

04|22: Prevalence of helminths eggs and coccidia of economic importance in cattle from Karamoja region

Cattle and small ruminants from Karenga | Kaabong districts are disproportionately infested with helminths & Coccidia

Executive summary

Helminths and Coccidia which infest and parasitise gastrointestinal systems of livestock [cattle, sheep, and goats] result into substantial economic losses. Such losses accrue from loss of weight [due to anaemia, diarrhoea, reduction in growth rate], reduced productivity, morbidity, mortality and condemnation of carcasses infested with zoonotic or tissue destructive worms [*Taenia spp.*, *Echinococcus spp.* and *Fasciola spp.*] calling for deworming programs to limit such losses. Such deworming programs are particularly beneficial in pastoral communities like Karamoja where communities are heavily dependent [95%] on livestock assets but are faced with the problem of poor veterinary services and minimal investment in livestock disease control. Despite these well characterised economic losses due to helminthiasis and coccidiosis to the livestock industry, there're not up to date, regional or national helminths datasets for Uganda [and Karamoja region in particular] that could be used to estimate current economic losses due to these parasites and help design risk-based helminths and coccidia control programs using the readily available dewormers and anti-coccidia agents. To this end, we screened 2,313 cattle faecal samples from Amudat, Kaabong and Karenga districts using standard faecal sample analysis techniques and determined helminths/coccidia prevalence for Karamoja region. Additionally, we interviewed cattle keepers [n=103] and animal health observers [n=63] and estimated annual household economic cost [EC] associated with these parasites using standard household economic costing techniques. **Cattle were infested with seven different helminths and coccidia of economic importance: with those from Karenga and Kaabong 3 and 4 times more likely to be positive than those from Amudat. As such, over a third [37%] of all cattle were infested at a level for which they needed treatment, or else they progressively came down with helminthiasis/coccidiosis.** Farmers and animal health providers indicated that **helminthiasis contributed 48.5% and 13.4% to the total annual household EC due to small ruminant diseases in Amudat [USD 290] and Kaabong/Karenga [USD 505] districts respectively, while the cost in cattle due helminthiasis was 2.7% and 0.7% of the annual household EC in Amudat [USD 2,665] and Kaabong [USD 6,835] districts respectively.** Given that small ruminant helminths and coccidia can infest cattle and vice versa, there is need to plan and implement a deworming program that would reduce helminthiasis/coccidiosis impacts in the ruminant production systems in Karamoja region. Such a program should prioritise livestock herds in Kaabong and Karenga districts that were 3 and 4 times more likely to be helminths and coccidia infested than Amudat herds.

1.0 Introduction

Gastrointestinal cattle parasites belong to different Genera which inhabit and parasitise the gastrointestinal system often resulting into loss of weight [due to anaemia, diarrhoea, reduction in growth rate], reduced productivity, and sometimes morbidity and mortality¹. The commonest Coccidia of economic importance include *Eimeria spp.*; that cause coccidiosis in all animals and poultry. Helminths on the other hand parasitise the gastrointestinal tract [GIT] of sheep, cattle and goats often resulting into parasitic gastroenteritis. The economic losses due to gastrointestinal parasites of cattle are as a result of apparent malnutrition, anaemia, and gastroenteritis [leading to diarrhoea and weight loss] that these endoparasites directly cause and condemnation of carcasses infested with zoonotic or tissue destructive worms [*Taenia spp.*, *Echinococcus spp.* and *Fasciola spp.*]. Withdraw of worm burden from cattle would therefore ameliorate these effects and effectively improve cattle productivity.

Despite the well-known production [anaemia, reduced weight gain, mortality, morbidity] and carcass value losses due to helminths and Coccidia, there were not up to date, regional or national helminths datasets for Uganda [and Karamoja region in particular] that could be used to estimate current economic losses due to these parasites and help design risk-based helminths and coccidia control programs using the readily available dewormers and anti-coccidia agents. To this end, we aimed at determining the regional helminths burden for north-eastern Uganda, predictors associated with their infestation and the economic cost associated with them.

¹ Rehman A *et al.* doi:<https://doi.org/10.1016/B978-0-323-90583-1.00029-5>

2.0 Approach and Results

We therefore screened cattle faecal samples [$n=2,313$] for helminths eggs and coccidia oocysts using standard coprological methods and interviewed their owners [$n=103$] and key informants [$n=63$] about the economic impact of these parasites to their small and large ruminant livestock enterprises and their livelihoods. As had been reported for other regions, we found a diverse repertoire of helminths taxa [$n=7$] eggs and *Coccidia spp.* oocysts in the screened cattle faecal samples from Amudat, Kaabong and Karenga districts [Figure 1]. **Over 37% [863/2,313] of the screened cattle faecal samples had helminths eggs or *Coccidia spp.* oocyst burden that qualified them to be clinical cases of helminthiasis or Coccidiosis and therefore needed treatment.** Altogether, these data indicate that helminths and coccidia are a common occurrence in cattle from Karamoja region and therefore a main constraint to their health and production

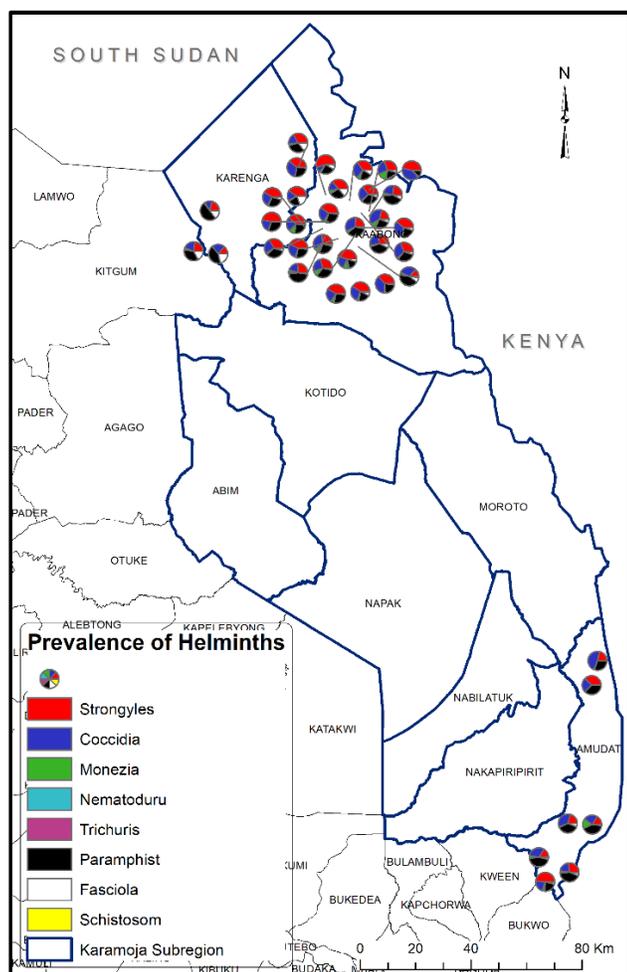


Figure 1. Prevalence of Helminths eggs and Coccidia oocysts in cattle faecal samples from Amudat, Kaabong and Karenga Districts, Karamoja region. Village level prevalence of Helminths and Coccidia ranged from 13-29 for every 100 sheep and goats sampled

The highest burden of helminths and coccidia was in Karenga and Kaabong districts with **cattle from Kaabong and Karenga districts 3 and 3.9 more likely to be positive for different helminths eggs and coccidia oocysts than those from Amudat district [Figure 2].** This could be explained by the difference in the management systems [e.g rate of deworming across the study area]. For example, **the annual household expenditure on helminths control in cattle was 4.5 times more in Amudat [USD 10] than in Kaabong,** while **the annual expenditure on helminths control in goats and sheep was 1.3 times more in Amudat [USD 8.2] than in Kaabong.** Cattle and small ruminant deworming efforts should be concentrated in Kaabong/Karenga Districts and the southern fringes of Amudat district. These are areas with current lowest deworming efforts [and therefore high burden of helminthiasis] which would benefit most from a livestock deworming program.

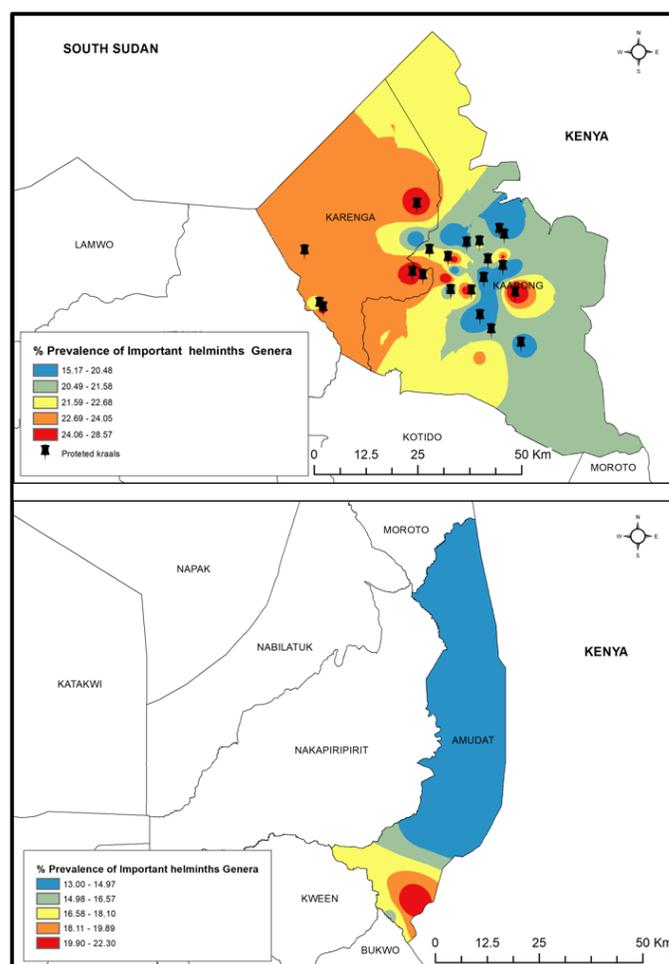


Figure 2. Helminths eggs and Coccidia oocysts in cattle faecal samples from Amudat, Kaabong and Karenga Districts, Karamoja region. Village level prevalence of Helminths eggs and Coccidia oocyst varied greatly from 13-29 for every 100 sheep and goats sampled.

In addition to screening cattle faecal samples for helminths eggs and Coccidia oocysts, we interviewed cattle owners [$n=103$] and animal health providers [$n=63$] to have an insight of the household economic losses due to helminths and coccidia on animal production in Karamoja region.

Farmers and animal health providers indicated that **helminthiasis in cattle contributed 2.7% and 0.7% of the annual household EC[due to cattle diseases] in Amudat [USD 2,665] and Kaabong [USD 6,835] districts respectively, while the helminthiasis cost in small ruminant was 48.5% and 13.4% of the annual household EC[due to small ruminant diseases] in Amudat [USD 290] and Kaabong [USD 505] districts respectively.** Between goats and sheep, the EC was 5.2 times more in sheep than in goats.

To help with reducing the impacts of helminthiasis on the already largely income [61%] and food [75%] poor² Karamojong households, it would be beneficial to design and implement a helminth control program for Karamoja region targeting both large and small ruminants from Kaabong | Karenga and the southern fringes of Amudat district.

3.0 Conclusion

Helminths and Coccidia are a major constraint to animal health and production in Karamoja region with Kaabong [x 3 more] and Karenga [x 4 more] districts disproportionately more affected than Amudat district. Over a third of all screened cattle [37%] had helminths eggs or *Coccidia spp.* oocyst burden that qualified them to be clinical cases of helminthiasis or Coccidiosis and therefore needed treatment. Farmers and key informants indicated that helminthiasis contributed 48.5% and 13.4% to the total annual household economic cost due to small ruminant diseases; 2.7% and 0.7% to the total annual household economic cost due to cattle diseases in Amudat and Kaabong/Karenga [districts respectively]. The detected helminths and Coccidia are transmissible between animal species indicating that they are also important in constraining cattle health and production.

4.0 Implications and Recommendations

The majority of Karamojong households are income [61%] and food [74%] poor. Livestock assets from which 95% of Karamojong households derive livelihoods remain the widest gateway for their exit from income and food poverty. Unfortunately, we report here that Helminths and Coccidia are a major constraint to animal health and production in Karamoja region with Kaabong [x 3 more] and Karenga [x 4 more] districts disproportionately more affected than Amudat district. **Over a third of all screened cattle**

[37%] had worm burdens that required treatment for such animals to remain productive. To limit the effects of helminthiasis in cattle and small ruminants in Karamoja region, there is need to plan and implement a deworming program that prioritises Kaabong and Karenga districts which were 3 and 4 times more likely to report worm-infested cattle than Amudat district. Resources allowing, such a control program would include sub counties in the southern fringes of Amudat district which were also highly infested with helminths and coccidia.

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² UBOS: UNHS 2019/20