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Cross-Sectional Study of Gastrointestinal Parasitic Infections in Small Ruminants Slaughtered at Wudil Slaughter Slabs, Kano State, Nigeria

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Abstract
Gastrointestinal (GI) parasites remain a major constraint to small ruminant production due to their negative impacts on health, productivity, and economic returns. This study determined the prevalence and economic significance of GI parasites among goats slaughtered at Wudil town, Wudil Local Government Area (LGA), Kano State. A total of 230 fecal samples were collected and examined using the Rapid Baermann technique. Data were analyzed descriptively, and associations between infection and selected variables (age, location, and breed) were tested using chi-square statistics. Results showed that 127 (55.3%) goats tested positive for GI parasites. Adults were more infected (64.0%) than young goats (41.7%). *Haemonchus spp.* was the most common parasite (26.8%), followed by *Strongyloides spp.* (18.1%). Fasciolosis accounted for the highest frequency of organ condemnation (72%). Significant associations were observed between infection and both age ($\chi^2 = 10.15$; $p = 0.0014$) and breed ($\chi^2 = 23.83$; $p<0.0001$), while location showed no significant association. The study highlights the need for improved management practices, routine deworming, and enhanced slaughter slab hygiene.

Keywords: GIT, Intestine, infection, Kano, parasites, prevalence, Wudi

Introduction

Goats play an important role in Nigeria's agricultural economy. They serve as a source of meat, milk, hides, manure, and income, especially in rural communities (Ojewela & Onwuka, 2001) [8]. Their adaptability to harsh environments and short reproductive cycles make them suitable for smallholder farming systems.

Despite their value, goat productivity is significantly reduced by several factors, lincluding diseases, poor nutrition, and inadequate management practices. Gastrointestinal parasites are particularly important because they cause both clinical and subclinical infections, reducing growth rate, feed efficiency, and causing morbidity and mortality (Ozung *et al.*, 2011) [10].

In sub-Saharan Africa, the warm and humid climate favors the survival of various parasitic species, leading to high prevalence rates among small ruminants (Boes *et al.*, 2000) [5]. The extensive management system commonly practiced in Nigeria increases exposure to contaminated grazing areas, water sources, and communal grazing fields (Ovutor *et al.*, 2014) [9].

Given the economic and public health significance of GI parasites, continuous monitoring is essential for effective control strategies. This study therefore assessed the prevalence and economic impact of GI parasites in goats slaughtered at Wudil LGA, Kano State.

Study Area

The study was conducted at the slaughter slabs located in Sabon Gari Wudil and Darki wards, within Wudil Local Government Area of Kano State, Nigeria. Wudil LGA lies approximately 40 km southeast of Kano metropolis Nigeria. It is situated within the Sudan Savannah ecological zone with annual rainfall of 800-1000 mm, temperatures of 20-40 °C, and two distinct seasons. The major occupation is farming, and the slaughter slabs receive goats from multiple communities. The slaughter slabs receive goats from within Wudil and surrounding areas, making them suitable for epidemiological sampling due to the diversity of goats brought for slaughter.

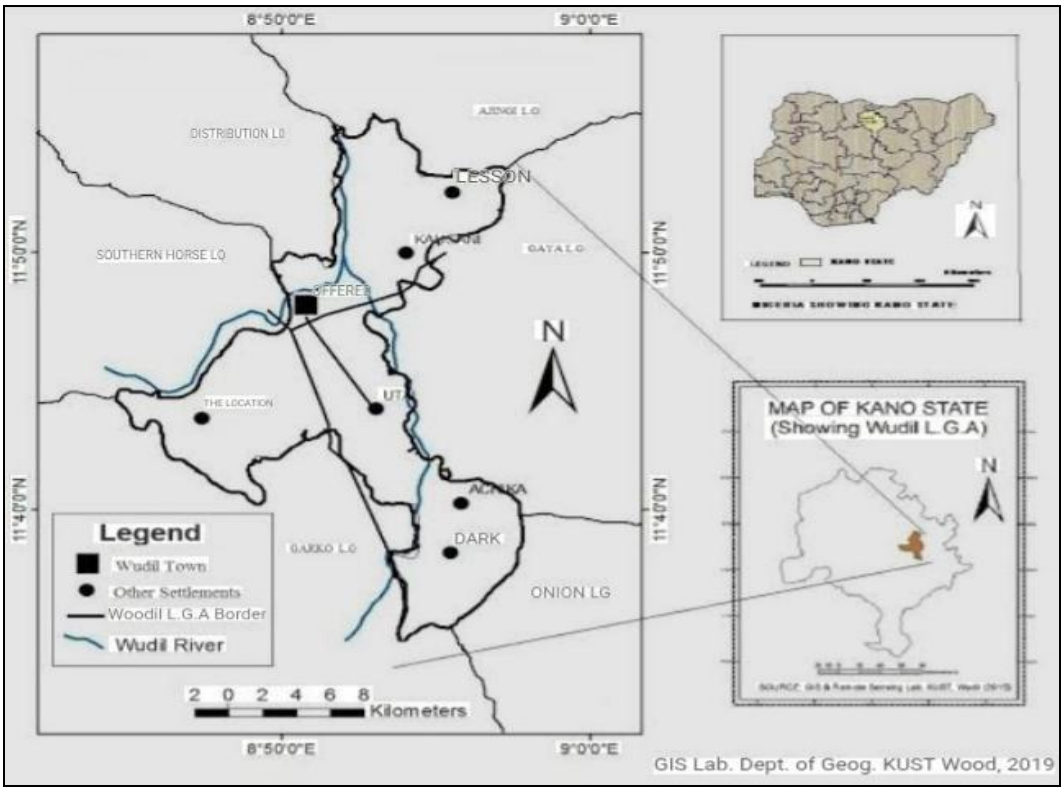

Fig 1: Map of the study area

Materials and Methods

Study Animals

Goats of different ages, sexes, and breeds brought to the slaughter slabs were included.

Study Design

A cross-sectional study was conducted. Simple random sampling was used to select animals. Sample size determination followed Thrusfield (2007) [11].

Sample Collection

Fresh fecal samples were collected directly from the rectum using sterile gloves, placed in labeled sterile bags, and transported to the laboratory for analysis.

Sample Processing

The Rapid Baermann Technique (Baermann, 2016) [3] was used: 1-2 g of feces was mixed with 10-20 mL saline in a container. Mixture was filtered into a Baermann funnel. Sample stood for 30 minutes to 2 hours. Sediment was examined under a microscope for parasite eggs and larvae

Data Analysis

Descriptive statistics (percentages) were used to determine prevalence. Chi-square tests (χ^2) assessed associations between infection and age breed and location of slaughter

Results

Table 1: Overall prevalence of gastro-intestinal parasites in goats at Wudil town, Wudil Local Government Kano state

Examined	Positive	Percent
230	127	55.3

Table 2: Parasites-Specific Prevalence

Parasite	Occurrence (n)	Prevalence (%).
Haemonclus spp.	34	26.8
Strongloides spp.	23	18.1
Tricluris spp.	21	16.5
Eimeria spp.	22	17.3
Entamoeba spp.	11	8 .7
Moniezea spp.	16	12.6
Total	127	100

Table 3: Prevalence by Location

Location Examined	Positive	Prevalence (%).
Sabon Gari Wudil 140	84	64.1
Darki Ward 90	43	47.7

Chi-square: $\chi^2 = 2.83$, $p = 0.0923$ (Not significant)

Table 4: Prevalence by Age

Age Examined	Positive	Prevalence (%).
Young 91	38	41.7
Adult 139	89	64.0

Chi-square: $\chi^2 = 10.15$, p = 0.0014 (Significant)

Table 5: Breed-based Prevalence

Breed Examined	Positive	Prevalence (%).
West African Dwarf 129	90	56.1
Kano Brown 101	37	43.9

Chi-square: $\chi^2 = 23.83$, $p<0.0001$ (Highly significant)

Table 6: Disease Conditions and Corresponding Organ Condemnation

Disease /Organ Condemned	Frequency	Prevalence (%).
Fasciolosis, Duodenum	36	72
Gastroenteritis, Stomach	31	6.2
Lungworm infection, Lungs	20	4.0
Schistosomiasis, Intestine	27	5.4
Paramphistomosis, D. Mucosa	14	2.8

Discussion

The overall prevalence of 55.3% indicates a high burden of GI parasites among goats in Wudil LGA. This agrees with similar studies in Africa and Asia, where prevalence ranges from 40-70% (Ayaz *et al*., 2013; Lone *et al*., 2012) [2, 7]. The extensive management system and exposure to contaminated pastures likely increased infection risk.

Haemonchus spp. was the most prevalent parasite, consistent with findings by Besier *et al*. (2016) [4] who reported its dominance in tropical climates. *Haemonchus contortus* is a highly pathogenic blood-feeding nematode causing anemia and death.

Age had a significant association with infection, with adults having higher prevalence. This may be due to prolonged exposure and accumulation of infective larvae over time (Gupta *et al*., 1987) [6].

Breed also showed significant association. West African Dwarf goats exhibited higher prevalence, which may be due to environmental exposure, management practices, or physiological stress.

Organ condemnation, particularly due to fasciolosis, shows substantial economic losses. This aligns with reports by Azeem *et al.* (2008) [1] highlighting helminth-induced losses in small ruminants. Poor hygiene, contaminated feed, inadequate deworming, and lack of veterinary care were major contributors to the high prevalence observed. Improving management practices and implementing routine deworming programs could reduce infection rates.

Conclusion

The study demonstrates a high prevalence of gastrointestinal parasites in goats slaughtered in Wudil LGA. Adult goats and West African Dwarf breeds showed the highest infection rates. Fasciolosis was the leading cause of organ condemnation, indicating significant economic impact.

Recommendations

It is recommended that regular deworming programs using effective anthelmintics be implemented to reduce the burden of gastrointestinal parasites in goats. Farmers should adopt improved feeding practices and avoid grazing animals in contaminated areas to minimize exposure to infective stages of parasites. Hygiene and sanitation measures at slaughter slabs should also be strengthened to prevent environmental contamination and reduce the risk of parasite transmission. Furthermore, continuous farmer education and awareness programs on parasite prevention and control strategies are important for effective disease management. Future studies should be conducted during the dry season to enable seasonal comparisons and provide a more comprehensive understanding of the epidemiology of gastrointestinal parasites in the study area.

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