

# Health of Ethiopian Animals for Rural Development (HEARD)

## Bovine mastitis control and prevention training material for smallholder farmers



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## Bovine mastitis control and prevention training material for smallholder farmers

Dagim Berhanu, Mamusha Lemma, Solomon Gizaw and Theodore Knight-Jones

International Livestock Research Institute (ILRI)

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*Patron: Professor Peter C. Doherty A. C, FAA, FRS  
Animal scientist, Nobel Prize Laureate for Physiology or Medicine–1996*

Box 30709, Nairobi 00100 Kenya  
Phone +254 20 422 3000  
Fax+254 20 422 3001  
Email [ilri-kenya@cgiar.org](mailto:ilri-kenya@cgiar.org)

[ilri.org](http://ilri.org)  
*better lives through livestock*  
ILRI is a CGIAR research centre

Box 5689, Addis Ababa, Ethiopia  
Phone +251 11 617 2000  
Fax +251 11 667 6923  
Email [ilri-ethiopia@cgiar.org](mailto:ilri-ethiopia@cgiar.org)

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# Contents

Introduction	1
Training objectives and intended outcomes	1
Training content	1
Training approach and process	2
Training methods and materials	2
Training duration	2
Session 1. Introduction to bovine mastitis	3
Session 2. Transmission of infectious bovine mastitis	6
Session 3. Clinical signs of bovine mastitis	8
Session 4. Prevention and control of bovine mastitis – a herd health approach	10

# Introduction

Livestock form the main source of livelihoods for smallholder farmers in Ethiopia. Production diseases are among the major constraints to livestock production. Bovine mastitis is one of the production diseases that affect dairy farms having huge economic implications. Managing lactating animals plays a significant role in preventing mastitis. However, farmers lack awareness and knowledge of the diseases and the prevention measures. Raising awareness and knowledge of dairy farmers through experiential and collaborative training activities can help regularly monitor and ultimately reduce the number of cases of mastitis resulting in a decrease in economic losses. Controlling mastitis is important because the condition has significant implications such as financial losses for dairy farmers, adverse effects on cow welfare and potential effects on public health.

## Training objectives and intended outcomes

The overall objective of the training is to increase awareness and knowledge of female and male farmers about the causes and transmission of bovine mastitis so that they can take appropriate measures to prevent the disease.

Specifically, the training aims to:

- Explain the cause, forms and economic and public health effects of bovine mastitis.
- Describe the transmission pathways of bovine mastitis.
- Identify the clinical signs of bovine mastitis.
- Explain and implement herd health interventions developed to prevent and control the deleterious effect of bovine mastitis.

## Training content

- What of bovine mastitis
- Economic importance
- Public health importance
- Causative pathological agents
- Transmission pathways
- Clinical and subclinical manifestations
- Preventive measures for bovine mastitis

## Training approach and process

The training adopts a participatory and interactive approach drawing on farmers' knowledge and experiences. Exploring farmers' views and experiences will enable facilitators to identify knowledge gaps and introduce new knowledge to address these gaps.

The training will also use mixed and couple's training approach to ensure knowledge application and increase outcomes. Involving development agents in farmer training events will ensure better articulation of farmers' problems and contextualization of training content. This will also help facilitate training application (outcomes) as the development agents continue mentoring and supporting farmers after the training. The participation of 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 farmers
- Storytelling
- Disease leaflets
- Pictures

## Training duration

A complete grasp of the training content will take a day training time. It will be delivered in community centres to create easy access to participants and safe learning environment. The training can be delivered in consecutive/sequential half-day sessions to allow pastoralists/farmers time for reflection and catering to farm and household activities (particularly women livestock keepers).

# Session 1. Introduction to bovine mastitis

In this section, farmers will learn about what mastitis is, the causative agents of the disease, types of mastitis and economic and public health importance of the disease.

## Learning objectives

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

- Explain to other farmers what bovine mastitis is
- Recognize what causes bovine mastitis
- Value economic losses due to bovine mastitis
- Recognize and appreciate the public health importance of bovine mastitis

## Content

- Definition
- Etiology
- Types of mastitis
- Economic importance
- Public health importance

## Methods and materials

- Interactive discussion
- Disease leaflets/posters
- Examples/scenarios

**Duration:** 1 hour

## Learning activities

### Activity 1. Welcome and expectations

- Welcome participants
- Introduce yourself

- Mention that the training is about bovine mastitis control and prevention
- Ask farmers what they expect from the training and what they hope to change due to the training

On a flipchart, write down farmers' expectations and intentions to apply the training.

Then, briefly explain the training objectives and approach.

## Activity 2. What is bovine mastitis?

In an interactive discussion, ask farmers to identify the major diseases in dairy production. Write down their responses on a flipchart in the local vernacular.

Show the image below and ask farmers to identify what the problem could be.



Find out the local term for 'bovine mastitis'.

Then, explore what farmers understand by 'bovine mastitis' and discuss the following points to supplement their understanding.

Main learning points:

- A healthy herd is a profitable herd.
- Bovine mastitis is a disease affecting dairy herds.
- It is inflammation of cow udder and mammary glands.

## Activity 3. Economic and public health importance of bovine mastitis

Ask farmers to mention what they think are the consequences of mastitis on dairy cows, their livelihood and the public.

Use the following discussion questions:

- What is the effect of the disease on cows? Probe: welfare and productivity
- What is the effect of the disease on farmers and their households? Probe: reduced milk, contaminated milk, blindness of milk teats, reduced reproductive performance, zoonotic disease, increased treatment cost, etc.

Summarize the discussion and highlight the main points.

Then, discuss the following points, asking farmers to share their experiences.



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Ask farmers if they have any questions.

Main learning points:

- Economic losses: a decrease in milk yield, discarded milk, veterinary services expenses, cost of veterinary medicines, reduced animal value, labour expenses, deterioration of milk quality, death of animals.
- Deteriorating milk quality: changes in milk composition, milk fat percentage.
- A public health risk due to consuming unsafe milk.
- The bacterial contamination of milk from affected cows may cause food poisoning, for example, Tuberculosis, Streptococcal sore throat and brucellosis.
- Residue of antibiotic used in mastitis treatment (in milk or meat) which causes sensitization and allergic reaction.

#### Activity 4. Causes and types of bovine mastitis

Find out what farmers think causes mastitis in cows. What conditions can expose cows to mastitis infections?

Summarize their responses.

Then, discuss the following points, asking farmers to share examples or stories.

Main learning points:

- Mastitis is caused by various pathological agents (bacteria, mycoplasma and fungus).
- Mastitis is classified based on causal agents, mode of transfer and clinical symptoms.
- Mode of transfer: contagious and environmental mastitis.
  - Contagious pathogens are unable to survive for long in the environment and generally are transmitted from one cow to another (cow to cow mastitis) during milking (e.g. milking pot, hands of milkers). It commonly manifests as subclinical or chronic mastitis.
  - Environmental mastitis (environment to cow mastitis) is caused by pathogens in the digestive tract of cattle or their surroundings such as faeces, soil, bedding material, manure or drinking water. As the cow moves around, eats, drinks or even sleeps, environmental mastitis can easily get to the teats and udder, especially during milking periods or shortly after milking when the teat pores are still open.
- Sever cold and high winds can increase mastitis risk in dairy cows.
- Clinical symptoms: different stages of severity of infection (clinical mastitis, subclinical mastitis, peracute mastitis, acute mastitis, subacute mastitis and chronic mastitis).
- Subclinical mastitis is economically the most critical due to its long-term effects on milk yields.

# Session 2. Transmission of infectious bovine mastitis

In this session, farmers will learn about the transmission of bovine mastitis. They will learn about the sources and routes of infection and the conditions that expose dairy cows to mastitis infections.

## Learning objectives

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

- Identify the sources of mastitis infection
- Identify the transmission pathways of mastitis
- Recognize conditions that expose cows to mastitis infection

## Content

- Source of infection
- Route of infection
- Predisposing factors

## Methods and materials

- Interactive discussion
- Storytelling/experience sharing
- Disease leaflets/posters
- Cases/scenarios

**Duration:** 2 hours

## Learning activities

### Activity 1. Sources of mastitis infection in dairy cows

Find out what farmers think are the sources of mastitis infection in dairy cows.

Ask them: 'Where do you think cows get mastitis infection?'

Encourage farmers to chat among themselves.

Then, invite them to share their views. Appreciate their contributions.

Summarize the discussion and highlight the main points.

Explain the following points to supplement farmers' understanding of the sources of mastitis infection.

Main learning points:

- Bovine mastitis is caused by the introduction of bacteria through injured teats, exposure of teats to chemical irritants, infected udder, environmental contact or the milking procedure.
- A cow's udder becomes infected when the teats get exposed to a pathogen and the pathogen penetrates the teats' ducts.

## Activity 2. Route of mastitis infection in cows

Build on the previous activity and ask farmers what they think about how mastitis causing pathogens enter the mammary glands of cows.

Explain that microbes can get into the mammary gland through injured teats and the opening of the teat canal during suckling or milking.

Show the image below and discuss farmers' milking practices.



## Activity 3. Predisposing factors

Find out what farmers think can expose cows to mastitis infections.

Expand the discussion to farmers' existing dairy cow management practices, including feeding practices, housing and sanitation.

Building on previous discussions, highlight the main points.

Mention that management, environmental and host characteristics and microbial factors play a critical role in mastitis infection.

# Session 3. Clinical signs of bovine mastitis

Bovine mastitis has both clinical and subclinical manifestations. In this session, farmers will learn about the clinical symptoms of acute and chronic mastitis in cows.

## Learning objectives

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

- Monitor the health condition of animals.
- Identify clinical signs of mastitis in cows.

## Content

- Clinical symptoms of acute and chronic mastitis
- Monitoring the health and welfare condition of animals
- Reporting disease incidence
- Seeking advice from an animal health professional

## Methods and materials

- Pictures
- Animal health promotion leaflets
- Experience sharing/storytelling

**Duration:** 2 hours

## Learning activities

### Activity 1. Clinical signs of bovine mastitis

Show the image below and ask farmers to identify what they think are the clinical signs of bovine mastitis from their experience.



Write down their responses on a flipchart and highlight the main points.

Mention that the clinical signs of bovine mastitis vary with the severity of the disease.

Main learning points:

- Physical, chemical and bacteriological changes in the milk
- Formation of clots and flakes in milk due to changes in milk composition
- Pathological changes in the glandular tissue
- Udder inflammation, swelling, hardness, heat, pain and redness
- Reduction in milk production
- Movement problems due to swollen udder and pain
- Sunken eye
- Diarrhoea and digestive disorders
- The blindness of one or more teats
- Formation of pus in the udder and teats

# Session 4. Prevention and control of bovine mastitis – a herd health approach

In this session, farmers will learn about an integrated herd health approach to the prevention and control of mastitis in cows. Farmers' awareness about the disease and their knowledge about prevention and control measures can reduce the incidence of infection on the farm.

## Learning objectives

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

- Explain the interdependence between the host, agent and the environment.
- Take an integrated approach to the prevention and control of mastitis in cows.
- Consult a veterinarian when they see clinically ill cows.

## Content

- Interrelationship between the host, agent and the environment
- Improved preventive management practices

## Methods and materials

- Illustrations/posters
- Sharing experience/storytelling
- Buzz sessions

**Duration:** 2 hours

## Learning activities

### Activity 1. Farmers' existing dairy management practices

Show the image and ask farmers what they think about it.

Invite farmers to share their existing dairy cow management practices.

Use the following questions to facilitate interactive discussion:

- What is the housing condition look like? Probe: sanitation, bedding, ventilation, etc.
- How often do you clean cow barns?
- How do you dispose of cow manure?
- How do you feed and water dairy cows? Do you use feeding and watering troughs?
- How often do you clean feeding or watering troughs?

Write down farmers' responses on a flipchart and highlight the main points.

Building on farmers' experiences, communicate the following learning points.

Main learning points:

- Mastitis cannot be fully eliminated from the dairy herds but, with adequate management, economic losses and public health risks can be reduced.
- Care and management of lactating cows are important in the prevention of mastitis in a dairy herd.
- Hygienic housing conditions: clean, dry and adequate bedding for cows to lie.

## Activity 2. Farmers' existing milking procedures

Engage farmers in an interactive and reflective discussion drawing on their milking practices. Make sure that each participant gets the chance to share their experiences.

Use the following questions to facilitate discussion:

- Who in your household often does the milking?
- What utensils do you use for milking?
- How often do you clean the milking utensils?
- Do you use the same utensils to milk more than one cow?
- When do you wash your hands?
- Do you wash your hands between cows?

Summarize farmers' responses and highlight the main points.

Then, communicate the following main points.

Main learning points:

Pre- and post-milking hygiene procedures:

- Use of teat dips and disinfectants: dipping teats before and after milking.
- Milking mastitic cows last and bury the infected milk.



- Proper sanitation of utensils, milker's hands and udder before milking.
- Clean and dry teats before milking: use different cloths for cleaning the teats on each cow.
- Feed cows after milking so that they do not lie down immediately to prevent the entry of microorganisms into teat canals that are still open from milking.

### **Activity 3. Review of main learning points and action plans**

Recap and review the main learning points and communicate key action messages that farmers should take to prevent and control mastitis in cows.

Ask a few female and male farmers to reflect on their learning experiences and identify key take home messages.

Then, in plenary, ask farmers what actions they can take to prevent and control mastitis infections in cows.



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