



RESEARCH  
PROGRAM ON  
Livestock

*More meat, milk and eggs by and for the poor*

# Learning module on Coenurosis transmission and control

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International Livestock Research Institute



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# Module description

The learning module is designed for women and men farmers in the highlands of Ethiopia. Farmers have limited knowledge about the cause, mode of transmission, and prevention and control measures of coenurosis.

In this module, farmers will learn about the cause, transmission pathways, clinical signs and prevention and control measures of coenurosis. They will learn about the economic and public health significance of coenurosis.

The module is intended to help training facilitators prepare for training events as well as during training delivery. It is designed for trainers who are new to their role in facilitating training activities but have significant experience with the concepts. In addition to the curriculum, the module provides learning activities and resources for each learning session. Training facilitators are encouraged to innovate and adapt the learning process and methodology during the actual delivery of the training.

## Learning goal and objectives

The purpose of the training is to contribute towards improvement of livestock and dog health. It aims to develop knowledge, attitudes and skills of farmers about the cause, clinical signs, and prevention and control measures of coenurosis.

By the end of the module, learners will be able to:

- Explain the cause and transmission pathway of coenurosis.
- Identify clinical signs of coenurosis in affected sheep and goats.
- Take measures to prevent and control coenurosis transmission.
- Collect and submit dog fecal samples for parasite testing.
- Avoid giving sheep and goat heads to dogs.
- Follow regular community dog deworming schedules.

## Module content

- Coenurosis and its importance
- Cause and transmission pathway of coenurosis
- Clinical signs of coenurosis
- Prevention and control measures for coenurosis
- Dog fecal sample collection methods
- Deworming dogs with suitable drugs such as Praziquantel

## Training approach and methods

Throughout the training course, active and collaborative learning methods will be applied. Learning activities will start from and build on women and men farmers' knowledge and experience with coenurosis. Activities and exercises are arranged in a way that encourages participants to go through a process, whereby they first reflect on their own personal experiences and observations. Then they link these reflections to new information and how they can apply it.

It is recommended that a mixed training approach is used where female and male farmers and community animal health workers are trained together to enhance collaborative learning, reflection and action.

## Learning materials and resources

The training course will use practical learning materials and resources to facilitate learning, reflection, and knowledge retention and application. Posters, leaflets, illustrations, PPT presentations, stories, and sample collection and labeling materials will be used in the training process.

## Course duration

The learning course has both theoretical and practical sessions. A complete grasp of the course will take one day training time. It is best delivered in community centers to create easy access to all, including women and for practical purposes.

It could be run over one full day or sequentially in two half-day sessions to allow participants time for reflection and cater for farm and household activities.

## Learning assessment methods

Pre- and post-training assessments can be conducted in a participatory way to establish the baseline and measure learning by the end of the training.

A few True or False statements can be prepared to measure knowledge, attitudes and skills of men and women farmers in the training content before and after the training. The facilitator can read participants the statements and ask them to indicate their knowledge in the training course by standing in opposite sides of the training room. Farmers who agree or disagree to statements can be counted and disaggregated by gender, and the data can be used to analyse participants' level of knowledge before and after the training.

Participants will develop action plans by the end of the training to apply the learning. Interviews with some participants between three and six months after the training can help evaluate retention and learning application and capture changes because of the training.

# Session 1: Introduction to Coenurosis

## Session description

The session aims to provide participants with an overview of coenurosis. They will learn about what coenurosis is, what causes it, and which animals it affects.

## Session objectives

By the end of the session, participants will be able to:

- Explain what coenurosis is and what causes it
- Identify which animals are affected by coenurosis
- Explain importance of coenurosis for herd and dog health

## Session content

- What coenurosis is
- Cause of coenurosis
- Affected animals and how it affects them
- Economic significance of coenurosis

## Learning methods and materials

- Brainstorming
- Storytelling
- Reflection and sharing experiences

## Duration

60 minutes

## Learning activities

### 1. Welcome and opening

Warmly welcome and greet participants as they arrive to establish friendly relationship. Place posters and pictures relevant to the training to attract and motivate participants and to set the context for the training.

Observe local traditions and customs. Have elders and/or community leaders welcome participants and open the training event. What happens in the welcome and start can set the tone for the rest of the training process.

## 2. Introduce the training facilitation team

Introduce yourself and describe where you come from, your position, and what you do. Introduce the rest of the facilitation team.

## 3. Ice breaker

Ask participants to stand in a circle. In the middle of the circle, display multiple pictures of small ruminants and dogs on the ground. Ask participants to pick a picture card, go around to find a participant who has the same picture card and discuss why they picked the picture cards and what health issues they have with the animals.

Give pairs 5 minutes to share why they picked the picture cards and what issues they have with the health of the animals in the picture. After 5 minutes, ask pairs to find other pairs who have the same pictures as theirs. Ask them to share why they picked the same pictures and the issues they have with the health of the animals.

In plenary, ask a few pairs to explain why they chose the pictures and what issues they have with the health of the animals in the pictures.

Write down explanations for choosing picture cards and the issues they have with the health of the animals in the pictures.

Thank participants and ask them to take their seats.

## 4. Participant expectations

Identify what participants expect from the training. Ask the audience one by one what they expect to get out of the training and write it on a flip chart.

Tick off each correct one and discuss the different ones and why they will not be covered.

Stick flipchart on the wall.

Then present the following training objectives:

- Explain coenurosis and its significance in herd and dog health
- Identify the cause and mode of transmission of coenurosis
- Discuss community measures for prevention and control of coenurosis

## 5. Establish ground rules

Tell participants that to achieve their training expectations, they should follow some agreements. Ask them to identify what is expected of them and write agreements on a flipchart and place it visibly.

## 6. Assess pre-training knowledge, attitudes and skills of participants based on key content of the training

Tell participants that you will read out statements about coenurosis and they will indicate their agreement or disagreement to these statements.

Place papers labeled “Agree” or “Disagree” on the floor in opposite sides of the training room.

Ask participants to stand on either side of the training room to indicate their agreement or disagreement to the statements. Positions are likely to be influenced by others' movements, so ask participants not to be influenced by others and indicate their knowledge in the training as objectively as possible.

Make sure that they are clear with the task and demonstrate with examples.

Read out loudly and slowly the following statements:

- Coenurosis is mainly affecting sheep and goats.
- There is no relationship between health of dogs and sheep and goat.
- Dogs can spread worms that infect sheep and goat.
- Dog worms can infect humans.
- It does not make sense to deworm dogs.
- It is unsafe for dogs to feed on sheep and goat heads.
- It is safe to burn and bury sheep and goat carcasses.

Ask participants to discuss why they agree or disagree and then count the number of people by gender who agree or disagree to each statement.

Thank participants and ask them to take their seats.

## 7. Introduce the training

During the ice breaker exercise, you explained why you chose picture cards and shared the issues you have with the health of the animals in the picture cards.

We will follow up on that and discuss more about the health of sheep and dogs.

In plenary, ask participants to share real situation experiences. Ask them to think of a situation where they faced significant losses of sheep or goats due to coenurosis.

Discuss the following questions:

- What is the local name for coenurosis?
- What do you think causes coenurosis?
- How prevalent is coenurosis in your community?
- What is the economic importance of coenurosis?

Write responses on flipchart and highlight main points.

Make PowerPoint/Flipchart presentation on what coenurosis is, what causes it, which animals does it mainly affect, and how does it affect them.

## Trainer notes

Coenurosis (Circling) is a parasitic infection. Coenurus cerebralis is the larval stage of the worm *Taenia multiceps*, causing nervous problem, which is fatal disease of sheep and goats. Coenurosis affects mainly sheep and goats. It also affects cattle.

Adults of *Tenia multiceps* live and reproduce in dog intestine. The eggs are released in the feces and small ruminants can then ingest the eggs from contaminated food or water. Eggs hatch in the intestine of small ruminants and larvae use the bloodstream to reach the brain, or more rarely the spinal cord. The larva develops cysts in the brain that grows during several months, compressing the brain. Coenurosis presents direct losses due to death of sheep and goats, costly treatment for sick animals, reduction in market prices due to poor body condition appearance and poor carcass weight.

## PowerPoint presentation

### Session 1. Introduction to coenurosis

- Coenurosis (Circling) is a parasitic infection, which is fatal disease of sheep and goat
- Coenurosis affects mainly sheep and goat. It can also affect cattle.



### What causes coenurosis?

- Caused by the larval stage of the parasite called *Taenia multiceps* known as *Coenurus cerebralis*.
- The adult tapeworm grows in the intestines of dogs.
- In sheep and goats the larva develop cysts in the brain.



Larvae  
Tape worm



Cyst in the brain



## Economic importance of coenurosis

- Coenurus presents with direct losses due to death of sheep and goat
- Reduction in market prices due to appearance, poor carcass weight
- Treatment costs for sick animals



# Session 2: Transmission of Coenurosis

## Session description

The session deals with transmission of coenurosis. Participants will learn about the life cycle of the tapeworm *Taenia multiceps* (*T. multiceps*), and how it infects sheep and dogs. They will also learn how similar dog tapeworm can infect humans.

## Session objectives

By the end of the session, participants will be able to:

- Explain the life cycle of the tapeworm *Taenia multiceps* (*T. multiceps*)
- Identify hosts of the tapeworm *Taenia multiceps* (*T. multiceps*)
- Explain how a similar dog tapeworm (echinococcus) infects humans and show its life cycle.

## Session content

- Life cycle of *Taenia multiceps* (*T. multiceps*)
- Life cycle of *echinococcus granulosus*

## Learning methods and materials

- Posters showing life cycles of the tapeworm *Taenia multiceps* (*T. multiceps*) and *echinococcus granulosus*
- Illustrations
- Video clips
- Coenurosis leaflets

## Duration

2 hours

## Learning activities

### 1. Introduce the session

You have learned that coenurosis is a parasitic disease of sheep and goats caused by a dog tapeworm *T. multiceps*. You will now learn about how coenurosis is transmitted to and infect sheep and goats.

### 2. Display a poster or PowerPoint slide showing the life cycle of *Taenia multiceps* (*T. multiceps*)

Discuss how coenurosis is transmitted, the developmental stages of the worm, and how it infects sheep and goats.

### 3. Group work activity

Ask participants to sit or stand in a circle. In the middle of the circle, display illustrations of tapeworm eggs in dog feces on grass (a dog dropping feces), sheep and goats (grazing grass polluted with dog feces), and dogs feeding on sheep and goat heads.

Fecal sample collection



Invite volunteers to arrange the illustrations demonstrating the transmission pathway of coenurosis. Encourage questions from other participants and provide explanation to reinforce participants' understanding.

In plenary, ask participants what they learned from the group exercise.

### 4. Mention that a similar tapeworm in dogs (echinococcus) can infect humans. It does not show any clinical signs in livestock.

Using poster or PowerPoint slide, discuss the life cycle of echinococcus.

## Trainer notes

### Cycle of infection

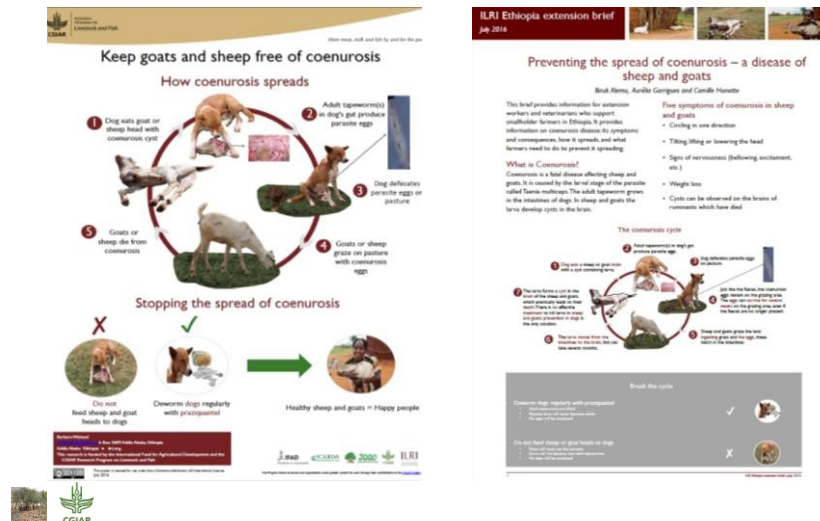
Adult worms develop in dogs when dogs ingest infected small ruminants head or offal with coenurosis cyst. The adult tapeworms in dog's gut produce parasite eggs. Then dogs defecate parasite eggs on pasture. The coenurosis eggs remain on the grazing area. The eggs can survive for several weeks on the grazing area, even if the feces are no longer present. Sheep and goats graze on contaminated pasture with coenurosis eggs and it hatches in the small intestine and travels to the brain and spinal cord via the blood stream. The coenurus typically develops in the brain, reaching the infective stage in about 6 to 8 months. In the final stage, if untreated, coenurosis will cause death of animal.

Adult tapeworm *Taenia multiceps* (*T. multiceps*) develops in the small intestine of dogs (also in foxes and other canids), causing a disease.

Humans become infected after the accidental ingestion of eggs from contaminated food (fruits, vegetables, raw meat) and water contaminated with dog feces, or infected by handling soil, dirt or animal hair that contains the eggs.

## PowerPoint presentation

### Session 2. Transmission Pathways of Coenurosis



### Role of tapeworms (Echinococcosis) in public health

- Echinococcosis is a zoonotic disease of animals that affects humans.
- Is an infection caused by tapeworms of the genus *Echinococcus* spp. A tapeworm that lead to illness and death of human.
- The adult tapeworm grows in the intestines of dogs and cats.
- The growth of the larvae forms cysts in organs such as the liver and lungs in humans.
- Treatment with antiparasitic drugs such as albendazole or mebendazole may shrink or destroy the organism, also prevents it from regrowing in human.



Cysts in the liver



[http://people.uepi.ca/smartinson/Liver\\_lab\\_1\\_SAM.pdf](http://people.uepi.ca/smartinson/Liver_lab_1_SAM.pdf)

# Transmission Pathways of Echinococcosis

## Preventing the spread of Echinococcosis

*Hiwot Desta, Biruk Alemu,*

This brief provides information for extension workers and veterinarians who support smallholder farmers in Ethiopia. It provides information on Echinococcosis disease: what it is, lifecycle, how it spreads, and what farmers need to do to prevent it spreading.

### What is Echinococcosis?

Echinococcosis is a zoonotic disease of animals that affects humans, caused by Echinococcus spp. A tapeworm that lead to illness and death of human. It is an infection caused by the parasite called Echinococcus spp. A tapeworm that lead to illness and death of human. The adult tapeworm grows in the intestines of

dogs. In sheep and goats, the larva develops cysts in the liver and lung.

### Transmission of Echinococcosis to human

The eggs of Echinococcosis are shed in the environment, they can contaminate fruits, vegetables or water

Echinococcosis eggs also stick to the fur of dogs and cats and be transferred on hands of human then to the mouth.

### How echinococcus spreads



### Breaking a Cycle

#### De worm dogs regularly with praziquantel

- Adult tapeworms are killed
- Parasite larva will never become adults
- No eggs will be produced

#### Do not feed sheep or goat carcasses to dogs

- Dogs will never get the parasite
- Larva will not develop into adult tapeworms
- No eggs will be produced

### Important

- Sheep and goats infected before treatment of the dogs has begun will still be affected by Echinococcosis and transmit the disease to human.
- Praziquantel treats Echinococcosis and other parasites in dogs, so your dogs will be healthier and stronger.

### Recommendations

Avoid feeding sheep or goat carcasses to dogs before deworming

Whole villages should join forces to regularly deworm all dogs and to burn and bury all sheep and goat carcasses in the village.

Deworm dogs every three months

- Place praziquantel into food (dosage 100-150 mg per dog)

Leave prepared foods for dogs to eat

- Make sure dogs swallow the tablets

Burn and bury sheep and goat carcasses

For more information, attend local village meetings and ask extension officers or veterinarians.

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# Session 3: Clinical signs of Coenurosis

## Session description

In this session, participants will learn about clinical signs of coenurosis in affected sheep and goats drawing on their own knowledge and experiences.

## Session objectives

By the end of the session, participants will be able to:

- Identify clinical signs of coenuruses in affected sheep and goats.

## Session content

- Clinical signs of coenurosis in affected sheep and goats

## Learning methods and materials

- Brainstorming
- Presentation
- Pictures/images of sick sheep
- Video clips

## Duration

2 hours

## Learning activities

### 1. Introduce the session

In the previous sessions, you learnt the cause and transmission pathways of coenurosis. In this session, you will learn about the clinical signs of coenurosis.

### 2. Brainstorming

In plenary, get participants to brainstorm clinical signs of coenurosis in sheep and goats.

Ask them: "From your experience, what physical symptoms or behavioral changes of affected sheep and goats have you observed?"

Encourage participants to share experiences and tell stories of affected sheep or goats. Write responses on flipchart.

### 3. Group activity

Write clinical signs of some common animal diseases on cards. In addition, display pictures of sick sheep and goats (showing different clinical signs).

Ask participants to make a circle. In the middle of the circle, place the cards and pictures. Invite literate volunteers to identify (pick up) the cards and pictures which describe clinical signs of coenurosis in sheep and goats.

Ask them why they did not pick up the other cards or pictures. Ask people what they learned from the group activity.

### 4. In plenary, discuss the following questions.

- How do you relate clinical signs with the cause of coenurosis?
- Do you think affected sheep or goats can recover from coenurosis?
- When you slaughter affected sheep, what do you observe in the brain of the sheep?
- In your community, is there any cultural practice or perception about coenurosis affected sheep?

### 5. Recap the session. Mention that the clinical signs of coenurosis develop when the central nervous system of affected sheep is invaded by the cystic larval stage of the tapeworm *Taenia multiceps*. Ask for questions or comments.

### Trainer notes

Clinical signs of coenurosis in sheep and goats:

- Incoordination: affected animals tend to stand apart from the flock and react slowly to external stimuli
- Depression, unilateral blindness, emaciation
- Circling in one direction and altered head position
- Dilated pupils, dizziness and paralysis
- Weight loss
- Difficulties to move
- Cysts can be observed on the brains of ruminants which have died

### Session 3. Clinical Signs of Coenurosis

#### Five symptoms of coenurosis in sheep and goats

- Circling in one direction
- Tilting, lifting or lowering the head
- Signs of nervousness (bellowing, excitement, etc.)
- Weight loss
- Cysts can be observed on the brains of ruminants which have



# Session 4: Prevention and control measures of Coenurosis

## Session description

The session deals with measures for prevention and control of coenurosis. Building on their knowledge about the cause and transmission of coenurosis, participants will learn how to prevent and control coenurosis infection in dogs and sheep or goats.

## Session objectives

By the end of the session, participants will be able to:

- Identify challenges in assessing prevalence and control of coenurosis
- Explain how to prevent and control the spread of coenurosis
- Explain why farmers should not give affected sheep and goat heads to dogs
- Burn and/or bury affected sheep and goat heads quickly and correctly
- Routinely deworm dogs in the community every three months.

## Session content

- Deworming dogs
- Disposal of affected sheep and goat heads
- Challenges in assessing prevalence and control of coenurosis

## Learning methods and materials

- Brainstorming
- Posters showing life cycles of coenurosis and echinococcosis

## Duration

90 minutes

## Learning activities

### 1. Introduce the session

In the previous sessions, you learnt the cause, transmission and clinical signs of coenurosis in sheep and goats. In this session, you will learn how you can prevent and control the transmission of coenurosis to keep your herd and dogs healthy.

### 2. Brainstorming

In plenary, have participants brainstorm measures to prevent and control the transmission of coenurosis.

Ask: “How can you prevent and control the transmission of coenurosis?”

Probing questions:

- What do you do with the heads of affected sheep and goats? Do you give sheep and goat heads to your dogs? Do you throw raw sheep and goat heads into bush? or Do you dispose (bury or burn) sheep and goat heads?
- Do you regularly deworm your dogs? Do you follow a community-based deworming calendar?
- Do you know which dewormers you should use and how to use them?
- Do you have access to these dewormers (availability and cost)?

On a flipchart, write down brainstorming results.

### 3. Group activity

In groups, ask participants to identify challenges in assessing prevalence and control of coenurosis and suggest community-based solutions to address these challenges.

- In your community, are dogs left free all time?
- When you diagnose coenurosis in sheep or goats, what will you do? Do you slaughter and consume them? or Do you sell them?
- Do you report coenurosis cases to animal health officers before you slaughter, or sale affected sheep or goats? If not, why?
- What do you think is the advantage of community-based dog deworming calendar?

In plenary, ask a few groups to share their responses.

### 4. Summarize using PowerPoint presentation.

Mention that farmers shouldn't give dogs access to sheep carcasses, particularly sheep head. They must also collectively deworm dogs, preferably every three months.

Mention that deworming dogs with praziquantel also prevents echinococcus. Thus, when controlling coenurosis, we also tackle a public health problem (control human infection with echinococcus).

### Trainer notes

- Dogs become infected by eating infected sheep or goat head.
- Sheep offal (trimmings or waste of sheep or goat) and brain should especially be avoided burned or buried.
- Strategic deworming for dogs in the community to prevent coenurosis cycle.
- Deworming of dogs also prevents human infection with echinococcus.

## PowerPoint presentation

### Session 4. Prevention and Control of Coenurosis

- Avoid feeding sheep or goat heads to dogs
- Burn and bury infected sheep and goat heads
- Whole villages should deworm their dogs with praziquantel every three months to prevent Coenurosis



### Prevention and Control of Echinococcosis

- Avoid feeding sheep or goat carcass (liver and lung) to dogs and cats
- Burn and bury infected sheep and goat carcass (liver and lung)
- Whole villages should deworm their dogs every three months praziquantel to prevent Echinococcosis



# Session 5: Dog fecal sample collection and submission

## Session description

The session deals with collection and submission of dog fecal samples for laboratory analysis. Participants will learn the reasons for dog fecal sample collection. They also practice how they can appropriately take dog fecal samples and submit them for laboratory analysis.

## Session objectives

By the end of the session, participants will be able to:

- Explain the importance of dog fecal sample collection
- Correctly follow dog fecal sample collection and submission guidelines
- Take appropriate precautions during and after taking dog fecal samples

## Session content

- Reasons for dog fecal sample collection
- Dog fecal sample collection and submission guidelines
- Dog fecal sample collection kits
- Precautions during and after dog fecal sample collection and submission

## Learning methods and materials

- Pictures and video clips
- Fecal sample collection materials
- Practical demonstration
- Leaflets

## Duration

90 minutes

## Learning activities

### 1. Introduce the session

In the previous session, you have learnt how to prevent and control transmission of coenurosis. In this session, you will learn about the importance of and how to appropriately take and submit dog fecal samples for laboratory analysis.

## 2. Brainstorming

In plenary, ask participants to brainstorm why it is important to take dog fecal samples for laboratory analysis.

Discussion questions:

- Why do you think we should take dog fecal samples for laboratory analysis?
- What materials will you use to collect and submit dog fecal samples?
- What precautions you should take during and after taking dog fecal samples?
- What challenges could you face in collecting and submitting dog fecal samples?
- What time and where you should take dog fecal samples?

## 3. Make PowerPoint presentation

Handout dog fecal sample collection guidelines to participants. Discuss the reasons for and steps in collecting and submitting dog fecal samples.

## 4. Demonstrate, practice and reflect

Collect different sample collection materials and demonstrate how to appropriately collect fecal samples and give time for participants to practice sample collection in small groups.

Observe while participants practice taking and packaging fecal samples and reflect on their experiences.

## 5. Reflection, action plan and closing

We have come to the end of our training course. I hope you have learned something new, and you will be able to apply the learning to improve your herd and dog health.

Let us now recap and reflect on the training process and our learning experiences.

Write reflection questions on a flipchart paper.

- What I learned from the training course ....
- How I would apply the learning ...
- The challenge I may face applying the learning .....

Ask participants to stand or sit in a circle and give them moment of reflection about their key learnings, how they can apply the learning, and what questions they still have.

You may start from a volunteer and go around the circle. Encourage participants to share any experience in no order and they do not have to think seriously. Encourage illiterate and passive participants to reflect on their learning experiences by giving examples.

Appreciate responses and write them on a flipchart paper.

### Action plan

In plenary, have participants agree on action plans to apply the learning as a group.

Ask them: "What can you do to prevent and control coenurosis transmission individually and collectively?"

Write responses on a flipchart. Provide comments on their action plans and clarify expectations and benefits of applying the learning to improve herd and dog health.

### Post-training evaluation

Assess post-training knowledge, attitudes and skills of participants based on key content and learning objectives of the training.

Repeat the process for the pre-training assessment. Analyse and compare results for pre- and post-training knowledge assessments. Present results using graphs.

Summary table for pre- and post-training evaluation

| Statements   | No of participants who agreed | No of participants who disagreed |
|--|-------------------------------|----------------------------------|
| Coenurosis is mainly affecting cattle.                     |                               |                                  |
| There is no relationship between health of dogs and sheep. |                               |                                  |
| Dogs spread worms that infect sheep.                       |                               |                                  |
| Dog worms can infect humans.                               |                               |                                  |
| It does not make sense to deworm dogs.                     |                               |                                  |
| It is unsafe for dogs to feed on sheep heads.              |                               |                                  |

### Closing

Thank participants for their time and active participation. Express that you have learned quite a lot from their experiences and stories.

Invite community leader or veterinary officer to close the training course.

## Trainer notes

### Dog fecal sample collection and submission guidelines

- Collect a fresh Sample. When the dog defecates, the stool sample should be picked up as quickly as possible. You should know when your dog usually eliminates feces.
- Wear gloves and avoid direct contact with the feces you collect.
- Collect a small amount of sample
- Store the sample in a clean container with one third filled with 10% formalin
- Keep the sample cool
- Mark the sample. Write owner's name and phone number, age of the dog, the date and hour of sample collection and name of kebele.

- Wash your hands with soap and water immediately after handling the feces and dump the gloves that you have used.

## Dog fecal sample collection equipment

- A plastic knife/spoon
- A pair of latex gloves when handling the feces
- Container with a sealable cap/screw cap
- A stick, which may be used to avoid touching the feces with your hands
- A label
- Permanent marker

## PowerPoint presentation

### Feces collection equipment



Sealable cap or screw cap



Permanente marker



A pair of latex gloves



### Fecal sampling



## Further reading

- Acheneff, M., Markos, T., Feseha, G., Hibret, A. and Tembely, S. 1999. Coenurus cerebralis infection in Ethiopian highland sheep: incidence and observations on pathogenesis and clinical signs. *Tropical Animal Health and Production* 31(1): 15–24. Available at <https://dx.doi.org/10.1023/A:1005125316275>
- Bekele, T., Woldeab, T., Lahlou-Kassi, A. and Sherington, J. 1992. Factors affecting morbidity and mortality on-farm and on-station in the Ethiopian highland sheep. *Acta Tropica* 52(2/3): 99–109. Available at [https://dx.doi.org/10.1016/0001-706X\(92\)90025-S](https://dx.doi.org/10.1016/0001-706X(92)90025-S)
- Shiferaw, A. and Abdela, N. 2016. Public health and economic significance cerebral Coenurosis in sheep and goat: A review. *Acta Parasitologica Globalis* 7 (2): 54–65.