
OCCURRENCE OF SMALL RUMINANT GASTROINTESTINAL PARASITES IN ENUGU NORTH, NIGERIA

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ABSTRACT

Small ruminants such as sheep and goats are highly susceptible to various parasitic infections, which can have a significant impact on their overall health and productivity. These parasites can cause a range of health issues, including the transmission of other diseases, and can also weaken the immune system of their hosts, leaving them more vulnerable to secondary bacterial infections. Hence, it is crucial to have a comprehensive understanding of the prevalence of these parasites for effective management of small ruminants and to prevent disease outbreaks. Therefore, the occurrence of gastrointestinal parasites in small ruminants (sheep and goats) in Enugu North Senatorial Zone, Enugu State, Nigeria, was determined. A total of 120 faecal samples were collected and analyzed for the presence of gastrointestinal parasites using standard laboratory techniques. The parasite eggs were identified based on their morphological features using a parasitological atlas. An overall occurrence rate of 40% (n = 48) was recorded. Based on species, an occurrence rate of 40.2% (n = 45) and 37.5% (n = 3) were obtained for goats and sheep, respectively. Among the parasites detected, strongyles had the highest rate of occurrence (85.42%; n = 41), while the parasites with the least occurrence were paramphistomum and trichuris (2%; n = 1), respectively. The parasite had the highest occurrence in the males (ram: 50% and buck: 50%), 4½-year-old (52%) animals, and as a single infection (67%). Chi-square analysis showed that there was no association ($p > 0.01$) between the occurrence rate in relation to species, sex, age, and type of infection, but a significant difference was found between breed and occurrence of gastrointestinal parasites.

Keywords: gastrointestinal parasite, small ruminants, Enugu state.

INTRODUCTION

Sheep and goats are essential component of livestock industry in Nigeria. They are raised for meat, milk, and wool, and their production plays a significant role in the livelihoods of many rural households (Chukwudi *et al.*, 2020). Sheep and goats are prone to a variety of parasitic infections that can significantly impact their health and productivity. Among these parasites are ectoparasites and endoparasites, which cause skin and gastrointestinal problems, respectively. Ectoparasites, such as ticks, lice, and mites, are arthropods that live on the skin or hair of animals and can transmit diseases, while endoparasites live inside the body of their host, typically in the gastrointestinal tract. These gastrointestinal parasites cause a range of health problems in small ruminants, such as anaemia, weight loss, poor growth, and reduced milk production (Rizwan *et al.*, 2021). They can also transmit diseases and compromise the immune systems of their hosts, making them more susceptible to secondary bacterial infections (Batool *et al.*, 2022). The prevalence of ectoparasites and endoparasites in small ruminants has been a subject of interest to researchers, veterinary practitioners, and animal health policymakers. In Nigeria, several studies have been conducted on the prevalence of ectoparasites and endoparasites in small ruminants (Karshima and Karshima, 2020); however, there is limited information on the prevalence of endoparasites in these animals in Enugu State. Understanding the prevalence of these parasites is critical for the effective management of small ruminants and the prevention of disease outbreaks (Ani and Nshiwu, 2015). This study aims to investigate the occurrence of gastrointestinal parasites in small ruminants in Nsukka, Enugu State.

Material and Methods

The study was carried out in Nsukka agricultural ecological zone of Enugu State, Nigeria, where the predominant farming system centres around an extensive livestock production approach. This study used a cross-sectional design to determine the occurrence of gastrointestinal parasites in small ruminants.

A total of 120 small ruminants were randomly selected from farms and abattoirs in Nsukka. Fresh faecal samples of 4 to 5g were collected from each animal directly from the rectum into a faecal sample container. These were adequately labelled and transported to the Department of Veterinary Parasitology and Entomology Laboratory, University of Nigeria, Nsukka, for laboratory analysis using the faecal flotation technique (Hendrix *et al.*, 2006). The parasite eggs were identified based on their morphological features using a parasitological atlas. The occurrence of each parasite species identified was calculated.

Data Analysis: The data was summarized with SPSS v20. Pearson's chi-squared test was used to check for an association between the occurrence of gastrointestinal parasites within each variable (age, species, breed, and sex). The significance level of alpha was set at $p < 0.01$.

Results

Out of the 120 sheep and goats sampled, gastrointestinal parasites occurred in 40% of the faecal samples. Five genera of gastrointestinal parasites were identified, of which strongles eggs had the highest occurrence rate of 85.2% and the least, Trichuris and Paraphistomum, with occurrence rates of 2% each (Table 1). Based on species, sex, breed and age, the following: 40.2% of caprine; 50% of buck, 50% of ram; 100% of Sahel and 52% of 4½ year animals had the highest occurrence rate (Table 2). Based on the type of infection, a single infection had the highest occurrence rate of 67% (Fig 1). There was a significant association between the occurrence of gastrointestinal parasites and the breed of animal ($P = 0.006$).

Table 1. Occurrence of gastrointestinal parasite in small ruminants in Nsukka Agricultural Zone

Parasite	Number (%) of animals infected (N = 120)	Frequency of occurrence (N = 73 isolate)
Strongyloid	18 (37.5%)	24.66%
Coccidia	12 (25%)	16.44%
Strongyles	41 (85.42%)	56.16%
Trichuris	1 (2%)	1.37%
Paraphistomum	1 (2%)	1.37%

Table 2. Occurrence of gastrointestinal parasite in small ruminants examined in Nsukka Agricultural Zone based on species, sex, age, and breed.

		No of animal	No infected (%)	Pearson Sq/Correlation	Chi- P value
Specie	Ovine	8	3 (37.5%)	.678	0.526
	Caprine	112	45 (40.2%)		
Sex	Ovine	Female	6	2 (33.3%)	0.520
		Male	2	1 (50%)	
	Caprine	Female	110	44 (40%)	
		Male	2	1 (50%)	
Breed	Ovine	WAD	5	2 (40%)	0.006*
		Yankass	3	1 (33.3%)	
	caprine	RS	108	44 (40.74%)	
		Sahelian	1	1 (100%)	
		WAD	3	0	
Age	Less than 1	5	2 (40%)	-.066	0.474
	1½	12	6 (50%)		
	2½	51	17 (33.3%)		
	3½	23	8 (34.8%)		
	4½	25	13 (52%)		
	Unsure	4	3 (75%)		

*Correlation is significant at the 0.01 level (2-tailed).

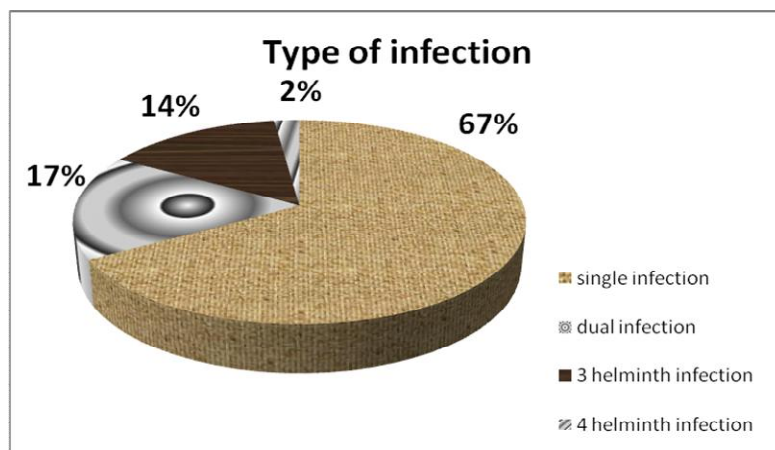


Figure 1. Pie chart showing the distribution of type of gastrointestinal parasite infection in small ruminants examined in Nsukka Agricultural Zone

Discussion

The occurrence of gastrointestinal parasites recorded in this study is 40%. This is comparable to the 38.6% prevalence rate reported in Port-Harcourt (Abah *et al.*, 2022) and the 40.0% prevalence estimated in Nigeria (Jegade *et al.*, 2015). Oyewusi *et al.* (2017) reported a higher prevalence rate of 51.46% in Abeokuta, Nigeria. This high rate may be attributed to poor management practices (poor hygienic conditions, inadequate grazing, poor nutrition and overcrowding) and climatic factors (Williamson *et al.*, 2011).

This study revealed strongyles, coccidia, *Strongyloides* spp, *Paramphistomum* spp, and *Trichuris* spp as the most prevalent gastrointestinal parasites affecting sheep and goats in Enugu state. This implies that infections due to nematodes accounted for most of the animals examined. This is per the report of Whittier *et al.* (2009) who stated that the commonly encountered and prevalent helminth parasites of veterinary importance are nematodes. Coccidia detected in all age groups and sex suggests its wide distribution in small ruminants in the study area. This finding is in line with the reports of Yakhchali and Golami (2008) and Hashemnia *et al.* (2014) who reported that coccidia species are frequently observed in small ruminant faecal samples.

Gender-based analysis revealed higher occurrence rates among males (50%) compared to females (39.66%), while age-based analysis revealed higher occurrence rates among the 4½ age group, although their associations were not statistically significant. These suggest a notable gender disparity in infection rates, but no discernible age-related patterns in the prevalence of gastrointestinal parasites among the studied sheep and goats. This finding is not in tandem with the report of Lopes *et al.* (2013). Notably, the observed significant association in gastrointestinal parasite occurrence among the various breeds suggests the relevance of genetic factors in assessing susceptibility in both sheep and goats. This may also have been due to the limited sample size used in the study.

This study also revealed a single infection with gastrointestinal parasites as the highest form of occurrence. This disagrees with the report of Win *et al.* (2020) who reported mixed infection as the highest type of infection.

Conclusion

The present study has brought to light a marked prevalence of gastrointestinal parasites among small ruminants in the Enugu North Senatorial zone. As a result, it is imperative to routinely administer suitable anthelmintic to these animals to reduce their worm load. This proactive measure will help prevent any weakening of their immune systems and ultimately enhance their overall productivity. Additionally, implementing better management practices such as improved hygiene, proper grazing, and good nutrition can help mitigate the impact of these parasites.

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