



Photo: ILRI/Camille Hanotte

LIVESTOCK HEALTH COENUROSIS CONTROL: BREAK THE CYCLE

KEY MESSAGES

- Coenurosis (also known as gid or sturdy) is one of the major diseases affecting sheep and goats in the highland regions in Ethiopia.
- Due to the communal nature of small ruminant smallholder management systems, a community-based approach to control coenurosis is essential to achieve long-term sustainable success.
- Regular deworming of dogs with anthelmintic (praziquantel) combined with increased knowledge on the cycle of the disease has been effective in controlling the spread of the disease.
- The practice of deworming dogs with anthelmintics can address other important helminths (parasitic worms) such as *Echinococcus granulosus*.
- Good progress and impacts have been recorded in the implementation sites
- Government should prioritize actions and policies to scale-up the community-based approach to coenurosis control and support livestock farmers to prevent the spread of the disease.

INTRODUCTION

Coenurosis (gid or sturdy) is a parasitic and fatal disease in small ruminants that can lead to significant economic loss for livestock keepers. The disease is widespread in the highlands of Amhara, Tigray, Oromia and Southern Nations, Nationalities and Peoples Regions of Ethiopia where 75% of the country's sheep population are found (Adane *et al.*, 2015). The disease accounts for 5% of the annual mortality of sheep and goats (Nigau *et al.*, 1988).

Coenurosis was identified as one of the major small ruminant disease constraints in sites under the CGIAR Research Program on Livestock (Livestock CRP) (Alemu *et al.*, 2019). The clinical sign of the disease—circling of animals—is often confused with other nervous diseases. To bring the disease under control, it is essential to break the transmission cycle, which occurs between dogs and sheep and goats. Dogs are the definitive—or main—carriers of the disease, and while the effects are relatively benign for them, in sheep and goat infection can be deadly (Scala & Varcasia, 2006).

There is no cure or vaccine available against the disease. Therefore, researchers from the International Livestock Research Institute (ILRI), in partnership with the International Center for Agricultural Research in the Dry Areas (ICARDA), national and other international partners, have developed a community-based approach to control and prevent the spread of coenurosis.

A livestock keeper and his dog in Yabello, Ethiopia. To bring coenurosis under control, it is important to break the transmission cycle, which occurs between dogs and sheep and goats.

THE INNOVATION

Coenurosis is primarily spread through the practice of feeding dogs infected sheep or goats heads and failure to regularly deworm dogs. The parasite can continue reproduce in the dogs, and their eggs can continue to live in their feces. Sheep and goats that graze in areas where dogs have deposited their feces can pick up the parasite, thereby creating a cycle of infection.

Control of the disease can occur when farmers and pastoralists are equipped with knowledge and adopt best practices in animal health. Training was conducted among farmers and pastoralists who have limited knowledge and understanding of the disease, in areas where the disease has a high impact on the morbidity and mortality of small ruminants. Focus was on raising awareness of the disease, the mode of transmission and how it can be prevented and controlled. The village-based trainings also helped the participants understand the economic

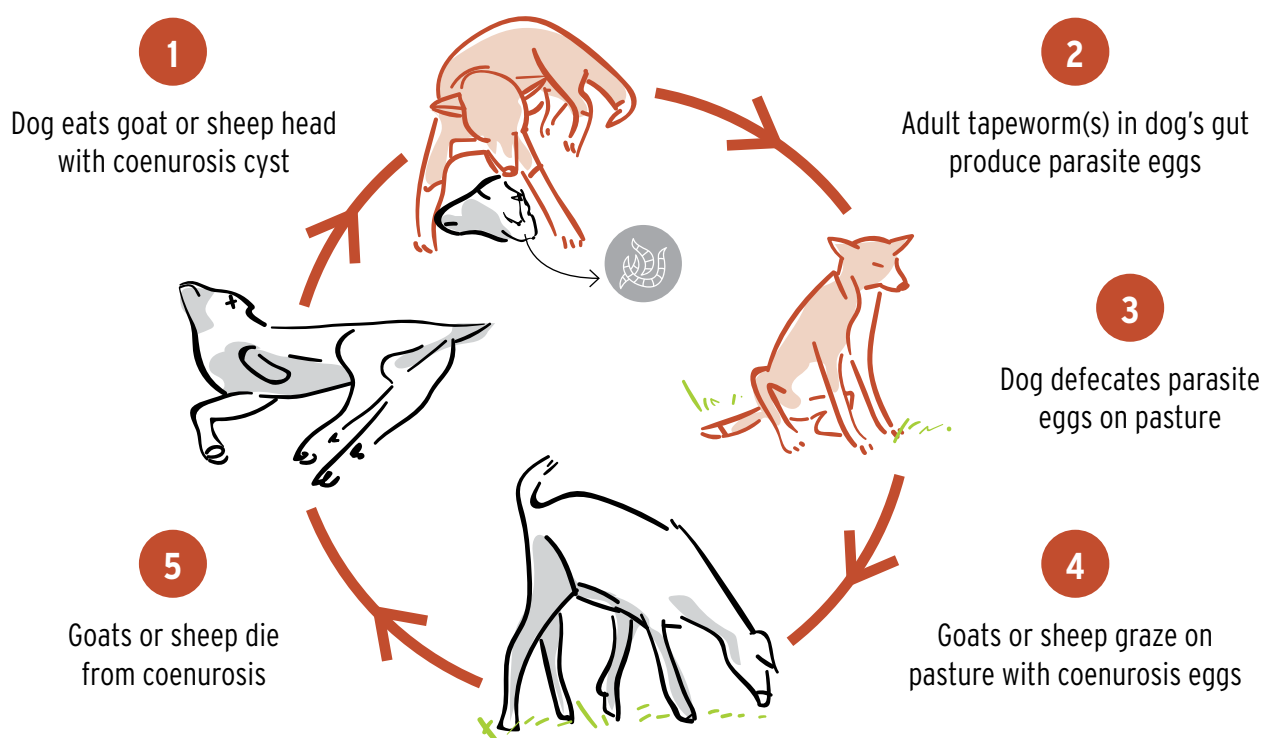
and public health issues associated with coenurosis.

Participants were shown how the correct disposal of parasite-infected heads and regular dog deworming in the community would interrupt the coenurosis transmission to small ruminants, thereby reducing morbidity and mortality of the animals.

Figure 1 traces the continual cycle of infection, which greatly impacts the production and productivity of small ruminants. Therefore, the awareness campaigns conducted at the community level were designed to address the lack of understanding of the disease, how it spreads and the importance of treating dogs with anthelmintic drugs such as Praziquantel. The campaign also provided the drugs to the farmers, who developed their own means of dispensing the drugs to their dogs. In Yabello, Oromia region, farmers coated mashed boiled corn or haricot beans—a common feed for dogs in this region—with Praziquantel.

Figure 1. Keep goats and sheep free of coenurosis

How coenurosis spreads



Stopping the spread of coenurosis



DO NOT feed sheep and goat heads to dogs



DEWORM DOGS REGULARLY with praziquantel



HEALTHY SHEEP AND GOATS
= **HAPPY PEOPLE**

DRIVERS OF INNOVATION

The anthelmintic drugs provided additional co-benefits for the animals. The drugs control not only coenurosis but also reduce or eliminate other diseases common in dog-keeping areas, such as cystic echinococcosis (CE). Also known as hydatidosis, CE is one of the top ten zoonotic diseases in Ethiopia, caused by the metacestode larval stages of the tapeworm *E. granulosus sensu lato* (s. l.) (Eckert and Deplazes 2004). One recent study reported the incidence rate of 2.3 cases per 100,000 in Bahir Dar town, based on hospital records (Kebede et al. 2010), while another study reported the prevalence rate of estimate of 2.6% in pastoralist tribes in the southwestern part, based on ultrasound screening in the community (Woldeyes et al. 2015).

PROGRESS AND IMPACTS

Pilot testing and interventions to control the spread of coenurosis were completed in Yabello, Bonga and Menz sites. Although the program is in its early stages, there have been initial positive progress and impacts recorded at the implementation sites.

These include:

- Improved awareness of farmers on the cycle of the disease.
- A reduction in the practice of feeding sheep heads to dogs.
- Dogs in the intervention sites were registered and dewormed.
- A culture and understanding of the importance of annual deworming of dogs has developed.
- A reduction in the morbidity of small ruminants infected with coenurosis.
- Implementation of regular deworming of dogs in communities every three months. Deworming campaigns were conducted by national agricultural research institutes in collaboration with veterinarians from district agricultural offices.
- A practical laboratory training was conducted for national research partners who are carrying out fecal examinations in the coenurosis control program.

CRITICAL FACTORS OF SUCCESS OF THE PROGRAM

The factors that contributed to the success of the community-based coenurosis control program were:

- Capacity development of the community on cause, mode of transmission, and prevention and control measures of the disease.
- Capacity development of national research partners on fecal sample examination.
- A feasibility study in Yabello tested the effectiveness of existing training materials to ensure they were appropriate for the communities. The study also found that deworming of dogs can be easily implemented at community level.

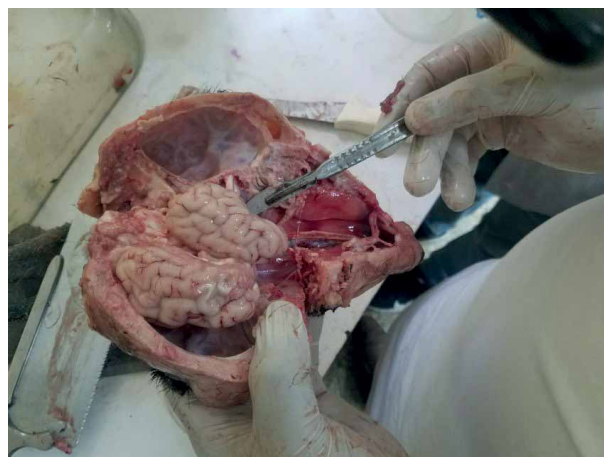


Photo LLRI/Mesfin Mekonnen

National research partners are trained in the diagnosis and control of coenurosis and other parasitic diseases.

IMPLICATIONS AND RECOMMENDATIONS

- The community-based approach for the control of coenurosis has the potential to be scaled-up across the country, thereby reducing economic losses of communities where the disease is endemic. Government should prioritize actions and policies to support livestock farmers in controlling the spread of the disease.
- To achieve long-term results, small ruminant cooperatives located in areas where coenurosis is prevalent should prioritize the disease and implement an annual dog deworming calendar.
- Private sector and government actors should be incentivized to provide a regular supply of praziquantel for annual dog deworming seasons at lowered or no costs.
- National and international research institutes, together with development organizations, should recognize the extent and impact of the disease in small ruminants, especially in areas where dogs co-exist alongside sheep and goats. They should likewise support regular community-based dog deworming as a good approach to control coenurosis as well as zoonotic helminths of dogs and plan accordingly.

CONCLUSION

To succeed in reducing coenurosis across the country, long-term community involvement is crucial. Prevention of infection is the only way to protect small ruminants as no efficient treatment is available for sheep and goats against the disease. It is imperative that communities are given the knowledge to break the cycle of the disease and people remain committed to following the prescribed measures. Follow up/refreshment trainings should be conducted to keep the community motivated to continue with the prescribed best practices.

Related publications

Alemu, B., Desta, H., Kinati, W., Mulema, AA., Gizaw, S. and Wieland, B. 2019. Application of mixed methods to identify small ruminant disease priorities in Ethiopia. *Frontiers in Veterinary Science* 6:417. <https://doi.org/10.3389/fvets.2019.00417>

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Alemu B, Desta H, Kinati W, Mulema AA, Gizaw S, Wieland B. Application of mixed methods to identify small ruminant disease priorities in Ethiopia. *Front Vet Sci.* (2019) 6:417. <https://doi.org/10.3389/fvets.2019.00417>

Eckert, J., Deplazes, P., 2004. Biological, epidemiological, and clinical aspects of echinococcosis, a zoonosis of increasing concern. *Clinical Microbiology Reviews* 17:107-135 <https://doi.org/10.1128/CMR.17.1.107-135.2004>



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With no vaccine or efficient treatment available, community awareness and collective action can play important roles in controlling the spread of coenurosis.

Kebede, N., Mitiku, A., Tilahun, G., 2010. Retrospective survey of human hydatidosis in Bahir. *Eastern Mediterranean Health Journal* 16:937-941. <https://doi.org/10.26719/2010.16.9.937>.

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Partners

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