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Research Article

Studies on Helminths in Cattle and Goats Slaughtered at Lafia Abattoir, Lafia Local Government Area, Nasarawa State, Nigeria

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Abstract

Gastrointestinal parasites pose a serious health threat and limitation to the production of ruminants and other livestock in Nigeria. This study surveyed gastrointestinal helminths of cattle and goat slaughtered at Lafia abattoir in Lafia LGA, Nasarawa State, Nigeria between May and June 2018. Two hundred (200) faecal samples were collected from 100 cattle and 100 goats respectively. The samples were analyzed using formol-ether concentration technique and floatation method. Of the 200 samples analyzed, 84 (42.0%) were infected by intestinal helminths. *Fasciola* spp. 16 (8.00%) was the most prevalent helminth found infecting the ruminants while *Paragonimus uterobilateralis* 2 (2%) was least prevalent. The prevalence of gastrointestinal helminths in relation to the two ruminants showed a significant difference (P = 0.03599). The female ruminant 59 (43.70%) were more infected by intestinal helminthes than males 25 (38.46%). However, the prevalence of gastrointestinal helminths in relation to gender of ruminants showed no significant difference (P = 0.5459). The prevalence rate between helminthic groups highly varied significantly (P < 0.001). Considering the impact of the gastrointestinal helminths infections on animal production and public health, it is therefore suggested that effective prophylactic measures be adopted by ruminants' livestock owners as a first step to curtailing helminthic infections among free range animals. Also, abattoirs should be well maintained in relation to high sanitary standards.

Keywords: Helminths; Cattle; Goat; Abattoir; Lafia

Introduction

Livestock represent an important source of animal protein through their daily supply of meat and dairy products in developing countries [1]. Nigeria is the largest livestock producer in the Sub-Saharan Africa with population of 34.5 million goats, 22.1 million sheep and 13.9 million cattle [2]. However, the larger proportion of these animals' population is largely concentrated in the northern region of the country where they are kept under the traditional pastoral (extensive) system [3] or semi extensive system, where the animals are allowed to roam the neighborhood to fend for themselves with little or no special provision of supplement for the animals [4]. Consequently, in communities where livestock production has become prevalent, helminthosis have, in addition to other socio-economic parameters, constituted major impediment to the development of an economically viable livestock industry [5].

Zeryehun [6] confirmed that helminthosis constitutes one of the most important constraints to ruminant production in Nigeria. Bamaiyia [7] opines that the infection is more prevalent in the very young and very old or immuno-compromised animals. These infections are mostly caused by nematodes such as Trichuris species, *Strongyliodes* species, *Capillaria* species, *Ostertagia* species; cestodes such as *Moniezia* species, *Taenia* species and trematodes such as *Fasciola gigantica, Dicrocoelium* species [8]. Helminthes are associated with infections resulting in morbidity in severe cases and loss of weight, abortion, infertility, reduction in food utilization, reduced meat and milk production in chronic cases [9]. They also cause reduction in work capacity, spontaneous culling, high rate of treatment and reduction in the market value of infected animals and in severe cases, death of animals [10].

It is estimated that about 20% of total goats flock in Nigeria are slaughtered or die in extremes due to helminthosis [11]. A study

by Fakae (2009) puts the prevalence of helminth diseases of ruminants in Nigeria to 77 - 100% throughout out the year irrespective of seasonal variation. To reduce the burden of intestinal parasites and increase meat protein in Nigeria, the parasites should be identified and viable control methods developed to fit individual production situation. Therefore, this study was conducted to determine the prevalence of gastrointestinal helminths of cattle and goat slaughtered at Lafia abattoir Lafia, Nasarawa State.

Materials and Methods

Study area

The study was conducted at Lafia Abbatoir, Lafia Nasarawa State, Nigeria. Lafia is located on latitude 8° 35'N, longitude 8° 32'E, altitude 181.53m above sea level with mean temperature of 34°C, relative humidity of 40 – 86% and average day light of 9 - 12h. It is the capital city of Nasarawa State and the largest town in Nasarawa State.

Sample collection

Faecal samples were collected between May and June 2018 from the rectum of freshly slaughtered cattle and goats into pre-labeled sample bottles containing 10% formalin using gloved fingers [5]. Data was collected on the basis of gender and age. Samples were transported to the Zoology laboratory of Federal University Lafia, parasitological examination.

Parasitological examination of faecal samples

In the laboratory, samples were examined for detection of helminth eggs using standard procedures of floatation and sedimentation methods. These were identified based on their color, shape and content as described by Soulsby [5].

Data analysis

Data obtained were analyzed using R Console software (version 3.2.2). The prevalence of helminth infection in relation to ruminants (cattle and goat), gender and as well as their age was compared using Pearson's Chi-Square (χ^2) test. The P-values < 0.05 were considered statistically significant. The degree of freedom is denoted by df while the probability value is denoted by P.

Results

The prevalence of gastrointestinal parasites in relation to the two selected ruminants at lafia abattoir

Of the 200 ruminants examined, 84 (42.0%) were found infected with gastrointestinal parasites (Table 1). The infection was more prevalent in cattle 48 (57.1%) than goats 36 (42.9%). However, there was no significant difference (χ^2 = 0.94011, df = 1, P = 0.3322) in the overall prevalence of gastrointestinal helminths parasites in relation to cattle and goats.

Distribution of helminths parasite among cattle and goats in lafia abattoir

The most prevalent group of helminth parasite found infecting the ruminants sampled was the nematode group 51 (60.7%) followed by the trematodes 28(33.3%) while cestodes 5 (6.0%) were the least prevalent helminths group found at the study site (Table 2). The prevalence rate in ruminants between helminth groups showed a very high significant difference (χ^2 = 37.786, df = 2, P < 0.0001).

Animal	Number Examined	Number Infected (%)
Cattle	100	48 (57.1)
Goat	100	36 (42.9)
Total	200	84 (42.0)

Table 1: The Prevalence of Gastrointestinal Parasites in Relation to the Two Selected Ruminants at Lafia Abattoir, Nasarawa State Between May and June 2018.

χ^2= 0.94011, df = 1, P = 0.3322.

Groups of helminths	No. Infected (%)
Nematode	51 (60.7)
Trematode	28 (33.3)
Cestode	5 (6.0)
Total	84 (42.0)

Table 2: Distribution of Helminths Parasite among Cattle and Goats in Lafia Abattoir.

χ^2 = 37.786, df = 2, P < 0.0001.

Composition of gastrointestinal helminths species in cattle and goats in lafia abattoir

Fasciola hepatica 16 (19.0%) was the most prevalent intestinal helminths species found in the ruminants examined followed by *Trichuris trichiura* 14 (14.6%), while *P. uterobilateralis* 2 (2.4%)

Helminths species	Cattle (*Boss* sp.) (n = 100)	Goats (*Capra hircus*) (n = 100)	Total (n = 200)
	No. infected (%)	No. infected (%)	Total No. infected (%)
Nematodes			
Strongyloides spp.	8 (16.7)	2 (5.6)	10 (11.9)
Trichostrongylus spp.	6 (12.5)	4 (11.1)	10 (11.9)
Hookworm	4 (8.3)	9 (25.0)	13 (15.5)
Ascaris lumbricoides	0 (0.0)	4 (11.1)	4 (4.8)
Trichuris trichuria	8 (16.7)	6 (16.7)	14 (16.7)
Trematodes			
Fasciola hepatica	9 (18.8)	7 (19.4)	16 (19.0)
Dicrocoelium dendriticum	6 (12.5)	4 (11.1)	10 (11.9)
P. uterobilateralis	2 (4.2)	0 (0.0)	2 (2.4)
Cestode			
Taenia spp.	5 (10.4)	0 (0.0)	5 (6.0)
Total	48 (57.1)	36 (42.9)	84 (42.0)

Table 3: Checklist of Gastrointestinal Helminths Species in Cattle and Goats in Lafia Abattoir.

was the least prevalent helminths found (Table 3). The prevalence of different gastrointestinal helminths in relation to cattle and goats was statistically significant (χ^2 = 16.481, df = 8, P = 0.03599).

Prevalence of gastrointestinal helminths of cattle and goats in relation to gender

The female ruminants 59 (43.7%) were more infected by intestinal helminths than their male counterparts 25 (38.5%) (Table 4). The prevalence of gastrointestinal helminths in relation to gender of ruminants was not statistically significant (χ^2 = 0.36467, df = 1, P = 0.5459).

Animal type	Male		Female	
	No. examined	No. infected (%)	No. examined	No. infected (%)
Cattle	30	14 (46.7)	70	34 (48.6)
Goat	35	11 (31.4)	65	25 (38.7)
Total (%)	65	25 (38.5)	135	59 (43.7)

Table 4: Prevalence of Gastrointestinal Helminths of Cattle and Goats in Relation to Gender.

χ^2 = 0.36467, df = 1, P = 0.5.

Discussion

The 42.0% prevalence of infection observed in this study shows that gastrointestinal helminths are a major health problems of ruminants in the study area. This could also be linked to the extensive farming practices employed by livestock owners and inadequate medication of livestock in the study area. The observed prevalence is consistent with that of [12] who reported a prevalence of 41.46% in Northern Ethiopia. It also agreed with [11] and (Elele., *et al.* 2013) who reported a 59.2% and 62.1% prevalence of gastrointestinal parasites in Minna and Port-Harcourt, Nigeria respectively.

Nematodes infection was particularly high, as they accounted for 60.7% of the total helminths burden. According to Nwosu., *et al*. [13] and Ekong., *et al.* [14], high nematode infection has huge impact on livestock production since they result in reduced milk, meat, wool, hide products, and stamina of livestock, hence resulting in the diminution of production potentials such as decreased growth rate, weight loss in young growing calves, and late maturity of the ruminant. The trematodes and cestodes groups had low prevalence in this study. However, their zoonotic and economic importance cannot be overemphasized. This result agrees with that of Olajide., *et al.* [15] who recorded a higher prevalence of nematodes (54.17%) in Akure, Nigeria.

The high prevalence of helminths infection observed in cattle (57.1%) than in goats (42.9%) could be linked to free-range grazing management which increases their chances of picking up the cyst, ova, larvae or the intermediate host of these gastrointestinal helminths parasites that were attached to the pastures. This result did not agree with that of Ntonifor., *et al*. [16] who had a higher prevalence of gastrointestinal parasites in goats (90.4%) than cattle (56.7%) in Cameroon. However, the result was in line with that of Sylvia., *et al*. [17] who reported a higher prevalence of gastrointestinal parasites in goats (96.7%) than cattle (33.0%) in Abeokuta, Nigeria.

The lack of variation in the prevalence of helminths infection in relation to gender suggests that the infections were not gender specific. Both male and female ruminants had equal likelihood of being infected with gastrointestinal parasites. One major factor that would have accounted for this is the fact that both the male and female cattle under the local setting in Nigeria are exposed to poor feeding and veterinary care, factors accountable for equal susceptibility to helminths infections.

Though earlier findings by Raza., *et al.* [18] indicated that the male cattle were more likely to be infected with helminths than the female, because male animals were more aggressive when feeding and thus likely to pick up more ova of helminths on the pasture. Furthermore, male domestic ungulates are said to be more susceptible to infections with gastrointestinal tract parasites than females due to hormones debilitating immune functions, which favor the growth and spread of parasites in male guts [19,20].

The higher prevalence of helminths infection in female ruminants (43.7%) than their male (38.5%) counterparts conforms to the report of Adedipe., *et al*. [21] who equally recorded a higher prevalence in female (41.25%) than in male (40.0%) ruminants in Ibadan.

Conclusion and Recommendation

The result of this study shows a high prevalence of gastrointestinal parasites infection of economic and zoonotic importance among the ruminants examined at Lafia modern abattoir. Therefore, ruminant livestock farmers should always administer drugs to their free range animals.

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