

Prevalence of Gastrointestinal Parasites in Goats and Sheep in Mbula Kuli, Adamawa State, Nigeria

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Abstract

Gastrointestinal (GI) parasitism is a major constraint to small ruminant productivity in Nigeria, causing reduced growth, weight loss, and economic losses to herders. This study assessed the prevalence of gastrointestinal parasites in goats and sheep in Mbula Kuli, Adamawa State, Nigeria, between 2025 and 2026. A total of 110 faecal samples (40 from goats and 70 from sheep) were collected and examined using the flotation method. Overall prevalence of gastrointestinal parasite infection was 77.3% (85/110), with goats (85.0%) showing a higher prevalence than sheep (72.9%). Parasites identified included *Trichostrongylus* spp., strongyle-type eggs, *Eimeria* spp. (coccidia), *Haemonchus contortus*, *Strongyloides papillosus*, *Trichuris ovis*, and *Moniezia expansa*. Infection was recorded across all eight animal-owning households sampled, indicating that parasite exposure is widespread across the community rather than confined to particular herds. These results highlight a high burden of gastrointestinal parasitism among small ruminants in the study area and underscore the need for regular deworming programmes and improved parasite management practices among livestock owners.

Keywords: gastrointestinal parasites; goats; sheep; prevalence; flotation method; Adamawa State; Nigeria

1. Introduction

Small ruminants, particularly goats (*Capra hircus*) and sheep (*Ovis aries*), play a pivotal role in the agricultural economy and food security of rural communities in Nigeria and across Sub-Saharan Africa. These animals contribute substantially to household protein supply through meat and milk, and to household income through sale and trade. Nigeria holds an estimated 76 million goats and 43 million sheep (FAOSTAT, 2021), making it one of the largest producers of small ruminants in Africa. In Adamawa State, small ruminants are a common feature of rural households, serving as a form of savings, social currency for cultural ceremonies, and a means of livelihood for millions of rural dwellers (Adebayo and Tukur, 1999).

Despite their economic and nutritional importance, the productivity of goats and sheep in Nigeria is significantly hampered by gastrointestinal parasitism, one of the most critical health constraints facing small ruminant producers. Gastrointestinal parasites derive nutrients at the expense of the host and cause a spectrum of pathological changes ranging from subclinical production losses to severe disease and death (Taylor, Coop and Wall, 2016). The warm and humid climatic conditions prevalent in much of Nigeria and Adamawa State favour the development and survival of infective parasite stages, making parasitism an endemic and pervasive challenge (Umar et al., 2014). Major gastrointestinal nematodes reported in small ruminants in Nigeria and tropical Africa include *Haemonchus contortus*, *Trichostrongylus* spp., *Oesophagostomum* spp., and *Strongyloides* spp. (Waller, 2006), while *Fasciola gigantica* is the most economically important trematode (Spithill, Smooker and Copeman, 1999).

Mbula Kuli is a rural community in Demsa Local Government Area of Adamawa State, situated near the Benue River floodplains, where goats and sheep are widely kept under extensive management systems that facilitate the transmission of gastrointestinal parasites. Despite the widespread keeping of small ruminants in Mbula Kuli, there has previously been no documented scientific data on the prevalence of gastrointestinal parasites in this community; existing Adamawa State studies have focused mainly on urban and peri-urban settings such as Yola and Ganye (Umar et al., 2014). This knowledge gap limits the ability of animal health workers and livestock farmers to design evidence-based parasite management strategies for the community. This study therefore reports the prevalence and species composition of gastrointestinal parasites of goats and sheep in Mbula Kuli, generating baseline data intended to support improved parasite management in the study area.

2. Materials and Methods

2.1 Study area

The study was conducted in Mbula Kuli, a rural community in Demsa Local Government Area of Adamawa State, Nigeria, situated in the Upper Benue Valley at approximately Latitude 9°27'20" N and Longitude 12°8'0" E. The area experiences a tropical wet-and-dry (Sudano-Saharan) climate, with a rainy season from May to October and a dry season from November to April; annual rainfall ranges from 600-1200 mm and temperatures range from 23-37°C. Its

proximity to the River Benue floodplains, which serve as primary communal grazing sites, creates conditions conducive to the survival and transmission of gastrointestinal parasites.

2.2 Ethical consideration

Verbal informed consent was obtained from pastoralists, herd owners, and livestock handlers prior to sample collection. Faecal sample collection was carried out in accordance with standard veterinary practice, with all procedures kept non-invasive, hygienic, and safe for the animals.

2.3 Sample collection

Between 2025 and 2026, faecal samples were collected from 110 small ruminants (40 goats and 70 sheep) belonging to eight households in Mbula Kuli. Samples were collected directly from the rectum of each animal using individual disposable gloves to prevent cross-contamination, placed into clean, pre-labelled plastic containers, and transported to the laboratory in an insulated cool box for processing.

2.4 Laboratory analysis

Faecal samples were examined qualitatively using the standard saturated sodium chloride flotation technique described by Soulsby (1982) to detect and identify parasite ova and oocysts. Identification of parasite taxa was based on the morphological characteristics of eggs and oocysts under light microscopy.

2.5 Data analysis

Data were compiled and analysed using descriptive statistics. Prevalence was calculated as the percentage of animals found positive for one or more gastrointestinal parasites relative to the total number examined, presented overall, by host species, and by animal-owning household.

3. Results

Of the 110 goats and sheep examined, 85 (77.3%) were positive for at least one gastrointestinal parasite, while 25 (22.7%) showed no evidence of infection.

3.1 Prevalence by host species

Goats recorded a higher prevalence of infection (85.0%; 34/40) than sheep (72.9%; 51/70), although both species were commonly affected (Table 1).

Host species	No. examined	No. positive (%)
Goats	40	34 (85.0%)
Sheep	70	51 (72.9%)
Overall	110	85 (77.3%)

Table 1. Prevalence of gastrointestinal parasites in goats and sheep in Mbula Kuli.

3.2 Parasite taxa identified

Among positive animals, seven parasite taxa were identified. *Trichostrongylus* spp. was the most frequently detected (19 positive animals), followed by undifferentiated strongyle-type eggs (13), *Eimeria* spp./coccidia (12), *Haemonchus contortus* (12), *Strongyloides papillosus* (10), *Trichuris ovis* (10), and *Moniezia expansa* (9) (Table 2).

Parasite taxon	No. of positive animals
<i>Trichostrongylus</i> spp.	19
Strongyle-type eggs (undifferentiated)	13
<i>Eimeria</i> spp. (coccidia)	12
<i>Haemonchus contortus</i>	12
<i>Strongyloides papillosus</i>	10
<i>Trichuris ovis</i>	10
<i>Moniezia expansa</i>	9

Table 2. Gastrointestinal parasite taxa identified among positive animals in Mbula Kuli.

3.3 Prevalence by animal-owning household

Infection was recorded in animals belonging to all eight households sampled, with household-level prevalence ranging from 67% to 100% (Table 3). This distribution indicates that parasite exposure was widespread across the community rather than confined to particular herds.

Owner	Goats	Sheep	Total tested	Positive (%)
Hamana Titus	20	5	25	22 (88%)
Disom Nbbilna Soko	8	0	8	8 (100%)
Kelvin Muzong	7	5	12	8 (67%)
Dbwamem Jessa	5	0	5	4 (80%)
Luka Simon	0	27	27	18 (67%)
Elisha Sinamoh	0	12	12	10 (83%)
Moses Muzong	0	15	15	10 (67%)
Bakaria Titus	0	6	6	5 (83%)

Table 3. Prevalence of gastrointestinal parasites by animal-owning household in Mbula Kuli.

4. Discussion

The overall prevalence of gastrointestinal parasites recorded in this study (77.3%) confirms that gastrointestinal parasitism is a widespread and significant health constraint among goats and

sheep in Mbula Kuli. This finding is broadly consistent with previous reports of high gastrointestinal parasite prevalence in small ruminants elsewhere in Nigeria (Adamu, Bui and Muhammad, 2012; Alade and Balami, 2014; Elele et al., 2013), and reflects the tropical climatic conditions and extensive grazing management practices that favour parasite transmission in the study area, including proximity to the Benue River floodplains (Fakae, 1990).

The higher prevalence recorded in goats (85.0%) compared with sheep (72.9%) is consistent with findings from other studies in Nigeria that have reported goats to be more susceptible to gastrointestinal parasitism than sheep under similar extensive management systems (Nwosu, Madu and Richards, 1996), possibly reflecting differences in grazing and browsing behaviour between the two species. The predominance of *Trichostrongylus* spp. and other strongyle-type nematodes among the parasites identified aligns with the wider literature on gastrointestinal nematodes of small ruminants in tropical Africa, where strongyle-type nematodes are consistently reported as the most prevalent group (Waller, 2006; Banwo et al., 2025). The detection of *Haemonchus contortus* in a substantial proportion of positive animals is of particular concern, given its blood-feeding activity and association with anaemia, hypoproteinaemia, and mortality, especially in young animals (Chiejina, 2001).

The presence of *Eimeria* spp. (coccidia) among the parasites identified is notable given its recognised impact on young stock, while the detection of *Moniezia expansa* reflects continued exposure of grazing animals to oribatid mite intermediate hosts on communal pastures. The finding that all eight sampled households had at least some animals testing positive suggests that parasite exposure in Mbula Kuli is a community-wide problem linked to shared grazing and water sources under the prevailing extensive management system, rather than being restricted to individual flocks.

This study relied on qualitative flotation examination rather than quantitative faecal egg counts, and was therefore able to determine the presence and frequency of parasite taxa but not the intensity of infection. Morphological identification of eggs and oocysts also cannot reliably distinguish between certain closely related nematode species, which would require larval culture or molecular methods (Paul et al., 2015). These represent limitations to be addressed in future work.

5. Conclusion

This study provides the first documented baseline data on the prevalence of gastrointestinal parasites in goats and sheep in Mbula Kuli, Adamawa State, Nigeria. A high overall prevalence (77.3%) was recorded, with goats more affected than sheep, and infection distributed across all sampled households in the community. *Trichostrongylus* spp., strongyle-type nematodes, *Eimeria* spp., and *Haemonchus contortus* were the most frequently identified parasites. These findings underscore the need for regular, community-wide deworming programmes and improved grazing and management practices to reduce the burden of gastrointestinal parasitism among small ruminants in the study area.

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References

- Adamu, M., Biu, A. A., and Muhammad, B. (2012). Prevalence of Gastrointestinal Parasites of Sheep and Goats in Maiduguri, Nigeria. *Journal of Veterinary Advances*, 2(1), 22-33.
- Adebayo, A. A., and Tukur, A. L. (1999). Adamawa State in Maps. Paraclete Publishers, Yola, Nigeria.
- Alade, A. A., and Balami, A. J. (2014). Prevalence of gastrointestinal parasites of small ruminants in semi-arid Nigeria. *Journal of Biology, Agriculture and Healthcare*, 4(15), 11-16.
- Banwo et al. (2025). A systematic review and meta-analysis of studies on the prevalence of gastrointestinal parasites among ruminants in Nigeria. *Folia Veterinaria*, 69(3), 1-15.
- Chiejina, S. N. (2001). The epidemiology of helminth infections of ruminants in Nigeria. *Nigerian Veterinary Journal*, 22(2), 1-18.
- Elele, K., Opara, M. N., Campbell, B. M., and Obeagu, E. I. (2013). Prevalence of gastrointestinal parasites of small ruminants in Ikwuano Local Government Area of Abia State, Nigeria. *Journal of Biological and Chemical Research*, 30(2), 656-667.
- Fakae, B. B. (1990). The epidemiology of helminthosis in small ruminants under the traditional husbandry system in Eastern Nigeria. *Veterinary Research Communications*, 14(5), 381-391.
- Food and Agriculture Organization (FAO). (2021). FAOSTAT Statistical Database. Rome, Italy.
- Nwosu, C. O., Madu, P. P., and Richards, W. S. (1996). Prevalence and seasonal changes in the gastrointestinal helminths of Nigerian Sahel goats. *Veterinary Parasitology*, 66(1-2), 75-83.

- Paul et al. (2015). Point Prevalence and Intensity of Gastrointestinal Parasite Ova/Oocyst and Its Association with Body Condition Score (BCS) of Sheep and Goats in Maiduguri, Nigeria. *The Journal of Advances in Parasitology*, 2(2), 26-33.
- Soulsby, E. J. L. (1982). *Helminths, Arthropods and Protozoa of Domesticated Animals* (7th ed.). Bailliere Tindall, London.
- Spithill, T. W., Smooker, P. M., and Copeman, D. B. (1999). *Fasciola gigantica: epidemiology, control, immunology and molecular biology*. In *Fasciolosis* (pp. 465-525). CABI Publishing.
- Taylor, M. A., Coop, R. L., and Wall, R. L. (2016). *Veterinary Parasitology* (4th ed.). Wiley-Blackwell.
- Umar, Y. A., Lawal, I. A., Bobbo, A. G., and Okaiyeto, S. O. (2014). Prevalence of gastrointestinal parasites in small ruminants in Yola, Adamawa State, Nigeria. *Journal of Veterinary Science and Technology*, 5(3), 1-5.
- Waller, P. J. (2006). Sustainable nematode parasite control strategies for ruminant livestock by grazing management and biological control. *Animal Feed Science and Technology*, 126(3-4), 277-289.