



INITIATIVE ON
Sustainable Animal
Productivity

Community-based training on small ruminant flock health and welfare management

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About SAPLING

CGIAR's Sustainable Animal Productivity for Livelihoods, Nutrition and Gender Inclusion (SAPLING) is working in seven countries focusing on livestock value chains to package and scale out tried-and-tested, as well as new, innovations in livestock health, genetics, feed, and market systems.

SAPLING aims to demonstrate that improvements in livestock productivity can offer a triple win: generating improved livelihoods and nutritional outcomes; contributing to women's empowerment; and, reducing impacts on climate and the environment. Its seven focus countries are Ethiopia, Kenya, Mali, Nepal, Tanzania, Uganda and Vietnam.

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Introduction

Small ruminants are important source of livelihood for livestock farmers in Ethiopia. They are raised under traditional husbandry practices characterized by frequent mixing of different flocks resulting in the spread of many transmissible diseases. Economic losses because of lamb and kid mortality in Ethiopia are huge. Improving the survival of lambs/kids is essential for the economic viability of a flock and for its long-term genetic improvement.

Improving the knowledge of farmers concerning small ruminant diseases is important to take appropriate prevention and control measures. Improving animal health by minimizing the impact of diseases through improved animal health and husbandry practices will assist farmers to maximize productivity, minimize treatment costs and drug resistance, improve enterprise profitability and improve animal welfare.

Training objectives and intended learning outcomes

The overall objective of the training is to increase awareness and knowledge of female and male farmers about small ruminant flock health and welfare management so that they can take appropriate measures to improve the health and welfare of their animals.

Specifically, the training aims to:

- Discuss the importance of strategic deworming and vaccination.
- Identify biosecurity measures for small ruminant disease prevention and control.
- Engage farmers in a discussion about their newborn management practices.
- Explore farmers' small ruminant husbandry practices.
- Explain the importance of good feeding and sanitation in the health and welfare of animals.
- Explore perceptions and practices of farmers about antimicrobial use and resistance.

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

- Follow strategic vaccination and deworming campaign programs for small ruminant flocks.
- Apply appropriate biosecurity measures to prevent and control small ruminant diseases.
- Apply improved husbandry practices that enhance the small ruminant flock's health and welfare.

Content

- Importance of (strategic) deworming and vaccination
- Biosecurity for disease prevention and control
- Newborn management
- Improved husbandry for animal welfare
- Judicial use of drugs and antimicrobial resistance

Training and mentoring approach

The training and mentoring process adopts an experiential and collaborative learning approach drawing on farmers' knowledge and experience. Learning activities are arranged in a way that encourages farmers to go through a process whereby they first reflect on their experiences. Then, they link these reflections to new information introduced and how they can apply it. During the training, farmers will pause and reflect from time to time on what they have learned, relate it to their experience and think about how they can apply it. Exploring farmers' views and experiences will enable facilitators to identify knowledge gaps and introduce new knowledge to address these gaps. Figure 1 shows the learning activities and process.

Unlike conventional training, collaborative and experiential training starts with what the participants already know or their experiences (Exploration). This encourages farmers to learn from one another, explore and analyse the problem (knowledge and practice gaps), own the problem and seek solutions (new knowledge). The exploration stage will also help trainers adjust content and depth to the needs of farmers (major knowledge and practice gaps). No PowerPoint presentations will be used for community training (instead a checklist of talking/discussion points will be used to structure the flow and progression of learning). Pictures/posters, storytelling and questions will be used to facilitate discussion/experience sharing.

Then, new knowledge is introduced to address knowledge and practice gaps or supplement farmers' understanding/experience in an interactive way.

Key takeaway action messages are communicated to integrate and reinforce learning and motivate farmers to act.

This will lead to engaging farmers to identify action points that they will take individually and/or collectively to apply the learning. The action points also serve as the basis for providing monitoring and mentoring support for farmers after the training.

Figure 1: Collaborative and experiential training process.

Learning activities	Methods	Outcomes
Exploration and analysis	Strategic questioning, challenge scenarios, storytelling, role-plays	Community awareness created; knowledge and practice gaps identified
Introduction of new knowledge	Interactive, picture-supported training/communication	Knowledge and practice gaps addressed; new knowledge/understanding created
Learning integration and reinforcement	Key learning points and action messages	Confidence, action motivation
Action planning and support strategies	Action planning/goal setting questions	Ownership and action commitments

The training will use a mixed and couple's training approach, where applicable, to ensure knowledge application and increase outcomes. Involving local project partners in the training will ensure better articulation of farmers' problems and contextualization of the training content. This

will also help facilitate training application (outcomes) as the partners continue supporting the farmers after the training. The participation of couples (both wife and husband) in farmer training and mentoring will increase collaborative learning, joint actions, balanced role sharing and training application at the household level.

A training transfer action plan will serve as the basis for providing household based mentoring and monitoring support for farmers. The household based mentoring approach¹ will involve not only the household head, which usually is a man, but it involves all members of the household (husband, wife, children and caregivers). In addition to transforming household gender relations and division of work, the approach will facilitate collaborative learning and action among household members that will lead to the adoption of improved management practices as a family business. Figure 2 shows the household based mentoring process.

Figure 2: Overview of the household based mentoring process.

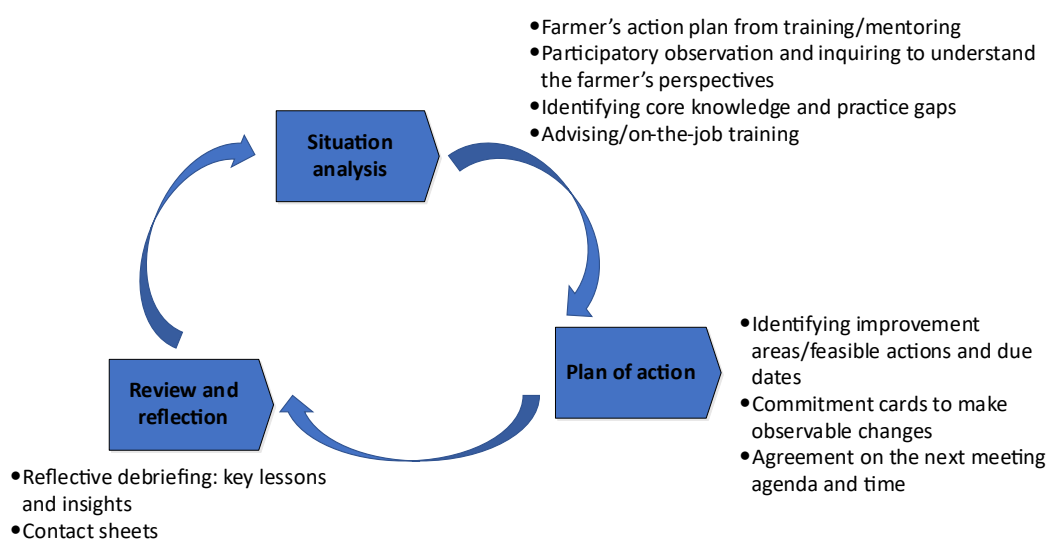


Table 1 provides an example contact sheet to document mentoring activities, outcomes and observations during the mentoring process.

Table 1: Contact sheet for mentoring of farmers

Date	Name of farmer	Mentoring duration	Issues discussed and conclusion reached	Observations and feedback	Next actions	Due date

The training and mentoring support will be delivered by local project partners. In addition to action plans by farmers, the partners will conduct participatory small ruminant farm condition assessments and identify critical action points for improvement. During the mentoring process, the partners will take pictures of farm conditions and improvements made during the mentoring support. Farmers can also be encouraged to take pictures of their improved management practices. This will help conduct photo monitoring of the small ruminant farm situation before and after the training and mentoring intervention. Following the training, a minimum of three rounds of mentoring and advisory support is recommended for farmers. By the end of the training and mentoring process, in addition to the photo monitoring, the partners will hold discussions with the farmers to capture

1. Please see Lemma et al. (2016) for more information.

their training and mentoring experience and capacity created to sustain the changes.

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 two days of training time. It will be delivered in community centres to create easy access to men and women farmers, create a safe/comfortable learning environment for farmers and facilitate practical/peer learning. It is recommended that the training be delivered in sequential half day sessions with about a week interval to allow farmers time for reflection and cater to farm and household activities. There will be four rounds of training in half day sessions delivered at a community centre. Sequential training sessions can be scheduled parallel to the small ruminant flock health management interventions.

By the end of each training round, farmers will make action points to apply the learning. Each successive training session will start off with a recap of the previous session to create logical progression between sessions/training rounds.

Learning measurement

Pre and post training assessments can be done using objective questions such as True or False or Correct or Wrong responses. The questions that cover both knowledge, attitude and practice aspects are based on the core messages of the training content. Additionally, behaviour observation checklists can be used to monitor knowledge retention, application and practice change over time (Table 2). The photovoice method can also be used. Farmers can be encouraged to take pictures of their existing situation before the training/interventions and what they think are their improvements. Photo monitoring can be a useful method to engage farmers in deeper/reflective discussions and capture changes.

Table 2: Monitoring and evaluating household based mentoring activities

Observation parameters	Status on first visit	Status on second visit	Status on third visit	Status on last visit
• ..	• ..	• ..	• ..	• ..
• ..	• ..	• ..	• ..	• ..
• ..	• ..	• ..	• ..	• ..
• ..	• ..	• ..	• ..	• ..

Identify desirable and feasible farm management practices that farmers are minimally expected to practice.

Develop a checklist with Correct or Wrong scoring to observe and monitor practice changes over time due to successive advisory/mentoring visits.

The farm situation before and after the mentoring support will be compared to capture incremental changes due to the training and mentoring intervention.

Topic 1. Strategic deworming for endoparasite control and prevention

Endoparasites are important flock health problems in small ruminants. Farmers might take various measures to tackle these problems. But for the measures to be more impactful, they must be done strategically taking into consideration the local epidemiology of the diseases. In this section, building upon their existing perceptions and practices, farmers will learn about the importance and principles of strategic deworming. They will appreciate the basic epidemiology of the diseases and will be motivated to apply preventive and control measures.

Intended learning outcomes

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

- Identify factors that contribute to the distribution and intensity of parasitic worms.
- Identify exposure routes and seasonality of worm infections.
- Explain the importance of (strategic) deworming in the prevention and treatment of diseases.
- Increase their uptake or compliance with strategic deworming measures.
- Apply good animal husbandry practices to reduce worm parasite infestations.
- Use appropriate grazing land management practices to create safe pastures.

Content

- Worm parasites
- Worms' ecology and seasonality
- Anthelmintics and strategic deworming

Methods and materials

- Interactive discussion
- Examples/scenarios
- Duration: 4 hours
- Learning activities

Activity 1. Welcome and opening

What happens in the welcome and start that can set the tone for the rest of the training process?

- Greet and welcome participants as they arrive to establish friendly relationship.
- Place posters 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.

Icebreaker/warmup exercise

Hand out a skinny/thin sheep picture and ask participants to buzz in pairs or trios.

Then, ask for feedback from some men and women participants.

- What do you see in the picture?
- What is happening in the picture?
- How does the picture reflect the situation in your community?

The aim of the exercise is to get farmers started talking/interaction. They may mention many different things. If not mentioned, ask them to reflect on internal parasites.

Summarize the discussion and mention that you are going to discuss internal parasites.

Activity 2. What are worm parasites? How do they cause diseases?

Ask farmers to describe what they understand by worms and how they affect animals.

Use the following brainstorming questions:

- How do you know when your animals are sick?
- Which of these signs you have just mentioned can be due to worm infections?
- What are parasites? Can you give examples of parasites in sheep?
- How do you know if your sheep are suffering from worms?
- What do you think are the effects of parasites in sheep?

Encourage men and women farmers to share their views. Allow time for an adequate level of discussion. Summarize the discussion and highlight the main points.

Communicate/discuss the following points to supplement farmers' understanding.

Key messages:

- A worm is an organism that lives in a host organism feeding at the expense of its host.
- Worm infection is a condition in which worm parasites infect mainly the gastrointestinal tract of animals and some worms affect the liver and lungs.
- Worm parasites cause disease when they are present in large numbers or when the host animal has weak immunity due to disease or poor nutrition. Worm parasites compete with animals for food nutrients.
- Animals can carry different worm parasites at the same time.
- Worm parasites are major threats to the health, welfare and productivity of sheep and goats.
- Nematodes (gut roundworms) and trematodes (liver fluke) are major worm parasites in small ruminants.
- Different parasites have different lifecycles.
- Young and weak animals or animals in poor conditions are more susceptible to parasitic infections.
- Worm parasite infections reduce the productivity, performance and fertility of animals and increase mortality and morbidity and treatment costs.

Activity 3. Worm ecology and seasonality

Ask farmers to mention risk factors that can expose their sheep and goats to worm parasite infections, focusing on nematodes and trematodes.

Expand the discussion using the following questions:

- What environmental factors determine the incidence and severity of parasitic diseases?
- What is the seasonality of nematode infection in this community? Which months of the year are high risk periods? Why?
- What host factors determine the incidence and severity of parasitic diseases?

Encourage farmers to share experiences and learn from one another.

Summarize the discussion and highlight the main points.

Discuss the following points, asking for examples from farmers. Ask for feedback and encourage them to ask questions.

Key messages:

- Agro-ecology and climate contribute to the distribution and intensity of worm parasites.
- The survival outside the host, development to infective stages and transmission of the nematode infective larvae are mostly influenced by climatic conditions (moisture, temperature and rainfall).
- Environmental factors include agro-ecological conditions and animal husbandry practices (such as housing systems, deworming intervals and managing pasture).
- Moisture and temperature are the most important factors that influence the survival, development, dissemination and availability of free living stages of helminths. Moisture facilitates horizontal and vertical migration of nematode larvae into the environment.
- Seasons of high moisture and temperature are favourable for parasitic infestation.
- Sheep and goats can get infected with worm parasites during grazing and through contaminated feeds.
- Susceptibility of the host is determined by many factors: age, breed, physiological status (parturition, depression of immunity), level of immunity (previous exposure) and plan of nutrition. The nutritional status of the host animal determines the distribution and intensity of worm parasites.

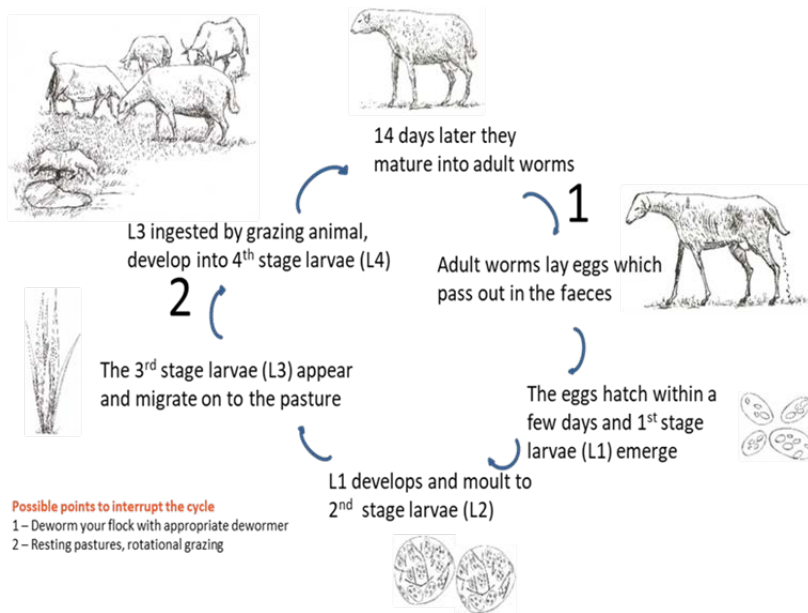
Activity 4. Clinical signs and transmission of worm parasites

Using the picture below, discuss the life cycle and transmission of nematode infection.

Facilitate the discussion using the following questions:

- What do you see in the picture?
- Do you think grazing lands can be contaminated with faeces of worm infected sheep?
- Do you think watering points can transmit worm parasitic infections?
- Do you think overcrowding of animals can cause parasitic infections? If yes, how?
- How do you graze animals during the rainy season?

Figure 3: Lifecycle of roundworm parasites and potential areas of intervention to break the cycle.

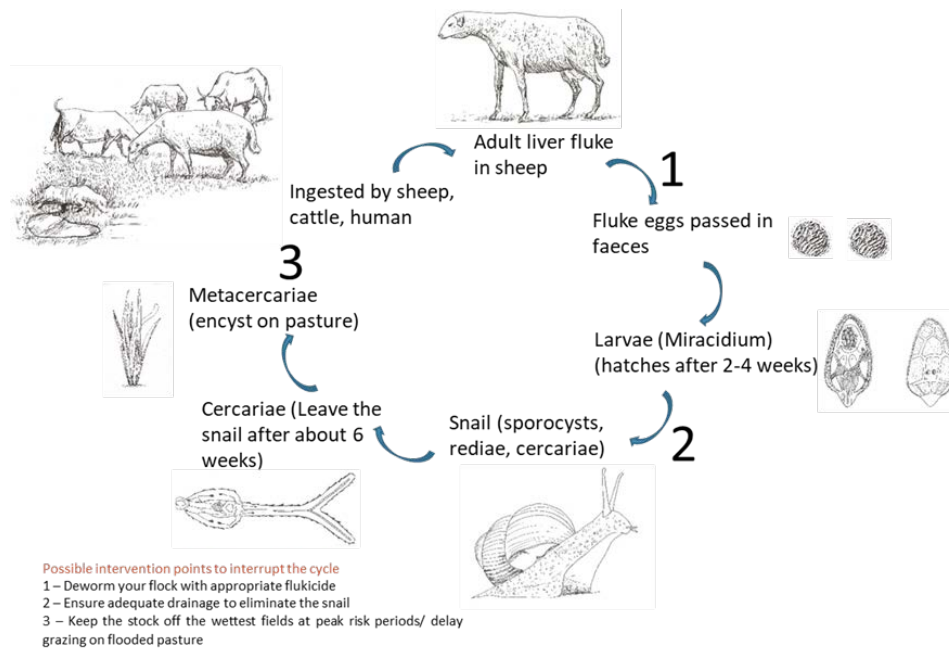


Using the picture below, discuss the life cycle and transmission of trematode infection.

Facilitate the discussion using the following questions:

- What do you see in the picture?
- How do you think liver flukes infect sheep and goats?
- Which animal species (age, sex, physiological status) are most susceptible to liver fluke infections? Why?
- Do you think grazing lands can be contaminated with faeces of trematode infected sheep and goats? If yes, how?
- What is the seasonality of trematode infections in this community? What times of the year are high risk periods?

Figure 4: Lifecycle of liver fluke parasite and potential areas of intervention to break the life cycle.



Encourage men and women farmers to share their views and experiences. Ask for examples and explore their practices. Allow time for a sufficient level of discussion.

Summarize the discussion and highlight the main points.

Then, building on the discussion, discuss the following messages, asking farmers to share examples or experiences.

Key messages:

- If animals are kept in poor conditions (housing, feeding, environmental stress), they can be susceptible to parasite infections.
- Animals mostly get nematode infections from contaminated grazing pasture or drinking water. Sheep and goats get infected when ingesting roundworm larvae while grazing on contaminated pastures.
- Lambs or youngstock are more susceptible to nematode infections since they have less developed natural immunity. They are the major contributors to egg contamination on pasture.
- During lambing, ewes are important sources of pasture contamination to newborn lambs.
- General symptoms typical of worm parasite infections are diarrhoea, weight loss or reduced weight gain, pale mucus membranes, unthriftiness, loss of appetite and reduced reproductive capacity and performance.

Activity 5. Preventing and controlling worm parasite infections

Encourage discussion about farmers' existing animal husbandry and pasture management practices.

Discussion questions:

- Do you practice rotational grazing (resting of pastures) in private or communal grazing lands? If yes, why?
- Are there times in which small ruminants are excluded from pastures/grazing lands? If yes, when and why?
- Do you practice cutting and carrying feeding system during the wet season? If yes, why?
- Do you think manure left on farms, open air or discarded into the environment can cause worm infections? Why?
- Do you cograze or alternate small ruminants with cattle on pastures? If yes, why?

Encourage men and women farmers to share their experiences and learn from one another. Allow time to explore their perceptions and practices, asking them to give examples.

Summarize the discussion and highlight the main points.

Then, extend the discussion to explore farmers' existing anthelmintic use practices. Expand the discussion to include strategic deworming.

Discussion questions:

- When do you deworm your sheep and goats? Why?
- Against what worm parasites do you deworm your sheep?
- Do you follow a community based deworming calendar? If yes, why?
- What are the benefits of community based deworming calendars?
- Where do you get dewormers? Do you think it is safe to buy dewormers from the market?
- What are the consequences of inappropriate drug usage?

Expand the discussion to cover the concept, importance, principles and implementation of strategic deworming for nematode and trematode infections.

Key messages:

- Several species of snails serve as intermediate hosts for trematode infections.
- Strategic deworming entails killing worm parasites within the host to reduce contaminating pasture prior to the onset of the parasite favourable season and reduce the worm burden of the host during the peak of parasitic infestation to ease the pathology on the host.
- Strategic deworming involves administering anthelmintics to the flock prior to the onset of the wet and warm seasons which is favourable for developing parasite eggs into infective parasitic stages in the pasture.
- It also involves selective treatment in the middle of the wet season to reduce the worm burden inside the hosts that is acquired from the infectious pasture due to developing a high level of the infective stage by the favourable season and facilitation of movement of infective stages to the pasture herbage due to high rainfall.
- Farmers must follow strategic deworming calendars to effectively control worm infections.
- Misuse of anthelmintic drugs can cause drug resistance.
- Good animal husbandry and grazing land management practices reduce parasitic infections.
- The larvae of most worm parasites move to the tops of plants when the intensity of light is low at sunrise, sunset and in the overcast sky. Grazing should be avoided during these conditions.
- Most worm larvae crawl up the plant only 5 cm from the ground. Preventing animals from grazing below that point decreases the number of worm larvae ingested.
- Always keep the manure by making a heap so that eggs, larvae, cysts or other stages of parasites are killed due to heat generated during composting.
- Deworming of new animals that are arriving in the herd minimizes parasitic burdens and the spread of infection.

Activity 6. Learning integration and action points

Communicate the following key messages to reinforce learning.

- Transmission of worm parasites generally follows a seasonal pattern because it is dependent on climatic variations.
- Faeces and manure can act as reservoirs of worm infection.
- Balanced nutrition is important to keep animals healthy and develop appropriate disease resistance.
- Breeding does are more susceptible to worms between two weeks before and up to eight weeks after kidding, as their immunity is lowered due to the physiological processes they experience during this time.
- Since the susceptibility of animals varies with age, during the rainy season, the young stock should graze in advance of the older stock.
- Use a cut and carry feeding system in times of high parasite season which can significantly limit worm infestation.
- Avoid livestock overpopulation (overstocking) which increases parasite concentration and forces animals to graze closer to faecal material and the ground and may result in the consumption of a higher number of infective larvae.
- Strategically deworm animals using broad spectrum anthelmintic to reduce the buildup of worm burdens and limit pasture contamination.
- Improve drainage and fence off wet pastures with poor drainage.
- Dose animals with an appropriate flukicide before introducing them to pastures.

- Animals grazing on communal pastures should be treated at regular intervals following a seasonal calendar (strategic deworming).
- Deworm all newly introduced animals before allowing them to mix with the remaining flock.
- Rotate pastures to avoid high worm parasite burdens and ensure adequate drainage to eliminate the snail vectors.
- If possible, delay grazing on flooded pastures until the area has been dry for at least eight weeks. Grass from these pastures can be used as hay if dried properly.
- Provide watering troughs as an alternative to muddy watering holes.

Community action points

Ask farmers what actions they will take individually and collectively to prevent and control the transmission of internal parasites.

Encourage them to identify practical actions based on what they have learned. Mention that the action points will serve as the basis for getting technical/mentoring support from partners.

Topic 2. Biosecurity and strategic vaccination for preventing disease

In this session, farmers will learn about the causes and modes of infection and transmission of infectious diseases. They will explore their existing animal husbandry practices and disease prevention and control measures. They will be introduced to new knowledge on improved disease prevention and control through biosecurity and vaccination measures.

Learning objectives

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

- Identify causes, routes and means of infectious disease transmission in small ruminants.
- Adopt biosecurity measures such as isolation of sick animals and quarantine of new animals or animals returning from markets.
- Avoid mixing flocks in the field.
- Practice various hygienic measures to prevent disease occurrence and transmission.
- Follow strategic vaccination calendars for important small ruminant diseases.

Content

- Disease causes and transmission
- Biosecurity measures: isolation, quarantine, hygiene, disinfection
- Strategic vaccination principles

Methods and materials

- Interactive discussion
- Examples/scenarios

Duration: 4 hours

Learning activities

Activity 1. Disease causes, transmission and biosecurity measures

Ask farmers to mention common small ruminant diseases or disease symptoms. Ask them to share what they think cause these diseases.

Expand the discussion by giving examples of infectious diseases caused by different agents, for example, sheep pox caused by the pox virus, mastitis caused by different kinds of bacteria and fasciolosis caused by the liver fluke parasite.

Discussion questions:

- What is a disease?
- What are the common small ruminant diseases in this community?
- What agents cause small ruminant diseases?
- What are the routes of infection?
- What are the methods of disease transmission?

- Does your flock mix with other flocks (e.g., due to shared housing, at grazing fields or at markets)?
- Do you quarantine new animals or animals returned from the market? If yes, how and for how long?
- Do you isolate sick animals from the flock? If yes, how and for how long? How do you treat isolated animals?
- How often do you clean animal housing?
- Do you wash your hands after handling animals? Why?

Encourage men and women farmers to share their perceptions and practices. This facilitates learning among the farmers as well as helps them understand and own the challenge. They will then seek for new information to address their knowledge and practice gaps.

Summarize the discussion and highlight the main points.

Then, based on the discussion, explain/communicate the following message. Make sure that farmers understand the key messages well.

Key messages:

- Animals are susceptible to different diseases caused by bacteria, viruses, fungi and parasites.
- Disease agents can be transmitted to animals either directly or indirectly.
- Direct transmission occurs when a susceptible animal is exposed to sick animals and their secretions or excretions.
- Indirect transmission occurs when animals encounter contaminated inanimate objects, environmental fomites and animate vectors.
- Introducing new animals into the herd is the most common source of infections.
- The market is an important source of infections. Animals can appear healthy while at the same time carrying a range of diseases.
- Separating sick animals from the flock is important to limit disease transmission.
- Quarantine new animals or unsold animals for a few weeks to prevent new disease introduction into the flock.
- Minimize animal stress through good care (comfortable, clean and ventilated housing; clean and balanced nutrition including adequate and clean water).
- Dispose of dead animals by burning, deep burying or disposal pit.
- Maintain good records relative to flock health including vaccination history, disease problems and medication.
- Routinely dispose of manure, properly clean feed and water troughs and remove objects that animals might chew or lick.

Activity 2. Strategic vaccination

Explore farmers' understanding of vaccination and its importance. Ask farmers to share their experiences. Expand the discussion to include the principles of strategic vaccination.

Encourage a discussion using the following questions.

- What is vaccination?
- How do vaccines work?
- Is vaccination the same as treatment or curing a sick animal?

- Against what diseases is an animal vaccinated?
- When and how often are animals vaccinated?
- Is vaccination a standalone disease prevention measure?

Summarize the discussion and highlight the main points. Mention that vaccines only protect against specific infections and there may be other infections that cause similar signs that the vaccinated animal is not protected against. Vaccination is like insurance; in that, it protects against something that could happen. It must be done before the time of risk and is typically given to all animals. Treatment is very different in that it cures animals once they are sick.

Then, discuss the following key learning points, asking farmers to give examples or share their experiences.

Check for understanding and ask if farmers have any questions.

Key messages:

- Vaccination is the process of introducing a vaccine into an animal. It is used to control a range of diseases caused by bacteria and viruses.
- Vaccination for important bacterial, viral, fungal and parasitic diseases is key to safeguarding the health and welfare of food producing animals.
- Vaccinating animals does not present a risk to the food we eat from those animals.
- Vaccines work by stimulating the animal's own immune system to respond and 'remember' when a real disease threat occurs in the future.
- Vaccination improves animal health and welfare and maximizes production by preventing infectious disease outbreaks. It allows for prevention, rather than trying to cure disease.
- Vaccinations must be given for each disease that the animal should be protected against.
- Vaccination should be given strategically (a few weeks prior to the expected high risk of infection and repeated at the recommended frequency).
- Vaccination must be considered as a supplement to other disease control procedures and must be carried out prior to the challenge of the disease.

Activity 3. Learning integration and action points

Communicate the following messages to reinforce learning.

- Preventing diseases from entering and spreading in livestock populations is the most efficient and cost effective way of managing disease. It is a very expensive undertaking to treat animals after they are sick.
- Strategic vaccination entails vaccinating animals to induce strong immunity that peaks at the time of high disease risk.
- Strategic vaccination involves vaccinating animals ahead of stressful times, flock mixing, high rainfall and flooding seasons.
- A vaccine is not a medicine that fights disease. It allows the animal's body to stop the disease from taking hold. This is called immunity and is the natural way that the body deals with disease.
- Vaccinating animals helps stimulate an immune response without causing the disease itself. This creates early exposure to disease causing organisms, where the animals' immune systems can recall the infectious agent to which the animal is vaccinated.
- Vaccines are cost effective methods used in preventing animal diseases and are good for long-term prevention.

- Vaccination increases immunity, reduces the impact of subclinical disease, reduces the spread of disease and eradicates disease.
- Do not vaccinate animals with poor health and body condition, stress or sickness because the vaccine will not be effective and even could aggravate the disease.

Community action points

Based on what they have learned, ask farmers what actions they will take individually and collectively.

Document the action points and mention that these will serve as the basis for monitoring and mentoring support.

Topic 3. Managing newborn lamb care

In this session, farmers will learn about critical newborn management measures to reduce lamb and kid morbidity and mortality and apply them in their husbandry practices.

Learning objectives

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

- Identify predisposing factors affecting mortality rate in lambs/kids.
- Apply proper management of the flock during gestation and at lambing/kidding to reduce lamb/kid mortality.
- Give proper care to young lambs/kids.

Content

- Maternity
- Lambing observation
- Colostrum management
- Hygiene

Methods and materials

- Interactive discussion
- Examples/scenarios

Duration: 3 hours

Learning activities

Activity 1. Managing lambing/kidding

Encourage discussion around managing ewes/does and managing lambing/kidding to explore farmers' existing knowledge and practices. Extend the discussion to include maternity, lambing observation, care for the young lambs/kids, hygiene and causes of early lamb/kid mortality.

Ask farmers to share what they do before breeding and during gestation. Find out if they evaluate the body condition of the ewe/doe flock, implement nutritional flushing before breeding and control breeding/mating times.

Discussion questions:

- Do you practice control breeding to avoid lambing/kidding during food shortage periods? If yes, how do you do this?
- What season is good for the survival of lambs/kids?
- Do you experience an occasion when the ewe/doe rejects her lambs/kids? Why do you think this happens?
- What behaviour does a pregnant ewe/doe show around lambing/kidding time?
- What care do you take when assisting the ewe/doe at lambing/kidding?
- Why is it important to improve the survival of lambs/kids?
- How do you manage young stock?

- Do you implement flushing around the breeding time of ewes/does? If yes, why and how do you implement it?
- What factors affect the mortality rate in lambs/kids?

Summarize the discussion and highlight the main points. Then, discuss the following key points, asking farmers to share their experiences.

Key messages:

- Type of birth (litter size), birth weight, parity and nutritional status of the dam and season of lambing/kidding affect mortality rate in lambs/kids.
- Lack of colostrum, poor mothering and poor nutrition of the dam during pregnancy and nursing leading to low milk production can be causes for lamb/kid mortality.
- The highest lamb/kid mortality occurs within the first week of birth and from birth to weaning.
- Proper management of the flock during gestation and at lambing/kidding can significantly reduce lamb/kid mortality.
- Adjust breeding/mating times so that lambing/kidding could occur at a favourable time for survival.
- Insufficient feed intake, particularly energy, will result in thin ewes/does that have weak lambs/kids. Moreover, such ewes/does produce inadequate colostrum, have reduced milk production throughout lactation and thus increased lamb/kid mortality.
- Ewes/does should be routinely vaccinated against diseases common in the area. Vaccinating dams in late pregnancy will not only boost their own immunity to infection but the antibodies produced are concentrated in colostrum and are crucial to lamb/kid survival.
- The dam should give birth in a clean environment; either on a well rotated pasture or stall bedded with straw or other absorbent material.
- At the birth of a lamb/kid, clean off any excess mucus to clear airways.
- Newborn lambs/kids lose heat at a much higher rate when they are wet than when they are dry.
- Lambs/kids require warm, dry conditions in cold or wet weather and adequate shade in hot weather. Sheds must be warm, dry and well ventilated. Avoid overcrowding as it increases the risk of infection and the spread of disease.
- The time of weaning should be determined based on the amount of feed and water the lambs/kids are consuming.
- The most important consideration when deciding when to wean a lamb/kid is whether the average daily consumption of feed is adequate for growth and development to continue in the absence of milk. Graze lambs/kids on clean/safe pastures at weaning.
- Providing small volumes of targeted feed to young stock can help rumen development prior to weaning and fill nutrition gaps when dams are off grazing.

Activity 2. Managing colostrum for lambs/kids

Find out the local term for 'colostrum'. Encourage discussion around the importance of feeding newborn lamb/kid colostrum.

Discussion questions:

- What is colostrum?
- Why it is important to feed colostrum?
- How quickly should colostrum be given?
- What factor influences the availability of colostrum at birth?

Encourage farmers to share their perceptions and practices of colostrum management. Allow time for sharing and learning among farmers.

Summarize the discussion and highlight the main points.

Then, discuss the following points.

Key messages:

- Feed colostrum (first milk) to provide lambs/kids with antibodies that provide immunity for the first couple of months of life. It is a highly concentrated source of energy and acts as a laxative.
- Colostrum has a high level of several nutrients that are important for lamb health and performance.
- Lambs should be fed colostrum within 30 minutes to 6 hours after birth.
- Colostrum enables the newborn to follow its mother and protects it from over cooling (chilling) which is the single most important cause of death.
- Moreover, allowing the lamb/kid to suckle colostrum is an important part of the maternal bonding process.
- Starvation and hypothermia cause early lamb/kid mortality. Body energy reserves become critically depleted unless newborns receive colostrum within two or three hours of birth.
- Starvation typically occurs during the first three days of life. A lamb/kid will stand with its head down, ears dropping back or it may be too weak to stand.

Activity 3. Learning integration and action points

Ask a few farmers to mention what they have learned. Integrate learning by communicating key takeaway action messages.

Then, ask farmers what they will do individually/household based on what they have learned.

Topic 4. Improved feeding and housing for animal welfare

In this session, farmers will learn about animal welfare and its positive impact on production and productivity. They will learn that the welfare of their animals is intertwined with their own livelihoods and health.

Learning objectives

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

- Improve their animal housing and feeding management practices.
- Increase animal health and productivity to generate more household income.
- Reduce animal losses due to injuries, stress, malnutrition and diseases.
- Increase their satisfaction when giving good care to their animals.

Content

- Animal welfare
- Housing type, space and hygiene
- Feeding and nutrition

Methods and materials

- Interactive discussion
- Examples/scenarios

Duration: 3 hours

Learning activities

Activity 1. Animal welfare, productivity and livelihoods

Explore what farmers think about animal welfare, what they do to meet the needs of their animals, what constraints they face in meeting the needs of their animals and what they think is the relationship between animal welfare and their own livelihoods.

Discussion questions:

- Is it important to help your animals feel good? Why?
- What does an animal need to be happy, healthy and productive?
- When your animal is not feeling good, how does this affect you and your family members?
- What do you do to care for your animals?
- What does animal welfare mean to you?
- How well do you think you're meeting the needs of your animals right now?
- What is preventing you from meeting your animal's needs?

Explore farmers' perceptions and practices of giving good care to animals. Find out the local term for 'animal welfare'.

Summarize the discussion and highlight the main points.

Then, discuss the following messages.

Key messages:

- Animal welfare is the protection of the health and wellbeing of animals.
- Each animal requires support and care in the form of feed/water, health care, housing and handling.
- Animals have feelings and require resources to be happy, healthy and productive.
- This includes components: the animal's health, the environment in which it lives, its nutritional needs, if it can perform important behaviours and if you handle it well. All these components affect how the animal feels.
- Animals rely on people, everyone in a household, to provide care for them.
- In the same way, all household members rely upon healthy and happy animals to increase household members' wellbeing.
- Animals will learn to either feel scared or safe with the handler, depending on how they treat them. Moving animals calmly helps the animal trust the handler.

Activity 2. Animal housing type, space and hygiene

Facilitate discussion around farmers' animal husbandry practices focusing on animal housing. Extend the discussion to cover the type, space, ventilation and cleaning of animal housing.

Discussion questions:

- What type of housing do you have for your sheep?
- Do you have separate housing for young stock and ewes/does during lambing/kidding?
- Is the animal housing well ventilated and drained? How is it easy to clean and handle animals?
- Who cleans animal barns and how often?
- How do you manage the manure? Do you dispose of manure in the field?



Summarize the discussion and highlight the main points. Then, discuss the following points, asking farmers to share their experiences.

Key messages:

- Provide warm, comfortable, well ventilated and clean shelter.
- Practice good sanitation and keep barns clean and dry. Hygiene in animal housing involves air, bedding and surface hygiene.
- Provide proper and comfortable bedding for animals.
- There must be sufficient space for all animals to simultaneously lie down and ruminate, stand up, turn around, adopt resting postures and move around easily.
- Good drainage is needed to keep the floor dry.
- Isolate ewes with newborn lambs into mothering pens for a few days.
- Poor housing conditions have negative consequences for sheep welfare and udder health.

Activity 3. Providing adequate and clean water and feed

Find out what farmers describe as 'animal feeds' and what is perceived as quality feed. Expand the discussion to include the availability, quality and using locally available feed resources and farmers' feeding and watering practices.

Discussion questions:

- What does 'animal feed' mean to you?
- How do you allocate feeds to different animals? To which animals do you give priority? Why?
- How often do your animals get adequate and clean water?
- Who does what regarding animal feeding and watering in your household?
- Who decides on feed allocation to different animals?
- How do you improve the availability and quality of animal feeds?
- Do you use watering and feeding troughs? If yes, why?
- How frequently do you clean feeding and watering troughs?



Summarize the discussion and highlight the main points. Then, discuss the following key points, asking farmers to share their experiences.

Key messages:

- Animal feeds encompass water and dry matter and provide essential nutrients such as protein, fat, energy, minerals and vitamins.
- Different animals have different feed requirements based on age, sex, weight, production level and physiological status.
- Provide different types and amounts of feeds based on the nutrient requirements of animals (i.e. production, reproduction and maintenance).
- An adequate supply of quality water for dams that are feeding young is extremely important. Ewes with lambs need 4–10 litres of water per day.
- Water access also influences feed intake.
- Water requirement depends on species/breed, diet, temperature, frequency of water provided, type of housing and environmental stress.
- Provide free access to clean water or access to water several times a day.
- Animals need time to drink undisturbed; they may need some time before they will drink the water, so time and space must be given to them.
- Adequate nutrition improves the body condition of animals and leads to higher market prices.
- Provide sufficient feed (each animal has different diet requirements).
- Animals lose body mass when their energy needs are not met.
- Poor nutrition is a key reason for poor reproduction in female animals.
- Female animals that are fat are at risk of difficulty during parturition, are more likely to develop metabolic diseases and are prone to lameness and infertility.
- Managing feed involves avoiding underfeeding and overfeeding, feeding good quality feed (clean and uncontaminated) and selecting feed properly so that the animals get a balanced diet that comprises essential nutrients.

Activity 4. Learning integration and action points

Communicate key takeaway action messages:

- Improper husbandry (poor hygiene, poor infection prevention, poor feeding and poor housing) and introducing new animals into a herd/flock are common causes of animal diseases.
- When animals are not well cared for, it leads to reduced resistance to diseases.
- Animals that are well fed and housed are more resistant to disease than those that are poorly nourished and poorly housed.
- Improve animal welfare and health through proper handling and care (comfortable, clean and ventilated housing and shelter; clean and balanced nutrition including adequate and clean water; positive animal handling behaviour; avoiding physical pain in animals).
- Minimize animal stress through good management practices. Stress makes animals use more energy instead of growing and producing and makes them more susceptible to illness.
- Community action
- Ask farmers what actions they will take individually/in households to improve the welfare of their animals.

Topic 5. Antimicrobial resistance (AMR)

In this session, farmers will learn about how improper use of antimicrobials not only could fail to cure treated animals but also will make the drug not work in the future both for animals and humans.

Learning objectives

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

- Follow prescriptions and advice of trained veterinarians.
- Rationally use anthelmintics.
- Practice alternative disease prevention and control measures to reduce the need for antimicrobials.

Content

- Different antimicrobials for different diseases
- Treatment based on diagnosis
- Dosing and treatment duration
- Causes and consequences of drug resistance
- Alternatives to drugs

Methods and materials

- Interactive discussion
- Examples/scenarios

Duration: 3 hours

Learning activities

Activity 1. Use of antimicrobials

Ask farmers to name common infectious diseases that affect small ruminants and explain what they think causes these diseases. Explore what farmers know about antimicrobials (antibiotics and anthelmintics) and their uses.

Discussion questions:

- What are antimicrobials?
- For what cases/animal diseases do you use them?
- What are your sources of information about the use of antimicrobials?
- What information do you get from these sources about antimicrobials?

Summarize the discussion and highlight the main points. Then, discuss the following key points, asking farmers to share their experiences.

Key messages:

- There are various disease causing agents and animal diseases and their treatment actions differ by the type of causative agents.
- There are different types of antimicrobials and the purpose, administration route and dosage differ based on the type of disease.
- Antibiotics and anthelmintics do not cure every disease.

Activity 2. Treating animal based on diagnosis

Explore farmers' animal treatment practices. Find out what stepwise approach they use in seeking treatment for their sick animals.

Discussion questions?

- Do you comply with prescriptions when using antimicrobials? If not, why?
- Do you make direct contact with drug sources to deliver your own treatment to sick animals? If yes, why?
- What do you do with leftover drugs?
- How often do you use antimicrobials to treat sick animals?
- Do you use human drugs for veterinary purposes? If yes, why?
- Do you quarantine animals on treatment for a few days?
- Do you think it is safe to consume animal source foods immediately after treatment?

Summarize the discussion and highlight the main points. Then, discuss the following key points, asking farmers to share their experiences.

Key messages:

- Adequate diagnosis, although not always so easy, is of paramount importance.
- Do not self treat animals without proper diagnosis and advice by a trained veterinarian for the appropriate choice of treatment including dosages and treatment duration.
- Store veterinary drugs properly.
- Comply with drug withdrawal periods.
- Buy drugs only from approved sources.

Activity 3. Drug resistance

Find out what farmers think is drug resistance in livestock and its causes and consequences. Encourage them to share their experiences or stories.

Discussion questions:

- What is antimicrobial resistance (AMR)?
- What causes AMR?
- What are the manifestations of AMR emergence?
- What can be done to reduce the spread of AMR?
- What are the consequences of AMR emergence?

Summarize the discussion and highlight the main points. Then, discuss the following key points, asking farmers to share their experiences.

Key messages:

- AMR occurs when disease causing agents (bacteria, virus, parasite, etc.) change over time and are no more sensitive to antimicrobials which were effective before.
- The causes of AMR include inappropriate prescription practices, lack of diagnostic facilities, unauthorized sale of antimicrobials, lack of appropriately functioning drug regulatory mechanisms and misuse of veterinary drugs.
- Every time an animal is treated with the same antibiotics, sensitive bacteria (bacteria that antibiotics can still attack) are killed, but resistant bacteria are left to grow and multiply without competition.
- Misuse of antimicrobials such as inappropriate dosage, incorrect duration of treatment, inappropriate drug use, incorrect selection and poor quality of drugs are the major causes of resistance.
- Administer antimicrobials effectively (the right dose in the correct way and the right treatment duration).
- Use antimicrobials only when necessary. Use alternative disease prevention and control measures when possible.
- Antimicrobial use can leave drug residues in animal source foods which can affect human health.
- Spread of AMR can cause treatment failure (drugs do not work) in animals and humans.

Activity 4. Alternatives to the use of drugs

Ask farmers to share proverbs/sayings about the value of disease prevention. Encourage farmers to recall animal disease prevention and control measures and share experiences.

Ask farmers to give examples and share experiences of good animal husbandry practices and how these can prevent the transmission of diseases and reduce the use of drugs and drug resistance.

Summarize the discussion and highlight the main points.

Then, discuss the following key learning points, asking farmers to give examples.

Key messages:

- Preventing infections is better than cure/treatment.
- Sanitation (biosecurity, good housing, ventilation, good hygiene), vaccination and nutrition are the primary measures to reduce the use of antimicrobials and the spread of AMR.

Activity 5. Learning integration and action points

Ask farmers to share what they learned and identify actions to reduce AMR emergence and spread.

Mention that development agents will continue providing mentoring support based on the action points.

Further reading

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