SCIENCEFORECAST
A digital science library

Research Article
Published: 16 Apr, 2018

SF Journal of Environmental and Earth Science

Low Prevalence of Helminths in Faecal Samples of Cattle and Goats from Trans-Amadi Abattoir (Slaughterhouse), Port Harcourt, Nigeria

Amuzie CC*, Moslen M and Clement A

Department of Animal and Environmental Biology, Rivers State University, Nkpolu-Oroworukwo, Port Harcourt, Nigeria

Abstract

The prevalence of eggs of helminth parasites was evaluated in faecal samples of 60 goats and 70 cattles slaughtered at the Trans-Amadi slaughterhouse, Port Harcourt, Nigeria. Floatation and direct microscopy techniques were employed in examining the samples. Two parasite species were recovered from the samples: *Dicrocelium dendriticum* (a trematode) from three cattle samples accounting for an overall prevalence of 2.30%, and *Nematodirus* spp. (a nematode) from one goat sample resulting into an overall prevalence of 0.80%. This indicates a very low number of helminth parasites occurring at a low prevalence rate as compared to studies from other parts of Nigeria. The results could be explained by the care given to the animals including feeding them with specially compounded feeds, regular de-worming, and frequent inspection and sanitation of their pens. It is also presumed that a larger sample size may have led to the recovery of more parasite species. However, adequate feeding, sanitation and regular de-worming of farm animals are recommended as management techniques to reduce the prevalence of helminth parasites.

Keywords: Helminth; Parasites; Faecal samples; Cattle; Goats; Slaughterhouse

Introduction

The rearing of cattle and goats often constitutes part of the agricultural practices of many households in parts of Nigeria [1]. They are kept either for family use or as sources of funds when sold. Yahaya and Kyav [2] summarised the economic importance of the livestock farming of cattle. They are also imported from neighbouring African countries to meet demands for meat in major cities in the country [1,3]. They are however, hosts to a number of parasitic and zoonotic diseases, which include parasites belonging to two phyla of helminths- platyhelminths and nematodes. Adverse effects of helminth infection in these animals range from death to sub-lethal conditions such as decreased growth rate [1,3].

Helminths are parasitic in a wide range of vertebrates including amphibians [4], fishes, reptiles and birds [5-7]. They are frequently reported in parasitic examinations of farm animals including cattle and goats worldwide [3, 8-12], often resulting into reduced productivity [3,13] and high morbidity [14-15].

In Nigeria, some of the commonly reported helminth parasites from cattle and goats are nematodes (such as *Strongyloides* spp., *Trichostrongylus* spp., *Trichuris* spp., *Toxocara vitulorum, Nematodirus* spp.), trematodes (including *Paramphistomum* spp., *Fasciola gigantica*, *Dicrocoelium dendriticum*), and cestodes (e.g., *Avitellina centripunctata*, *Moniezia benedeni, M. expansa*) [12,16-19].

High prevalence rates of infection with helminth parasites are commonly reported from studies in the geographical zones of the country [12,19-20]. Most of them are studies investigating animals kept in abattoirs as these are sources of larger numbers of animals and represent the pool from which smaller community markets and households get their supply. Though Elele *et al.* [1] investigated animals from abattoirs in Rivers State, the researchers examined only goats and did not take samples from the Trans-Amadi abattoir. This research, therefore, set out to investigate the species of helminth parasites in exotic cattle and goats slaughtered in Trans-Amadi slaughterhouse, Port Harcourt, Nigeria.

OPEN ACCESS

Correspondence:
Amuzie CC, Department of Animal and Environmental Biology, Rivers State University, Nkpolu-Oroworukwo, Port Harcourt, Nigeria.
E-mail: *ekeh.chidinma@ust.edu.ng*
Received Date: *08 Mar 2018*
Accepted Date: *11 Apr 2018*
Published Date: *16 Apr 2018*

Citation: *Amuzie CC, Moslen M, Clement A. Low Prevalence of Helminths in Faecal Samples of Cattle and Goats from Trans-Amadi Abattoir (Slaughterhouse), Port Harcourt, Nigeria. SF J Environ Earth Sci. 2018; 1(1): 1012.*

ISSN 2643-8070

Table 1: Prevalence (in parenthesis) of gastrointestinal parasites in cattle and goat faecal samples from Trans-Amadi slaughterhouse, Port Harcourt.

	Cattle	Goat
Number positive	3 (4.3%)	1 (1.7%)
Number negative	67 (95.7%)	59 (98.3%)
Total	70 (100.0%)	60 (100.0%)

Table 2: Overall prevalence (in parentheses) of gastrointestinal parasites of cattle and goat faecal samples from Trans-Amadi slaughterhouse, Port Harcourt.

Animal	Number examined	Number positive	Number negative
Cattle	70 (53.8%)	3 (2.3%)	67 (51.5%)
Goats	60 (46.2%)	1 (0.8%)	59 (45.4%)
Total	130 (100.0%)	4 (3.1%)	126 (96.4%)

Materials and Methods

Study location

Trans-Amadi slaughter house is located in Port Harcourt Local Government Area of Rivers State. It is situated close to the Port Harcourt zoo on the eastern flank of the city and attracts numerous commercial activities including a daily market where foodstuffs are sold. It is one of the major abattoirs in the city representing a major centre for the purchase of both live and slaughtered cattle and goats.

Collection of faecal Sample

Weekly visits were made to the slaughter house in the months of June and July, 2017, for collection of faecal samples from cattle and goat specimens. The samples were randomly collected directly from the rectum of the animals in sterile vials containing 10% formalin and immediately transported to the parasitology laboratory of the Department of Animal and Environmental Biology, Rivers State University. A total of 130 samples (70 from cattle and 60 from goats) were collected and examined for the presence of helminth parasites.

Examination of faecal samples

Faecal examination was done as described by [3] and [12]. Saturated sugar floatation techniques and direct microscopy were employed in sample analysis. The saturated sugar floatation technique was used as described. One gram of either cattle or goat faecal sample was emulsified in 4ml of the solution in a test-tube. The mixture was filtered into a sterile beaker using a net gauge of 2cm mesh size. The filtrate was introduced into a sterile test tube filled to the brim with the saturated sugar solution and covered with a cover slip. The solution was allowed to stand for about 20-30 minutes after which the cover slip was carefully removed, placed on a microscope slide and examined using x10 and x4 magnifications of the light microscope.

The direct microscopy technique was used as quality assurance/ quality control check to affirm the results obtained from the saturated sugar floatation techniques. In the direct microscopy technique, one gram of each faecal sample was homogenized in 10% formalin. Direct faecal smears were then made on glass slide and a drop of Lugol's iodine was added to the smear using Pasteur pipette. The stained smear was covered with a cover slip and examined under the light microscope.

Eggs were identified according the protocols of Soulsby [21]. Prevalence was computed as the percentage of infected samples.

Results and Discussion

A total of 130 faecal samples were examined, 70 were from cattle while 60 were from goats. Only four of the samples were positive for gastrointestinal parasites: *Dicrocoelium dendriticum* infected three cattle samples, while *Nematodirus* spp. was recovered from one goat sample. Table 1 presents the prevalence rates of the intestinal parasites from both animals, and the overall prevalence rates are presented in Table 2. The prevalence rates of both parasites in the animals were 4.3% in cattle and 1.7% in goats.

Elele *et al.*, [1] examined goats from abattoirs in four locations in Rivers State, Nigeria, which were Rumuodomaya, Ogbogoro, Eliozu and Aluu, for the presence of helminth parasites. They reported an overall prevalence of 62.1%, and recovered nematodes of the following genera *Haemonchus, Strongyloides, Charbetia, Trichuris, Ostergia, Bunostonium, Trichostrongyloides* and *Ascaris*. They also reported trematodes (*Fasciola, Eurytrema, Schistosoma, Gastrothylax*, and *Dicrocoelium* species) and cestodes (*Taenia, Avitellina, Moniezia benedeni* and *M. expansa*).

Adedipe *et al.* [3] in their research recovered *D. dendriticum* and *Nematodirus* spp. from cattle faecal samples collected from a slaughterhouse in Ibadan. However, the authors also found other helminth parasites such as three nematodes (strongyle-type eggs, *Strongyloides* spp., *Toxocara vitulorum*); two trematodes (*Paramphistomum* spp., *Fasciola gigantica*); and one cestode (*Moniezia benedeni*), which were not recovered in the course of the present research. From their findings, Adedipe *et al.* [3] reported that the highest prevalence was accounted for by strongyle-type eggs; the prevalence rates of *D. dendriticum* and *Nematodirus* spp. were the least being 2.52% and 0.3%, respectively. The authors however, noted that nematode parasites were more prevalent than other classes of helminths.

Nwigwe *et al.* [12] also recovered *Nematodirus* spp. from both cattle and goat faecal samples from Abakiliki, south-eastern Nigeria, in addition to other helminth parasites (such as *Fasciola* spp., *Trichostrongylus* spp., *Trichuris* spp. and *Cooperia* spp., and the protozoa *Eimeria*. These authors also reported *Paramphistomum* spp., though from cattle faecal samples only.

These results indicate that the number of helminth parasite species recovered from the faecal samples examined in the present study was rather low. The prevalence of infection of both parasitic helminth species identified were also lower than the reports of other researchers from other locations in the country [1-3,19-20]. However, Nwigwe *et al.*, [12] noted that trematode parasites were more prevalent in cattle whereas nematode parasites were more prevalent in goats which are similar to the finding in the present research. Conversely, while Nwigwe *et al.* [12] found that more goats than cattle were infected, it was observed that the cattle faecal samples from the Trans-Amadi slaughterhouse were more infected than the goat fecal samples. This could be accounted for by individual differences in the immunological status or susceptibility of the host specimens.

Literature on helminth parasites of goats from parts of Nigeria indicate that *Nematodirus* spp., *Strongyloides* spp. and *Trichostrongylus* spp. are the most prevalent nematode parasites [12,18]. Okeyo *et al.* [22], however, reported that *Haemonchus contortus* was the most prevalent helminth parasite of goats from a location in Kenya followed by *Trichostrongylus* spp and *Ostertagia* spp. The results obtained in the present research, therefore indicate a low level of infection of cattle and goats from Trans-Amadi slaughterhouse. This may be attributed to the amount of care given to the animals including feeding them

with specially compounded feeds, regular de-worming, and frequent inspection and sanitation of their pens. It is also presumed that a larger sample size could have resulted to the recovery of more parasite species. However, adequate feeding, sanitation and regular de-worming of farm animals are recommended as management techniques to reduce the prevalence of helminth parasites.

Though this research reported a low prevalence of helminth infections, the presence of *D. dendriticum* is of zoonotic importance [1,3].

Conclusion

Two helminth parasites were found to infect cattle and goats from Trans-Amadi slaughterhouse, Port Harcourt. While it is presumed that the examination of more samples would yield more parasite species, the importance of hygienic care and adequate feeding is highlighted as important factors in the control of helminth parasites of livestock to minimise transmission to the final consumers.

References

1. Elele K, Owhoeli O and Gboeloh LB. Prevalence of species of helminths parasites in cattle slaughtered in selected abattoirs in Port Harcourt, south-south, Nigeria. International Research on Medical Sciences. 2013; 1: 10–17.
2. Yahaya A and Tyav YB. A survey of gastrointestinal parasitic helminths of bovine slaughtered in abattoir, Wudil Local Government Area, Kano State, Nigeria. Greener Journal of Biological Sciences. 2014; 4: 128-134.
3. Adedipe OD, Uwalaka EC, Akinseye VO, Adediran OA and Cadmus SIB. Gastro-intestinal helminths in slaughtered cattle in Ibadan, south-western Nigeria. Journal of Veterinary Medicine. 2014; 1: 12.
4. Amuzie CC, Agala KA and Aisien MSO. Parasitic fauna of amphibians from Rumuji-Emohua, Rivers State, Nigeria. The Bioscientist. 2016; 4: 32-40.
5. McAllister CT, Bursey CR and Freed PS. Helminth parasites of selected amphibians and reptiles from the republic of Ecuador. Comparative Parasitology. 2010; 77: 52-66.
6. Ogbeibu AE, Okaka, CE and Oribhabor BJ. Gastrointestinal helminth parasites community of fish species in a Niger Delta tidal creek, Nigeria. Journal of Ecosystems. 2014.
7. Tomas A, Rebelo MT and de Fonsera IP. Occurrence of helminth parasites in the gastrointestinal tract of wild birds from Wildlife Rehabilitation and Investigation Centre of Ria Formosa in southern Portugal. Veterinary Parasitology: Regional Studies and Reports. 2017; 8: 13-20.
8. Tsotetsi AM and Mbati PA. Parasitic helminths of veterinary importance in cattle, sheep and goats on communal farms in the north-eastern Free State, South Africa. Journal of the South African Veterinary Association. 2003; 74: 45–48.
9. Wang CR, Qiu JH, Zhao JP, Xu LM, Yu WC and Zhu XQ. Prevalence of helminthes in adult dogs in Heilongjiang Province, the People's Republic of China. Parasitology Research. 2006; 99: 627–630.
10. Nwosu CO, Madu PP and Richards WS. Prevalence and seasonal changes in the population of gastrointestinal nematodes of small ruminants in the semi-arid zone of north-eastern Nigeria. Veterinary Parasitology. 2007; 144: 118–124.
11. Kumsa B, Tadesse T, Sari T, Duguma R and Hussen B. Helminths of sheep and goats in Central Oromia (Ethiopia) during the dry season. Journal of Animal & Veterinary Advances. 2011; 10: 1845–1849.
12. Nwigwe JO, Njoku OO, Odikamnoro OO and Uhuo AC. Comparative study of intestinal helminths and protozoa of cattle and goats in Abakaliki metropolis of Ebonyi State, Nigeria. Advances in Applied Science Research. 2013; 4: 223-227.
13. Keyyu JD, Monrad J, Kyvsgaard NC and Kassuku AA. Epidemiology of *Fasciola gigantica* and amphistomes in cattle on traditional, small-scale dairy and large-scale dairy farms in the southern highlands of Tanzania. Tropical Animal Health & Production. 2005; 37: 303–314.
14. Charlier J, Van der Voort M, Hogevean H and Vercrhysse J. Paracalc; a novel tool to evaluate the economic importance of worm in-fections on the dairy farm. Veterinary Parasitology. 2012; 184: 204-211.
15. Mawatari T, Hirano K, Ikeda H, Tsunemitsu H and Suzuki T. Surveillance of diarrhea-causing pathogens in dairy and beef cows in Yamagata Prefecture, Japan from 2002 to 2011. Microbiology/ Immunology. 2014; 58: 530-535.
16. Fakae BB and Chiejina SN. The prevalence of concurrent trypanosome and gastrointestinal nematode infections in West African Dwarf sheep and goats in Nsukka area of eastern Nigeria. Veterinary Parasitology. 1993; 49: 313–318.
17. Anene BM, Onyekwodiri EO, Chime AB and Anika SM. Gastrointestinal parasites in sheep and goats of southeastern Nigeria. Small Ruminant Research. 1994; 13: 187–192.
18. Ikpeze OO and Nzemeka FI. Gastrointestinal tract (GIT) helminth parasites of goats in Ibusa, Delta State, Southern Nigeria. African Journal of Medical Sciences. 2009; 2: 20-26.
19. Okike-Osisiogu FU, Arinze AG and Ekaiko MU. Prevalence of intestinal parasites in cattle slaughtered in Aba. International Journal of Research & Development. 2016; 2: 20-27.
20. Edosomwan EU and Shoyemi OO. Prevalence of gastrointestinal helminth parasites of cattle and goats slaughtered at abattoirs in Benin City, Nigeria. African Scientist 2012; 13: 109–114.
21. Soulsby EJL. Helminths, Arthropods and Protozoa of Domesticated Animals, 1st ed. Bailliere Tindall, London. 1982.
22. Okeyo AM, Inyangala BAO, Githigia SM, Munyua SJM, Wanyoike MM, Gachuiri CK, et al. Reproductive performance and level of gastro-intestinal parasite infestation in goats on-farm and on-station at Machang'a, Embu, Kenya. In: Lebbie S.H.B., Kagwini E. (Eds.), Small Ruminant Research and Development in Africa. Proceedings of the Third Biennial Conference of the African Small Ruminant Research Network, UICC, Kampala, Uganda. 1996; 1-10.