young male and female goatsaccounted for 38 and 49 respectively been positive for the parasites.

Table 3; showed the frequency distribution of nematodes, cestodes and trematodes eggs/ova and adult worms in the faecal samples of goats slaughtered in Ankpa L.G.A. The proportions of nematodes eggs/ova and adult worms recovered accounted for 267(85.9%) and 169(85.4%) respectively. These were *Ascaris sp, Trichuris sp, Strongyloides sp, Trichostrongylus sp, Oesophagustomum sp, Haemonchus sp, Bunostomium sp, Gaigeria sp, Gongylonema sp, Ostertagia sp,*. The cestodes showed that eggs/ova and adult worms recovered accounted for 41(13.2%) and 26(13.1%) respectively. While least proportion of trematode eggs/ova and adult worms were recovered which accounted for 3(1.0%) and 3(1.5%) respectively. The cestodes

were *Avitellina* sp,. *Taenia* sp and trematode was only *Schistosoma* sp.

Table 1: Age-wise distribution of gut helminthes of goats slaughtered in Ankpa L.G.A

Age	No. examined	No. infected	Percentage infected (%)
Adult	136	96	38.7
Young	112	87	35.1
Total	**248**	**183**	**73.8**

Table 2: Sex-wise distribution of gut helminthes of goats slaughtered in Ankpa L.G.A

Sex	No. examined	No. infected	Percentage infected (%)
Male	115	83	33.5
Female	133	113	45.6
Total	**248**	**183**	**73.8**

Table 3: The frequency of nematodes, cestodes and trematodes eggs/ova and adult worms in the faecal samples of goats slaughtered in Ankpa L.G.A.

Helminthes	Species	No. of eggs/Ova (%)	No. of adult worms (%)
Nematodes	*Ascaris sp*	35	19
	Trichuris sp	3	12
	Strongyloides sp	87	39
	Trichostrongylus sp	40	17
	Oesophagustomum sp	17	24
	Haemonchus sp	12	7
	Bunostomium sp	22	3
	Gaigeria sp	14	21
	Gongylonema sp	18	23
	Ostertagia sp	19	4
Total		267(85.9%)	169(85.4%)
Cestodes	*Avitellina sp*	17	8
	Taenia sp	24	18
Total		41(13.2%)	26(13.1%)
Trematodes	*Schistosoma sp*	3	3
Total		3 (1.0%)	3 (1.5%)
Overall total		**311**	**198**

DISCUSSION:

Gut helminthes represent a major public health problem in rural communities which Ankpa is among. The research made it obvious that there are helminthes parasites in the goats of the sampled area, Ankpa, Kogi State. In this study, the frequency distribution of nematodes, cestodes and trematodes eggs/ova and adult worms in the faecal samples of goats slaughtered in Ankpa L.G.A., the proportions of nematodes eggs/ova and adult worms recovered showed high prevalence pattern of helminthiasis which accounted for 73.8% (Table 1). This can be attributed with the high frequency of goats contact with faecally polluted soils both in field and pen system. In table 1; the result reviewed that out of the population sampled (N = 248; 136 adult goats & 112 young goats), the adult goatsaccounted for 38.7% and young goats35.1% (Table 1). A total of 96 adult goats and 87 young goats were positive for parasites. The percentages of infections were high for both adults and young goats (Table I). Statistical analysis showed no significant difference between the infection rates in both

sexes (P > 0.05). The study also revealed that adult animals were carrying heavy worm burden than the young ones. This might be as a result of intermittent relaxation of immunity at post peripaturient periods as suggested by Urquhart (1996).The result showed that cestodes and trematodes were not common in Ankpa goat and if they do, they occur in mild form which may not be harmful to the host as a single infection. They may occur as multiple infections in combination with the infested worms. From these, it shows that Ankpa and its environment are quite endemic to helminthic infections (of which nematodes are the commonest). In fact, the parasites encountered are pathogenic routine that should have been solved by deworming. The high prevalence of gut transmitted helminthiases in Ankpa and is comparable with previous reports in Northern and Southern Nigeria (Urquhart *et al*., 1996; Larson, 1999; Aliu, 2001; Githigia *et al*., 2001 Abubakar, U. 2002; Oni, 2002 Okoli, 2006)**.** Goats are often the main supply of diary meat in Ankpa local Government Area, Kogi State of Nigeria particularly the indigenous breed, West African Dwarf (Oni, 2002). Goats although representing an important source of animal protein in Ankpa, seem to have benefited little from the veterinary care and production improvement. Goats are also hampered by infections and parasitic diseases coupled with inadequate management (Doma, *et al*., 1999; Danda, 2004). The development of the variable eggs of parasitic helminthes are influenced by climatic factors such as sunlight, temperature, rainfall, humidity and soil moisture within the feacal pallets herbage(Jacquiet,*et al*., 1992). Most parasitic goats which may appear to be healthy can have high worm lodges when examined (Urquhart *et al*., 1996; Nginyi *et al*., 2001). The prevalence Pattern of helminthiasis in the study shows that, management plays an important role as well as climatic factor in the occurrence of helminthiasis of goats. Under semi intensive management system in which little or no veterinary action such as deworming and improper feeding, the goats are prone to helminthiasis.

Conclusion:

The incidence of helminthes parasites in the faecal samples of goats in Ankpa as examined can be due to poor management since the study was carried out using goats kept under semi-intensive system of management with little or no routine deworming, frequent cleaning, (removal of their droppings) and bedding from their pens which may contribute to helminthiasis. They may account for the ubiquitous nature of egg distributions and hence very high prevalence in the area and its environs.

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