Training Notes

For

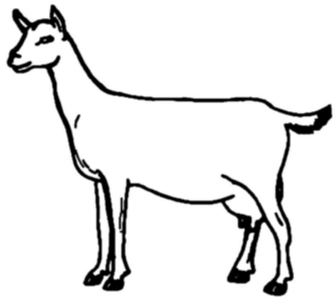
Community Animal Health Workers

Goats and sheep

Small Scale Livestock and Livelihoods Program
PO Box 1604, Lilongwe Malawi

Goats and sheep

Session 1: Goat and sheep production in Malawi*



Session Objectives:

At the end of this training session, each participant should be able to:

1. **Understand the importance of goats in Malawi, both meat and milk breeds**
2. **Understand the major problems associated with raising goats**
3. **Describe the various ways under which goats are raised in Malawi**
4. **Understand the importance of improvement in the general management of goats**

Exercise:

Discuss the reasons why people raise goats. (Each participant should state reasons for the goats that are raised in his/her area).

Create a list that ranks the reasons from the most important to the least important. Some possible reasons might include:

- Prestige
- Cultural ceremonies
- Supplementary income source
- Accumulation of capital (security)
- Meat
- Milk
- Skins and hides
- Manure for improved soil fertility

* **In this unit, we will concentrate on goats more than sheep because goats are much more numerous than sheep and because many of the management needs and problems are the same for both goats and sheep.**

Exercise:

Discuss the problems/constraints associated with goat production and the best ways in which those problems can be addressed. Examples of problems might include:

- Communal land ownership system
- Poor selection of breeding animals
- Problems of not providing good housing
- Problems of disease control especially in the wet season
- Problems associated with feeding
- Absence of well organised markets
- Conflict with other farming enterprises especially young crops
- Risk of loss of goats through theft
- Risk of predation, especially when tethered

Exercise:

Discuss the advantages of goats or sheep under village production systems compared to cattle. Examples of advantages over other species might include:

- Better survival during dry season
- Easier to feed - goats browse and thrive on a variety of bushes rather than pasture
- Goats seem to be fairly resistant to diseases and parasites
- Small size makes management simpler
- Smaller value means risk of loss is not as significant
- They are prolific - twinning is common in goats; they also have a short generation interval
- The initial investment is small - if death/theft occurs, losses are smaller than for cattle
- Disease control and feeding are less costly than for cattle

Management systems for goats

Management System	Description
Village Systems	Under this system goats are allowed to browse (free range) freely. Uses family labour. Kitchen remnants and/or crop residues are sometimes fed to goats. The goats are often tethered during the rainy season to prevent crop destruction and released during the dry season.
Semi-Intensive Systems	Compromise between intensive and extensive systems. Limited grazing or stall feeding is practised depending on time, labour and feed availability. Variable duration of grazing between 4-6 hours daily. Goats are housed after grazing and provided with forages. Essentially a part-time operation.
Intensive Systems	This system is suited for areas where browsing areas are limited. It is suited for a small size of flock and where land is limited. It involves confinement of the goats. The goats are stall-fed (zero-grazed) exclusively and mating is controlled. This is a labour intensive method that requires high capital investment. Does, bucks and kids may be housed separately.

Session 2: Housing systems for goats

Session Objectives:

At the end of this training session, each participant should be able to:

1. **Understand and describe the basic housing systems for goats including both ground based and stilted ("pigeon type") kholas**

Khola types for goats and sheep:

- Stilted kholas - these are made of wood, usually round poles, with a raised floor made of closely spaced poles. Goats manage well on these rough wooden floors, provided the gaps are even and not too wide. The dung pellets should fall between the spaces and can be collected from underneath for use on crops. These kholas are more expensive because they require a lot of timber and nails but they are ideal for housing goats. Mats on the sides are important to protect animals from draught.
- Brick kholas - these are made from baked bricks and are expensive but sturdy and long lived.
- Mud brick or rammed earth kholas - round or rectangular and designed on the basis of what farmers commonly build. The construction technique is similar to that traditionally used for houses and kitchens. These kholas are easy to build and the building materials are locally available and cheap.

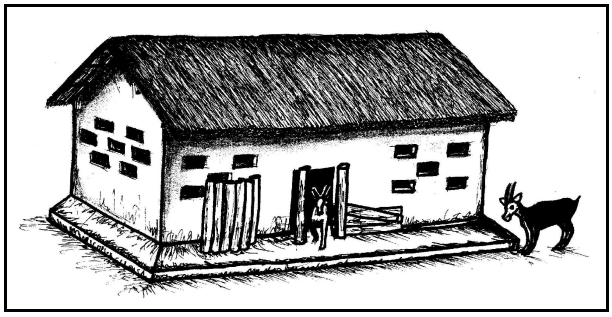
Siting for kholas

- If theft is a high risk, the khola might need to be close to the house.
- The khola must not be sited on an area which may become swampy or inundated with water in the wet season.

Khola dimensions:

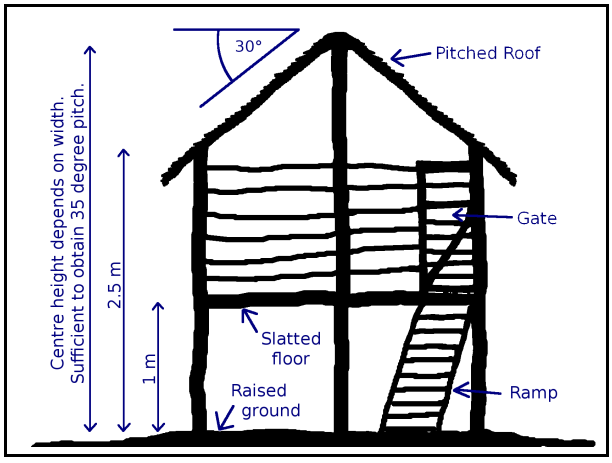
- The size depends on the number of adult goats (breeding stock plus young stock).
- The minimum floor area should be **0.5 square metres per adult goat**.

Number of goats	Area	Rectangular khola	Round khola
1-10 adults	5 square metres	2 x 2.5 metres	2.5 metres diameter
11-20 adults	10 square metres	3 x 3.3 metres	3.6 metres diameter
21-30 adults	15 square metres	3 x 5 metres	4.4 metres diameter



Ground based goat khola

Raised goat khola



Front view of a traditional stilted goat khola

- The khola should be cleaned often to avoid accumulation of faeces. The droppings can be heaped close to the khola to be used as manure for the garden. These can also be mixed with crop by-products or residues and other household leftovers, producing a compost of higher quality.
- The roof should not leak. Any leaks detected should be repaired. If the roof is thatched, the minimum slope should be 30 degrees.
- Avoid using plastic to keep the roof rain proof. It is better to use good thatching with a good pitch of at least 30 degrees. Plastic eventually frays and if it is ingested by the goats, it can cause sickness and death.
- It is best to nail the horizontal rails on the inside of the upright posts, not the outside. That way, the rails will have more strength when the goats bump against them.

Session 3: Feeding and nutrition for goats

Session Objectives:

At the end of this training session, each participant should be able to:

1. **Know some commonly available feed ingredients which can be used for supplementary feeding of goats**
2. **Know a supplementary ration which can be fed to goats**

Exercise:

Discuss the way in which goats normally get fed at the different times of the year. How does this compare to sheep and cattle? What might we do to improve nutrition in goats?

- Goats and sheep have different feeding habits. Sheep are more like cattle - they prefer grazing on grass, whereas goats prefer a more mixed diet, browsing on tree leaves and shrubs. Goats can accurately select shoots and other favoured parts of plants.
- Goats cope better in the dry season in Malawi compared to cattle or sheep.
- Goats cope worse during the wet season than do cattle and sheep. They may cope even worse if they are tethered. Supplementary feeding during the wet season may be necessary. Some of the supplementary feeds commonly available in Malawi include:
    - maize bran
    - rice bran
    - groundnut hay
    - cassava leaves
    - sweet potatoes vines
    - fresh kitchen wastes
    - pods of *faidhebia albida* (msangu) a daily ration of 0.5 Kg per day for a pregnant doe; it is a good source of protein
    - branches of leafy trees eaten by goats; these should be hung to avoid them being contaminated by urine

A supplementary ration example:

A source of energy eg Maize bran (madeya) or rice bran	6.9 Kg
A higher protein feed eg Dried leucaena leaves or soya meal	3.0 Kg
Kitchen salt	0.1 Kg
Total	10 Kg
Feed 0.75 - 1.0 kg of this ration per adult goat per day.	

Session 4: Breeding for goats and sheep

Session Objectives:

At the end of this training session, each participant should be able to:

1. **Understand what breeds of sheep and goats are present in Malawi and the main characteristics of each**
2. **Know the basics of the reproduction parameters for goats**
3. **Know the basics of breed improvement programs and techniques for goats**

Exercise:

Name some of the different breeds/types of goats and sheep in Malawi and the advantages and disadvantages of each. The information in the following table might be useful:

Goats:	Primary uses and advantages
Small East African (local goat) 	This is the goat most common in Malawi. It is used mostly for meat production but in some areas people also milk the females. Its average body weight is about 45 kg for males and 32 kg for females.
Boer goat 	Boer goats are mainly used for meat. Boer goats are much bigger than local goats. Mature males have an average body weight of about 110 kg and females about 90 kg. They can be crossed with local goats to improve goat meat production.

Saanen goat 	Saanen goats are used mainly for milk and meat production. They produce much more milk than local goats. They can be crossed with local goats to establish and improve goat milk production. Saanen goats are heavier than local goats but not as heavy as Boer goats. The males average about 70 kg and females about 55 kg.
Sheep:	
Local sheep	Meat.
Dorper	Meat. Used for improved meat production. Not common.

Basic reproduction parameters for goats

Exercise:

At what age does a goat become sexually active?

How long does heat (sexual receptivity) last?

How long is the period between heats if the goat is not pregnant?

How long after mating does it take for the goat to kid?

What are the signs of heat in goats?

Reproduction parameters for goats

Oestrus Cycle	18-20 days
Duration of Oestrus	24-36 hours
Gestation Period	150 days
Litter size	1-2
Age to sexual maturity: Buck Doe	 8-9 months 7 months

Signs of heat in goats

- Nannies become vocal during oestrus, some very much so
- There is constant tail wagging
- The vulva appears slightly swollen and reddened and the area around the tail may be wet and dirty because of vaginal discharge
- There may be decreased appetite
- There may be increased frequency of urination
- Nannies in heat may mount another goat or let another nanny mount her
- Nannies in heat also are more easily identified if a mature and smelly buck is nearby - they will pace restlessly along the fence looking for a way to get to the buck.

Selection and breeding

- Selection is the process of choosing some individuals in preference to others as the parents of the next generation. Selection is an important technique which is often not used by goat owners in Malawi. Breeding bucks should be selected on the basis of good size, health, and fast growth. Bucks which are inferior can be castrated, sold or slaughtered. Persistent attention to this technique will lead to a gradual improvement in production in goats.
- The use of Boer goats for faster improvements in goat production has been practised in many places in Malawi over many years. Boer bucks can be purchased from local sources and placed within a flock of local goats to improve the production potential of the flock. There are several points worth emphasising in regard to such programs:

    1. Improved breeds require careful management and attention to feeding and disease control. Introduced animals may be more susceptible to the new environment and may be more susceptible to new diseases in Malawi.
    2. For best results, existing bucks should be castrated, or removed from the flock so that the newly introduced bucks dominate as sires of new kids;
    3. Introduced bucks should be exchanged at intervals to avoid in-breeding;
    4. To enable such requirements under normal village conditions, organisation of owners through a local village committee will be necessary, so that all owners understand how they should cooperate with one another.

Exercise:

Discuss what options would be available to you in the following situation. Discuss how best to approach the different individuals and groups involved:

- A village livestock committee has agreed to purchase two Boer bucks to improve the genetic potential of the goats in their village. All members of the committee agree to castrate or remove their existing bucks so that the females are served by the new Boer bucks.
- After the Boer bucks have been purchased by the committee, it emerges that one farmer with at least five local bucks refuses to remove his bucks. It is difficult for other farmers to prevent these bucks from mixing with their flocks and mating with their females.
- The farmers who have paid for the Boer bucks complain to you about the farmer whose local bucks are defeating their plans to improve their goats. They want you to enforce the farmer to remove his local bucks or castrate them.
- How do you go about trying to solve this problem?

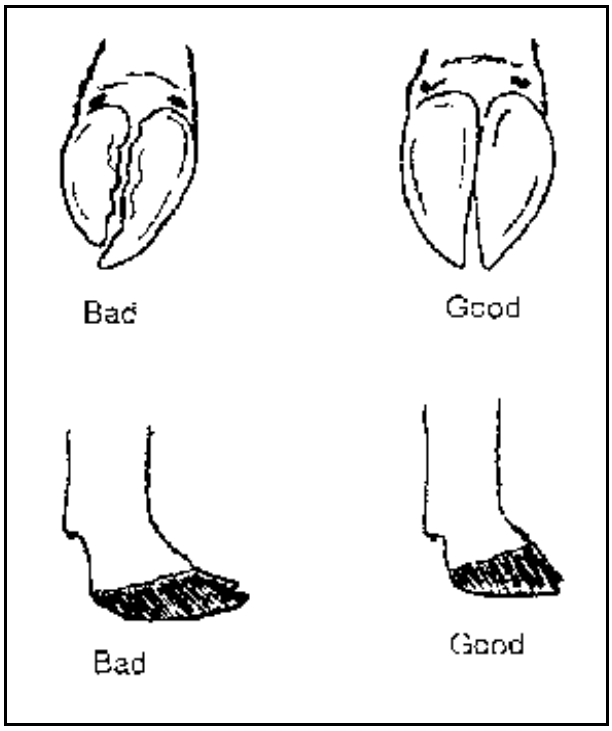
Session 5: Hoof trimming

Session Objectives:

At the end of this training session, each participant should be able to:

1. **Recognise hooves which are in need of trimming**
2. **Know how to trim goat and sheep hooves without causing harm to the animal**

- It is not uncommon for the hooves of goats or sheep to become overgrown or abnormally shaped.



Hoof shape - overgrown and normal
(Courtesy FAO "A manual for the primary animal health care worker")

- Overgrown hooves are painful and the animal may suffer and eat less feed.
- The hooves can be trimmed with a pair of hoof trimmers or a sharp knife. They should be brought back to a normal shape.
- Animal hooves are similar to our fingernails. If you cut too far down, the animal feels pain and bleeds.
- Remove only **a little at a time**.
- **Stop** if any bleeding occurs.

Session 6: Some common diseases of goats and sheep

Session Objectives:

At the end of this training session, each participant should be able to:

1. **Know what are the major common diseases of goats and sheep in Malawi**
2. **Recognise the signs of these diseases**
3. **Know what is the appropriate means of prevention or treatment, if any**

Exercise:

What are some common diseases of goats in Malawi? For each disease, what are the signs? How would you best prevent it? How would you best treat it? What advice would you give to the owner?

Some common diseases of goats in Malawi

Worms	Worms can cause sickness, diarrhoea and death in goats. Worms in the intestines produce tiny eggs which come out with the faeces. These eggs are then eaten by other goats as they graze, causing them to get sick when the eggs become worms in their intestines.
Cause	Worms are picked up from the pasture when the animal feeds. They grow in the gut of the animal and cause disease. They produce worm eggs which come out in the droppings and re-contaminate the pasture.
Signs and symptoms	Scouring and poor body condition. Worms are usually a problem during the wet season (December to March). They are often the worst disease affecting goats in Malawi. They can kill many goats. They are even worse in kids than in adult goats.
Prevention	If goats are housed indoors under clean dry conditions and hand fed, they will be at less risk of worm infestation. If the floor is slatted and droppings can fall underneath, the worm eggs are not consumed and there will be fewer worms in the gut. Low stocking density will reduce the number of worm eggs on the pasture and thereby reduce infection of animals. It appears that improved breeds including Boer and Saanen goats are more susceptible to worms.
Treatment	There are medicines called deworming drugs which can kill the worms. Some are fed to the animal and others are given by injection - both are effective.

Mange	Mange is a disease of the skin. There is itching, rough skin and the animal does not grow well. The disease is spread from affected goats to other healthy goats when they contact each other.
Cause	Tiny mites (insects) which burrow into the skin and cause itching.
Signs and symptoms	Roughened patches of fur appear. The areas of the skin normally affected are the head, neck and back, which become thick and scaly. There is hair loss and skin thickening.
Treatment	Dips and pour-on treatments are available. These kill the mites. Ivermectin injection is also highly effective.

Pink-eye	Pink-eye is a disease of the eye. The eye often look slightly pinkish or white. There is pain and the animal can go blind. It does not eat well and fails to grow well. Pink-eye is spread from infected goats to healthy goats when they are close to each other in the khola.
Cause	A germ which is spread from animal to animal by dust and flies.
Signs and symptoms	The eyes become red and swollen. There is excessive lacrymation. The eyes may become cloudy and whitish and a discharge may be apparent. Ulceration of the eye-ball may occur. The affected animal recovers in the majority of cases without treatment. However, during recovery, the disease can spread to other animals.
Prevention	Separation of affected animals from the flock will assist to reduce spread of the disease.
Treatment	Antibiotic eye-powder or ointments are available.

Pneumonia	Pneumonia is a disease of the lungs. It can kill the animal or make it very sick. Pneumonia is spread from infected goats when they cough near healthy goats or when they are close together in the khola.
Cause	A germ which gets into the lungs and causes difficult breathing and death.
Signs and symptoms	The goat may appear very sick and may have a nasal discharge, eye discharge, difficult (laboured) breathing, coughing, and death may occur.
Prevention	Removal of infected animals from the flock may help prevent spread to the others. Protection from wind, cold and rain will give goats more strength to resist the disease.
Treatment	Medicines (antibiotics, oxytetracycline) are available.

Footrot	Footrot is a disease of the hoof. It is caused by a germ which can spread from one animal to another when conditions are wet and muddy.
Cause	A germ which infects the hooves and causes damage and lameness.
Signs and symptoms	Footrot is more common in wet muddy conditions. It causes lameness which may be severe.
Prevention	Avoid prolonged exposure to wet muddy conditions. Provide good quality dry housing with a raised platform floor. Isolate infected goats to stop them infecting healthy companions.
Treatment	Medicines are available for treatment of footrot. There are antibiotics, penicillin-streptomycin, tetracycline, and topical preparations can be used in the treatment of the disease. Foot-baths containing 5% copper sulphate, 10% zinc sulphate and 5-10% formalin can be used in intensive production systems.

Dermatophilosis	Dermatophilosis is a disease of the skin which can spread directly from an infected goat to a healthy goat, especially in the wet season.
Cause	A germ which infects the skin of the animal. It comes from animals which already have the disease.
Signs and symptoms	There is skin irritation (dermatitis) which causes the formation of crusts and thick scabs, especially on the muzzle, face, nose, ears, scrotum and feet. It may begin with the production of a greasy exudate and crusts on the skin which later on turn into yellowish scabs. The yellowish scabs then become hard and horny and there may be loss of hair in the affected areas. The disease is more common where there is rain and humid conditions and where insects and ticks are more common. It is more commonly seen in the rainy season compared to the dry season.
Treatment	Medicines (antibiotics) are available for treatment of dermatophilosis.

Orf	This disease is a common disease which causes scabs on the mouth and lips of goats. It is also known as scabby mouth, contagious pustular dermatitis or contagious ecthyma.
Cause	A virus which is easily spread from infected animals to others. The virus enters through abrasions of the skin caused by spiky plants and such.
Signs and symptoms	This disease causes pustular and scabby lesions on the muzzle, lips and nostrils. Occasionally, it affects the udder. It produces a thick layer of grey crust and later on thick scabs which are difficult to remove. It mainly affects kids and lambs of 3-6 months old. It can also affect man. Animals generally recovery in 2-3 weeks. Badly affected animals do not eat and can thus lose considerable condition.
Treatment	Badly affected animals can be hand fed a soft diet until they recover. This will help them through the difficult period when they cannot eat. Antiseptic ointments such as Lugol's iodine can be used to reduce severity of lesions.

Review questions

1. What are the reasons people raise goats in Malawi?

2. What are some of the common problems or constraints associated with goat production in Malawi?

3. Draw a diagram of a stilted khola and show the dimensions for the height of the floor above the ground, and the height of the side poles.

    - What is the minimum floor area per adult goat?

    - What is the minimum angle for a thatched roof?

4. Name some of the supplementary feeds which can be fed to goats when feed is scarce.

5. What are some of the common breeds of goats in Malawi and what are their main uses?

6. Reproduction in goats:
   What are the signs of heat in goats?
   How often does a goat come into oestrus?
   What is the duration of oestrus?
   How long is the gestation period of a goat?
   How old should a doe be before being mated?

7. What are some steps and precautions to take when a community wants to improve their goats through breeding with a Boer buck?

8. When are worms most likely to be a problem in goats?
   What are the symptoms of worm infestation in goats?
   How can we treat worms in goats?

9. What are the symptoms of pneumonia in goats?
   How can we treat pneumonia in goats?