

**SURVEY ON GASTROINTESTINAL HELMINTHS IN PIGS SLAUGHTERED AT IKPA
SLAUGHTERHOUSE NSUKKA, ENUGU STATE**

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ABSTRACT

*Livestock farming plays a vital role in agriculture, significantly contributing to the economy and providing essential proteins through meat production. However, parasitic infections can greatly impact livestock productivity, which presents serious health challenges and economic burdens. This study evaluated gastrointestinal parasites in pigs slaughtered in Nsukka, Enugu State, Nigeria. A total of 103 faecal samples from 58 boar and 45 sows were collected and analyzed for the presence of gastrointestinal parasites using flotation technique. An overall occurrence rate of 60.2% was found. Four genera of helminth parasites were detected: *Schistosoma* spp., *Oesophagostomum* spp., *Ascaris* spp., and *Trichuris* spp. Among them, *Ascaris* spp. showed the highest occurrence rate at 61.3% (n=38). Additionally, boars exhibited an infection rate of 58.6%, and pigs aged 7 to 12 months had an infection rate of 62%. Chi-square analysis indicated no significant association ($p > 0.05$) between the occurrence rate and the sex or age of the pigs. The results of this study highlight a high prevalence of gastrointestinal parasitic infections among pigs in Nsukka, indicating a potential risk of cross-infection with humans, as most of the identified parasites are zoonotic. In conclusion, it is essential to implement effective control measures, such as extension programs for stakeholders and farmers in the area, to raise awareness about the importance and economic benefits of effectively managing gastrointestinal parasites in pigs.*

Keywords: Gastrointestinal helminths, Pigs, Enugu state.

INTRODUCTION

Pigs play a crucial role in agriculture due to their high reproductive rates and efficient feed conversion ratios. In Southeastern Nigeria, pig farming is a vital economic activity, with many smallholder farmers relying on it as a primary source of income. This practice offers a relatively quick return on investment compared to other livestock. In Nsukka region of Enugu State, pig farming is deeply integrated into the livelihoods of many rural households, contributing to food security, income generation, and agricultural sustainability in these areas, allowing families to access better education and healthcare. Additionally, pork consumption helps address malnutrition and promotes better health outcomes (Nwanta *et al.*, 2011). Due to the relatively low pig production cost, pork is an affordable protein source for many households. Furthermore, pig manure is an excellent organic fertilizer that enhances soil fertility and crop yields, promoting sustainable agriculture (Loss *et al.*, 2019). However, parasitic infections significantly affect pig productivity, which poses serious health and productivity challenges and economic burdens/losses due to decreased productivity, increased mortality, and higher veterinary costs (Kagira *et al.*, 2012). Understanding the prevalence and impact of gastrointestinal parasites on pigs is essential for developing effective control strategies and improving livestock productivity.

MATERIALS AND METHODS

This study was conducted in Nsukka, Enugu State, Nigeria, from March to June 2024, during which faecal samples were collected per rectum from 103 randomly selected pigs presented for slaughter at the Ikpa slaughterhouse and appropriately labelled. The age and sex of the pigs were recorded. The dentition method was used to determine their ages (the presence of the erupting molar tooth). The samples were transported in leak-proof containers with ice packs to the Department of Veterinary Medicine Laboratory, University of Nigeria, for parasitological examination for the presence of gastrointestinal helminth using the flotation technique as outlined by Dryden *et al.* (2005). Parasite eggs were identified based on morphological characteristics (Soulsby, 1982).

Data Analysis

The data collected were analyzed with SPSS v20. Pearson’s Chi-square test and Odds Ratio (OR) were employed to assess the association between the occurrence of gastrointestinal helminths and specific variables (age and sex) and to evaluate the likelihood of occurrence, respectively. A significance level of $p \leq 0.05$ was considered.

RESULTS

The study revealed the occurrence of gastrointestinal helminth in 62 out of the 103 pigs sampled given an occurrence rate of 60.2%. Four helminth ova were detected: *Schistosoma spp.*, *Oesophagostomum spp.*, *Ascaris*, and *Trichuris spp.*, with *Ascaris spp.* having the highest occurrence rate of 61.3% (n=38). Table 1 and Figure 1 present the distribution and images of the helminth eggs identified in faecal samples. The analysis of the sex and age distribution of the sampled pigs, shown in Table 2, indicated that boars and sows aged 7 to 12 months had higher occurrence rates of 58.62% and 62%, respectively, but no significant associations were found. The Odds Ratio indicated a higher likelihood of infection in these categories.

Table 1. Distribution of Helminth Eggs Found in Pigs Slaughtered at Ikpa market in Nsukka

Helminthes Identified	No (%) of animals infected (N=103)
Overall	62 (60.2%)
<i>Ascaris</i>	38 (61.3%)
<i>Schistosoma</i>	3 (4.8%)
<i>Oesophagostomum</i>	16 (25.8%)
<i>Trichuris</i>	5 (8%)

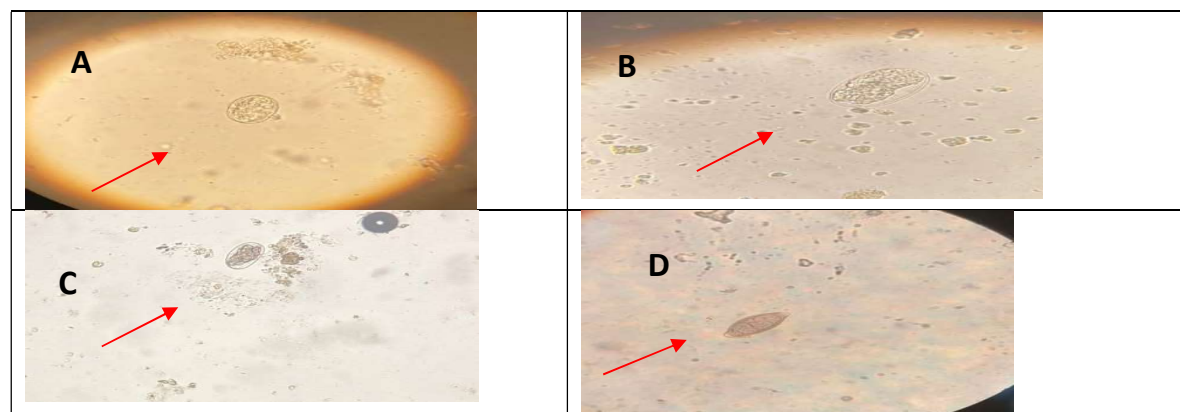


Figure 1. Images of Helminth Eggs

KEYS: A = *Schistosoma* egg, B = *Oesophagostomum* egg, C = *Ascaris summ* egg and D = *Trichuris* egg

Table 2. Sex and Age Distribution of Pigs Sampled at Ikpa Market in Nsukka.

Variables	No infected (%)	No of negative	Chi-Square	Odd Ratio	95% CI	P -value
	62 (60.2%)	41				
Sex						
Boar	34 (58.62%)	24	0.028	0.86	0.35 - 2.05	0.867
Sow	28 (41.38%)	17				
Age						
7-12 months	59 (62%)	37	0.94	2.11	0.36 – 2.05	0.367
12 months & above	3 (43%)	4				

DISCUSSION

The occurrence of helminth eggs in pigs at the Ikpa Slaughterhouse, Nsukka, was found to be 60.2%, significantly higher than the 24.1% and 28.6% reported by Wosu (2015) and Abonyi and Njoga (2019) in similar studies in Enugu State in pigs 7 to above 12 months of age. This rise may be attributed to

inadequate control measures and the usage of unprescribed drugs by farmers to reduce veterinary costs, leading to anthelmintic resistance (Njoga *et al.*, 2018; Chukwudi *et al.*, 2020). This study identified helminth eggs belonging to *Ascaris spp.*, *Schistosoma spp.*, *Oesophagostomum spp.*, and *Trichuris spp.* as reported by other researchers (Abonyi and Njoga, 2019; Bernard *et al.*, 2021). Notably, *Schistosoma* eggs had not been reported in previous studies of pig faecal samples. *Schistosoma* species, known as blood flukes, reside in the blood vessels where females release eggs which can cause significant pathology, as they migrate through tissues to reach the intestines' lumen or bladder for excretion (Costain *et al.*, 2018). The disease caused by this parasite is zoonotic which is considered by the World Health Organization to be the second-most socioeconomically devastating parasitic disease after malaria, affecting hundreds of millions worldwide (WHO, 2011). Pigs are essential in transmitting this infection to humans and are used in schistosomiasis research (Johansen *et al.*, 2000).

The high prevalence of *Ascaris spp.* in this study can be linked to their resilience and high fecundity as reported by Abonyi and Njoga (2019). Zoonotic transmission has been documented, particularly from *A. suum* in pigs to humans (Betson *et al.*, 2014). *Trichuris suis* and *Oesophagostomum spp.* primarily infect the large intestine of pigs, with *Trichuris* attaching to the mucosa and feeding on tissue and blood, while *Oesophagostomum* forms nodules in the intestinal wall (Roepstorff *et al.*, 2011). *Ascaris suum*, *Schistosoma spp.*, and *Trichuris suis* are notable global zoonotic parasites. The risk of cross-infections is heightened in areas where pigs and humans coexist, such as in rural areas or among pig farmers (Onunkwo *et al.*, 2018) and the use of pig dung as manure for vegetable plants consumed by humans further increases this risk.

The age of the pigs influenced the occurrence of helminth infections with pigs aged 7-12 months showing a higher infection rate than those over 12 months with an odds ratio of 2.11 (95% CI: 0.36 - 2.05). This trend is consistent with findings from Abonyi and Njoga (2019), indicating that younger pigs are more vulnerable due to their developing immune systems (Bernard *et al.*, 2021). The occurrence of helminth eggs was slightly higher in boars than in sows, but the difference was not statistically significant. Some studies reported higher rates in females due to lower immune responses during pregnancy and lactation (Nissen *et al.*, 2011; Abonyi and Njoga, 2019). This study's lack of significant differences indicates that management practices and environmental factors may influence infection rates more than sex.

CONCLUSION

This study revealed an overall occurrence rate of 60.2% for helminth eggs among pigs at the Ikpa Slaughterhouse, Nsukka with young pigs (7-12 months) and boars having a higher occurrence rate. Zoonotic GI parasites identified pose public health risks, especially in areas where pigs and humans live in close contact or where pig dung is used as manure on vegetables meant for human consumption, which is common practice in the study area. Therefore, it is crucial to educate farmers about preventing zoonotic parasites. Regular deworming, responsible use of anthelmintics, and improved management and hygiene practices in pig farms are essential for protecting public health and animal welfare.

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