Government of Zimbabwe

Zimbabwe AGRICULTURAL GROWTH Programme

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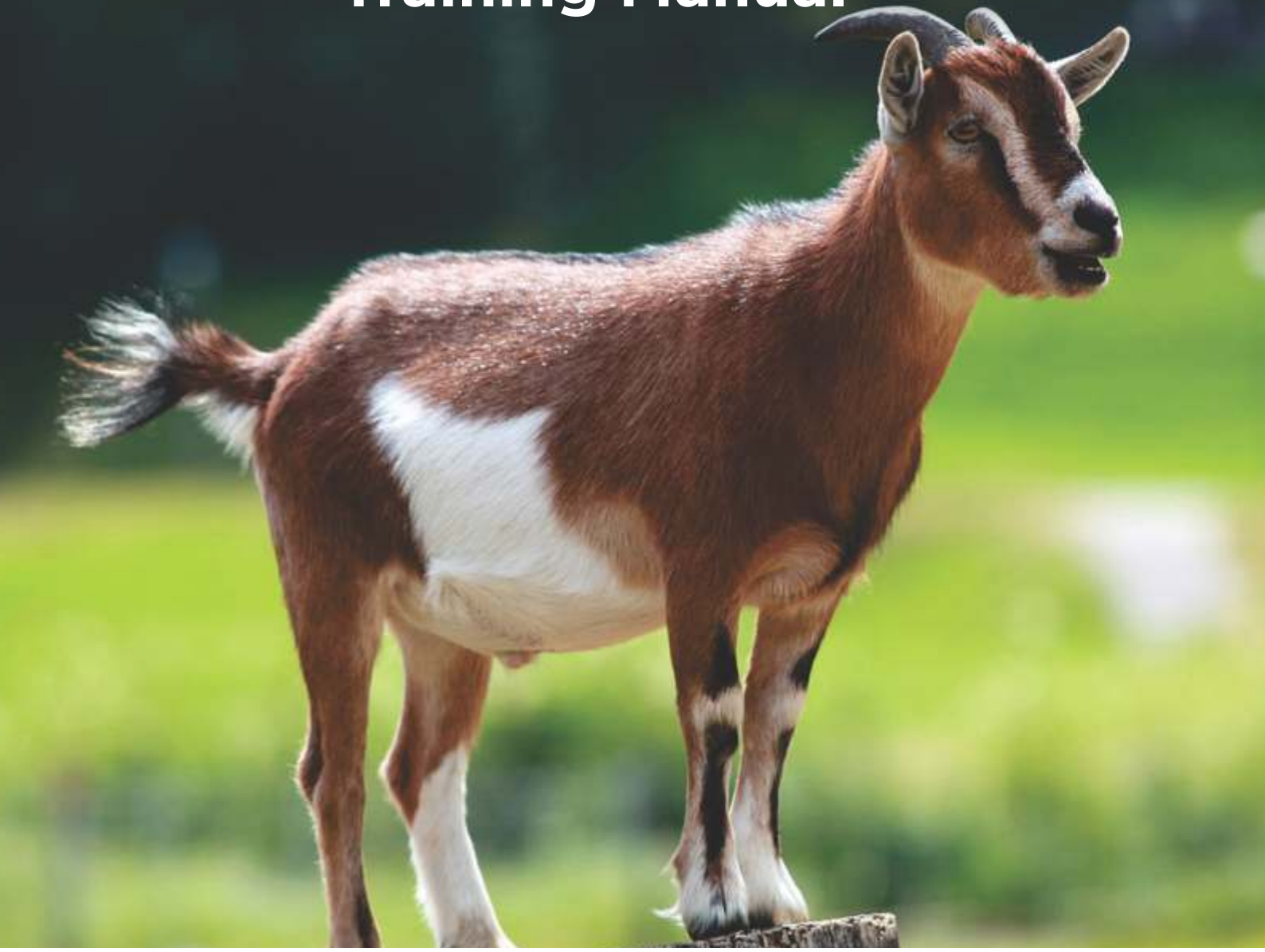
Goat Disease Control and Animal Health Care Training Manual



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VALUE CHAIN ALLIANCE FOR LIVESTOCK UPGRADING AND EMPOWERMENT

VALUE

Promoting Zimbabwe's Goat and Pork Value Chains

Value Chain Alliance for Livestock Upgrading and Empowerment

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1 INTRODUCTION

Preventive medicine is the cheapest way of reducing animal health cost. Animal health cost is the most important factor in goat production. Huge economic losses are experienced due to diseases, accounting for more than 50% of flock mortalities in smallholder goat farming enterprises. Productivity of the goats depends entirely on the health status of the animal, which in turn is affected by disease control and prevention strategies on the farm. This manual should help farmers to effectively identify signs of ill – health in goats both at herd and individual animal level. It will also give highlights of diseases.

This training manual is intended to serve as a guide for the trainers. Some goat farmers are not implementing the necessary disease prevention and control methods in their goat production business. This is severely affecting the growth and profitability of their business. High mortality rates in both young and mature animals thus affecting the availability of goat ready for market.

This module is a training tool for developing the capacities of enterprises in practices of good disease prevention and control strategies. The target group is the small to medium farmers (including young 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 the Goat Value Chains. Improved disease prevention and control strategies will enhance and contribute to the overall growth and development of goat value chains in the country.

2 INFORMATION AND INSTRUCTIONS TO THE TRAINER

This manual should be used purely as a facilitator's guide. The sessions under each unit are presented with an outcome(s) 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 before the 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/whiteboard/chalkboard, some of their points will or may coincide with the contents in this Module, and then mention to them the items of sub-topics 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 don't 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, equipment and materials: projector, flip charts or whiteboard, whiteboard markers, marking pens, and handouts. Be time conscious as you facilitate the Session

This Manual is organised around aspects of goat disease prevention and control such as environmental disease prevention, biosecurity issues, cleaning of goat houses, injection sites, kids and adult goats problems and diseases. The manual also suggests a vaccination programme to be followed at farm level to reduce chances of disease condition developing in goats.

3 USERS OF THE MANUAL

The manual is intended to be used by facilitators at the goat production node in 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. Some assessment questions are suggested as activities whilst in some, the facilitator to make own discretion in determining the kind of questions to be asked.

Unit One:

6 PREVENTION OF DISEASE AT FARM LEVEL

6.1 Objectives

> To help learners define and identify disease and their causes.
> To help learners develop models for disease control.
> To help learners to set up a road map to achieve performance targets.

6.2 Outcomes

> Learners should define disease and what causes disease.
> Learners to set their disease control and prevention models at farm level
> Learners should identify disease pre-exposing conditions.

6.3 Introduction

> A disease is a condition that affects normal body function.
> It is generally caused by multiple factors e.g. infectious (brucellosis, rabies), or non-infectious (trauma or poisoning).
> Clinical signs may or may not be obvious, and they may range from minor conditions to death.

6.4 Causes of goat diseases

> There are many causes of ill health in goats. The following list covers most if not all causes of goat diseases.

- Viruses
- Protozoa.
- Bacteria.
- Fungi.
- Helminthes
- External parasites (ticks, mosquitoes and manges)
- Poisons
- Physical injuries
- Nutritional disorders.
- Nutritional deficiencies.
- Stress due to adverse environment
- Genetic problems.

Figure 6-1: Abnormal head position and recumbency in a sick goat

6.5 Some of the signs of ill health

- Poor demeanor
- Poor coat (see Figure 6-6)
- Difficulty in breathing
- Coughing and shivering
- Bloated rumen
- Failure to chew the cud.
- Failure to ruminate.
- Abnormal posture (see Figure 6-4)
- Prolonged recumbency (see Figure 6-1).
- Lameness.
- Abnormal head position.
- Discharges.
- Salivation and frothing
- Mucus membrane congestion.
- Failure to urinate
- Soiled back

6.6 Most common goat health challenges

- The most common disease bedevilling the goat production enterprises in communal goat production are;
  - Tick borne diseases (Heart water, Gall sickness, and Red water disease)
  - Pulpy kidney
  - Mange
  - Pneumonia
  - Helminthosis
  - Coccidiossis
  - And for more diseases refer to Table and Table 1-2
  - Nutritional disorders and
  - Orf virus disease (see Figure 6-2)
- Main diseases are Heart-water. Anaplasmosis, and Babesiosis
- Usually associated with poor tick control or incorrect use of acaricides.

Figure 6-2: A doe with orf virus disease

Figure 6-3: Ticks can cause health problems in Zimbabwe

6.7 Control of tick Borne diseases

- Ticks must be controlled with acaricide.
- Control is by spraying or dipping once weekly during rainy season and twice a month during dry season.
- Acaricide application should be carried out paying attention to prescribed guidelines by the chemical manufacturer.
- Apply tick grease in ears, around the horns, tail, limbs and between the legs and shoulders (armpits)

6.8 Consequences of ill health

- Reduced production or weight.
  - In most cases, ill health animals will not grow and will lose weight.
  - They fail to attain market weights within the recommended time frame
- Reduced milk production in lactating goats.
  - Lactating goat may fail to wean their kids and most of them will die before reaching the age of weaning
  - If the kids are weaned most of them are underweight thus affecting time to attain age of puberty and subsequent reproductive cycles
- Emaciation
  - They are usually very thin and have a very poor body condition score
- Infertility.
  - Experience nutritional anoestrus
  - May fail to conceive
  - They usually abort.
- Death
  - In most cases ill health animal die
  - They have a very poor immunity system hence succumb easily to outbreak of diseases.

Figure 6-4: A buck in a poor body condition and ill health

Figure 6-5: A goat kid with diarrhoea and potbelly, signs of ill health

Figure 6-6: A doe showing signs of mange

Figure 6-7: Foot wound, can be a result of tick infestation

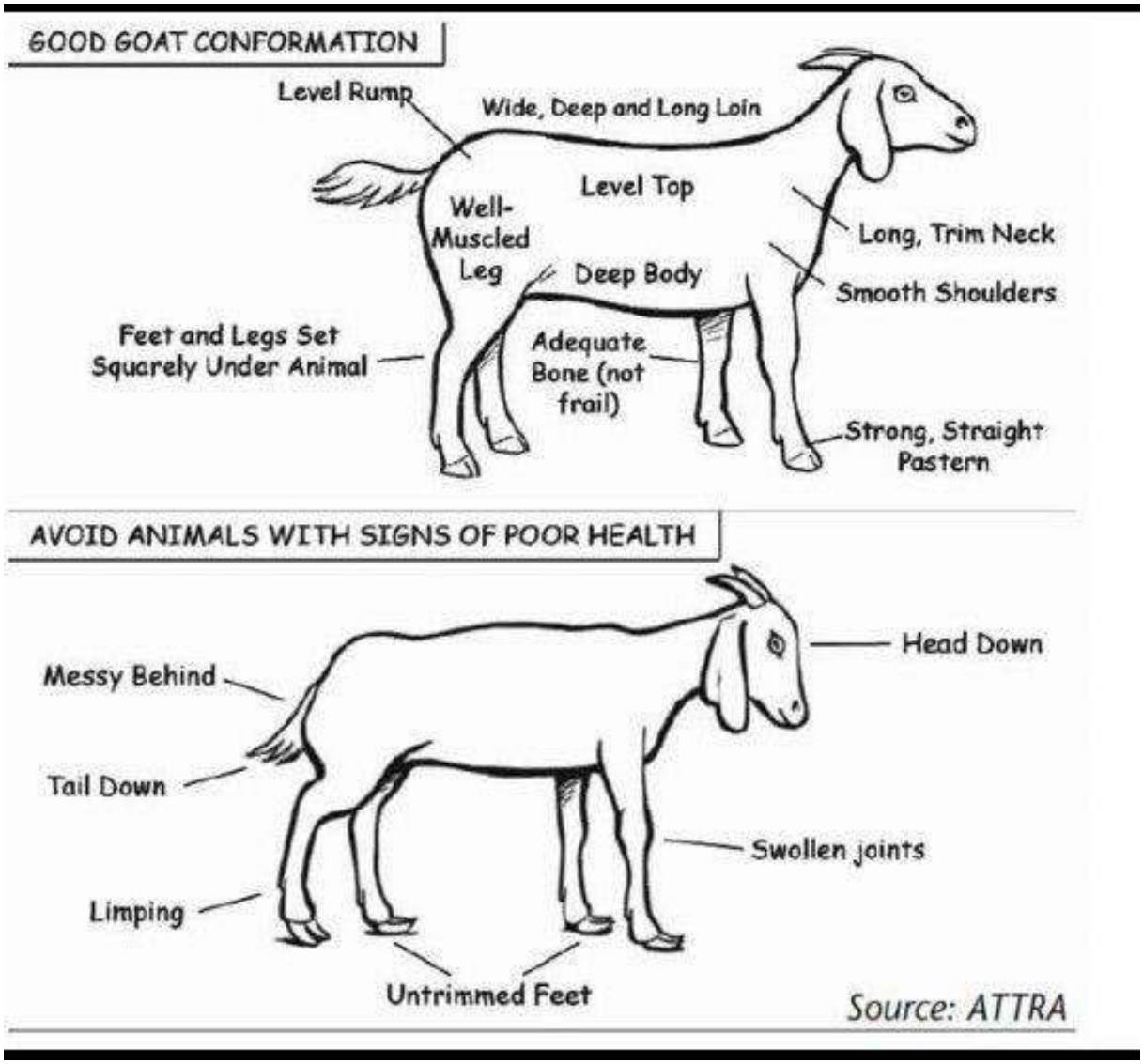

Figure 6-8: Illustrations of goat in good goat conformation and one to avoid with signs of poor health Adopted from ATTRA.

Picture credit (http://www.theorganicfarmer.org/tag/managing-meat-goats/).

> *Figure 6-8 show that animals in good health can be identified easily.*

> *It is important to know common signs of ill health as listed above.*

6.9 Disease prevention and control

> Clinical disease is usually the interaction of a pathogen with errors in management and a variety of contributing influences such as environment and host factors (see Figure 6-9).

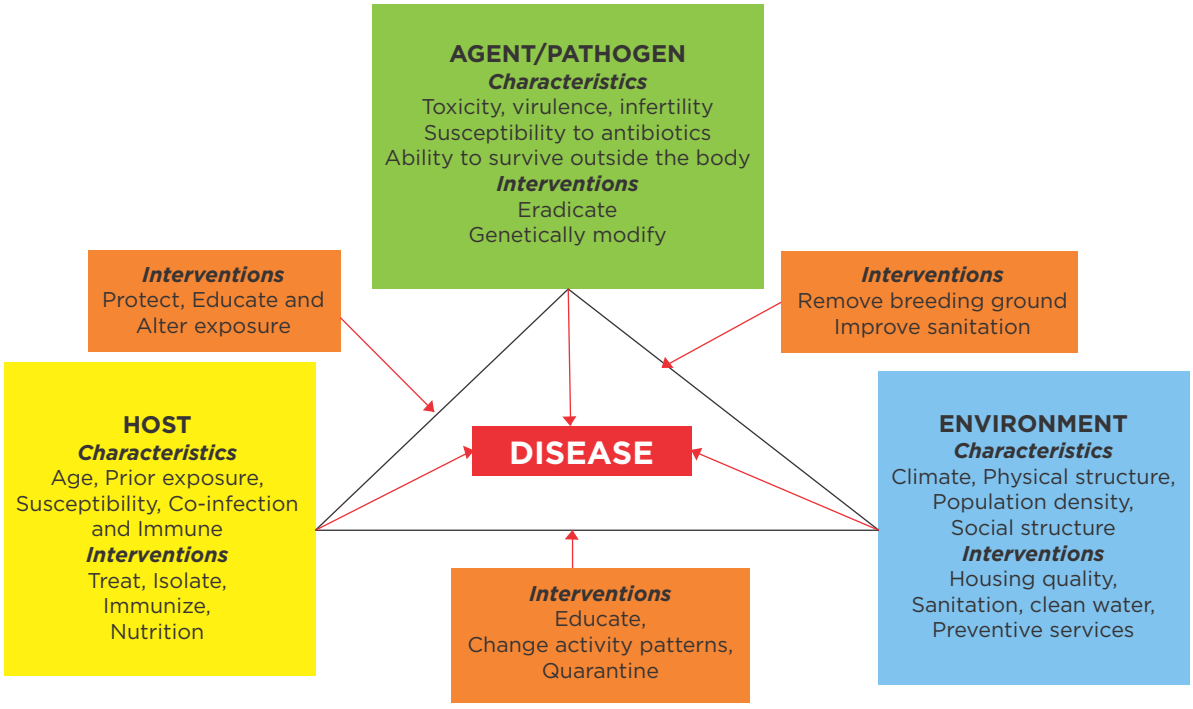

Figure 6-9: The interaction of the components of the triangle can affect the course of disease

6.10 Keeping goats healthy

> Farmers and stockmen should know how to prevent, control and treat animal diseases through farm health planning and close working with vets.
> As a farmer, you have to prevent the spread of disease - between animals, from animals to humans, and from humans to animals.
> The general strategy to prevent outbreaks of clinical disease is to minimize the level of pathogen challenge while maximizing herd and individual immunity.
> Poor management might result in a population of animals with naive immune systems encountering novel pathogens or in stress leading to a weakened immune system in vulnerable animals.
> Alternatively, management errors might result in an overwhelming pathogen challenge in the case of an endemic disease or the entry of a new pathogen into a population of goats without specific immunity.

6.11 Health strategies

> Preventive management is essential to maintaining a healthy goat flock.
> Correct nutrition, sanitation, and ventilation, as well as timely vaccinations, isolation of sick animals, and treatment or culling of problem animals, helps keep the herd in good health and reduces health care costs
> Health strategies can be divided into three categories.

> **First,** those designed to live with endemic diseases caused by pathogens that survive in the environment and are too difficult to eliminate, or they are ubiquitous organisms that generally cause little problem.
  - o Endemic pathogens are handled by maximizing immunity and minimizing the challenge.
  - o Ubiquitous organisms cause disease flare-ups that are often triggered by environmental-management deficiencies, which if corrected will restore the healthy state in the herd.
> **Second,** some pathogens can be eliminated e.g. *Sarcoptes scabiei var. caprae (Mange mites)* can be eliminated from a herd.
  - o It is usually desirable in the long-term to eliminate the diseases, if possible and if it results in savings from reduced routine medication or vaccination.
> **Third,** include strategies to prevent pathogens from entering the herd.
  - o As herd size has increased, the emphasis on maintaining the population of animals free of certain diseases has increased in importance.

> Some diseases are classified as notifiable, which means that if you suspect an animal has one of these diseases you must inform your Division of Veterinary Field Services (DVS) Office and other relevant government offices immediately.

6.12 Biosecurity

> Biosecurity refers to practices used to prevent both the introduction and the spread of diseases within a farm.
> Disease control through biosecurity focuses on controlling and reducing movements of animals, people and vehicles to and from areas where livestock is kept.

6.12.1 On-farm biosecurity measures

> Good biosecurity should be practiced at all times, not just during an outbreak, to help you minimise the risk of any disease affecting your goats.
> The key to good biosecurity is reducing and controlling the movements of people, vehicles or equipment into areas where your farm animals are kept.
> You should check the health status of livestock before buying or selling animals.
> Disinfectants should be applied under low pressure, for example from a knapsack sprayer.
> Disinfectants can also be used as biosecurity barriers for vehicles and people at farm entrances.
> Before disinfecting structures such as sheds, you should clean them with detergents to remove organic matter and oily films.

6.12.2 Risk factors

Humans; Goods/equipment; Animals; Insects/rodents/wild life; Water; Feed

6.12.3 Biosecurity elements

6.12.3.1 Sanitation

> Routine cleaning and disinfection of pens, equipment, vehicles or personnel who enter and exit the farm area or the incident site.
> Cleaning or disposal of equipment used during and post-investigation activities such as syringes, test kits and so on.

6.12.3.2 Isolation

> Creating and maintaining an environment where animals are separated from disease agents or potential carriers such as animals, humans, contaminated clothes and equipment, contaminated air, water and feed.
> Protection from vectors - for example, ticks, flies, mosquitos may be a consideration for some diseases.

6.12.3.3 Movement control

> Controlling humans, animals, equipment and vehicles that move in and out of a farm as well as restricting unauthorized people and vehicles from entry to the farm area.

6.12.3.4 Zoning

> Biosecurity zoning depends on risk factors of disease transmission, transmission to other animals or officers (zoonosis).
> Infection risks can be high or low.
> Especially in areas with Foot and Mouth disease

6.12.4 Examples of biosecurity implementation

- ✓ Washing hands with soap, taking bath and washing clothes after handling animals
- ✓ Cleaning and disinfecting (spraying, dipping) all goods, particularly vehicles that will enter farm area
- ✓ Spraying pens with insecticide or disinfectant where indicated
- ✓ Disposing and burning medical waste after investigating the incident site.
- ✓ Limiting disease transmission caused by employee mobility and restricting people from freely entering the farm as it may cause disease transmission.
- ✓ Burning or burying carcass of livestock that died after suffering from diseases, infectious diseases in particular
- ✓ Removing dead livestock from the pen immediately to be buried or eliminated by the authorized officers
- ✓ Using a quarantine pen to monitor goats that just arrived on a farm
- ✓ Separating sick animals from healthy; rearing species separately, separate age cohorts.
- ✓ Treating sick animals
- ✓ Regular cleaning and manure/litter removal
- ✓ Good husbandry, low stress, good nutrition, clean water
- ✓ Vaccinating animals - Vaccination is a key health management tool to enhance individual and herd immunity.

> It is a good idea to work with a veterinarian because the decision to use a vaccine depends on several factors and needs to be assessed and frequently reassessed on an individual herd basis.
> It is important to remember that even in healthy and well-nourished young animals, some just do not respond to vaccinations.
> Young animals that are sick, stressed, wormy or poorly nourished will respond poorly to a vaccination program.

6.12.5 Disinfection facilities/procedure(s)

6.12.5.1 Disinfection

> As animal husbandry housing and goat population grows so does the risk of the outbreak of contagious diseases.
> Disinfectants can be used to disinfect animal housing to reduce the pathogen load in the premises.

6.12.5.2 Biosafety (Self-protection)

> Refers to precautions/steps taken to protect oneself from getting exposure to a disease-causing (zoonotic) agent(s).
> Protective equipment that meets the desired conditions should be used.
> Full PPE (Gumboots, hand gloves and face mask and goggles) is only necessary when high risk and zoonotic agents are reasonably suspected.
> Disease agent contamination and operator risk can be minimized using simple precautions.

6.12.6 Storage of medication, administration, expiry dates and withdrawal periods

> Read the instructions that come with the product you purchase, they contain important information about using it such as dosing rates, whether it is safe for pregnant animals as well as how it should be stored.

Figure 6-10 Syringes and needles commonly used in giving injectable medications

> Plastic needles and syringes are disposable – in other words, meant to be used only once. Syringes and needles come in different sizes.
> 5ml syringe for adult goats and a 2,5ml syringe for kids (see Figure 6-10).
> Shorter syringes are used for vaccination.
> When vaccinating, you can use a syringe more than once, but you must fill it using a new needle so as not to contaminate the vaccine in the bottle.
> For injecting drugs and vaccines, sites shown in Figure 6-11 are supposed to be used. Injecting in other sites may affect the quality of meat.
> However, it should be noted that drug administration should be carried out by a qualified person, e.g. paravet or veterinarian

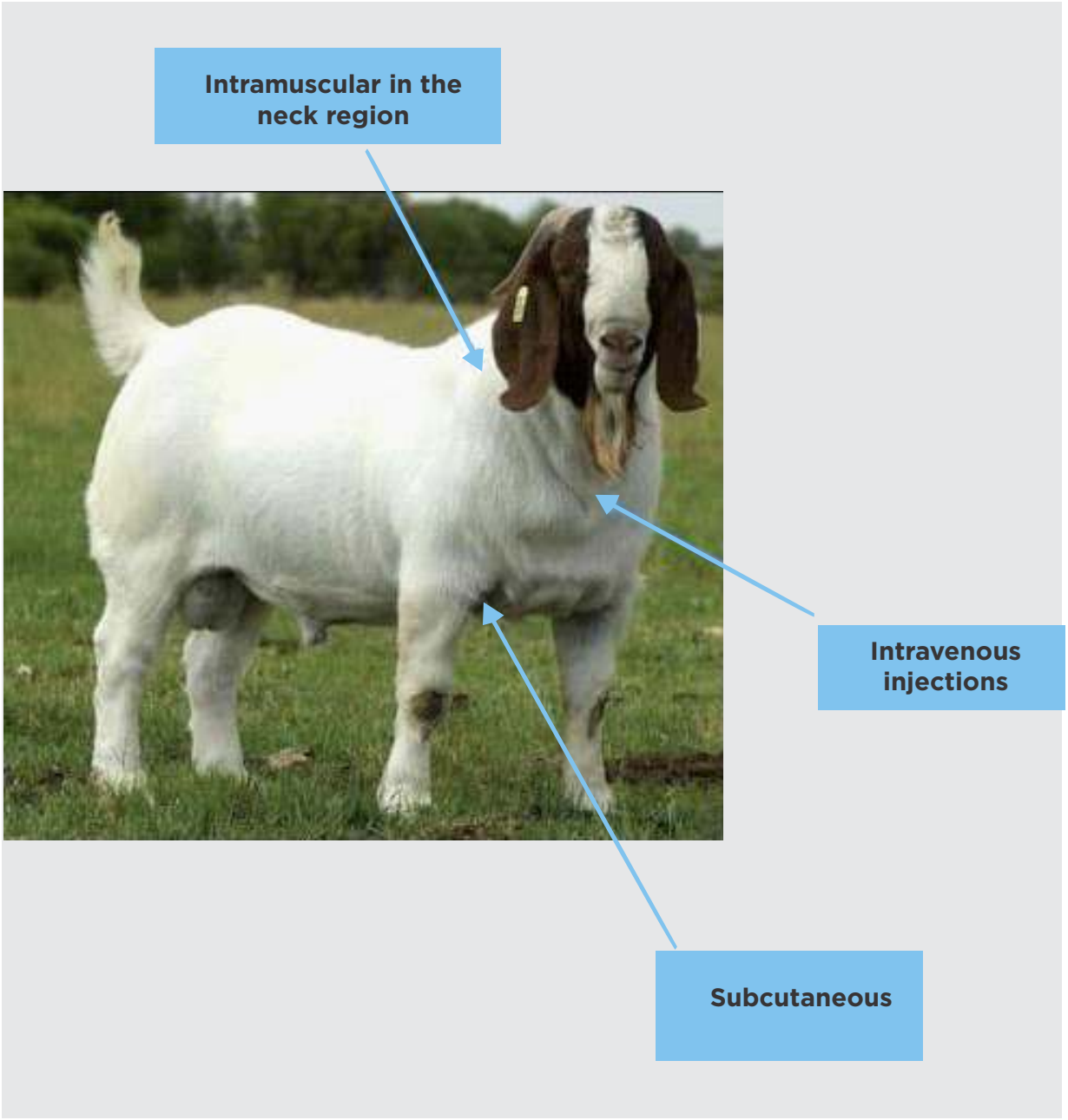

Figure 6-11: Injection sites for goats

Table 1-1: Diseases of young goats, their prevention, control and treatment.

CONDITION	SIGNS	TREATMENT	PREVENTION
Coccidiosis	Sudden onset of diarrhoea. Foul smelling faeces containing mucus and blood. Perineum matted with blood-stained stool. Sudden death may occur. Severe straining. Anorexia. Common in housed goats.	Give anticoccidial drugs.	Reduce stocking density. Clean and make sure pens are well - drained and dry. Minimise contamination of feed and water with faeces. Use of coocidiostats in feeds to keep egg level low but allow goats to become immune.
Colibacillosis	Fever at the beginning and later, fever drops down. Dry mouth. Diarrhoea (yellowish to whitish). Depression and weakness. Goat found lying down. Survivors of the infection may show nervous signs and problems with joints	Give plenty of clean water (oral fluids). Give antibiotic preparation on vet's advice. Isolate affected goats. Treat new cases immediately.	Give colostrum at birth. House new born kids separately. Disinfect the navel with iodine solution at birth. Avoid contamination of feeds and utensils by keeping clean. Avoid overcrowding. Regular feeding should be kept
Colostrum deprivation	Dry mouth. Fever. Severe weakness. Most die.	Use oral antibiotics on vets' advice.	Cleanliness of the pen. Quarantine of kidding pen if diseases occur with kids. Clamp and disinfect the navel. Give 10% of the birth weight of colostrum in the first 24 hours. Avoid moving late-pregnant does to new, distant locations to avoid exposing their offspring to infections of which they have not met before. Supervise birth to make sure births and animals do not get cold or too high temperatures.
Enterotoxemia Pulpy kidney	Sudden depression and deaths of kids. Unable to eat Watery brown faeces, some with blood or green pasty diarrhoea. Fever. Death within 2 -4 days. Drunken appearance. Lies on side when close to death, paddling legs.	Use oral antibiotics on vets' advice	Reduce feed intake. Vaccination with clostridial vaccines 3 to 4 weeks of age and then boost at 6 to 7 weeks and finally at 6 months. Give concentrates gradually to kids. Note: It is often advised that animals first be vaccinated against pulpy kidney before deworming.
Internal Parasites	Sudden death. May have swelling under chin. Anaemia and weakness. Poor exercise tolerance. Severe weight loss. Break in hair/falling off of hair	Use dewormers	Avoid contaminated feeds. Deworm just before the rains and after. Good housing to prevent contamination of feeds with faeces.
Suffocation	No physical signs of disease. Can occur if many kids and adults are kept together, especially in cold climates	First aid if found not dead	Avoid overstocking the kid pens
Malnutrition	Weakness, no stomach fill. Dramatic fall in milk production.	In cases of complete	Feeds (diets) should be balanced.

	Staggery gait and recumbence when deprivation is severe. Weight loss. Mental depression	deprivation give small amounts of highly digestible carbohydrates and protein feeds through the mouth. Avoid fats	
Tetanus	Causes stiffness that leads to paralysis and then death. Animals are at high risk when using the elastic band method of castration as this makes a wound.	-	Vaccination

Table 1-2 Diseases of adult goats their prevention, control and treatment

CONDITION	SIGNS	TREATMENT	PREVENTION
Mastitis	Fever; toxaemia. Lameness on the affected side. Swelling, gangrene of udder, belly wall. The udder will become hot and painful. Milk is watery and contains clots of blood.	Apply antibiotics via the teat as instructed by the vet. In severe cases of infection, an injection of antibiotics may be necessary. After weaning check the udders of high yielding goats for mastitis. Frequent milking and massaging of the affected udder	Provid e clean bedding area
Pneumonia (Pasteurellosis)	Coughing Breathing with difficulty; Running nose; Fever.	Antibiotics	Vaccination
Worms	Eggs may be observed in faeces. Stunted growth. Rough coat. May have a swelling under the jaw and may also have swelling under the abdomen. May have diarrhoea.	Use dewormers	Avoid contaminated feeds. Deworm before the rains and just after. Good housing that prevents contamination of feeds with faeces.
Heart water	Fever. Collapse, convulsions and death in a few hours.	Tetracy cline injections (early) on advice of your vet. Seek assistance.	Dip/Spray the goats against ticks.
Anaplasmosis	Severe anaemia Weight loss. Yellow mucus membranes	Tetracyline injections on advice of your vet.	Tick control by spraying or dipping
Babesiosis	Fever; Depression; Urine dark red in colour	To be effective the treatment must be urgent. Use diminazine aceturate on advice of your vet.	Control of ticks
Abscesses	Swelling on the skin	Open and drain the abscess when it has a yellow spot on it or when it softens. This can be done by cutting a cross over the soft spot.	Control ticks and improve on general hygiene. The disease is spread by direct contact with an infected animal or through contaminated equipment or a contaminated environment.
Tapeworm cyst in the brain	Affected goats walk in circles due to permanent brain damage	-	Regular deworming
Mange	Loss of hair and skin irritation.	Use appropriate acaricide	Dipping with a suitable dip if there are signs of mange in the area.
Orf	Wart-like sores on the animal's lips and nose and	Spray the affected areas with an iodine spray	Isolation of diseased animals Vaccination of all lambs and kids

	around the mouth of especially young lambs and kids and on the teats of their mothers.	daily. Hard scabs can be softened with Vaseline or glycerine to make it easier for the animals to eat.	when the females have stopped lambing for the season.
Footrot	Lameness	Iodine spray to the hoofs (between the claws). An appropriate antibiotic	Keep sheds clean. Footbath containing 10% zinc sulphate solution. The goats must be made to stand in the footbath for a period of 5 minutes. Keep affected goats separate from the rest of the flock to prevent spread.
Excessive hoof growth		Trimming	Regular hoof tri mming. Avoid excessively sandy pastures
Limping associated with abscesses	Swelling in the foot that is hot, red and painful. Sometimes, they burst open and ooze pus.	Open and drain the abscess when it has a yellow spot on it or when it softens. Apply an acaricide to kill the ticks.	Regularly check your goats' feet for ticks, especially the ones that are limping.
Bloat	The animal's stomach swells. Animals become uncomfortable and may lie down and cannot breathe and may die.	Drench with cooking oil (50 ml) or bloat guard. Do not let it lie down. If it is down, get it back on its feet and make it walk around until it has burped. In very bad cases stab the bulging area with sharp pointed knife to let air escape.	Goats must be introduced gradually to green lucerne and given large quantities of hay before grazing lucerne for a short while. Maize may also cause bloat. Make sure there is no wire or plastic lying around where animals graze.
Abortion	Loss of a foetus at some stage in the pregnancy.	Generally, no t reatment required unless there are complications.	The first step is to keep records of how many goats are aborting (as a percentage of the herd) and when they are aborting in order to try and identify the real cause of the problem (whether food or disease).
Black Quarter/Quarter Evil	Fever, loss of appetite, depression, stiff gait and reluctance to move due to lameness, gaseous bubbles in the muscles before death, sometimes nose bleeding and swelling of the head.	-	Vaccination.
Pregnancy Toxemia	Depression and anorexia until the doe becomes too weak to stand.	-	Properly manage the weight. Overweight and excessively thin ewes or does are at a higher risk for ketosis. Feeding grains with increased energy density during the third trimester, or about six weeks prior to kidding, will help to prevent pregnancy toxemia. Providing higher quality hay is also a good idea for gestating ewes or does.
Lactic Acidosis	Discomfort, anorexia, teeth grinding, muscle twitching,	-	High grain diets should be introduced slowly over a period of 10 to 14 days.

	ruminal stasis, and diarrhoea that may be off in colo ur with a watery consistency.		Dietary buffers, such as limestone or calcium carbonate, can also be fed to neutralize acid present in the rumen and keep appetiteand feed intake high. Do not store grain in areas where sheep or goats can access it easily.
White Muscle Disease	When the skeletal muscles are affected, the animal will arch its back with a hunched appearance and have a stiff gait. When the heart muscle becomes affected, the animal may present with difficulty breathing; fever; and frothy, blood-stained nasal discharge.	Vitamin E and selenium injection	Feed and mineral supplementation. Injections of selenium and vitamin E can also be given (consult a vet).

Table 1-3 Suggested Vaccination Programmes for Goats

MONTH	ESSENTIAL VACCINES	OPTIONAL VACCINES
January Kids (1 –3 months of age) Weaning Adult animals	Enterotoxaemia (oil vaccine) Epididymitis (male goats) *(Brucella melitensis)*	Quarter evil (1st inoculation) Botulism (first inoculation) Anthrax (in areas where the disease occurred in the last 5 years)
February Adult animals (4 –6 weeks before breeding season) Kids (5 –6 months old)	Enzootic abortion (Chlamydia) Enterotoxaemia (oil vaccine)	Blue udder Wesselbron disease Rift Valley fever Wesselbron disease Quarter evil (2nd inoculation) Botulism (2nd inoculation) Anthrax (only if disease occurred in the area for the last 5 years)
March From 15 March breeding season		
April/May All animals		Botulism Pasteurella Quarter evil
June Adult animals (not immunised before) (6–8 weeks before kidding) All animals	Tetanus (if kids are castrated using rubber ring) (1st inoculation) Vitamins A, D, E Deworm	Blue udder (1st inoculation)
July Adult animals (not immunised before) (2-4 weeks before kidding) Adult animals (2 –4 weeks before kidding)	Tetanus (if kids are castrated using rubber ring) (2nd inoculation) Vitamins A, D, E Pasteurella Tetanus Pasteurella	
August Kids (2 weeks old)		Pasteurella Vitamins A, D, E Heart water (in heart water area)
September All animals Kids (6 weeks old)	Enterotoxaemia (alum) Deworm	Pasteurella Pasteurella
October All animals	Deworm	

6.13 Activity

> Task 1: Farmers should clean goat house as a group under training
> Task 2: Discuss experiences with regards to biosecurity
> Task 3: Demonstrator to help farmers under training to identify site of injecting different drugs and antibiotics
> Discuss common health problems in your area

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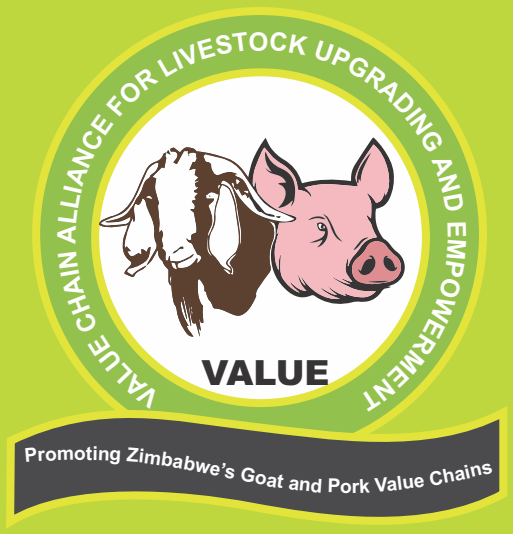

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