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Case Report

OVINE COCCIDIOSIS IN A FATTENING LOT IN MAIDUGURI, BORNO STATE, NIGERIA

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ABSTRACT

Coccidiosis is a significant parasitic disease affecting sheep worldwide. This case report describes a confirmed case of coccidiosis in a sheep fattening lot associated with poultry litter, characterized by progressive diarrhea, bloody stools, emaciation, straining with eversion of the rectum, and painful vocalization. A floatation technique for fecal sample examination revealed typical coccidial/*Eimeria* oocysts under a microscope, confirming the diagnosis. Sheep exhibiting morbidity were promptly isolated and treated with sulfadimidine sodium, administered intravenously at 150 mg/kg for 3 days, followed by intramuscular administration for 2 days. This treatment led to marked improvement within 48 hours, with full recovery achieved by day 10. Apparently healthy animals received a 7-day preventive dose of Amprolium orally (100grams/400Liters), while strict biosecurity measures and enhanced shed cleaning protocols were also implemented. This case underscores the importance of proper husbandry practices to control and prevent coccidiosis in sheep. Therefore, thorough diagnosis and treatment are indispensable for reducing economic losses due to coccidiosis.

Keywords: Coccidiosis, Maiduguri, Sheep, Standard floatation technique

INTRODUCTION

Sheep production plays a vital role in many cultures, fulfilling cultural obligations and generating valuable byproducts (Opong-Anane, 2013). However, the industry faces significant challenges, including feed scarcity, slow growth rates, and high mortality rates (Adams & Ohene-Yankyera, 2014). Sheep fattening has emerged as a viable solution, leveraging intensive feeding to accelerate growth and fat deposition (Alemu, 2007). This approach reduces production time and increases income for smallholder farmers (Shapiro *et al*., 1993; Pasha, 2006). One strategy to support sheep fattening is incorporating poultry manure into sheep diets, which can provide valuable nutrients (Onte *et al*., 2021). However, this practice also carries risks, particularly regarding disease transmission. One disease of significant concern is coccidiosis, a parasitic disease affecting sheep worldwide, particularly kids and lambs aged 4–6 months (Engidaw *et al*., 2015; Khodakaram-Tafti & Hashemina, 2017). Caused by *Eimeria species*, specifically *Eimeria ovinoidalis* and *Eimeria crandallis* (Odden *et al*., 2017; Khodakaram-Tafti & Hashemina, 2017), the disease is exacerbated by contaminated environments and stress factors (Constable *et al*., 2017). Clinical signs include weight loss, fever, diarrhoea (often bloody), dehydration, and potentially death (Andrade *et al*., 2012; Keeton & Navarre, 2018), leading to substantial economic losses due to treatment costs, reduced growth performance, and mortality (Reeg *et al*., 2005; Elmadawy & Elkhaiat, 2014; Ramadan *et al*., 2018).

Early treatment with anticoccidial drugs such as toltrazuril, diclazuril, and sulfaquinoxaline may reduce severity if initiated early (Kareem & Yücel, 2015). Morphological characterization of oocysts is a practical tool for

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identification and species differentiation (Ahid *et al*., 2009; de Souza *et al*., 2015). This case report describes a confirmed case of coccidiosis in a sheep fattening lot associated with poultry litter, highlighting the clinical presentation, diagnostic approaches, and treatment outcomes.

CASE HISTORY

On February 24, 2025, a client reported a case of progressive diarrhoea on a ram fattening farm, which started after an abrupt change to feed containing groundnut husk and poultry litter. The outbreak resulted in 7 mortalities out of 75 morbidities from a total population of 185 rams. The affected animals were adult male ovine of the Balami/Uda cross breed, managed under an intensive system. Notably, the rams had been routinely treated with Albendazole and Oxytetracycline 20% just 10 days prior to the outbreak.

CLINICAL EXAMINATIONS AND FINDINGS

Clinical examinations revealed several key findings, including, mucoid bloody diarrhoea, a rough hair coat, emaciation, recumbence in some animals, and death. A fleck of fresh blood with staining of the perineum and tail was observed, and the evacuated faecal matter was semisolid with a clot of blood. The conjunctival mucous membrane was slightly congested. The temperature range was between 39.0°C and 39.7°C, with an average of 39.5°C, a respiratory rate of 16–34 cycles/minute (average of 26 cpm) and a pulse rate of 70–80 beats/minute (average of 78 bpm). The average body weight was 60 kg, and the average BCS on a scale of 1-5 was 3-3.5.

Coccidiosis, salmonellosis and poisoning were considered in the differential diagnosis, with coccidiosis being tentatively diagnosed on the basis of the clinical signs of mucoid diarrhoea with blood clots, absence of fever, and history of a progressive course. The absence of fever and the nature of the diarrhoea helped ruled out salmonellosis, which typically presents with fever and more acute symptoms. Poisoning was also ruled out because there was no history of exposure to harmful substances or system/organ collapse.

SAMPLE COLLECTION AND LABORATORY INVESTIGATION

Fecal samples were collected directly from the rectum, and blood samples from the jugular vein, of affected animals for analysis. One carcass was also submitted for necropsy. All samples were processed at the University of Maiduguri Veterinary Teaching Hospital.

MATERIALS AND METHOD

FAECAL FLOATATION

Faecal examination for coccidia oocysts was carried out via a standard floatation technique to identify oocysts of *Eimeria* spp. Approximately 5 grams of faeces from each animal was thoroughly mixed with 10 milliliters of fully saturated salt solution in a plastic cup. The mixture was strained through a tea strainer to discard the faecal debris, and the resulting mixture was poured into a 15-milliliter centrifuge tube. The floatation solution was added to the tube and centrifuged at 3000 rpm for 2 minutes.

Following centrifugation, more floatation solution was added to the tube to form a reverse meniscus on the surface layer. Clean, dry cover slips were then placed on the rims of the tubes for 5 minutes and the oocysts adhered to the glass surface. The cover slips were subsequently removed and examined microscopically at X100 magnification to detect the presence of *Eimeria spp.* oocysts (Zajac and Conboy, 2006).

POSTMORTEM EXAMINATION

The submitted carcasses of sheep underwent a comprehensive post-mortem examination of all organs, with particular attention given to the lungs, trachea, and various sections of the gastrointestinal tract, including the small and large intestines (ileum, caecum, and upper colon) (Merdja *et al*., 2024).

HAEMATOLOGICAL EXAMINATION

The Packed Cell Volume (PCV), Haemoglobin (Hb) concentration, Red Blood Cell (RBC) count, and White Blood Cell (WBC) count were determined in each sheep blood sample according to the procedures described by Brar *et al*. (2000). Red Blood Cell indices, including Mean Corpuscular Volume (MCV), Mean Corpuscular Hemoglobin (MCH), and Mean Corpuscular Haemoglobin Concentration (MCHC), were calculated.

LABORATORY AND POSTMORTEM FINDINGS

Fecal examination revealed coccidia oocysts, with counts ranging from moderate (++) to high (+++) at 100x magnification. Postmortem examination revealed a carcass that was moderately emaciated with the anal region pasted with bloody diarrhoea, frothy exudates in the trachea and bronchi, congested lungs that failed to collapse with slight rib imprints, multiple cysts in the abdominal cavity, and intestines containing bloody contents with petechial and ecchymotic haemorrhages. The haematological examination results showed no evidence of anaemia (Table I).

However, a mild reduction in white blood cell count (leukopenia) was observed, primarily due to a decrease in lymphocytes (lymphopenia).

TREATMENT AND MANAGEMENT OF OVINE COCCIDIOSIS

A prompt treatment regimen was initiated, consisting of broad-spectrum antimicrobial sulfadimidine sodium administered intravenously at a dosage of 150 mg/kg for 3 days, followed by intramuscular administration for 2 days. Marked improvement was observed within 48 hours, with 40% of the animals showing cessation of diarrhoea by day 3, increasing to 70% by day 5. The full appetite was restored by day 6, and full recovery was achieved by day 10 (Figure IV). Apparently healthy animals received a 7-day preventive dose of Amprolium orally (100g/400L). Strict biosecurity measures were implemented, and sheds were sprayed with a 2% sodium hypochlorite solution to enhance cleaning and disinfection.

DISCUSSION

Eimeria species are a major cause of coccidiosis in livestock, resulting in significant economic losses due to reduced productivity and increased mortality rates. Diagnosis of the present case of ovine coccidiosis was on the basis of history, clinical findings, and laboratory results. Clinical coccidiosis in small ruminants is influenced by stress factors, the level of environmental contamination, and exposure to infection (Hundal *et al*., 2025). In particular, sheep are commonly affected by coccidiosis, with 15 *Eimeria species* identified to date (Saratsis*et al*., 2011). Among these, *E. ovinoidalis* and *E. crandallis* are considered the most pathogenic, causing clear clinical signs of the disease (Reeg *et al*., 2005). Other species, such as *E. ahsata*, E. marsica, *E. bakuensis*,*E. granulosa*, and *E. parva*, have been identified in sheep, although their pathogenicity is not well understood and requires further investigation (de Souza *et al*., 2015; Skirnisson, 2007).

Faecal examination by floatation technique revealed coccidia oocysts, with counts ranging from moderate (++) to high (+++) at 100x magnification. Although molecular identification could provide further insight into the *Eimeria species* involved, it requires specialized tools and high-cost facilities (Barkway *et al*., 2011). Given these constraints, this approach limits their use in resource-constrained countries like Nigeria. Therefore, morphological characterization utilizing morphometry of oocysts was employed as a practical and reliable tool for diagnoses (Hizikel, 2024).

The investigation also considered the potential impact of an abrupt change in feed, specifically the introduction of groundnut husk and poultry litter, as a contributing factor. Although poultry litter is unlikely to directly transmit *Eimeria species* to sheep due to the host-specific nature of the parasite (Cervantes *et al*., 2020), the abrupt introduction of this feed likely stressed the sheep. This stress could have weakened their immune system, increasing their susceptibility to coccidiosis caused by *Eimeria species* already present in the flock. Given the lifecycle of *Eimeria*, which involves an exogenous phase where oocysts sporulate and become infective in the environment (Joyner, 1982), any stress-induced compromise in the sheep's immune system could have allowed the parasite to overcome the host's defences and cause disease.

There was no anaemia but mild leucopenia occasioned by lymphopenia from the haematological examination. This may be a result of the stress and compromised immunity of the patients. The successful treatment with sulfadimidine is consistent with previous reports (Reddy *et al*., 2015; Gopalakrishnan *et al*., 2017; Hizikel, 2024).

The successful treatment of the present case with sulfadimidine is consistent with previous reports (Oyewusi *et al*., 2015; Reddy *et al*., 2015; Gopalakrishnan *et al*., 2017; Hizikel, 2024)), demonstrating its therapeutic efficacy against *Eimeria* infections in goat kids, rams, and calves, with notable improvement observed 48 hours post-treatment. Sulfadimidine targets *Eimeria* folic acid synthesis pathway by competitively blocking the enzyme that utilizes para-aminobenzoic acid (PABA), thereby inhibiting *Eimeria* growth and survival. It specifically targets developing schizonts and sexual stages of the parasite. In addition to its anticoccidial effects, sulfadimidine exhibits broad-spectrum antibacterial activity against both Gram-negative and Gram-positive bacteria (Lebkowska-Wieruszewska & Kowalski, 2010). In contrast, amprolium, administered prophylactically to apparently healthy animals, works by disrupting thiamine uptake and carbohydrate metabolism in the parasite (Kart & Bilgili, 2008). These findings highlight the effectiveness of both sulfadimidine and amprolium in managing ovine coccidiosis. Alternative treatment options include toltrazuril, diclazuril, and decoquinate, which can be considered based on regional availability, resistance patterns, and veterinary guidance (Noack *et al*., 2019).

CONCLUSION

Coccidiosis is a significant constraint on sheep production globally. Effective diagnosis and timely treatment with sulfadimidine are crucial in mitigating economic losses associated with this disease. To control and prevent coccidiosis in sheep, maintaining premises and feeding through hygiene, separating young animals from adults, providing a well-balanced diet, isolating new animals for a week or two before introducing them to the herd should be practised. Additionally, future studies would benefit from including histopathological examinations of intestinal samples to further elucidate the disease's impact.

Figure I: Rectal area of a sheep with bloody diarrhoea

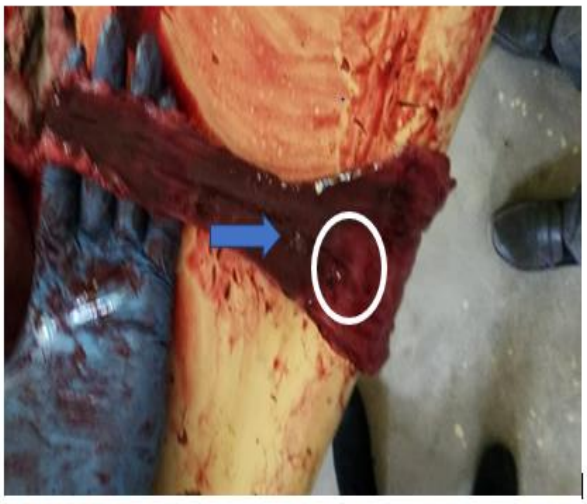
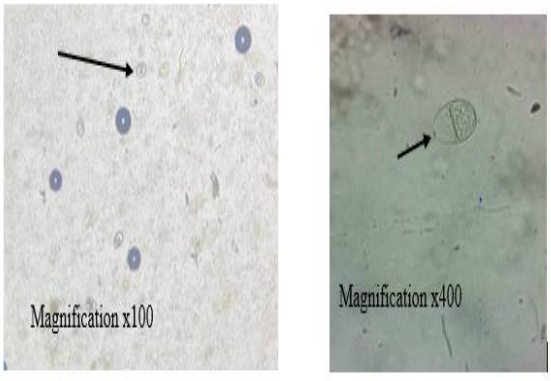


Figure II: Haemorrhagic intestine (cycle) and content (arrow)



Magnification x100 Magnification x400

Figure III: Coccidial oocyst under the microscope

Figure IV: Day 10, full recovery of the herd

TABLE 1: HAEMATOLOGICAL FINDINGS IN MORBID SHEEP FROM THE FATTENING LOT

Parameters	Average	Range	Reference Values
PCV %	35	33-37	27-45
Hgb (g/dL)	9	8.5-9.5	9-15
RBC (x 10)	4.5	4.3-4.7	9-10
MCV (fL)	79	77-81	28-40
MCH (pg)	20	19-21	8-12
MCHC (g/dL)	25	24-26	31-34
WBC	3.4	3.2-3.6	4-12
Neutrophils	1632 (48%)	1550-1730 (45-51)	600-6000 (10-50%)
Lymphocytes	1190 (35%)	1080-1290 (32-38)	1600-9000 (40-75%)
Monocytes	578 (17%)	510-650 (15-19)	0-750 (0-6%)
Eosinophils	0		0-1200 (0-10%)
Basophils	0		0-550 (0-3%)

REFERENCES

Adams, F. & Ohene-Yankyera, K. (2014). Socio-economic characteristics of subsistent small ruminant farmers in three regions of northern Ghana. *Asian Journal of Applied Science and Engineering*, 3(3), 351-364.

Ahid, S. M. M., Medeiros, V. M. C., Bezerra, A. C. D. S., Maia, M. B., Xavier, V. M. & Vieira, L. S. (2009). Species of the genus *Eimeria* Schneider, 1875 (Apicomplexa: Eimeriidae) in small ruminants in the

west mesoregion of the state of Rio Grande do Norte, Brazil. *Ciência Animal Brasileira*, 10(3), 984-989.

Alemu, Y. (2007). Short term intensive fattening of sheep and goats for rapid improvement in weight and condition and also producer incomes (Technical Bulletin No. 11). *ESGPIP*.

Andrade, A. L. F., Jr., Silva, P. C., Aguiar, E. M. & Santos, F. G. (2012). Use of coccidiostat in mineral salt and study on ovine eimeriosis. *RevistaBrasileira de ParasitologiaVeterinária*, 21(1), 16-2

Barkway, C.P., Pocock, R.L., Vrba, V. & Blake, D.P. (2011). Loop-mediated isothermal amplification (LAMP) assays for the species-specific detection of *Eimeria* that infect chickens. *BMC Veterinary Research*, 7(67), 1-8.

Brar, R. S., Sandhu, H. S. & Singh, A. (2000). Veterinary clinical diagnosis by laboratory methods (1st ed.). Kaylani, India.

Cervantes, H. M., McDougald, L. R. & Jenkins, M. C. (2020). Coccidiosis. In D. E. Swayne (Ed.), Diseases of poultry (14th ed., Vol. 2, pp. 1193-1217). *John Wiley & Sons*

Christensen JF (1938) Species differentiation in the coccidia from the domestic sheep. *Journal of Parasitology*, 24(5):45 3–467

Constable, P., Hinchcliff, K., Done, S. & Grundberg, W. (2017). Veterinary medicine: A textbook of the diseases of cattle, horses, sheep, pigs, and goats. *Elsevier*, (pp. 1879).

de Souza, L. E. B., da Cruz, J. F., Neto, M. R. T., Albuquerque, G. R., Melo, A. D. B. & Tapia, D. M. T. (2015). Epidemiology of Eimeria infections in sheep raised extensively in a semiarid region of Brazil. *RevistaBrasileira de ParasitologiaVeterinária*, 24(4), 410-415

Elmadawy, R. S. &Elkhaiat, H. M. (2014). Efficacy of clindamycin, yeast (*Saccharomyces cerevisiae*) and clindamycin-*Saccharomyces cerevisiae* combination versus toltrazuril on experimentally induced coccidiosis in lambs. *International Journal of Applied and Natural Sciences*, 3(5), 99-110.

Engidaw, S., Anteneh, M. & Demis, C. (2015). Coccidiosis\in small ruminants. *African Journal of Basic and Applied Sciences*, 7, 311-319.

Gopalakrishnan, A., Dimri, U., Joshi, V., Kundave, V. & Ajith, Y. (2017). A clinically rare occurrence of rectal mucosal prolapse associated with tenesmus in a calf caused by *Eimeria sp*. *Journal of Parasitic Diseases*, 41, 723-725.

Hizikel, E. (2024). A case report on coccidiosis in a lamb in Damot Sore District, Wolaita Zone, Southern Ethiopia. *Journal of Veterinary Medicine and Animal Sciences*, 7(2), 1148.

Hundal, R. S., Singla, L. D., Kaur, P., Nimbalkar, V. & Bal, M. S. (2025). Epidemiology and associated risk factors of coccidiosis in small ruminants of northern Punjab, India. *Indian Journal of Small Ruminants*, 31(1), 55–60.

Kareem, S. I. & Yücel, Ş. Y. (2015). Prevalence of *Eimeria* species in sheep in Sulaimaniya province, Iraq. *Journal of Entomology and Zoology Studies*, 3(4), 317-322.

Kart, A. & Bilgili, A. (2008). Ionophore antibiotics: Toxicity, mode of action and neurotoxic aspect of carboxylic ionophores. *Journal of Animal and Veterinary Advances*, 7(6), 748–751.

Keeton, S. T. & Navarre, C. B. (2018). Coccidiosis in large and small ruminants. Veterinary Clinics of North America: *Food Animal Practice*, 34(1), 201-208.

Khodakaram-Tafti, A. & Hashemina, M. (2017). An overview of intestinal coccidiosis in sheep and goats. *Veterinary Medicine Review*, 167, 9-20.

Lebkowska-Wieruszewska, B. & Kowalski, C. J. (2010). Sulfachlorpyrazine residues depletion in turkey edible tissues. Journal of Veterinary Pharmacology and Therapeutics, 33(4), 389–395.

Merdja, K., Hemida, H. &Boumezrag, A. (2024). Epidemiological and pathomorphologic investigation of peste des petits ruminants in Western Algeria: A comprehensive study of clinical and histopathological findings. *Open Veterinary Journal*, 14(8), 1905-1911.

Noack, S., Chapman, H. D. & Selzer, P. M. (2019). Anticoccidial drugs of the livestock industry. *Parasitology Research*, 118(7), 2009-2026.

Odden, A., Enemark, H., Robertson, L., Ruiz, A., Hektoen, L. & others. (2017). Treatment against coccidiosis in Norwegian lambs and potential risk factors for development of anticoccidial resistance: A questionnaire-based study. *Journal of Parasitological Research*, 116, 1237-1245.

Onte, S., Bhattacharjee, S. & Dey, D. (2021). Non-conventional feed resources. Agriallis, 1(1), 29-35.

Oppong-Anane, K. (2013). Review of the livestock/meat and milk value chains and policy influencing them in Ghana. *FAO/ECOWAS*.

Oyewusi, J., Oyewusi, I., Takeet, O., Muastapha, O. & Awoyomi, O. (2015). Ovine coccidiosis: A case report. *Journal of Veterinary Advance*, 5, 1023-1028.

Pasha, T. (2006). Feedlot fattening of sheep and goats for quality mutton production. Islamabad: Livestock and Dairy Development Board.www.iddb.org.pk/forms/

Ramadan, M. Y., Elmadway, R. S., Lashin, A. I. & ELdiarby, A.S. (2018). Prevalence of *Eimeria* species

in sheep with a special reference to vaccinated pregnant ewes for maternal immunity for the first time. *Benha Veterinary Medical Journal*, 34(3), 218-231.

Reddy, B., Sivajothi, S., &Rayulu, V. (2015). Clinical coccidiosis in adult cattle. *Journal of Parasitic Disease*, 39, 557-559.

Reeg, K. J., Gauly, M., Bauer, C., Mertens, C., Erhardt, G. & Zahner, H. (2005). Coccidial infection in housed lambs: Oocysts excretion, antibody levels and genetic influence on the infection. *Veterinary Parasitology*, 127, 209-219.

Shapiro, B. I., Mohamed-Saleem, M. A., & Reynolds, L. (1993). Socio-economic constraints to strategic sheep fattening: Evidence from the Ethiopian highlands. In S. H. B. Lebbie, B. Rey, & E. K. Irungu (Eds.), Small Ruminant Research and Development in Africa. International Livestock Center for Africa (ILCA).

Zajac, A. M. & Conboy, G. A. (2006) Veterinary clinical parasitology. *Blackwell, New York*, pp 3–4.