

DIAGNOSIS AND CLINICAL MANAGEMENT OF SEVERE HELMINTHIASIS IN WEST AFRICAN DWARF GOATS AT THE NYANYA VETERINARY CLINIC, ABUJA, NIGERIA: A CASE REPORT

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ABSTRACT

Small ruminants, such as goats and sheep, play a crucial role in the livelihoods, nutrition, and food security of many rural households in Nigeria. Despite their resilience and adaptability, these animals remain susceptible to parasitic infections, particularly *Haemonchus contortus*, a highly pathogenic gastrointestinal nematode. This case report describes four clinical cases of haemonchosis in West African Dwarf (WAD) goats presented to the Veterinary Clinic in Nyanya, Abuja. The goats exhibited severe anemia, submandibular edema (bottle jaw), and poor body condition. Diagnosis was confirmed using fecal flotation and larval culture techniques. An integrated parasite management (IPM) strategy, combining anthelmintics, supportive therapy, and improved pasture management, was implemented to treat the affected goats. All four goats showed marked clinical improvement by the fifth day of treatment. This case highlights the importance of prompt diagnosis, combined therapeutic strategies, and preventive management practices in controlling haemonchosis, particularly in resource-limited settings.

Keywords: Anthelmintics, Fecal culture, Goats, *Haemonchus contortus*, Integrated Pasture Management

INTRODUCTION

Small ruminant production plays a significant role in food security and rural livelihoods in tropical regions, including Nigeria. Small ruminants' ownership differs from community to community and also from households. However, sheep and goats are the common small ruminants available in many villages and communities. Small ruminants, in common with other ruminants, can convert low-quality fiber-rich diets to high-quality products (Tarekegn 2021). Moreover, certain characteristics of sheep and goats warrant special mention due to their relevance to agricultural development efforts. Small ruminants are commonly owned and reared by the majority of households, often in small numbers (Manirakiza *et al.*, 2020). They play an important role in household income generation as well as food and nutritional security due to their ability to convert low-quality forage and agricultural by-products into nutrient-dense animal products such as milk and meat, which

are rich in essential micronutrients (World Bank, 2019; Bertolozzi-Caredio *et al.*, 2021). These animals are also highly adaptable to diverse environmental conditions (Rakib *et al.*, 2022), and certain indigenous breeds, such as the West African Dwarf (WAD) sheep and goats, have demonstrated natural tolerance to local diseases and parasites (Chiejina *et al.*, 2015).

However, gastrointestinal nematodes, particularly *Haemonchus contortus*, remain a major constraint to productivity (de Tarso *et al.*, 2016; Tella & Chineke, 2022). *H. contortus* is a blood-feeding trichostrongylid nematode inhabiting the abomasum of goats and sheep (Hoberg & Zarlenga, 2016). In a day, a single worm takes up to 50 µL of blood. Its high fecundity, rapid life cycle, and ability to cause severe anemia and mortality make it one of the most pathogenic parasites of goats (Adduci *et al.*, 2022). Clinically, haemonchosis is characterized by progressive anemia,

submandibular edema (bottle jaw), weight loss, and pale mucous membranes (Arsenopoulos *et al.*, 2021). Infected ruminants have reduced digestive capacity, impacting their ability to absorb organic materials, energy, and nitrogen. Death usually occurs in heavy infestation. Diagnosis relies on fecal flotation for egg detection, but differentiation from other strongyles often requires fecal larval culture (Coles *et al.*, 2006). This case report describes four clinical cases of haemonchosis in WAD goats in Nyanya, Abuja, detailing the diagnostic findings, therapeutic management, and outcomes.

CASE PRESENTATION

Four West African Dwarf (WAD) goats (age: 4 -14 months) were presented to the veterinary clinic with a history of progressive weight loss, weakness, and swelling beneath the jaw. The goats were kept under semi-intensive management and grazed on communal pastures.

Clinical examination revealed:

- Severe anemia (pale conjunctival mucous membranes)
- Submandibular edema (bottle jaw)
- Emaciation and poor body condition score (2/5)
- Lethargy and reduced appetite
- PCV 14% -17%

Differential Diagnosis:

- Haemonchosis- based on anemia and bottle jaw.
- Fasciolosis- due to anemia and bottle jaw.
- Peste des petits Ruminants (PPR)- due to emaciation and weakness.
- Nutritional deficiency (protein deficiency)- due to bottle jaw

Tentative Diagnosis

Based on these findings, parasitic gastroenteritis was suspected.

Confirmatory Diagnosis was pursued as follows:

Fecal samples were collected directly from each goat's rectum and analyzed using saturated Sodium Chloride Solution (Hu *et al.*, 2016). Microscopic examination showed numerous strongyle-type eggs (Figure I), morphologically consistent with *Haemonchus spp.* To confirm the diagnosis, a fecal culture (Figure. II) was established by incubating fecal pellets in Petri dishes at room temperature, with daily moistening to prevent drying (Muchiut *et al.*, 2021). This process aimed to differentiate *Haemonchus* from other *strongyles*. Between days 5 and 9, characteristic *Haemonchus* L3 larvae (Figure III) were identified under the microscope, confirming haemonchosis.

Treatment Plan (Integrated Parasite Management)

The goats were treated for 5 consecutive days with an integrated regimen (Table I).

Table I: Treatment Regimen And The Purpose

Day	Treatment	Purpose
Day 1	Albendazole (10 mg/kg PO, repeated after 2 weeks), Iron dextran (10 mg/kg, IM, repeated after 2 weeks), vitamin B-complex (2ml, IM, 3/7) Multivitamins (2ml IM, 1/7) and Roborants (2ml, IM, 3/7) Oxytetracycline LA (20 mg/kg IM) Furosemide (2 mg/kg IM)	Eliminate adult worms, correct anemia, stimulate hematopoiesis, improve condition, prevent infections, boost immunity, and reduce edema (as a short-term diuretic)
Day 2–4	Continue supportive therapy (blood enhancers, Daily monitoring	Promote recovery, assess clinical improvement.
Day 5	Continue supportive care	Stabilize animals

By day 5, all four goats demonstrated clinical improvement. Submandibular edema reduced markedly, mucous membranes regained pink coloration, and appetite improved. However, sanitation, improved nutritional management, safe pasture practices, e.g., pasture rotation, Alternative grazing, and good grazing strategies were put in place.

FECAL CULTURE RESULTS

Fecal cultures revealed the development of *H. contortus* larvae from day 5. Microscopic examination of the fecal culture revealed numerous actively motile, slender, and sheathed third-stage larvae (L3) with tapered tails and distinct cephalic regions, consistent with *Haemonchus spp.* morphology (Gareh *et al.*, 2021). According to their morphology, parameters, and structures, including body length, cervical papillae length, spicule and gubernaculum length, barb length (distance from tip to hook), and the number of cuticular ridges have been used to describe *Haemonchus spp.* The body length, cervical papillae length, number of cuticular ridges, and vulval flap morphology are key diagnostic features used for identifying and differentiating female *Haemonchus species* (Gharamah, 2011). These morphological characteristics confirmed the presence of *Haemonchus contortus* as the etiological agent in this case.



Figure I: Showing Trichostrongylids- type eggs as seen under the microscope x10



Figure II: showing cultured fecal pellets

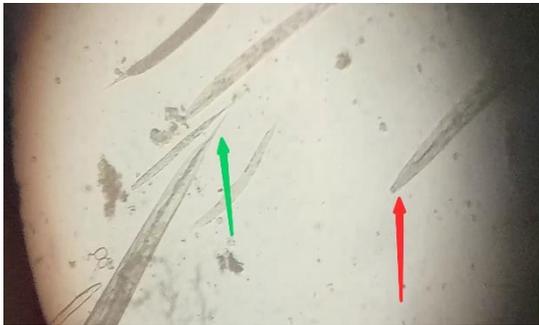


Figure III: showing hatched larvae, with tapered tails (green arrow), and pointed anterior End (red arrow).

DISCUSSION

This case report highlights the clinical significance of haemonchosis in goats under a semi-intensive system of management or conditions. *H. contortus* infections are highly pathogenic due to their hematophagous feeding, leading to severe anemia and hypoproteinemia, leading to pale mucus membranes and submandibular oedema (bottle-jaw) (Besier *et al.*, 2016; Gareh *et al.*, 2021). The clinical presentation of anaemia, bottle jaw, poor body condition, and emaciation observed in this report is consistent with classical haemonchosis (Emery *et al.*, 2016). Similar reports have been published by Saminathan *et al.* (2015) and Abosse *et al.* (2022), which can be due to pathological changes in the abomasum and systemic changes such as abomasal congestion, petechial haemorrhages, oedema of the abomasal mucosa, and thinning of the abomasal wall due to parasite attachment. Systemically, severe blood loss and hypoproteinemia lead to reduced plasma oncotic pressure, resulting in peripheral oedema, lethargy, and eventual cachexia.

The Packed Cell Volume (PCV) of the four goats, ranging between 14% - 17% is consistent with FAMACHA scores of 4 or 5 (Vatta *et al.*, 2001; Van and Batt, 2002). They were severely anaemic and required immediate deworming treatment and supportive care.

The integrated parasite management (IPM) approach used in this case targeted both the *Haemonchus contortus* burden and the associated physiological consequences of haemonchosis, including anaemia and hypoproteinemia. The strategy combined effective anthelmintic treatment, nutritional supplementation, and improved pasture management to interrupt parasite transmission and enhance recovery in the affected goats. Similar IPM approaches have been successfully implemented and reported by Ofuoku *et al.* (2012), Charlier *et al.* (2022), and Eyachew (2024) for the sustainable management of gastrointestinal nematodes and pasture contamination. In this case, the coordinated use of albendazole, hematinic and vitamin supplementation, and pasture rotation contributed to improved clinical outcomes, demonstrating the practical effectiveness of IPM under smallholder, semi-intensive goat production systems. Anthelmintics eliminated adult worms, while supportive therapy corrected anemia and boosted immunity. Similar combined strategies have been recommended in severe haemonchosis cases (Besier *et al.*, 2016; Puspitasari *et al.*, 2016).

Fecal culture was instrumental in confirming *Haemonchus spp.* infection and distinguishing it from other strongyle-type nematodes based on larval morphology. The infective third-stage larvae (L3) observed were slender, sheathed, and

actively motile, with a characteristic tapered tail and distinct cephalic (head) region containing refractile granules (Gareh et al., 2021), features consistent with *Haemonchus contortus* and distinguishable from other *Trichostrongylid* larvae such as *Trichostrongylus* and *Ostertagia spp.*, which have shorter, unsheathed or less distinctly tapered larvae (Muchiut et al., 2021; Lu et al., 2025). This morphological differentiation was crucial given the high prevalence of mixed gastrointestinal nematode infections in endemic regions.

Control of haemonchosis requires more than therapeutic intervention. Resistance to commonly used anthelmintics is widespread, necessitating integrated parasite management (Kaplan & Vidyashankar, 2012). Farmers should adopt strategies including: Strategic deworming aligned with rainfall patterns, rotational grazing and pasture management, Nutritional supplementation to improve host resilience, and deworming at the community level to reduce reinfection pressure.

CONCLUSION

Haemonchosis remains a significant health challenge in small ruminant production systems, especially in areas where grazing is communal and parasite transmission is high. The cases presented underscore the severe impact of *Haemonchus contortus* on goat health, highlighting symptoms such as anemia, emaciation, and bottle jaw, all of which contribute to reduced productivity and increased mortality. Through a well-structured integrated parasite management plan, which addressed both parasite elimination and physiological recovery, successful outcomes were achieved. The importance of accurate diagnosis, particularly via fecal culture and the need for supportive care in heavily infested animals, cannot be overstated. Ultimately, controlling haemonchosis goes beyond individual treatment and must include broader herd-level and community-level management strategies.

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