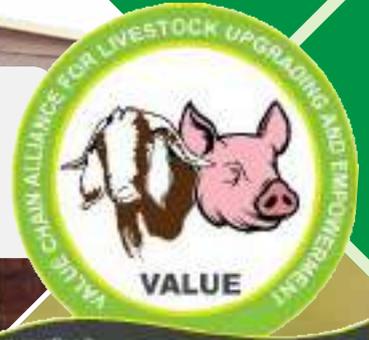




Zimbabwe
AGRICULTURAL
GROWTH
Programme



Funded by the European Union

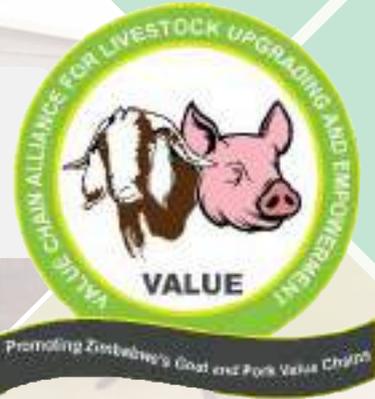


Promoting Zimbabwe's Goat and Pork Value Chains



**Value Chain Alliance for Livestock Upgrading
and Empowerment**

GOAT HOUSING AND WELFARE



**Value Chain Alliance for Livestock Upgrading
and Empowerment**

GOAT HOUSING AND WELFARE

INTRODUCTION

This training manual is intended to serve as a guide for the trainers so that they provide the necessary and relevant training methodologies and techniques to enable the value chain members in the goat value chain understand goat housing and welfare. The Goat Value Chain has been operating without proper goat housing and welfare. This module is a training tool for developing the capacities of the enterprises in practices of good goat housing and welfare. The target group is the small to medium farmers (including youth and women farmers), lead farmers (anchor, champion), farmer groups, Business Management Unit (BMU), syndicate or cooperatives and integrators, who will be trained in this program to enhance their skills at individual and organizational levels. The trainees are expected to utilize the skills in their respective activities in Goat Value Chains. Improved goat housing and welfare will contribute to the overall growth and development of goat value chains in the country.

TABLE OF CONTENTS

Table of Contents	3
List of Figures	4
1 INTRODUCTION	5
2 INFORMATION AND INSTRUCTIONS TO THE TRAINER	6
3 USERS OF THE MANUAL	7
4 PRESENTATION METHODOLOGY	7
5 ASSESSMENT	7
6 GOAT HOUSING AND WELFARE	8
6.1 Introduction to Goat Housing	8
6.2 House Siting	8
6.3 Goat housing systems	9
6.3.1. Production Systems	9
6.3.2 Housing structures	11
6.3.3 Types of housing	15
6.4 Introduction to Goat Welfare	19
6.4.1 Responsibilities of owners/keepers	20
6.4.2 Necessities of Stockmanship	20
6.4.3 Health and welfare plan	21
6.4.4 Disease control and biosecurity	22
6.4.5 Handling	23
6.4.6 Transportation	24
7 CONCLUSION	25
8 REFERENCES	26
9 Glossary	27

List of Figures

Figure 6-1 A Goat pen for 50 goats	9
Figure 6-2 Subsistence goat production	9
Figure 6-3 Extensive goat production	10
Figure 6-4 Intensive goat production	11
Figure 6-5 A Standard Goat Structure for 100 goats	11
Figure 6-6 Goat Pen floors	12
Figure 6-7 Goat Pen Walls	13
Figure 6-8 Goat Pen roofs	14
Figure 6-9 Water and Feed Troughs for goats	15
Figure 6-10 Walled and Roofed goat pens	15
Figure 6-11 Walled and Roofed goat pen illustration (mm)	16
Figure 6-12 Steel bars/Fence Roofed goat pens	17
Figure 6-13 Raised floor with wooden walls, roof and feeding area goat pen	18
Figure 6-14 Poles and Roof with no floor goat pen	18
Figure 6-15 Kids housing	19
Figure 6-16 Goat handling and interaction	20
Figure 6-17 Farm health record	21
Figure 6-18 Biosecurity features	22
Figure 6-19 Goat Pen floors and goat handling facilities	23
Figure 6-20 Transportation of goats	24

2

INFORMATION AND INSTRUCTIONS TO THE TRAINER

This manual should be used purely as a facilitator's guide. The sessions under each module are presented with an outcome(s) in order to facilitate the assessment of participants' understanding and depth of knowledge at the end of each session. Following the outcomes(s) are the topics to be covered and facilitating methodology. However, the facilitator should feel free to adapt the methodology suggested to the needs of participants. To enhance a participatory learning process, some methods of presentation and the steps to follow are therefore outlined. The manual also provides some background information on each session. The information is also meant to aid the facilitator in the preparation for the session. Like all participatory methods, the involvement of the participants in all stages of the learning process is vital. However, all users of this manual must study and research into the content of each module prior to presentation. Start each sub-topic and group activity by explaining the objective and learning outcomes expected of them, and ensure they are met. Though contents for each sub-topic are provided, lead the participants into giving their points, copy them in the flip chart/white board/chalk board, some of their points will or may coincide with the contents in this Module, and then mention to them the items of sub-topic's contents that were not pointed out by them.

The session should be interactive, participatory, lively, and interesting. Let the participants express themselves in vernacular Language for them to understand the concepts. Encourage them to ask questions especially on concepts that they do not understand. Switch to either English or vernacular language when you find some or all of them do not understand you in one of the languages.

Start the session with greetings, welcoming remarks, and introduce yourself. Ensure you have the necessary stationeries for the trainees and equipment and materials: projector, flip charts or whiteboard, white board markers, marking pens, and handouts. Be time conscious as you facilitate the Session.

This manual is organised around aspect of a goat housing and welfare such types of goat pens, goat welfare, competencies of goat owners/keepers and specific needs of goats.

3

USERS OF THE MANUAL

The manual is intended to be used by facilitators at various levels of the goat value chains in Zimbabwe.

4

PRESENTATION METHODOLOGY

The methods of presentation outlined in the manual are suggested as a guide to the facilitator. The facilitator is expected to use his or her judgement in selecting the appropriate method or combination of methods in presenting each session.

5

ASSESSMENT

At the end of each session, the facilitator is expected to assess/evaluate the participants understanding and level of knowledge by using a simple question and answer session as appropriate. In some of the sessions, assessment questions are suggested as activities whilst in some the facilitator is given a free hand in determining the kind of questions to be asked. However, all assessment must relate to the session.

6

GOAT HOUSING AND WELFARE

LEARNING OUTCOMES

By the end of this module, farmers should be able to:

1. Explain the purpose and objectives of housing goats.
2. Name the types of goat pens.
3. Explain welfare of goats.
4. Describe competencies of goat owners/keepers.
5. Explain specific needs of goats.

6.1 Introduction to Goat Housing

Goat house is a structure for sheltering goats which should provide optimum environment for growth meeting the welfare needs including their need to exhibit normal behavior, their need to be housed with, or apart from, other animals; to be free from discomfort, free from pain, injury and disease; as well as being free from fear and distress.

6.2 House Siting

- House siting for goat depends primarily on the availability and use of land.
- The site where the goat pens are positioned must be at least 20 m from the residences.
- Preferably the goat pens should not be erected too close to sources of cold temperatures like dams and rivers.
- The goat pens should be sited on downwind direction.
- Logging soils that are poorly drained must be avoided, as these can become wet basins.
- There should be enough space for the future expansion of the project.

Figure 3.7 Doe

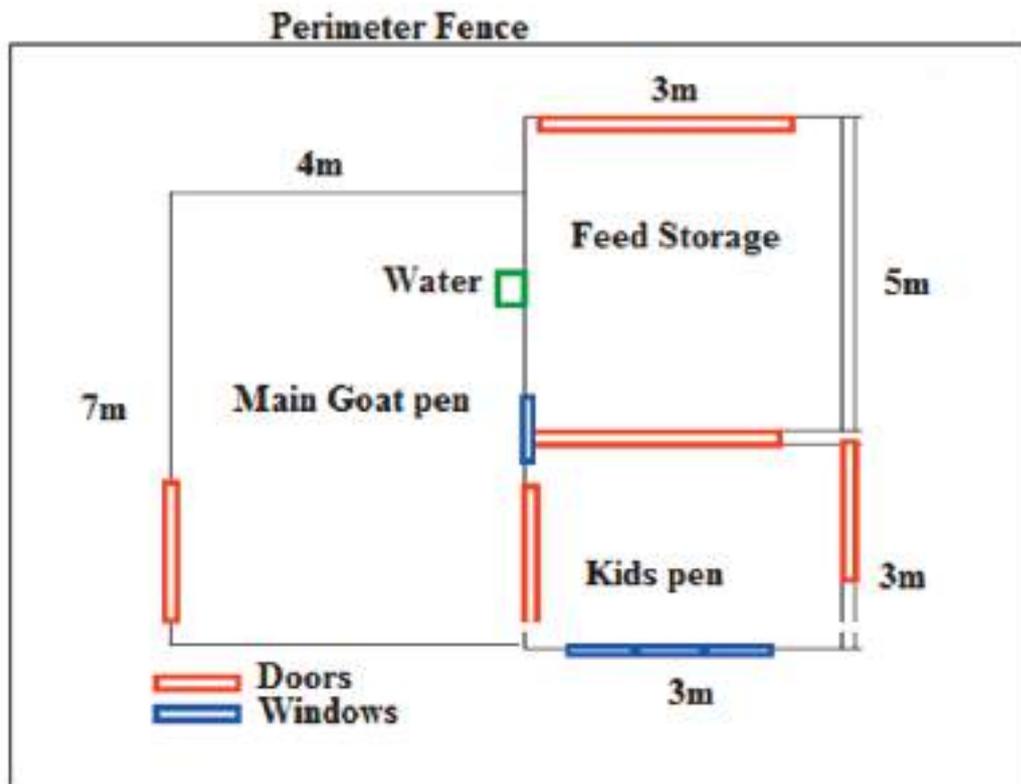


Figure 6.1 A Goat pen for 50 goats

6.3 Goat housing systems

Goat housing systems are determined by the level of production.

6.3.1 Production Systems

a. Subsistence

- In this system a few goats are tethered or herd during the day and put into a protective shelter at night.
- Infrastructural investment is very low.
- The primary reasons for goat keeping are obtaining milk and/or meat for home consumption.
- Goats have access to crop residues.
- Resource constrained.



Figure 6.2. Subsistence goat production

b. Extensive

- In this system the flock/herd grazes overlarge areas of marginal land unsuitable for agriculture.
- The flock is usually shut into a yard at night.
- Extensive goat production has lower costs for the installation and maintenance of production than intensive goat production.
- The primary reasons for goat keeping are for both obtaining milk and/or meat for home consumption and selling.
- Goats may be supplemented during periods of feed deficiency and have access to crop residues.
- Lower output and less efficient in comparison to the intensive system.



Figure 6.3 Extensive goat production

c. Intensive

- Under this system the goats are confined to yards and shelters the stocking density is very high.
- The feed is brought to the flock or they are allowed foraging in paddocks with improved pastures.
- The feed can either be purchased or farm formulated or both.
- This system offers the greatest protection for the flock from both predators and parasites.
- The level of management is very high.
- Although it may make the best use of limited land resources, this system also increases labour and the capital investment required for facilities.
- Infrastructural investment is very high.
- Intensive goat farms have higher costs for the installation and maintenance of production than extensive farms.
- The primary reasons for goat keeping are purely commercial that is obtaining milk, breeding goats and/or meat for selling.
- Higher output and more efficient in comparison to the extensive system.



Figure 6.4 Intensive goat production

6.3.2 Housing structures

Recommended space allowance in goat pens

- Space requirements depend on the age/size of the animal.
- It is important to allow for both feeding and movement space within a pen.
- The table below summarises space requirements for confined and open space reared goats.

Table 6-1: Recommended space allowance in goat pens

	Weight/kg	Floor space (m ² /animal)			Trough space m/animal
		Solid floor	Slatted floor	Open yard	
Kid		0.4 - 0.5	0.3 - 0.4		0.25 - 0.30
Doe	35	0.8	0.7	2	0.35
Doe	50	1.1	0.9	2.5	0.40
Doe	70	1.4	1.1	3	0.45
Pregnant doe		2.0	1.5	4	0.45
Buck		3.0	2.5	6	0.5

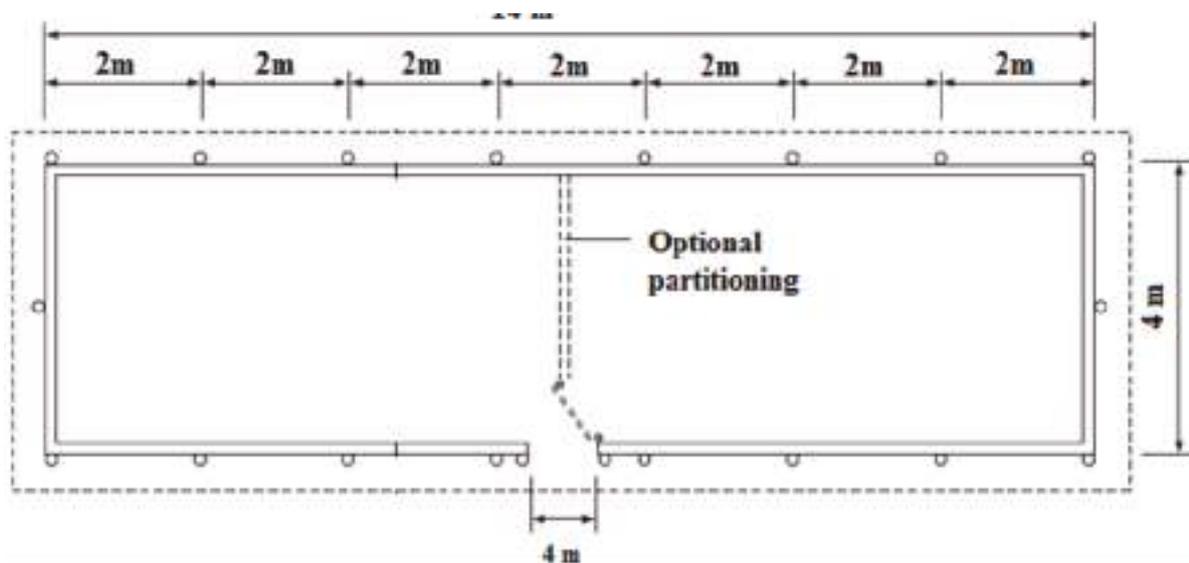


Figure 6.5 A Standard Goat Structure for 100 goats

In Zimbabwe because of high temperature, heavy rainfall and the susceptibility of goats-to parasitism, the most practical goat houses are those which are:

- Raised above the ground level,
- Well ventilated,
- Have long eaves to prevent heavy rain showers to splash in from the sides.

a. Floors

- The floor of the house must be raised about 60 cm above the ground.
- Floors can be of sand, wood or concrete not slippery and easy to clean.
- The floor should have a 1 or 2% slope toward a drainage area.
- If floorboards are being used, they should have spaces of 2 cm between them.
- Floor strength should be able to sustain the strain from the goats.
- Provision must be made for collection of dung and urine periodically.



Figure 6.6 Goat Pen floors

b. Walls

- Walls or poles for the structures should be strong so that the goats are contained within the pen.
- A 115 mm wall is strong enough provided the mortar used is of the right mix of cement and pit sand.
- Strong iron or wooden poles can be used.
- The wall should have air vents for proper ventilation.



Figure 6.7 Goat Pen Walls

c. Roof

- The pen needs roofing to protect the goats from rain, extreme cold and direct sun's rays.
- Several materials can be used for roofing, but it is advisable to use durable material.
- The roof must be made from iron sheets, asbestos, and polythene.
- In resource constrained situations locally available resources like thatching grass can be used.
- Thatching should be avoided because of the risk of fire.
- The gradient of the roof should be at least 1:40 to shed rainwater.

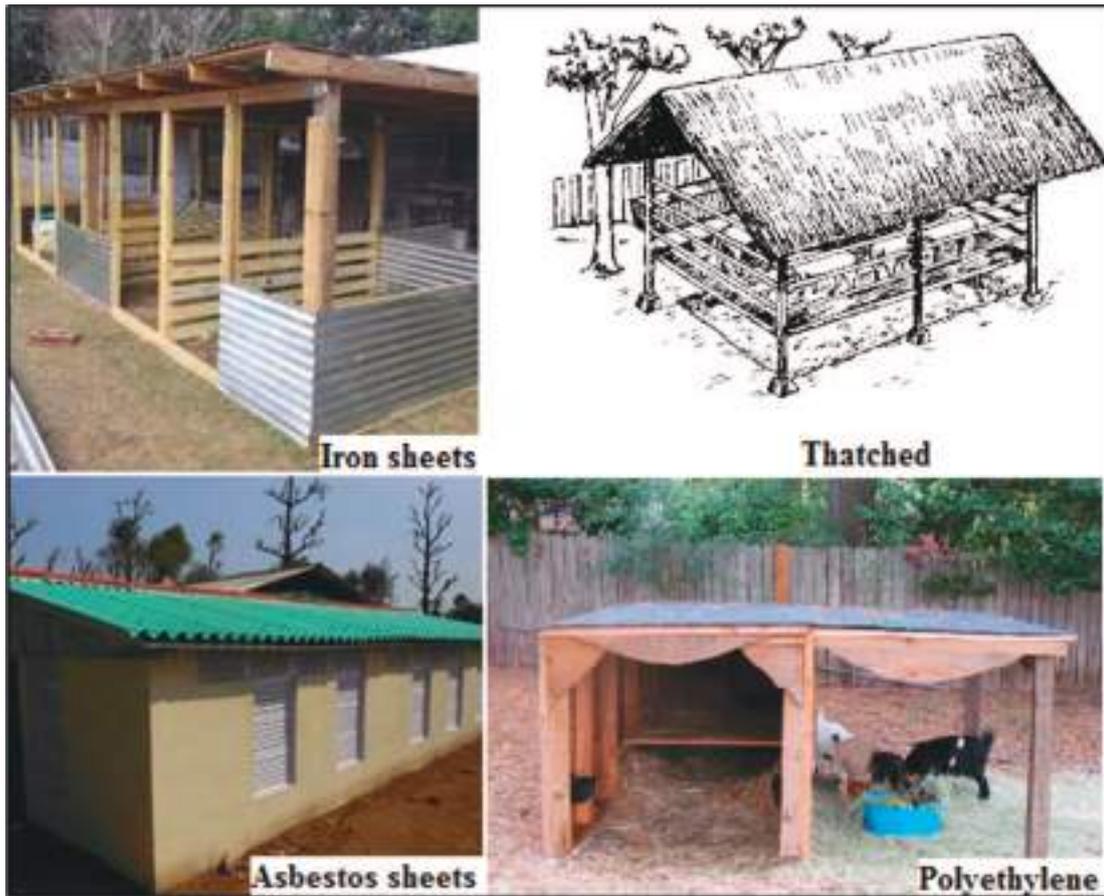


Figure 6.8 Goat Pen roofs

d. Feed and water troughs

- The feeders should keep food off the ground so that it is not trampled and soiled by the goats.
- They should be cleaned frequently.
- During designing of the structures in the goat pens, allow for trough/feeding space as shown in the table above.
- Suitable containers also need to be provided for licks.
- Make sure the kids can reach the water troughs without a danger of drowning.



Figure 6.9 Water and Feed Troughs for goats

6.3.3 Types of housing

a. Walled and roofed



Figure 6.10 Walled and Roofed goat pens

- A wall that is at least one metre in height is erected.
- However, the housing should be well ventilated, warm and be able to protect goats from wetness during the rainy season.
- The surface should be easy to clean.
- The wall can be erected using bricks, iron sheets or wooden poles and mud.
- The roof can be iron sheets, asbestos or from locally available thatching grass or stover for resource constrained farmers.
- Floors should be made from concrete, not slippery and easy to clean.

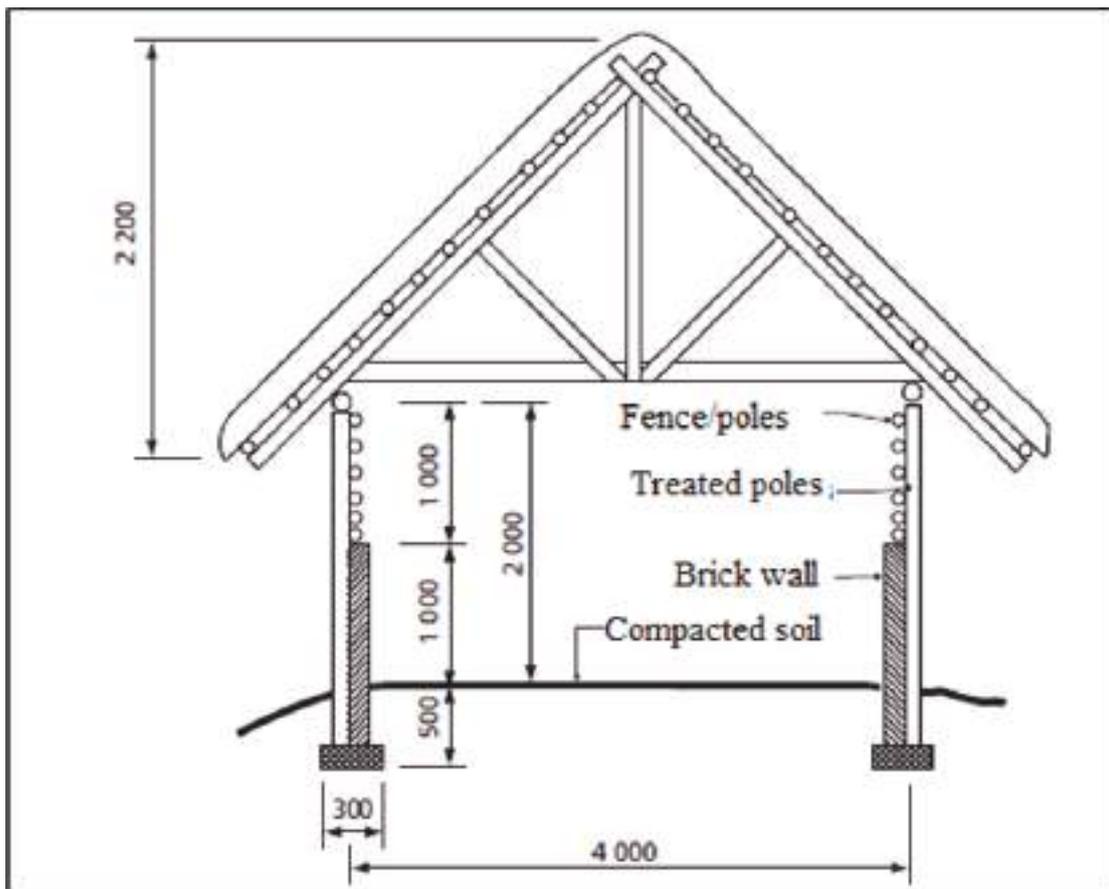


Figure 6.11 Walled and Roofed goat pen illustration (mm)

b. Steel bars or fence and roof (shed)

- An enclosure is made from steel bars or fence to allow maximum ventilation.
- Iron sheets or asbestos are used to roof the structure.
- The housing will protect the goats from intense heat and rain.
- Nevertheless, wind draughts and intense cold may cause problems to the flock.
- Curtains may be used in the cold season and at night.
- In constructing the structure it is important to partition based on the age of the animals.



Figure 6.12 Steel bars/Fence Roofed goat pens

c. Raised floor with wooden walls, roof and a feeding area

- This type of housing for adult goats is warm and easy to clean.
- Moreover, animals can be fed at the pens.
- The floors are well drained resulting in reduced foot rot incidences.
- This type of housing is usually ideal for small to medium size flocks.
- The distance between slats should be 2 cm and height from the ground at least 60 cm.

d. Poles and roof with no floors

- Locally available wooden poles are erected with little space (2m) in between.
- This type of housing allows free circulation of air.
- However, floors get wet and increase foot rot incidences.
- The structure is cheap to construct, expose animals to rain, heat, cold and draughts.
- The roof is made from asbestos, iron sheets or locally available thatching grass or stover.
- Goats are vulnerable to predation; therefore a perimeter fence is required on the farm.



Figure 6.13 Raised floor with wooden walls, roof and feeding area goat pen



Figure 6.14 Poles and Roof with no floor goat pen

e. Kid housing

- Kids are the most vulnerable group in goats; hence, they require warm and dry conditions during their first four weeks of life to reduce mortalities.
- Housing should protect kids from rain, heat, cold, direct wind draughts, and diseases transmission.
- Kids should be kept away from pastures for the first 1-4 weeks particularly if the does have to travel long distances to browse and water.
- Wooden or plastic or fibreglass kid boxes can be used in the kid pen to keep kids warm and safe.

- The box for housing a kid measure, 500-600mm long, 400-500mm wide and 300-400mm deep.
- Bedding in the box should be kept clean and fresh, using grass or wood shavings.
- This makes it easy to detect scours (diarrhoea) early.
- The kid can be kept in the box for up to a week and moved thereafter.
- Plastic drums can be secured in the pen and used as kid boxes during the cold season.

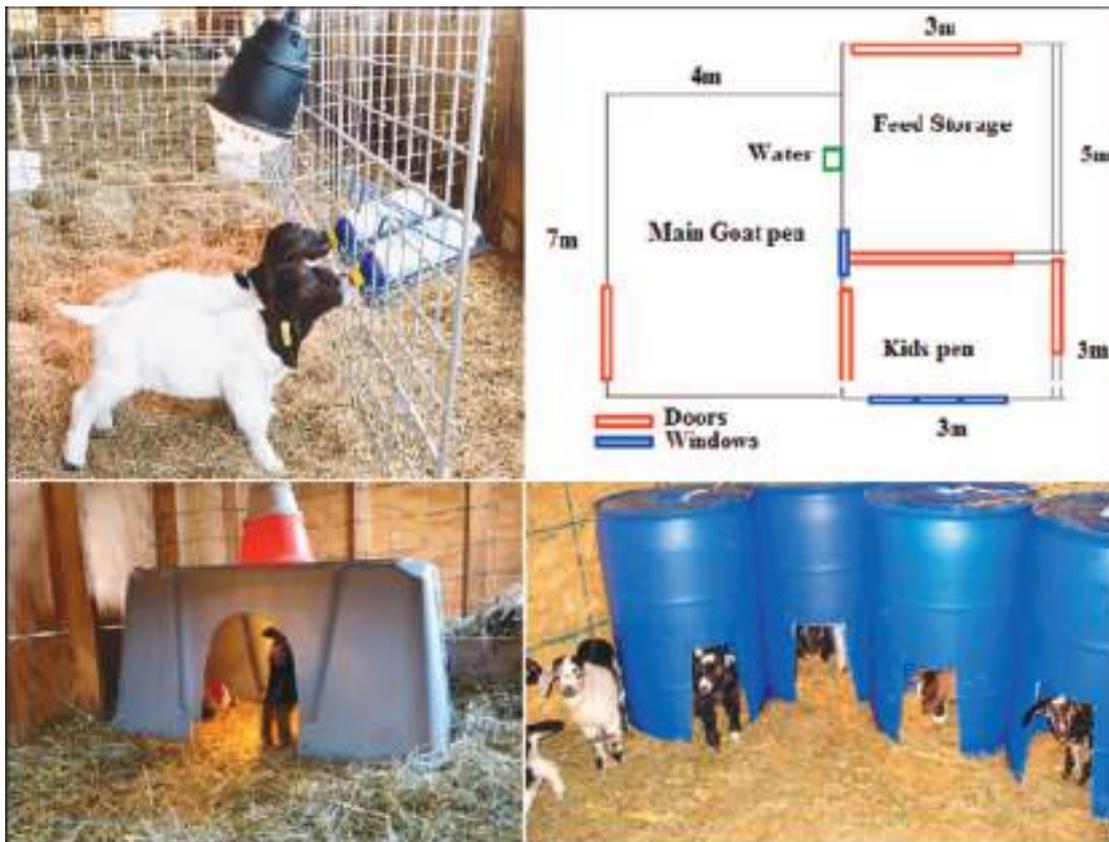


Figure 6.15 Kids housing

6.4 Introduction to Goat Welfare

- Goats are inquisitive and playful and their housing system must be able to satisfy these natural behaviours.
- Goats are vulnerable to stress but decent management can reduce the factors which predispose to stress.
- Poor handling and lack of socialisation with humans may lead to fear of humans.
- Goats are sensitive to gentle human cues.
- Factors such as previous experience with humans likely have a crucial role in development of an individual goat's behaviour towards humans.
- Knowledgeable, caring and low-stress stockmanship and animal management, when practised consistently, is the key to good goat welfare.

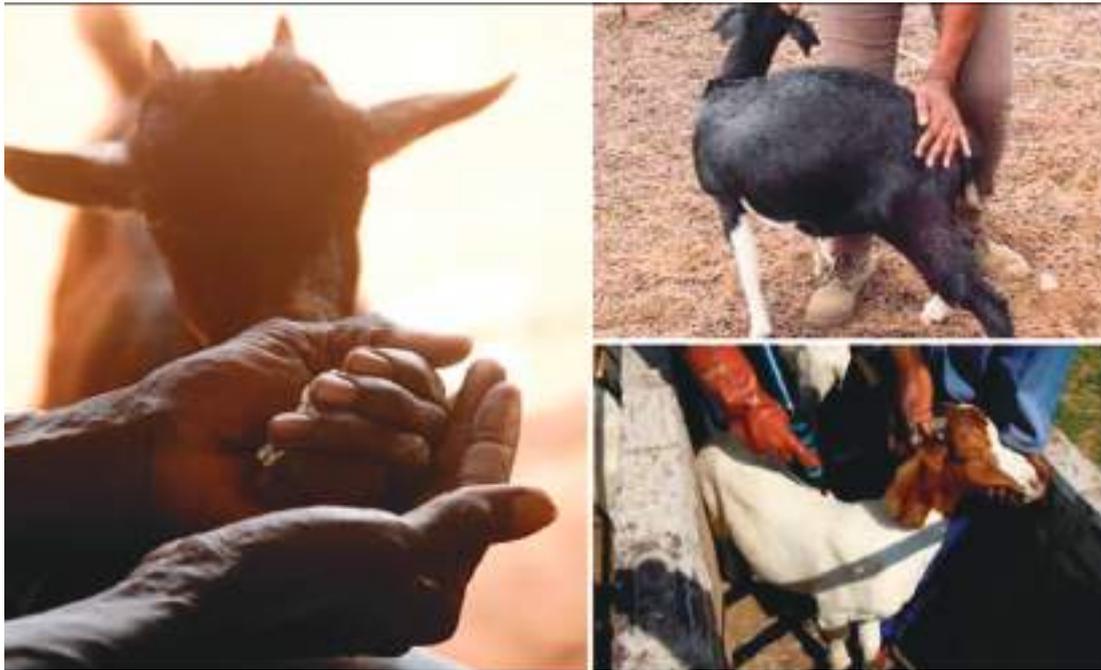


Figure 6.16 Goat handling and interaction

There are five freedoms needed to safeguard the welfare of goats, these are;

- from **hunger and thirst** - access to fresh water and feed
- from **discomfort** - an appropriate environment should be provided, including shelter and a comfortable resting area
- from **pain, injury or disease** - prevention of illnesses, or rapid diagnosis and treatment
- to **express normal behaviour** - sufficient space, proper facilities and company of the animal's own kind should all be provided
- from **fear and distress** - conditions and treatment which avoid mental suffering

6.4.1 Responsibilities of owners/keepers

Owners/keepers who care for goats should demonstrate:

- Caring and responsible planning and management;
- Skilled, well-informed and thorough stockmanship;
- Knowledge of proper environmental design;
- Caring loading, unloading and transport; and
- Ability to undertake humane slaughter and culling.

6.4.2 Necessities of Stockmanship

- Passion ownership and accountability;
- Knowledge of animal husbandry techniques that is sound knowledge of

6.4.4 Disease control and biosecurity

Biosecurity means a set of management actions and physical measures designed to reduce the risk of introduction, establishment and spread of disease

- Buying and moving goats from disease-free zone after consultations with local veterinary officers.
- Incoming stock presents the greatest risk to the health of a herd as regards infectious disease, therefore needs to be quarantined before mixing with the rest of the flock.
- When planning new sites or using existing buildings for new purposes, consideration should be given to providing the maximum possible distance between the proposed site and existing sites.
- Reporting suspicions that any animal is suffering from a notifiable diseases like anthrax and foot and mouth.
- Limit external vehicle / equipment / people movement onto the unit and instigate appropriate cleaning and disinfection procedures (sodium hypochlorite).
- High levels of hygiene / disinfection procedures during interventions, such as at kidding.
- Preventive disease control programmes including vaccination and parasite control programmes, (including deworming programmes for on-farm domestic animals that may present a risk to the goats).
- Proper disposal of carcasses burning etc.
- Control of rodents, and minimizing number of cats which can harbour *Toxoplasma gondii* (causing abortions).
- Proper storage of feed, minimize contamination.



Figure 6.18 Biosecurity features

6.4.5 Handling

- All owners/keepers should have access to easy to use and efficient handling systems.
- Proper handling facilities allow efficient handling of animals without causing stress to either goat or person.
- A crowding pen/gathering pen that feeds into the race should be available and the race/crush (a passage) where you can dose or vaccinate goats.
- Addition of a footbath in the race is required to dip hooves to control footrot or ticks.
- Other components required are sorting gates at the end of the race to divide the flock into different groups, a loading ramp to load goats into vehicles for transportation and a scale for weighing.
- Steel or wood can be used to construct the handling facilities.
- Sharp corners should be avoided in pens and handling systems.
- Owners/keepers must ensure that all floors and walkways are well maintained and provide a non-slip, but non-abrasive grip surface, to avoid damage to feet and legs.
- The floor should not slope too steeply, as this can increase the risk of slipping and injury.
- Excessive force must not be used. It is not acceptable to strike or kick animals.



Figure 6.19 Goat Pen floors and goat handling facilities

6.4.6 Transportation

It is useful to consider what can be done to ensure that the goats travel quietly and safely without encountering any injuries or becoming ill. The following should be in order:

- The vehicle must have sides high enough to prevent jumping, it should shelter animals from rain and wind as goats are sensitive to cold.
- A floor that prevents slipping partitions to control movement of animals (if it is a large vehicle).
- There should be sufficient ventilation in the vehicle while providing protection against bad weather conditions.
- Goats should not be overcrowded in the vehicle; each goat must have at least 0.4 m² space (1 m x 0.5 m).



Figure 6.20 Transportation of goats

If goats are being transported over long distances:

- Allow all goats to have access to water and food up until loading
- A single trip must not exceed 36 hours (this means leaving at 5am on one day and arriving at the destination by 5pm the following day)
- For longer trips, goats should be rested at least every 24 hours. The rest involves removing them from the vehicle for a 12 hour period and

providing them with feed and water

- Goats should be administered with Multivax P as soon as possible once a farmer knows the goat will travel to get some immunity before they go
- On the day of transport, the goats should receive a dose of long acting tetracycline.

Exercise

1. Discuss the attributes of a good pen for goats. Consider the siting, the size, the roofing, the feeding and drinking area and general cleanliness within the pen.
2. Discuss about locally available resources that can be used to construct shelter for goats.
3. List animal husbandry techniques that are important in reducing or avoiding inducing stress in goats.

7 CONCLUSION

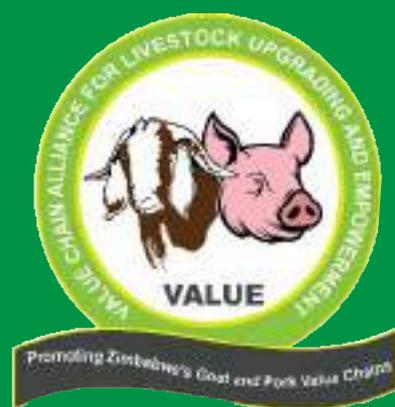
At the end of the training the facilitator is expected to highlight the most important factors on housing requirements for goats. Animal welfare needs to be stressed as it is very important, it may affect productivity or lead to mortalities/losses if goats are not managed humanely. The facilitator should assess if the participants have understood the concepts and assist where participants need clarification.

REFERENCES

- 1 Mdukatshani, Heifer International-South Africa and KwaZulu-Natal Department of Agriculture and Rural Development. 2015. Goat production handbook.
- 2 Pugh, D. G., & Baird, A. N. 2012. *Sheep and goat medicine*. Maryland Heights, Mo, Elsevier/Saunders.
- 3 Mobley, R., Lyttle-N'guessan, C. & Peterson, T. 2009. "The Herd Health Handbook for Goat Producers: Control of Parasites in Goats." Florida A&M University.
- 4 Moore, D.A. et al. 2008. "Comparison of published recommendations regarding biosecurity practices for various production animal species and classes." *Journal of the American Veterinary Medical Association* 233, 249-56.
- 5 Nöremark, M., Frössling, J. & Lewerin, S.S. 2010. "Application of routines that contribute to on-farm biosecurity as reported by Swedish livestock farmers." *Transboundary and Emerging Diseases* 57, 225-36.
- 6 Peacock C. 1996. *Improving goat production in the tropics. A Manual for Development workers*. Published jointly by FARM-Africa and Oxfam (UK and Ireland), Oxfam, UK. 87pp.

Glossary

Doe –	Female Goat
Doeling –	A baby female goat
Yearling –	A one year old goat
Buck –	Male Goat
Buckling –	A baby male goat
Kapater –	Castrated male goat
Kid –	Baby goat, either male or female
Kidding –	Giving birth
Polled –	When a goat is naturally born without horns
Scours –	Diarrhea that is usually caused from incorrect milk feeding
Estrus-	The period of time when the female is sexually receptive to the male. Also known as being in “heat”.
Teat-	The protuberance through which milk is drawn from an udder.
Udder-	The mammary system of a ruminant, produces and stores the milk. The proper term for a goat’s mammary glands.



This publication has been produced with the financial support of the European Union. Its contents are the sole responsibility of the VALUE project and do not necessarily reflect the views of the European Union.