

# Health of Ethiopian Animals for Rural Development (HEARD)

## Training material on blackleg prevention and control for smallholder livestock keepers



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## Training material on blackleg prevention and control for smallholder livestock keepers

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International Livestock Research Institute (ILRI)

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# Introduction

Livestock form the main source of livelihoods for smallholder farmers and pastoralists in Ethiopia. Production diseases are among the major constraints to livestock production. Blackleg is one of the diseases that affect cattle production having huge economic implications. Good livestock management plays a significant role in control and prevention of the disease. However, smallholder livestock keepers have limited awareness and knowledge of the disease and the prevention measures. Raising awareness and knowledge of livestock keepers through experiential training can help reduce disease incidence resulting in decreased economic losses. Preventing and controlling blackleg is important because the condition has significant implications such as financial losses for livestock keepers and adverse effects on the affected young cattle.

## Training objectives and intended outcomes

The overall objective of the training is to increase awareness and knowledge of female and male livestock keepers about the causes and transmission of blackleg disease in cattle so that they can take appropriate measures to prevent and control the disease and reduce its economic impact.

Specifically, the training aims to:

- Explain the cause and economic effects of blackleg disease in cattle.
- Describe the transmission routes of blackleg disease.
- Identify the clinical signs of blackleg disease.
- Discuss integrated herd health management measures to prevent and control the disease.

## Training content

- Causes and economic importance of blackleg disease
- Blackleg transmission
- Clinical signs of blackleg
- Prevention and control measures for blackleg

## Training approach and process

The training adopts a participatory, interactive and gender sensitive approach drawing on livestock keepers' knowledge and experiences. The intrahousehold impact of animal diseases and the roles of different household members in the prevention and control of diseases will be explored.

The training will use a mixed and couple's training approach to ensure knowledge application and increase outcomes. Involving development agents in community based training events will ensure better articulation of livestock keepers' problems and contextualization of the training content. This will help facilitate training application (outcomes) as the development agents continue mentoring and supporting the livestock keepers after the training. Participating couples (both wife and husband) in farmer training events will also increase training application at the household level.

## Training methods and materials

- Interactive discussions
- Conversations/experience sharing among livestock keepers
- Storytelling
- Disease leaflets
- Pictures

## Training duration

A complete grasp of the training content will take a day. It will be delivered in community centres to create easy access to men and women livestock keepers. The training can be delivered in half day sessions to allow livestock keepers time for reflection and catering to farm and household activities (particularly women livestock keepers).

# Session 1. Causes and economic importance of blackleg disease

In this section, livestock keepers will learn about what blackleg is, the causative agent of the disease and economic importance of the disease.

## Learning outcomes

By the end of the session, livestock keepers will be able to:

- Explain to other livestock keepers what blackleg is
- Recognize what causes blackleg
- Value economic losses due to blackleg
- Appreciate the intrahousehold impacts of the disease

## Content

- Definition
- Etiology
- Economic importance
- Intrahousehold disease impact

## Methods and materials

- Interactive discussion
- Examples/scenarios
- Pictures

## **Duration: 1 hour**

## Learning activities

### Activity 1. Welcome and expectations

- Welcome participants.
- Introduce yourself.
- Mention that the training is about blackleg prevention and control. Ask participants what they expect from the training and what they hope to change due to the training.

Then, explain the training objectives and expected outcomes.

## Activity 2. What is blackleg and what causes the disease?

In an interactive discussion, ask participants to identify common diseases in cattle. Explore what they think causes the diseases they have identified.

Show the image below and ask participants to discuss it in pairs or trios.

- What do you see in the picture?
- What is the problem?
- What causes the problem?



Jowel, M. S., et al. Characterization and antibiogram study of clostridium Chauvoei isolation from field cases of black leg in cattle

Find out the local term for 'blackleg' and why it is named like that.

Then, explore what participants think blackleg is and what causes the disease. Ask: What causative agent and conditions can expose young cattle to blackleg infection?

Then, communicate the following points to supplement livestock keepers' understanding.

Main learning points:

- Blackleg is a fatal disease caused by spore forming bacteria that grow anaerobically.
- When exposed to air, the bacteria form a spore and may live in the soil for many years. The spores are highly resistant to environmental changes and disinfectants and persist in soil for many years.
- Young animals are more commonly affected (6 months and 2 years). Blackleg occurs most often in rapidly growing animals that are 6 months to 2 years old.
- Blackleg produces an acute local infection and the resulting blood poisoning leads to rapid death. The site of infection is often a leg muscle which is dark in colour.

## Activity 3. Economic importance of blackleg

Ask livestock keepers to mention what they think are the impacts of blackleg on cattle production and their livelihood.

Use the following discussion questions:

- What is the effect of the disease on cattle production?



- 
- What is the effect of the disease on your livelihood?
  - How does the disease affect men, women, boys and girls differently?

Building on livestock keepers' understanding of the effects of blackleg on cattle production and their livelihoods, communicate the following points.

Main learning points:

- Blackleg causes severe financial losses to livestock keepers.
- The financial losses due to blackleg emanate from:
  - The high mortality rate from the disease
  - Production losses due to morbidity and
  - The costs for treatment and vaccination

## Session 2. Blackleg transmission

In this session, livestock keepers will learn about the transmission of blackleg infection. They will learn about the sources and routes of infection and the conditions that expose cattle and small ruminants to blackleg infection.

### Learning outcomes

By the end of the session, livestock keepers will be able to:

- Identify the sources of blackleg infection
- Identify the transmission pathway of blackleg
- Recognize conditions that expose cattle to blackleg infection

### Content

- Source of infection
- Route of infection
- Predisposing factors

### Methods and materials

- Interactive discussion
- Storytelling/experience sharing
- Cases/scenarios

**Duration: 2 hours**

### Learning activities

#### Activity 1. Sources of blackleg infection in cattle

Find out what livestock keepers think are the sources of blackleg infection in young cattle.

Ask them:

- Where do you think young cattle get blackleg infection?
- What is the seasonality of the disease occurrence?

Discuss the following points to supplement livestock keepers' understanding of the sources of blackleg infection.

Main learning points:

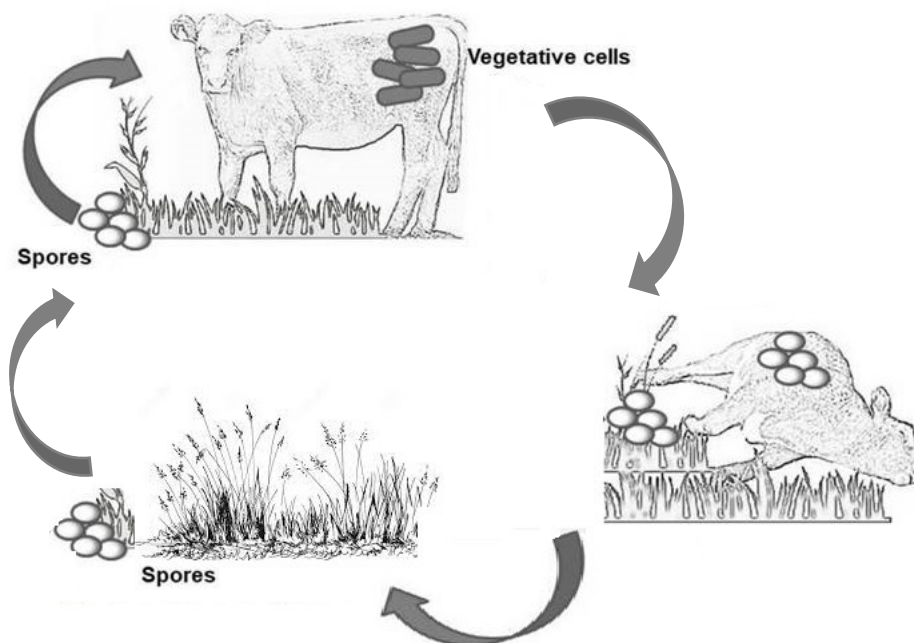
- Blackleg is a soilborne infection (environmental source).
- Bacterial spores enter animals through the mouth or wounds.
- Blackleg is an infectious disease, but it is not contagious. It does not pass from animal to animal. An infected animal cannot spread the disease directly to other members of the herd. Animals only contract it through the spores in the soil.
- Infected soil and pasture grown on infected soil are the major sources of blackleg infection.

## Activity 2. Routes of blackleg infection in young cattle

Building on the previous activity, ask livestock keepers what they think about how blackleg causing pathogens enter the alimentary mucosa of young cattle.

Show the image below and ask:

- What do you see in the picture?
- What is happening in the picture?
- Why is it happening?



Main learning points:

- Blackleg organisms can get into the mucosa of the alimentary tract of young cattle through ingestion of contaminated feed.
- Cattle often consume blackleg spores as they graze at pasture.
- When cattle consume low growing vegetation, they may ingest some soil and bacterial spores as well.
- Once the causative organism is ingested, it passes through the gastrointestinal tract wall and is deposited in muscle and other tissues after gaining access to the bloodstream.

## Activity 3. Predisposing factors

Find out what livestock keepers think can expose young cattle to blackleg infection.

Then, discuss the predisposing factors for blackleg transmission. Explore livestock keepers' feeding and grazing practices and disposal of animal carcasses.

Discussion questions?

- What is contaminated feed and water?
- How can animal feed and water get contaminated?
- How do you provide animals with clean feed and water?
- Do you allow your animals to graze close to the ground during the dry period? What can be the consequence?
- How do you care for the wounds of animals?
- How do you dispose of dead animals? Why do you do this?

Main learning points:

The predisposing factors for blackleg include:

- Muscle trauma associated with transporting, herding and handling creates suitable conditions in the muscle to allow bacterial multiplication and muscle damage
- Injury: sustained injury causes a hypoxic situation on the site
- Ingestion of contaminated feed and tooth eruption in young cattle.
- Drought stunting forage growth
- Recent excavation projects disturb the earth and allow spores to disperse over the ground
- Flooding which carries soil and spores over vast areas of ground
- Moving the herd to a new pasture, especially after heavy rains
- Improper carcass disposal: dead animals are the major source of infection for soil contamination

# Session 3. Clinical signs of blackleg

Blackleg has clinical manifestations. In this session, livestock keepers will learn about the clinical symptoms of blackleg in cattle.

## Learning outcomes

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

- Monitor the health condition of animals.
- Identify clinical signs of blackleg in young cattle.

## Content

- Clinical symptoms of blackleg

## Methods and materials

- Pictures
- Experience sharing/storytelling

**Duration: 2 hours**

## Learning activities

### Activity 1. Clinical signs of blackleg

Show the image below and ask livestock keepers to identify what they think are the clinical symptoms of blackleg from their experience.

Discussion questions:

- What do you see in the picture?
- What is happening in the picture?
- Does this happen in your cattle herd?



Blackleg (disease) - Wikipedia



Blackleg (disease) - Wikipedia

Main learning points:

- Usually, onset is sudden and few animals may be found dead without premonitory signs (sudden death).
- The development period of the disease is 1 to 3 days.
- The symptoms of blackleg in cattle include:
  - **Fever:** At the onset of infection, affected cattle may exhibit a fever, though the fevers often subside as the disease progresses.
  - **Lameness:** It is common for cattle to develop lameness in an affected leg.
  - **Loss of appetite:** Cattle that have developed active infections are likely to stop eating.
  - **Lethargy:** Lethargy or depression can develop in cattle with active blackleg infections.
  - **Hot, swollen muscles:** The pockets of gas gangrene that form can cause the muscles in the affected area to swell. Initially, these areas may be hot to the touch. Fever, lameness, loss of appetite, lethargy and swelling are typically some of the first signs that become visible.
  - **Recumbency:** Afflicted animals may lie down and be unable to get up.
  - **Discoloured skin lesions:** Skin in the affected area may become discoloured as the infection spreads and skin necrotizes.
  - **Crepitation:** Affected animals may have skin that seems to crackle when touched because of the gas that has formed in the muscle tissue.
  - **Diffuse lung sounds and dyspnoea:** Some cases of blackleg involve cardiac lesions in addition to skeletal muscle lesions. In these cases, the lungs make characteristic diffuse sounds and the animal may have difficulty breathing.
  - **Tachycardia:** Blackleg may also cause a rapid heart rate in some animals.
  - Rumen stasis: As the disease progresses, the animal's stomach functions may shut down.
  - Skin coldness and insensitivity: Initially, the skin in the affected area may be hot and swollen to the touch. But as the disease progresses, the lack of oxygen in the affected area and the progression of necrosis may cause the skin to become cold.
  - Malodorous liquid and gas in cut tissue: Because of the gangrene infection, cutting into affected tissue often releases malodorous liquid and gas. The odour is typically described as that of rancid butter.
  - Most animals die within 12 to 36 hours of the onset of clinical sign.

# Session 4. Prevention and control of blackleg

In this session, livestock keepers will learn about prevention and control measures for blackleg disease in cattle.

## Learning outcomes

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

- Apply proper animal carcass disposal practices
- Properly disinfect infected premises
- Fence off affected pastures
- Regularly vaccinate animals

## Content

- Regular vaccination
- Carcass disposal
- Moving animals

## Methods and materials

- Illustrations
- Sharing experience/storytelling
- Buzz sessions

## **Duration: 2 hours**

## Learning activities

### Activity 1. Veterinary consultation and regular vaccination

Facilitate discussion about livestock keepers' perceptions and practices of vaccination in animals.

Discussion questions:

- What is vaccination and how does it work?
- Do you think vaccination treats sick animals?
- When should cattle get vaccinated against blackleg?
- Do you contact the local veterinary office when you observe any disease symptoms in animals?

Building on livestock keepers' experiences, communicate the following points.

Main learning points:

- Contact the local veterinary office immediately.
- Detect and isolate infected animals as early as possible and present the animal to the veterinary clinic for treatment.
- Routinely vaccinate animals before the occurrence of the disease.
- Calves should be vaccinated against blackleg by four months of age.

## Activity 2. Carcass disposal

Find out livestock keepers' practices regarding carcass disposal. Encourage participants to share their experiences.

Discussion questions:

- Do you dispose of animal carcasses into the environment?
- Do you allow scavengers to feed on dead animals?
- Do you wear protective clothing when disposing of carcasses? Why?
- What methods do you use to dispose of carcasses? Which one do you think is more effective?
- Do you fence off infected areas to restrict the movement of animals? If yes, why?

Then, communicate the following main points.

Main learning points:

- Carcasses of animals dying of blackleg should be destroyed by burning or deep burial with quick lime to limit soil contamination.
- Proper disinfection of infected premises. Known blackleg organisms contaminated ground should be disinfected with 3% formalin.
- Do not open the carcass of dead animals.
- Moving animals away from the infected pasture.

## Activity 3. Summary of main learning points and action plans

Recap the main learning points and communicate key action messages that livestock keepers should take to prevent and control blackleg in cattle.

Mention the following:

- Blackleg in cattle is a serious disease but you can control the spread of the disease by regular preventive measures.
- Regular vaccination is the most effective measure to prevent the black quarter in cattle.
- Healthy and muscular animals are mostly affected.
- Keep your farm clean and safe all the time.

Ask a few female and male livestock keepers to reflect on their learning experiences and identify key take home action messages. Then, encourage them to identify practical actions that they can take to prevent and control blackleg in cattle.



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