

Review

A survey of common gut helminth of goats slaughtered at Ankpa abattoir, Kogi State, Nigeria

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The survey of common gut helminth of goat in Ankpa Local Government Area (L.G.A), Kogi State was carried out between August, 2013 and November, 2013. Faecal samples of 248 goats were collected from Ankpa abattoir, and screened using floatation and sedimentation methods in the Biological Sciences Laboratory, Kogi State University, Anyigba. The result revealed that out of 62 samples of adult males examined, 47 were positive with a total of 76% nematode parasite while 15 faecal samples were not infected. Out of 62 adult females examined, 49 were positive with a total of 79% nematode parasites. There is no significant difference between the rates of infection in male and female adults ($P > 0.05$). For 62 young male examined, 53 were positive with a total of 85% while for 62 young female examined, 51 were positive with a total of 82%. The data analysis between male and female young goats showed no 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's 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 infection. Hence there is need for effective system of management and treatment before consumption.

Key words: Helminths, infection, public health importance 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, an important killer disease

of small ruminants and high morbidity in man is caused by nematodes, trematodes and cestodes (Larson, 1999; Debela, 2002). The most pathogenic helminthes of goats commonly encountered in Nigeria includes *Haemonchus contortus*, *Strongyloides papillosus*, *Trichostrongylus*

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columbriforms, *Oesophagostomum columbianum*, *Fasciola* species and *Moniezia benedeni* (Aliu et al., 2001; Van Wyk et al., 2004). In the southern part of Nigeria, Strongyloidosis is a constant feature of gastrointestinal parasitism especially during the rainy season (Van Wyk and Bath, 2002; Okoli et al., 2006). Goats are often the main supply of diary meat in Ankpa Local Government Area, Kogi State of Nigeria particularly the indigenous breed of West African Dwarf (Oni, 2002).

In most part of the world, goats are kept mainly for meat, milk and leather (Peacock, 1996; Abubakar, 2002). In Northern part of Nigeria, the skin of goat is used as raw material in leather industries for manufacturing shoes, bags, belts etc. 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*, *Taenia ovis* and *Taenia 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 liver flukes, *Fasciola hepatica*, *Fasciola gigantica*, *Dicrocoelium* species and rumen flukes (paraphistomes) *paramphistomum* species (Anon, 1994; Hansen and Perry, 1994). The Nematelminthes (nematodes) include several super families of veterinary importance; these are Trichostrongyloidea, Strongyloidea, metastrongyloidea, Ancylostomatoidea, 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; 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 helminth 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, splenomegaly, 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 (Mondal et al., 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 count of below 500 eggs/grain faeces. A high proportion of small ruminants shed stongyle 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 result of the study revealed that infections were due to *Haemonchus*, *Trichostrongylus* spp., Metacestodes of *T. hydatigena*, *O. columbianum*, *Strongyloides* sp, *Moniezia expanza*, etc. and mixed infections were most prevalent.

The endemicity of parasitic gastroenteritis in the area was indicated by the high prevalence of the helminthes irrespective of the season of the year.

MATERIALS AND METHODS

Study area

Ankpa town is under Ankpa Local Government Area in Kogi State, Nigeria. Its headquarters are in the town of Ankpa on the A233 highway in the West of the area. It has an area of 1, 200km² and a population of 267, 353 at the 2006 census. The area is characterized by two seasons, the dry season and rainy season. The population of Ankpa is growing rapidly as a result of the presence of the Kogi State College of Education, and also as a result of the establishment of a private college of education. It has enhanced social amenities and its food demand has increased enormously which includes goat meat, hence there is need for increased production of goats in the area. Ankpa is a centre of commerce in Igala land, thus, it is said to be located at the centre of Igala towns and villages. 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 farmers and traders with animal rearing which serves as income supplement. It can multiply very fast and it also serves as source of income to the farmers.

Collection procedure

Faeces were 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. The number and sex of the goat is then noted on the polythene bag. The samples were then immediately taken to the laboratory for examination. The faeces are then examined for the presence of parasite eggs and oocysts. The method employed is the simple flotation method (Perry and Randolph, 1999). Simple flotation method is based on the observation that helminth eggs will float to the surface of the flotation medium which has a higher specific gravity than the eggs.

Table 1. Shows the frequency of gut helminth parasites of goats slaughtered in Ankpa Ankpa Local Government Area (L.G.A).

Samples	No. examined	No. infected	Percentage
Adults	136	96	38.7
Young	112	87	35.1
Total	248	183	73.8

Table 2. The sex distribution of gut helminth parasites of goats slaughtered in Ankpa L.G.A.

Sex	Adult goats			Young goats		
	No. examined	No. infected	% infected	No. examined	No. infected	% infected
Male	60	45	34.4	55	38	32.48
Female	71	51	38.9	62	49	41.9
Total	131	96	73.3	117	87	74.4

And the other technique employed if the sedimentation method for the detection of trematode eggs, the modified method of Dennis, Stone and Swanson as cited by Abubakar (2006).

Examination procedure of faeces

Simple floatation

About 2 to 3 g of the faeces is poured into a centrifuge tube. And ZnSO₄ sucrose (floatation medium) is added to the faeces to almost 2/3 of its volume. A glass/rubber rod is then used to break the faeces which in most cases are in pellets. After a homogenous mixture is obtained, it is then sieved through a sieve placed on a test tube. The coarse debris is then trapped on the mesh. The floatation media is then added to the filtrate and filled to the brim, until a convex meniscus is formed on the test tube. A cover slip is placed on it and left for about 5 min. After about 5 min, the cover slip is then pulled gently from the test tube and placed on a slide, which is now ready for viewing. Two cover slips are laced per slide for examination under microscope ($\times 10$ and $\times 40$) objectives.

Sedimentation method

About 4 g of the faeces is thoroughly broken and mixed in a centrifuge tube using a rod by adding appropriate quantity of distilled water. The mixture is sifted into a specimen bottle. Distilled water is then added to the filtrate and filled to the brim. This is then left for about 10 min. After 10 min, the supernatant is decanted and the sediment is ready for examination. A Pasteur pipette is used to collect the sediment and place on slide. It is then examined under the low power objective of the compound microscope.

Identification

Each individual species of the helminth parasite is recognizable by the characteristics of its eggs, shapes, sizes, colour, nature of shell (thickness), stage in development appearance of embryo if present

and using parasitological atlas. But in a situation where the examination of the collected faeces is not possible, 10% formaline is added immediately to hinder further development of the eggs and kept in a cupboard or the sample can be placed in a refrigerator overnight and examined later.

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 and 112 young goats), the adult goats accounted for 38.7% and young goats 35.1% (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 1). 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 and 117 young goats), the infected adult male and female goats accounted for 34.4 and 38.9%, respectively. While young male and female goats accounted for 32.5 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 for 62 and 55 respectively. The results of presented study also showed that the infected young male and female goats accounted 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

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.

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

and adult worms recovered accounted for 267 (85.9%) and 169 (85.4%) respectively. These were *Ascaris sp.*, *Trichuris sp.*, *Strongyloides sp.*, *Trichostrongylus sp.*, *Oesophagostomum sp*, *Haemonchus sp.*, *Bunostomium sp.*, *Gaigeria sp*, *Gongylonema sp.* and *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* species.

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. This can be attributed to the ubiquitous nature of egg distributions and hence very high prevalence in the area. The percentages of infections were high for both adults and young goats. The high prevalence of soil transmitted helminthiasis in the area is influenced by a multifactorial system, which

comprises hosts, parasite and environmental effects (Okoli et al., 2006). Githigia et al. (2001) attributed several factors that is, warmer and wetter grazing seasons, the greater time animals spend on pasture, ineffective deworming practices or the development of anti-helminthic resistance in this parasite. Although, 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 parturient periods as suggested by Urquhart (1996).

The result also 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 helminthiasis in Ankpa and is comparable with previous reports in Northern and Southern Nigeria (Urquhart et al., 1996; Larson, 1999; Aliu et al., 2001; Githigia et al., 2001; Abubakar, U. 2002; Oni, 2002; Okoli et al., 2006). Goats are often the main supply of diary meat in Ankpa L.G.A, Kogi State of Nigeria particularly the indigenous the 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; Dauda, 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 faecal 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.

Conflicts of interest

Authors have none to declare.

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