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PREVALENCE OF GASTROINTESTINAL PARASITES IN BOER GOATS: A CAUSE OF PARASITIC GASTROENTERITIS

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ABSTRACT

The study was carried out in Kashere, Akko Local Government Area of Gombe State to determine the prevalence of gastrointestinal parasites in Boer goats. The goats are managed under semi intensive management. A Stoll's ova dilution technique was used for faecal egg count. The overall prevalence of helminthes found in this study was high (63.33%). The prevalence varies across the different species of parasites: *Ascaris lumbricoides* having the highest incidence (63.33%) followed by *Fasciola hepatica* 60.00% and *Strongyloides* species (55.55%). Others parasites include *Taenia ovis* and *Trichuria ovis* having 40.00% each. The least prevalence was recorded in *Eimeria spp* with (35.00%). Mean egg count was also influenced by both age and sex of the animals. The incidence was higher in females (647eggs/gram) compared to the males (399eggs/gram). Similarly, the prevalence was also higher in kids than in the adult animals. It was concluded that there was a high prevalence of helminthes in the study area and the isolates are of economic importance that can affect the productivity of the animals. It is therefore recommended that good husbandry operations can reduce the incidence of parasites and the animals should be dewormed at regular intervals with a broad spectrum anthelmintic.

Keywords: Boer, Goats, Helminthes, Prevalence, Nigeria

INTRODUCTION

Goats are excellent meat producers for human consumption because of their short gestation intervals and absence of religious taboos associated with their meat (Ojewola and Onwuka, 2001). They are rich sources of protein and can help bridge the gap of protein malnutrition among consumers as well as important source of income and livelihood to rural farmers. It has been documented that goats are the principal domesticated small ruminants in terms of total numbers and production of food and fibre products (Adejinmi *et al.*, 2015). They produce a considerable amount of manure, which is of special importance in those areas where cattle are of lesser importance.

Growth and productivity of the exotic goats imported into the country is affected by mostly environmental factors and parasites. Boer goats imported into the country suffers gastrointestinal parasitic infections which was believed to be affecting small ruminants world-wide and particularly Sub-Saharan Africa due to the availability of a wide range of agro-ecological zones suitable for diversified hosts and parasite species (Boes *et al.*, 2000).

Small ruminants in Nigeria are reared extensively where the animals scavenge over great distances. This often exposes such animals to high levels of infestations. Gastrointestinal parasites are known to be widespread in the country (Ovutor *et al.*, 2014) and this affects the overall productivity of the animals in many parts of the country (Ovutor *et al.*, 2014). The direct losses caused by these parasites

are attributed to death, premature delivery and rejection of some parts of the meat, whilst indirect losses include are not limited only to productive potentials such as decreased growth rate, weight loss, diarrhea, anorexia and sometimes anaemia (Ozung *et al.*, 2011).

Considering the importance of Boer goats and their crosses in Nigeria little or no information is available on the prevalence of parasites in the country. Therefore, this research will be of importance to both farmers and government simply by providing a baseline information to both academics and sustainable agricultural development program.

Study Area

The study was conducted in Kashere and is located in Akko Local Government area of Gombe state. It is located along 9°46'0"N and 10°57'E and with a population of 77,015 (NPC, 2006). The annual rainfall of Kashere ranges from between 800mm to 900mm per annum. it is characterized by two distinct dry season (October-May) and rainy season (June-September). The annual temperature ranges from 32-37 °C.

Faecal Samples Collection

A total of 60 Faecal samples were collected directly from the animals using harness bags for examination and were transferred into faecal sample bottles containing formalin and were transported to the Biological Sciences Laboratory, Federal University of Kashere for further processing and analysis.

Laboratory Procedures

Samples were processed and tested under microscope through Stoll's ova dilution technique. Two smears were prepared from each sample. Faecal egg counts per gram (EPG) were determined following modified egg counting technique described by Soulby (1982). Eggs of different helminthes were identified by their morphological characteristics under a compound microscope (10x) as described by (Rahman and Hussain, 1997).

Data Analysis

The data were analyzed using simple descriptive statistics as contained in Statistical analytical system V. 9.4 (SAS, 2010). The mean egg counts, standard deviation and standard error of means were also computed and presented in form of Tables.

RESULTS AND DISCUSSION

Overall Prevalence of Helminthes in Boer Goats

The present study revealed high prevalence (63.33%) of gastrointestinal helminthes (Table 1). Fifty three animals which represent 88.35% were found to have single or multiple gastrointestinal helminthes. The high prevalence recorded might be due to high moisture which make it suitable for the survival of the infective stage of the parasites to hatch and develop to the infective stage outside the host. The current study was similar to the reports of Gadahi *et al.* (2009) and Emiru *et al.* (2013) who reported higher prevalence of gastrointestinal helminthes, but the values was significantly lower to the prevalence reported by Khajuria *et al.* (2013).

The most prevalent faecal eggs identified were that of *Ascaris lumbricoides* 63.33% which recorded the highest prevalence. Others were *Taenia ovis* and *Trichuris ovis* had 40% each, *Fasciola hepatica* (60%), *Strongyloides papillosus* (55%) while *Eimeria christenseni* (35%) had the least prevalence (35%). Mean egg count per gram ranges from 427±171.33 to 531±177.54eggs/gram with *Ascaris lumbricoides* having the highest while the least was observed in *Eimeria christenseni*. These values were lower to the findings of Mazid *et al.* (2006) who reported high infestation value (94.7%) of multiple gastrointestinal infections. The value is also lower to the reports of Poddar *et al.* (2017). This

might not be unconnected with the variations in climatic conditions of the two environments and the management strategies of the animals.

Table 1: Overall Prevalence of Helminthes in Boer Goats in Kashere, Gombe State.

Helminthes	Number infected	Prevalence (%)	Minimum Egg Count	Maximum Egg count	Mean Egg count
<i>Ascaris lumbricoides</i>	38(60)	63.33	518	543	531±177.54
<i>Eimeria christenseni</i>	21(60)	35.00	427	452	440±165.11
<i>Taenia ovis</i>	24(60)	40.00	417	460	438±158.97
<i>Trichuris ovis</i>	24(60)	40.00	401	453	427±171.33
<i>Strongyloides papillosus</i>	33(60)	55.00	511	526	517±186.24
<i>Fasciola hepatica</i>	36(60)	60.00	487	505	498±175.13

Effect of age on the prevalence of gastrointestinal helminthes in Boer goats

The result showed a higher infestation in the young than the older animals (Table 2). Prevalence of all parasites was higher in the younger kids than the older adults. In kids, *Strongyloides papillosus* had the highest prevalence of 80.33% and the least prevalence was *E. christenseni* (20%) with mean egg counts of 620eggs/gram and 374eggs/gram respectively. In adult animals *Ascaris lumbricoides* had the highest prevalence than other parasites. This corroborates the reports of Poddar, *et al.* (2017), Singh *et al.* (2013) and Asif *et al.* (2007) who reported higher infestation in younger animals from India, Pakistan and Islamabad. On the contrary, Lathamani *et al.* (2016) reported a lower infestation in adult animals. However, the lower infestation recorded in the current study in the adults might be due to the acquired immunity and repeated exposure while the young animals are more susceptible to different parasitic infection due to low immune system. Asanji and Williams (1987) also reported that young animals are highly susceptible to immunological immaturity and immunological unresponsiveness.

Table 2: Effect of age on the prevalence of gastrointestinal helminthes in boer goats

Age	Helminthes	Number infected	Prevalence (%)	Minimum Egg Count	Maximum Egg count	Mean Egg count
Adult >5months	<i>Ascaris lumbricoides</i>	6(15)	40.00	471	483	477
	<i>Eimeria christenseni</i>	2(15)	13.33	383	391	387
	<i>Taenia ovis</i>	4(15)	26.67	342	366	354
	<i>Trichuris ovis</i>	4(15)	26.67	454	460	457
	<i>Strongyloides papillosus</i>	2(15)	13.33	460	467	479
	<i>Fasciola hepatica</i>	3(15)	20.00	357	359	361
Young <5months	<i>Ascaris lumbricoides</i>	8(15)	63.33	630	640	635
	<i>Eimeria christenseni</i>	3(15)	20.00	345	403	374
	<i>Taenia ovis</i>	5(15)	33.33	555	571	563
	<i>Trichuris ovis</i>	6(15)	40.00	408	488	448
	<i>Strongyloides papillosus</i>	12(15)	80.33	625	639	632
	<i>Fasciola hepatica</i>	11(15)	73.34	600	640	620

Effect of sex on the prevalence of gastrointestinal helminths in boer goats

The results observed that sex had influence on the prevalence of the parasites (Table 3). Infection was higher in females compared to males. Highest egg count was recorded in *A. Lumbricoides* 647±250.33 in females whereas *Strongyloides papillosus* and *Fasciola hepatica* were the most prevalent in males. The present findings in accordance with the report of Das *et al.* (2017) who reported a predominance of strongyloides spp in male goats of India. It also agrees with the findings of Raza *et al.* (2007) and Nwige *et al.* (2013) who reported a higher prevalence rate of helminthes and protozoan parasites (*A. lumbricoides* and *strongyloides*) in females than in male goats as well as in cattle.

Table 3: Effect of sex on the prevalence of gastrointestinal helminthes in boer goats

Sex	Helminthes	Number Infected	Prevalence (%)	Minimum Egg Count	Maximum Egg count	Mean Egg count
Male	<i>Ascaris lumbricoides</i>	11(15)	73.33	353	377	365
	<i>Eimeria christenseni</i>	8(15)	53.33	316	344	330
	<i>Taenia ovis</i>	6(15)	40.00	237	303	270
	<i>Trichuris ovis</i>	6(15)	40.00	321	366	344
	<i>Strongyloides papillosus</i>	9(15)	60.00	368	399	399
	<i>Fasciola hepatica</i>	10(15)	66.67	359	373	373
Female	<i>Ascaris lumbricoides</i>	13(15)	86.67	621	673	647
	<i>Eimeria christenseni</i>	8(15)	53.33	666	670	668
	<i>Taenia ovis</i>	9(15)	60.33	534	602	568
	<i>Trichuris ovis</i>	8(15)	53.33	424	500	462
	<i>Strongyloides papillosus</i>	10(15)	66.67	580	592	586
	<i>Fasciola hepatica</i>	12(15)	80.00	634	662	648

CONCLUSION

In conclusion, high prevalence of gastrointestinal parasites has been found in boer goats in Kashere. Therefore, this burden of high prevalence needs to be checked periodically. Regular control measures should be practiced and farmers' education on the proper use of anti-helminthic should be a priority. High standard of sanitation and modern animal husbandry will also prevent exposure of the goats to the parasites.

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STATEMENT OF ANIMAL RIGHTS

Institutional Animal Ethics Committee has approved the use of these experimental animals.

COMPETING INTEREST

The authors declare that there is no competing interest.

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