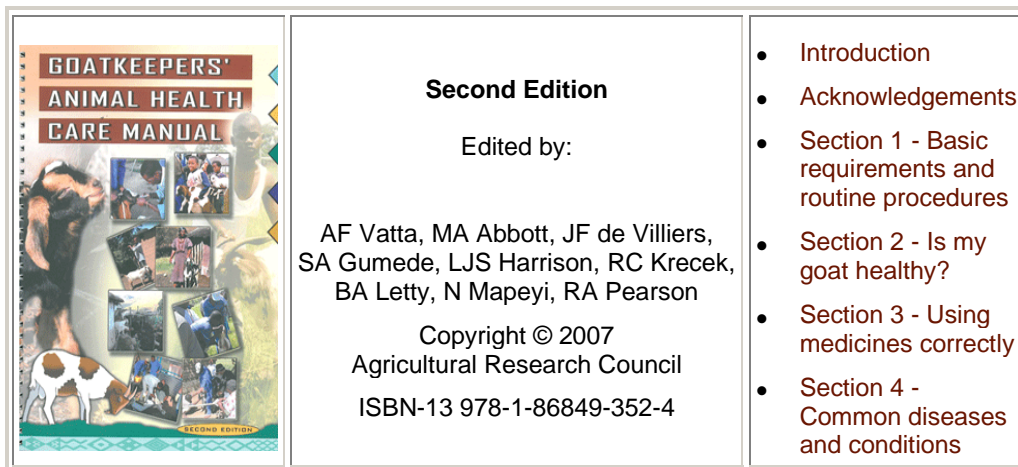


## GOATKEEPERS' ANIMAL HEALTH CARE MANUAL



Published by Onderstepoort Veterinary Institute with KwaZulu-Natal Department of Agriculture and Environmental Affairs.

Copies may be ordered from: The Public Relations Officer  
Onderstepoort Veterinary Institute  
Private Bag X05  
Onderstepoort, 0110, Republic of South Africa  
Telephone: national - 012 529 9111, international - +27 12 529 9111  
Fax: national - 012 565 6573, international - 27 12 565 6573  
E-mail: [ovi-info@arc.agric.za](mailto:ovi-info@arc.agric.za), Website: [www.arc.agric.za](http://www.arc.agric.za)

Extension Training Resources Development  
KwaZulu-Natal Department of Agriculture and Environmental Affairs  
Private Bag X9059  
Pietermaritzburg 3200, Republic of South Africa  
Telephone: national - (033) 355 9100, international - 27 33 355 9100  
Fax: national - (033) 355 9303, international - 27 33 355 9303  
E-mail: [AbbottR@dae.kzntl.gov.za](mailto:AbbottR@dae.kzntl.gov.za), Website: <http://agriculture.kzntl.gov.za>

## INTRODUCTION

While the *Goatkeepers' Animal Health Care Manual* is primarily intended for use by resource-poor goatkeepers living in the south-western region of KwaZulu-Natal Province, South Africa it will also be useful in other similar agro-ecological areas of southern Africa.

The manual has been designed for on-farm use by farmers as a guide to maintain herd health, to detect early signs of ill-health and for immediate reference when the more common diseases or conditions occur in their stock, and also as a useful tool for extension workers as they interact and meet with farmers.

The diseases and conditions covered in this manual are those identified as the most common and important through discussions with representatives of resource-poor goat farming communities and government extension staff working in KwaZulu-Natal Province.

We would like to acknowledge the comments and contributions from the farmers of the communities of Nkwezela, Hlafuna and Njobokazi (Bulwer) in KwaZulu-Natal Province, South Africa and those other experts who examined and field-tested the draft of the manual.

## ACKNOWLEDGEMENTS

The information, photographs and drawings presented in a number of the topics of this manual were initially sourced by former colleagues in the Animal Health for Developing Farmers Division of the Onderstepoort Veterinary Institute. In this regard, Drs Saadiya Y Magera, M S Kgaugelo Mashishi, Adriaan J Olivier, Mary-Louise Penrith and Jenny A Turton are gratefully acknowledged.

Dr Penrith is gratefully acknowledged for thoroughly revising the section on *post mortem* examination.

Information in the sections called *Is my goat healthy?*, *How old is this goat?* and *How do I use medicines correctly?* was obtained from the InfoPaks series published by the Department of Agriculture. InfoPaks are available from the Resource Centre, Directorate Agricultural Information Services, Private Bag X144, Pretoria 0001, South Africa.

During the development of this manual, extensive reference was made to the following books:

- Bath, Gareth and De Wet, Jan, 2000. *Sheep and goat diseases*, Tafelberg Publishers Limited, Cape Town, 205 pp.
- Hunter, Archie, 1996. *Animal Health Volume 1 General Principles*, The Tropical Agriculturalist, Macmillan with CTA, The Netherlands, 167 pp.
- Hunter, Archie, 1994. *Animal Health Volume 2 Specific Diseases*, The Tropical Agriculturalist, Macmillan with CTA, The Netherlands, 214 pp.

The picture of the goat house in the section on housing, watering and feeding goats was modified from a poster entitled *Dairy goats are great!*, FARM-Africa and The Mediae Company, Nairobi, Kenya. The pictures in the section on how to age a goat appeared first in an InfoPak of the Department of Agriculture, and were modified for this publication. Christine Seegers drew the original pictures of the hooves in the section on how to look after the goat's feet, the original pictures of the castration process and the original picture of the syringe and needle in the section on how to give injections. These pictures have been modified for this manual. Christine Seegers also drew the picture of the intestine that has been cut open and the picture demonstrating the use of the FAMACHA<sup>®</sup> card in the section on roundworms. Jacques Coetser drew the original pictures of how to use medicines correctly, which have been modified for this publication. Where applicable, Marina Lubbe made the relevant modifications to the pictures mentioned here and drew the remaining pictures not mentioned here.

Photographs were kindly made available by:

- Professor Gareth F Bath, Department of Production Animal Studies, Faculty of Veterinary Science, University of Pretoria, South Africa
- Dr Jan A L de Wet, Department of Agriculture, Free State Province, South Africa
- Dr Martyn Edelsten, Centre for Tropical Veterinary Medicine (CTVM), The University of Edinburgh, UK
- Ms Heloise Heyne, Mr Arthur Spickett, Mr Michael Stenson and Ms Ellen van Wijk, Division of Parasitology, Onderstepoort Veterinary Institute, South Africa
- Dr Shubh N Mahato, Country Director, Heifer International Nepal, Nepal
- Dr Thomas Terrill, Fort Valley State University, USA
- Dr Jenny A Turton, Geelong, Australia

The Food and Agriculture Organization of the United Nations, Rome, Italy kindly provided permission to reproduce the photograph of the gas-filled red intestines in the section on pulpy kidney. The picture originally appeared as Fig. 163 with the caption *Enterotoxaemia (pulpy kidney). Dilated intestine showing a patchy congestion. Note also congestion of mesenteric lymph nodes*, in the following manual:

- Herenda, D, Chambers, PG, Ettriqui, A, Seneviratna, P and Da Silva, TJP, 1994. *Manual on meat inspection for developing countries*, FAO Animal Production and Health Paper 119, Food and Agriculture Organization of the United Nations, Rome, Italy, 357 pp.

The first draft of the manual was tested during information days with the communities of Nkwezela, Hlafuna and Njobokazi. The authors are grateful to these communities for the valuable comments received.

The authors gratefully acknowledge the staff of the Department of Agriculture and Environmental Affairs, KwaZulu-Natal, especially Mr Jacob Nzimande and Mr Sibusiso Thusi, and of Onderstepoort Veterinary Institute, especially Mr Michael Stenson and Mr Daniel Chipana, who assisted with the organisation of the information days and the taking of photographs for the manual.

Mrs Karlien Meyer and Mr Errol Boekhoven, Onderstepoort Veterinary Institute are thanked for printing and laminating numerous draft copies of the manual.

Professor Gareth F Bath, Department of Production Animal Studies, Faculty of Veterinary Science, University of Pretoria, South Africa, Scientific Roets (Pty) Ltd, Kokstad, South Africa, Professor Roy C Tustin, Department of Veterinary Tropical Diseases, Faculty of Veterinary Science, University of Pretoria, South Africa and Dr A Lee Willingham, International Livestock Research Institute, Nairobi, Kenya are thanked for their useful comments on the manual. Dr Alan Macleod, National Society for the Prevention of Cruelty to Animals, South Africa is thanked for his useful input on the section on transporting goats.

Where it was not possible to obtain a photograph of a specific sign or pathological lesion in a goat, photographs of such signs or lesions as seen in sheep or cattle were used.

While this document is an output from Project R8151 funded by the Animal Health Programme of the UK Department for International Development (DFID) for the benefit of developing countries, the views expressed are not necessarily those of DFID.

Publication of this manual was, in part, funded through the Sustainable Rural Livelihoods Programme of the Agricultural Research Council, South Africa as well as the DFID Higher Education Link project *Improving the livelihood of resource-poor goat keeping families in southern Africa*, managed by the British Council.

## SECTION 1 - BASIC REQUIREMENTS AND ROUTINE PROCEDURES

The main focus of this manual is goat health care which is covered in sections 2-4. However, the general care of goats is also very important. This section briefly describes the basic things that you will need to know about the general care, housing, feeding, watering and handling of your goats.

In order for goats to thrive, it is important that they have a suitable shelter and that they are fed and watered appropriately.

Similarly, if it is necessary to move the goat it is important that the goat is well cared for on the journey and to remember that the goat will need food and water if he is to travel for a long time.

Accidental injuries, to both the goat handler and the goat, can result if goats are not handled or restrained in a safe manner.

It is useful to be able to determine the age of a goat, for example, before purchase or when selecting stock for breeding, sale or culling.

Checking on the condition of your goats on a regular basis will let you know that the goats are thriving.

It is also important to check the feet of the goat regularly since goats can become lame if their claws become overgrown.

Finally, we provide a list of useful equipment and medicines that you may need to have at hand in order to help with the day-to-day management of your goats.

As mentioned at the beginning, the primary concern of this manual is goat health so that this section on basic requirements and routine procedures is quite short. More detailed information on these topics can be obtained from a local agricultural extension officer, animal health technician, agricultural co-operative or veterinarian.

### HOW DO I HOUSE MY GOAT?



*Good shelter for bad weather*

- A well constructed goat house should have the following elements:
  - a good roof to keep the goats dry
  - a raised floor to keep the goats dry
  - slats in the floor to allow droppings and other dirt to fall through and to allow air to pass through
  - a strong secure door that can be locked to keep the goats inside, dry and safe
  - a water bucket and a feed trough which are easy to clean and easy for the goats to use
  - a container for a mineral block that is raised off the floor and protected from rain
- The goat house should be kept in good repair and should not contain any sharp objects

### HOW DO I WATER AND FEED MY GOAT?

- Good feeding and plenty of clean water are important to help your goat stay healthy
- A goat obtains most of the nutrients it needs from grazing. Ideally it needs to spend 6-8 hours a day grazing and browsing
- In the dry season the quality of the food available decreases and it is important to provide some supplementary food to the animals especially if they are in late pregnancy or early lactation
- Clean water should be available at all times. This is especially important when the goats have kids which they are suckling. Offer water at least 4 times a day if it is not freely available

#### Supplementary feeding

- Animals need both energy and protein to keep healthy. Conserved forage can be provided to supplement grazing in the dry season. Legume forages are best as they are high in protein as well as energy. Ideally the supplementary feed should contain at least 4 types of forage to ensure a balanced diet
- Concentrate feeds can be given as a supplement (about 400g per day for an adult non-pregnant goat). Feed a mixture of 2-3 different types of concentrate to make sure there is a balance of energy and protein
- A spoon of salt and mineral and vitamin mix should be added to the supplementary feed provided to make sure requirements for vitamins and minerals are met
- Concentrate feeds that are high in energy are maize, barley, brewers' grains and cotton seed oil cake meal

- Feeds that are high in protein include fishmeal, soya bean meal, cotton seed oil cake meal and brewers' grains
- A urea-molasses block for the animals to lick provides them with a good source of nitrogen and energy which helps them digest forage better, especially in the dry season. It should be put in a container off the floor in the goat house so all goats can lick it when they like

### Rules of feeding

- Buy the best quality feed that you can afford
- Store the feed well - protect it from sun and rain
- Collect hay for times of food shortage
- Offer the feed in a trough, not from the ground, to reduce spoilage and wastage
- Keep feed and water troughs clean and remove leftovers
- Make any changes to a ration gradually over a week
- Crush or crack the cereals to improve digestion and intake. Soaking the cereals is an alternative if crushing is not possible, but only soak the cereals for 3-4 hours before feeding
- Chop cereal crop residues and grass forages into short lengths before feeding in a trough
- Mix feed carefully and only in sufficient amounts for a day's feeding

### Feeding sick animals

- Sick animals have a higher water, energy and protein requirement than healthy ones, but they have a lower appetite
- Give a sick animal small amounts of concentrate feed 5-6 times a day
- Encourage its appetite with small meals, by moistening the feed and by adding molasses or salt
- Freshly cut green forage can help and provides a good source of vitamins
- Feed a sick animal away from other animals to prevent it from being disturbed
- Sick animals may eat more slowly and so may need more time to eat than when they are healthy

### HOW DO I TRANSPORT MY GOAT?

- It is important to transport animals correctly to prevent injury and death of goats
- Always handle the goats to be transported in a calm and quiet manner
- Provide the goats with feed and water up to the time that the journey starts
- Allow strange animals to mix with and become accustomed to each other before being loaded
- Do not load sick, tired or weak animals with strong, healthy ones as the weak animals are inevitably killed or badly injured
- Female animals that are obviously pregnant should not be transported as they may abort their kids or give birth prematurely because of the stress of transport
- The floor of the vehicle used to transport the goats must be solid and easy to clean
- It must be fitted with raised ridges to stop the goats from slipping and injuring themselves
- The sides of the vehicle should be high enough to prevent the goats from jumping out of the vehicle
- There must be no spaces between the floor and the side panels and any partitions. A goat might get its leg caught in this space and break its leg
- Partitions in the vehicle should be used to limit the movement of the animals while being transported so that they are not thrown about, for example, when the vehicle slows down
- Partitions should also be used to separate goats differing greatly in size, horned animals from those without horns and rams from other rams

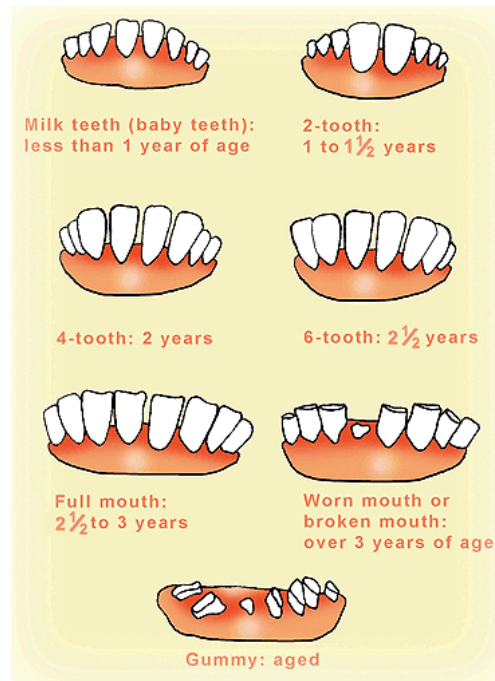
- There must be no sharp points or corners on the area of the vehicle where the goats will travel
- There should be no loose articles such as spades carried with the animals
- The vehicle must have proper ventilation so that the goats receive fresh air
- The vehicle should provide protection against bad weather (for example, rain or strong winds) and should provide shade against the sun
- Do not overload the vehicle. There should not be less than 0,4 m<sup>2</sup> of floor space per goat, that is just over 1 m by just under ½ m. This is about the length of the goat by twice its width
- Do not load the vehicle with too few goats. Rather restrain the animals appropriately, for example, by securing them in a sack tied at the neck of the animal. Do not tie the feet of an animal restrained in this way. Place the animal so that it lies on its breastbone
- Goats must not be kept in restraint for more than 4 hours in any 24 hour period. An animal secured in a sack must be checked every half an hour for bloating
- The driver must not brake or accelerate suddenly nor must the driver take the corners too fast
- Goats should not be transported by road for more than 36 hours from the time of loading. If goats need to be transported for more than 36 hours, they need to be offloaded at intervals not more than 24 hours and be allowed to rest and recover for 12 hours before being transported further. The goats must be provided with feed and clean water during the rest period
- The route should be carefully planned for extended trips where watering and feeding may be required
- The goats being transported should be inspected not later than 30 minutes after the start of the journey and then at least every 2 hours to check that none of the goats has fallen or gotten its head or foot stuck

#### **HOW DO I HANDLE AND RESTRAIN MY GOAT?**

- It is important that the goatkeeper can take one animal from the herd and work with it
- This must be done in a way so that neither the goatkeeper nor the goat will get hurt, tired or upset (especially pregnant does)
- Do not shout at the goats or chase them
- The easiest way to catch a goat is by giving it some extra food, or herding it gently into an enclosure or pen where you can catch the animal
- Quietly, go to the side of the goat, catch it by the horns, neck, or high on the hindleg
- A young goat can be caught by bending down and catching it with one arm in front of the front legs and the other arm behind the back legs
- If you are working on your own, you can hold the goat in one place by means of a loop of rope tied comfortably around the goat's neck and then tied around a tree or gatepost
- If you have someone to help you, they can hold the animal around the neck or by the horns
- If you are going to be working with the goat for a long time, roll it onto its side by reaching under the belly and gently pulling the two legs on the other side of the body towards you
- Then take hold of the front legs and raise the goat so that it is sitting on its rump

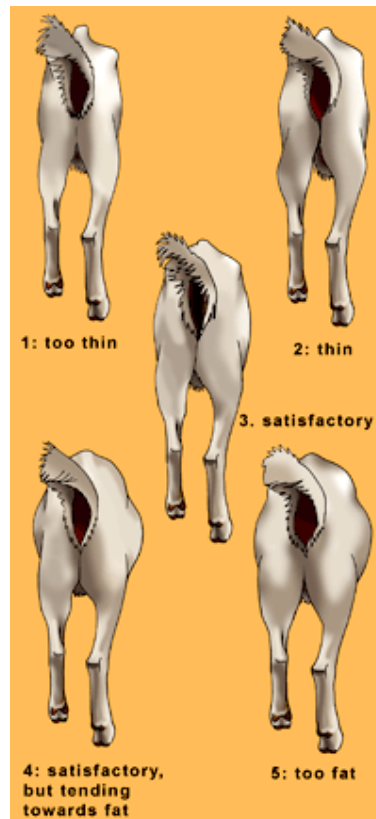
#### **HOW OLD IS MY GOAT?**

- You can estimate how old your goat is by looking at its teeth
- Teeth wear away with age
- Old animals may have worn-down teeth (*broken mouths*) and will not be able to eat as well as younger animals. As a result, they lose condition



### HOW DO I CHECK THE CONDITION OF MY GOAT?

- Body condition scoring is a quick and simple way of finding out whether your goats are getting enough to eat, or are eating too much



- This is of particular importance during certain times of the year, *i.e.* before the breeding and kidding seasons

- Female goats should have a score of 3-4 before breeding. This is to give them the best chance of becoming pregnant
- At lambing, the female animals should have scores of 3-3½ if they are carrying single kids or 3½-4 for those with twin kids. This is to make sure that the animals are able to produce enough milk for their young when these are born
- If the goats are too thin, feed them supplements to increase their condition
- Limit the amount of food the animals take in if they are too fat
- The drawings reproduced may be used to body condition score your goats

### HOW DO I LOOK AFTER THE FEET OF MY GOAT?

- Use a pair of hoof shears to trim the hooves when necessary
- Trim hooves regularly so that they keep their normal shape
- This will help ensure that the goat does not develop foot problems or go lame
- You will need an assistant to hold the goat for you while you trim its hooves
- The assistant must put the animal in a comfortable sitting position
- Using the tip of the hoof shears, remove dirt and mud from the hoof
- Determine the level of the sole of the hoof before starting to cut any of the wall of the hoof away
- Gradually trim the hooves down until you can see the white line of new hoof growth
- The following pictures show how to trim the hooves
- First trim off the point of the hoof of one claw

- *First trim off the point of the hoof of one claw*



- Then trim the outer side of the hoof





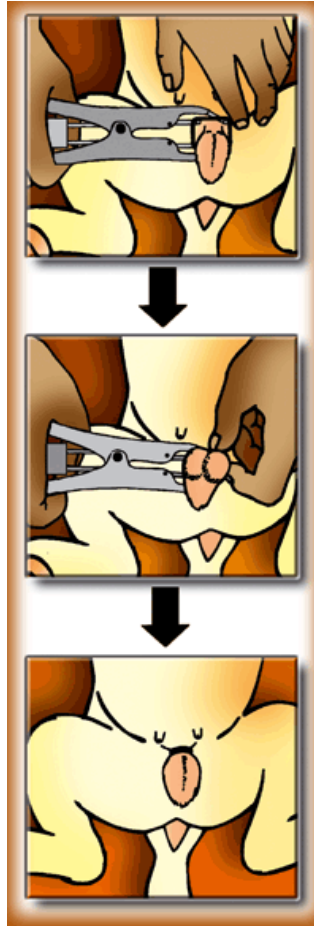
- Finally trim the inner side of the hoof. Then repeat the process on the hoof of the other claw



Step 3

### WHY AND HOW DO I CASTRATE A GOAT?

- We recommend that you castrate male kids before they are 2 weeks old using the Elastrator<sup>®</sup> method
- This is easier for you and safer for the animal than the open method of castration in which the testicles are removed
- Choose your best male goats and keep them for breeding
- The other male goats will be easier to handle if you castrate them
- When you later slaughter them, the meat will taste better
- By allowing only the best male goats to breed with your does, you can improve the quality of the kids in your herd
- Only castrate kids from does that were vaccinated against tetanus 6-8 weeks before kidding
- Ask an animal health technician or veterinarian to demonstrate castration before you attempt the procedure for the first time
- The Elastrator<sup>®</sup> method uses a special rubber ring that is applied around the scrotum above both testicles
- This rubber ring is left there and this stops the blood supply which causes the scrotum and testicles to shrink and drop off after about 3-4 weeks
- If possible, castrate the young males on a cool day
- Work as hygienically as possible
- Wash and disinfect the Elastrator<sup>®</sup>
- Hold the goat in a way that you can work on the testicles
- Before you start castrating, make sure that you can feel the two testicles
- Place the rubber ring on to the Elastrator<sup>®</sup>
- Using the Elastrator<sup>®</sup>, open the rubber ring



*The castration process*

- Holding both testi This is of particular importance during certain times of the year, *i.e.* before the breeding and kidding seasons
- Female goats should have a score of 3-4 before breeding. This is to give them the best chance of becoming pregnant

## SECTION 2 - IS MY GOAT HEALTHY?

It is important to know how to recognise healthy and sick goats as this allows you to do several very important things, for example it allows you to:

- Check goats and know they are healthy before you buy them
- Check that your existing goats are healthy every day when you inspect them
- Quickly identify any sick goats so that they can be treated
- Identify old, sickly or unthrifty goats so that they can be culled from the flock
- Select healthy female goats for breeding
- Decide which goats to sell or slaughter

This section tells you how recognise healthy and sick goats and suggests what to do when you identify a sick goat or if you discover that one has died.

It is also important to know when it is best to wear gloves when handling a goat to protect the handler from disease and to help prevent its spread.

Taking the temperature of a goat correctly will help you to work out what is wrong with the goat as it will tell you whether the goat has a fever or not.

Finally sometimes a goat might have died and since conducting a *post mortem* examination will help you determine the cause of death, a section is included on how to carry out such a procedure effectively.

Animal health technicians, state or private veterinarians will be able to provide further information.

## IS MY GOAT HEALTHY?

### Questions to ask from a distance without disturbing the herd...

- Do all the animals in the herd look well?
- Is the herd in good condition?
- Are about half the animals chewing the cud (ruminating)?
- Are the goats lively and inquisitive?
- At this distance, does everything about the goat look normal?
- Does the goat do what the rest of the herd is doing?
- Does the goat seem calm; not excited or depressed?
- Is the goat standing or walking normally?
- When it lies down, is its position normal?
- Is the goat eating and drinking normally?
- When the animal bleats, does it bleat in an expected manner; not excessively or because of pain?
- Is the animal behaving normally *i.e.* not scratching itself excessively or rubbing itself excessively against rough objects?
- If the goat is female and has a kid, is she feeding it well?
- If the goat is a male, has it made females pregnant?

### Go up to that goat, handle it and look closely to find out...

- Is the goat tame and easy to handle?
- Does the animal seem relaxed?
- Is the goat in question in good condition; neither too thin, nor too fat?
- If you pinch the skin, does it return to the normal position quickly?
- Is its coat bright and shiny?
- Is the coat free from loose hair?
- Is this animal free of ticks, lice and mites under the tail, around the udder, in the ear and between the claws?
- Is the goat free of wounds or lumps?
- Is the animal's temperature normal?

### Now look at all the different parts of the body...

#### Head and neck

- Is the head, neck and jaw free of any swelling?
- Is the position of the head normal; not stretched and not twisted?
- Are the goat's teeth in good condition and not all worn down?
- **Have you determined the age of the goat by looking at its teeth?**
- Is the goat chewing normally; not grinding its teeth in pain?
- Is there a normal amount of saliva?

- Is the mouth free of any other discharges?
- Does the goat swallow easily without spilling food from the mouth?
- Are the mouth and tongue healthy with no sores or bleeding?
- Are the gums pink and firm?
- Is the nose cool and moist and free from any discharge?
- Is the nose free of sores or signs of bleeding?
- Does the breath smell sweet?
- Are the eyes bright and full; not sunken; not cloudy?
- Are both eyes free of discharges?
- Are the eyelids free of growths?
- If I draw down the eyelid, is it pink, like the gums?

### **Chest**

- Is the animal breathing at the rate of 25 to 35 breaths per minute?
- Is the depth of breathing normal?
- Is the animal breathing with its mouth closed?
- Is it breathing with ease and making the usual breathing sounds?
- Is the animal free of coughing or sneezing?

### **Belly**

- Does the size and shape of the belly look normal?
- Is the outline of the belly smooth and free from swellings or hernias?
- When you look at the goat from the back, do both sides of the belly look the same?
- Is the goat urinating normally?
- Is urination controlled, free from pain and not too frequent?
- Is the urine clear, yellow and free from blood or pus?
- Is the tail or rear area of the animal clean of stains caused by diarrhoea?
- Does the goat pass faeces freely, without straining due to constipation?
- Are the faeces of the goat well formed?
- Are the faeces free of any sign of diarrhoea (watery faeces) or blood?

### **Females**

- Is the udder firm?
- Is the udder well shaped?
- Does the udder have a smooth outline?
- Are the teats well clear of the ground?
- Are there two evenly sized teats, both pointing forwards?
- Are the teats free of any sign of damage?
- Is there no sign of pain when you handle the udder?
- Is the temperature of the udder the same as that of the under belly?
- In a milking animal, is the milk creamy, smooth and free from clots or blood?
- Is the doe's vulva ("private parts") free from abnormal discharges and swellings?

### **Males**

- Are the sheath and penis free from any abnormal discharges, swellings and wounds?
- In uncastrated males, are there two testicles?
- Are the testicles roughly the same size?
- Do the testicles feel firm and cool?
- Are the testicles free of any swellings or wounds?

#### **Feet**

- Are the feet and hooves in good condition?
- Are the feet and hooves free of any signs of infection or discharge?
- Are the joints firm to the touch with no sign of swelling?
- Are the hooves shaped to the foot and not overgrown?
- Are all the limbs and feet of the animal intact *i.e.* there are no signs of injury or broken bones?

#### **What must I do if my goat is sick?**

- If your goat is sick, consult this manual. It will help you to recognise the most important diseases and conditions
- If the problem is not mentioned in this manual or you are not sure how to proceed, get advice from a local animal health technician, state veterinarian or private veterinarian
- If the animal is old, or there is a problem which will not easily clear up, destroy it
- Do not slaughter a sick animal for meat
- Never sell or buy a sick animal
- Do not buy any other animal from a herd with sick animals

#### **What must I do if my goat has died?**

- To find out what killed the animal, a *post mortem* examination should be done if at all possible
- Meat from an animal that has died should never be eaten or fed to other animals such as dogs or cats
- To dispose of the carcass, dig a deep hole and bury the carcass so that dogs and wild animals will not dig it up

#### **WHY AND WHEN SHOULD I WEAR GLOVES?**

**There are two main reasons for wearing gloves when treating a sick or injured goat**

- Plastic (or thin rubber) gloves protect you from the body fluids of the sick animal that can harm you
- Use plastic or thin rubber gloves when cleaning a wound so that you do not introduce germs from your hands into the wound

**Clean plastic shopping bags may also be used in the place of gloves**

**Always wear gloves or plastic bags when:**

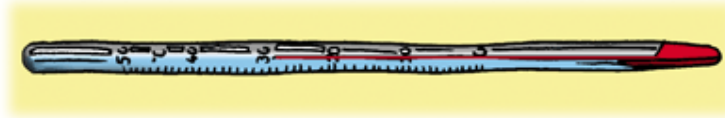
- handling the carcass of an animal that has died
- examining a discharge from a sick animal
- treating an abscess, and
- cleaning a wound

**After using gloves:**

- bury or burn disposable gloves and plastic bags after use
- or, if the gloves are re-usable, disinfect them and allow them to dry
- store re-usable gloves in the **equipment box**, and
- wash your hands with soap and clean water

### HOW DO I TAKE THE TEMPERATURE OF A GOAT?

- It is important to take the temperature of a goat that you think is sick because the temperature can change when the goat is sick
- Use a rectal thermometer to take the temperature of a goat
- Never use the same thermometer for humans after you have used it in an animal



*Bulb thermometer*

- Make sure the thermometer is clean
- Shake the liquid in the thermometer into the bulb
- Hold the goat in a standing position
- Slide the thermometer, bulb first, into the rectum of the goat for about 2 finger widths
- Hold the thermometer there for 2 minutes
- Remove the thermometer and read the temperature immediately
- The normal temperature of a healthy goat should be 39°C
- A goat with a temperature of 39.5°C or higher is sick with a fever
- After use, wash the thermometer in clean soapy water
- Store the thermometer safely, away from children
- If the thermometer breaks, very carefully collect all the liquid by scraping it onto paper and wrapping it in a plastic bag and bury it deeply. Wash your hands very carefully

### POST MORTEM EXAMINATION

- A *post mortem* examination is carried out on a dead animal to find out why the animal died
- A detailed description of how to carry out a *post mortem* examination of an animal is beyond the scope of this manual
- However, in areas where it is difficult to reach a veterinarian, the carcass and organs of an animal that has died should be examined. This will help to decide what steps to take to prevent more deaths
- If you are able to contact a veterinarian, the veterinarian can advise you on what the most likely cause of death was and the veterinarian can recommend measures to be taken to prevent the spread of the disease or the worsening of the problem
- Animals that die suddenly or that show signs such as bloating soon after death and oozing of blood or blood-stained fluid from the nose, mouth and anus **must not be examined**. Such animals may have died from anthrax, which may cause sickness and death in humans. The state veterinarian must be notified of any deaths suspected to be due to anthrax
- Always be careful when opening up a dead animal, because it may have died of a disease that can affect people, such as Rift Valley fever. Avoid allowing body fluids (blood, urine, gut contents, etc.) to splash into your face or eyes, and protect your clothes by covering them with an apron which you can make from a large plastic bag or sheet. If you have rubber boots and rubber gloves they offer extra protection. If you do not have gloves, make sure that you wash and disinfect your hands well before touching your face, smoking, or eating

- If body fluids happen to splash into your eyes or face, wash your eyes immediately with water and your face with soap and water. If you start to feel sick, go to the nearest clinic
- **Note:** It is only worth doing a *post mortem* examination if the animal is freshly dead. After death changes take place quite quickly so that the organs look and feel different, and it is much more difficult to decide if there were any abnormalities before death. Signs that the carcass is rotting include a bad smell, organs that appear greenish to blackish and are very soft, and gas bubbles in organs
- You will need a large sharp knife, a bucket of water to wash your instruments in and a second bucket of water to wash your hands in, soap and disinfectant, and a pen or pencil and paper to make notes. If you have a pocket knife, a saw or pair of cutters to cut the ribs, and a pair of scissors with rounded ends to open the intestines, you will find them useful
- Where you are able to consult a veterinarian, the following will help you to find out why your animal died:
  - Write down what you have seen during the *post mortem* examination and discuss it with the veterinarian. Have another person with a pen and paper to write down what you tell them, because your hands will be wet and dirty. If nobody is available, remember what you saw and write it all down as soon as you have finished the *post mortem* examination
  - Make notes of the following before you start:
    - date on which the animal died
    - any signs that the animal showed before it died
    - the number or name of the animal
    - the age, sex, breed and colour of the animal
    - the animal's condition
    - the number of other animals showing the same or similar signs
    - the period of time during which such problems have been occurring
    - the position the animal was lying in
  - Take samples for the veterinarian to send to a laboratory. He/she can give you a bottle that will contain formalin, a fluid that will preserve the samples. **Note: Formalin is a poison so keep this bottle in a very safe place where children and other family members cannot reach it.** To take samples, cut a small piece about half the size of your thumb nail from each organ (lung, the tip of the heart, spleen, liver, kidney, brain and any area in the stomachs or intestines that looks abnormal). Also take a piece of any unusual lump or swelling. Put the piece in the formalin and give it to your veterinarian.
- Examine the carcass carefully and notice:
  - The condition: is it in good condition, or is it very thin?
  - The hair coat: is there any loss of hair? Is any of the hair matted?
  - Are there any wounds, abscesses or swellings?
  - Are there any parasites? Particularly examine inside the ears, between the claws, and the parts where the legs join the body, for ticks.
  - Are the mucous membranes (eyes, mouth, anus, vulva or prepuce) a normal light pink colour? Can you see any blisters or sores?
  - Any discharges from the eyes, nose, mouth, penis or vulva?
  - Any soiling of the hind parts with diarrhoea?
- Place the animal on the ground on its right side (to find out the cause of death it is best to work on the ground and not to hang the animal up by the hind legs so that you can see if the organs are in their normal places). If you can use the skin, skin the animal first

- Cut the left front limb and the left hind leg from their attachments and bend them over the vertebral column so that they are bent away from the abdomen
- Open the abdomen and look for the following:
  - A large amount of fluid; bleeding or blood clots; pus. If there is a lot of fluid, smell it to find out if it is urine (male animals may suffer blockage that prevents urination, and eventually there is urine inside the abdomen)
  - Any organs not in their normal positions
  - Any obvious lumps, masses or abscesses
  - The appearance of the fat (no fat or watery fat means the animal was starving)
- Open the chest and look for the following:
  - Attachments between the chest wall and the lungs or heart
  - A large amount of fluid; bleeding or blood clots; pus
  - Any obvious lumps, masses or abscesses
  - Open the bag around the heart to see if it contains fluid or blood
- Remove the tongue, gullet, windpipe (trachea), heart and lungs and examine them:
  - Lungs: Feel them (should feel spongy), then make several cuts. Look for water in the lungs (water and foam appear when you cut them); pneumonia (lungs red or yellowish to grey, with patches of different colours, feel firm to hard); pus (may appear when you cut); abscesses; parasites
  - Heart: The heart should not have white spots or stripes
  - Gullet: Open the gullet, it should be empty but may contain some food
  - Windpipe: Open the windpipe and look for bleeding (seen in animals that died of bloat) and foam (water on the lungs)
  - Tongue: Look for sores on the tongue
- Examine the organs in the abdomen and the chest:
  - Spleen: Look for swelling (increased size, round edges), change from normal colour and/or shape
  - Liver: Look for swelling, change from normal red-brown colour (for example, dark red or yellow). Make several cuts into the different parts of the liver and squeeze a small piece of the liver between your thumb and forefinger to determine how hard, normal or soft it feels. Look for parasites (worms)
  - Gall bladder: If very full, the animal has not been eating. Open it and look for stones, change in colour or thickness of the bile, or bleeding
  - Kidneys: These should be the same size and shape, look smooth, and feel firm. Cut in half lengthways. They should not contain urine, pus, chalky white material, or blood clots
  - Bladder: Open to check the colour of the urine and whether blood is present
  - Stomachs: Examine the outside for bleeding, wounds or abscesses. Open the paunch (rumen) and check for amount and age of food inside (should be fairly fresh), ulcers or wounds in the lining, abnormal items such as plastic bags, pieces of wire, cloth, etc., and parasites. Open the milk stomach and examine for ulcers and parasites
  - Intestines: Look on the outside for any wounds. Open parts of the intestines. The colour inside should be pale. Make a note if the insides are red, or covered with a greyish to yellow layer, have any raised white spots or lumps, or show signs of bleeding. Look at the contents (should be normal digested food) and see if there are any worms. Open the last part of the intestine before the anus (the rectum) which should contain normally formed faeces



- If the animal is female, check whether she was pregnant
- Saw the head in half to remove the brain and examine it for pus on the surface, water-filled sacs (cysts) or abscesses
- Examine the teeth for wear: sometimes very old animals cannot eat because their teeth cannot work any more
- Look at the muscles along the backbone, the top part of the legs, the neck, between the ribs, and the side of the abdomen to see if there is any bleeding or bruising, abscesses, or areas of a different colour to normal, such as white spots or stripes
- The remains of the carcass should be buried deeply, together with the soil that was under and around the carcass when it was opened
- Wash your hands, arms, boots/feet, knife and other instruments, and apron well with soap and water, adding some disinfectant to the water

### SECTION 3 - USING MEDICINES CORRECTLY?

There are many different medicines available on the market. Each medicine comes with a set of instructions and it is very important to follow these. If the correct procedure is not followed, the medicine may not work, your goat will not get better and you will have wasted your money.

How you use medicines varies quite considerably. For example, it is important that an animal receives the correct dose of a medicine. The dose may be worked out on the size and weight of the goat.

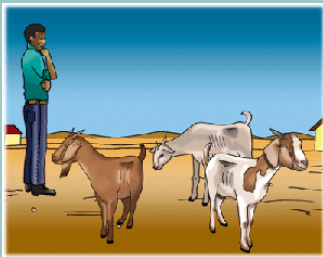
Some medicines need to be given on more than one occasion to ensure the treatment is effective, while others only need to be used once.

Different medicines also need to be given to the goat in different ways, for example, they can be given orally by drenching, by injection under the skin or into muscles, by application to a small area, by pouring them over the skin or by dipping.

This section deals with these matters and also, since goats can accidentally injure themselves, the safe way to treat wounds is also described.

#### HOW DO I USE MEDICINES CORRECTLY?

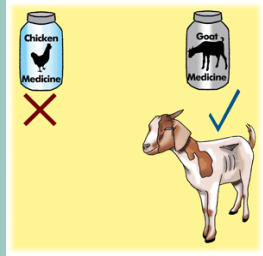
- Medicine can be used to **treat** animals when sick or wounded
- Medicine can also be used to **prevent** the animal from getting sick



- **You need to know what disease you are treating or preventing**
- Make sure you are using the right medicine



- **Always read the instructions that come with the medicine**
- Or, ask the shopkeeper, an animal health technician, an extension worker, experienced farmer or veterinarian to read and explain them to you



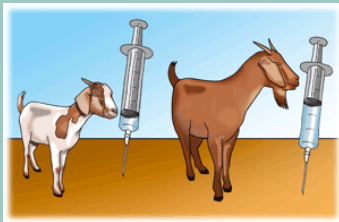
- **Make sure the medicine can be used for goats**
- For example, medicine for chickens cannot be used for goats



- **Check the expiry date**
- If the medicine is past the expiry date it will not work properly
- If the date is given as:  
EXP. DATE 03 2007  
03 refers to the month  
2007 refers to the year
- Do not use that medicine after March 2007



- **Medicine needs to be kept cool and in the shade**
- Make sure that the medicine was kept cool and in the shade in the shop before you bought it
- Make sure that you keep the medicine in a cool place away from sunlight



- It is important to give the right dose e.g. bigger goats take bigger doses
- Too little may not work, and too much may be harmful

### Various ways of giving medicine...

- **Make sure that you give the medicine by the right method**
- The instructions will tell you how to give the medicine:



- **Disposable needles and syringes used for injecting should be new and in their original packaging so that they are clean and the germs are killed**
- Use a disposable syringe and needle only once; then discard them
- Do not use the same needle on different animals
- Collect dirty needles in an empty cold drink can
- When it is full, ask an animal health technician to take it away to destroy it
- Drop the used syringe in the pit toilet



- **Give the medicine as many times as the instructions say, or it will not work properly**
- For example, some injections need to be given for 3 days. If you do not give the medicine for 3 days, you will have wasted your money and the animal will not get better



- **For the medicine to be effective, it must spread through the goat's body and the body fluids, including the milk**
- This means that there is medicine in the body parts and body fluids, including the milk
- Taking in animal medicine can make humans sick
- Read the instructions so that you can tell how many days to wait after giving the medicine before you may slaughter the animal for meat or drink the milk from the animal
- The period to wait is called the medicine's **withdrawal period**, which is given as days or weeks



- **Keep all medicines, syringes and needles away from children, to prevent the children from poisoning or hurting themselves.**



### HOW DO I TREAT A WOUND?

- Wounds need to be cleaned and kept clean, to stop them getting infected
- If the wound is very large or very deep, it is wise to consult an animal health technician, a state veterinarian or a private veterinarian
- Collect together the things you will need to treat the wound

- Use clean water that has been boiled and allowed to cool
- A disinfectant suitable for use in goats should be added to the water
- Wear plastic or thin rubber gloves or use clean plastic bags on your hands
- Restrain the animal
- Use clean paper towel, if this is available
- Clean the wound from the centre to the edge to stop dirt being wiped into the wound
- When the wound is clean, apply a wound spray that contains an insecticide against flies
- Some wounds may require treatment with an antibiotic, particularly if they are large, deep or already infected
- Keep the wound dry and clean
- Rest the animal
- If the gloves can be used again, wash them very well with warm soapy water, rinse them, disinfect them, hang them up to dry and store them carefully
- Burn the plastic bags, disposable gloves and any paper that was used

**Note:** Some open wounds do not heal even if you wash and treat them; these might be caused by a cancer.

- Cancer happens more often on an older animal (rather than a younger animal), on light-coloured bare skin that was exposed to the sun
- Only a veterinarian can treat a cancer and remove it by an operation
- But even this may not help if the wound is already quite large
- It may be best to cull animals with such cancer

#### **HOW DO I DRENCH A GOAT?**

- Drenching is the method used to give medicine by mouth, and is normally used to treat animals against worm infections
- This can be done by using the syringe without the needle
- Prepare the correct dose for the animal concerned
- Restrain the goat
- Open the goat's mouth
- Place the syringe in the side of the goat's mouth and over the base of the tongue
- The syringe should be directed towards the left-hand side of the mouth
- Raise the head of the animal a little, but not too high, which will prevent the animal from swallowing
- Do not hold the mouth open while dosing
- Slowly squeeze the contents of the syringe into the mouth
- Make sure the goat is swallowing the medicine and not choking on it
- If the goat jumps forward, move with the animal to prevent damaging the roof of its mouth

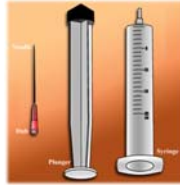
#### **HOW DO I TREAT FOR TICKS?**

- Ticks may be the cause of such problems as wounds and abscesses, including foot abscesses
- Ticks may also transmit diseases such as heartwater
- There are different ways of killing ticks on animals such as the use of plunge-dipping, the use of a spray race, local application using sprays and tick grease, and the use of pour-on remedies

- For the small-scale farmer, the use of a pour-on remedy is possibly the most effective and easy to apply
- Use a pour-on tick remedy in the armpits, groin areas and between the claws of the feet
- The frequency with which goats are treated for ticks will depend on such factors as the time of the year and the numbers of ticks on the animals
- Where wounds caused by ticks or foot abscesses are a problem, you may need to treat the goats for ticks more frequently, for example, once a week, until the problem is brought under control. Thereafter, the intervals between treatment can be increased

### HOW DO I GIVE MY GOAT INJECTIONS?

- Some medicines have to be injected into the goat rather than given by mouth



*Drawing of a syringe and needle*

- You use a syringe and needle to inject medicine into the goat

#### **Injecting under the skin**

- A convenient place to inject under the skin is on the side of the neck
- The place to inject is on the higher third of the neck; not the lower part of the neck where a large vein is found
- Make sure the syringe and needle are sterile
- Prepare the correct dose for the animal to be treated
- Restrain the goat
- Lift the skin between your index finger and thumb, and push the needle under the skin
- Make sure that you do not push the needle right through and inject through two layers of skin, by mistake
- Pull back on the plunger and make sure that no blood enters the syringe
- If there is blood, remove the needle and put it in at a different place
- If there is no blood in the syringe, gently push the plunger down into the syringe
- Pull the needle out after the injection has been given
- Rub the area for a few seconds
- Properly dispose of the needle and syringe

#### **Injecting into a muscle**

- A convenient place to inject into the muscle is on the rump of the animal
- Make sure the syringe and needle are sterile
- Prepare the correct dose for the animal to be treated
- Separate the needle from the syringe
- Restrain the goat
- With your fingers, feel for the pad of muscle on the animal's rump about a thumb's length behind the hip bone
- Holding just the needle, without the syringe, between the thumb and forefinger, insert the needle in one quick movement into this muscle

- Check that there is no blood in the hub of the needle
- If there is blood, pull the needle out and try again
- If there is no blood, fit the syringe on to the needle and push the plunger to inject the medicine into the muscle
- Remove the needle
- Rub the area for a few seconds
- Properly dispose of the needle and syringe



Step 1: Insert the needle without the syringe

#### SECTION 4 - COMMON DISEASES AND CONDITIONS?

This part of the manual describes the diseases and conditions that you are most likely to see in your goats. Each page describes a different disease or condition and is set out in a similar manner, describing the diseases and conditions as follows:

- What a particular disease or condition is
- What causes a particular disease or condition
- What the signs are that you see
- How you treat or cure the problem
- How you prevent the problem from happening again
- Any other useful information.

The diseases and conditions are presented in a specific order and we would like to explain why. The diseases and conditions you see in goats can be caused not only by various types of organisms or germs called viruses, bacteria, protozoa or worms, but also by poor nutrition.

Probably the most common cause of abortion in goats is poor nutrition of the does. Problems characterised by sores are abscesses, foot abscesses and orf. Sometimes one disease occurring in a goat can predispose it to a second disease. This is the case with orf and mastitis. Kids may spread orf from their mouths to the teats of their does. Does with orf lesions are, in turn, more likely to develop mastitis. Sometimes the same bacteria can cause more than one disease, for example pneumonia and mastitis can both be caused by *Mannheimia*.

Some diseases are best prevented through vaccination. This is the case with pulpy kidney and tetanus. Goats with tetanus, bluetongue and heartwater can all show nervous signs, twisting their bodies so that it is important to be able to differentiate the diseases. Finally, coccidiosis and the diseases caused by worms *i.e.* roundworms, tapeworms and flukes are grouped together since all four are gastro-intestinal parasites and can cause diarrhoea. The section concludes with a suggested vaccination schedule for goats.

If you think your goat is sick but you cannot see the problem in this manual, the goat may be suffering from something more unusual. In that case, ask your local animal health technician or a state or private veterinarian for advice.

## ABORTION

### What is abortion?

- Abortion is the natural or induced birth of a foetus before it is able to survive outside the womb

### What causes abortions?

- Stress resulting from starvation is probably the most important cause of abortion in goats raised on communal pasture
- Numerous infectious and parasitic organisms, such as *Chlamydia* and *Coxiella*, can also cause abortions in goats
- *Chlamydia* cause a problem called "enzootic abortion"
- Inbreeding in Angora goats can also cause habitual abortions year after year

### Abortion may be caused by stress from starvation

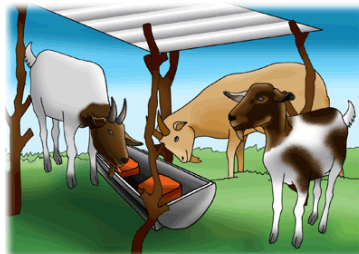
- This is because when the doe is pregnant she requires extra protein and energy for herself and for her foetus
- If she cannot obtain enough food of good quality she might lose her pregnancy and abort
- In summer rainfall areas, abortion caused by stress may be a severe problem from August to October because the veld has been grazed very heavily and the grass that is left has very little food value
- Often veld fires have destroyed large areas of grazing and this makes the situation even worse

### What signs do you see?

- Sometimes the foetus may be abnormal, but other times the foetus is quite normal
- When the abortion is caused by stress from starvation, a normal, well developed kid is delivered too early, after only 90 days of pregnancy
- When the abortion is caused by an infection, the foetus may be normal or it may be decomposed
- In habitual abortions in Angora goats, the foetus may be very swollen
- If possible, find the aborted foetus and the placenta (afterbirth)
- With plastic bags over your hands pick them up
- Wrap them carefully in plastic bags and take them to an animal health technician or a state or private veterinarian to find out what caused the abortion
- Wash your hands with soap and water after handling an aborted foetus

### Treatment

- Treatment of does that abort because of enzootic abortion is usually not practical nor economically feasible
- There is no specific treatment for abortions caused by *Coxiella*
- Abortions that are a result of starvation or are caused by inbreeding cannot be treated as such, but must be prevented



*Provide supplementary feed and licks when feed is scarce or of poor quality*



## Prevention

- To prevent abortion caused by starvation, give the does enough good quality food so that they gain weight
- To prevent abortion caused by *Chlamydia*, discuss the possibility of vaccination with a veterinarian
- To prevent abortions caused by the germ *Coxiella*, tick control is most effective

## Feeding the pregnant doe

- The most critical periods are the last 2 months of pregnancy and the first 2 months after giving birth
- During these 4 months, the doe needs 3 kinds of additional food, or feed supplement
- Each day, a pregnant doe that is grazing and weighs about 30kg, needs about 400g of additional feed that is high in energy. Such feeds include molasses, maize, barley, brewers' grain, wheat bran and cotton seed oil cake meal
- The pregnant doe will also need about 400g of additional feed that is high in protein per day. Such feeds include fishmeal, peanut oil cake meal, cotton seed oil cake meal and brewers' grain
- She must also get about 8g of salt and about 8g of mineral mix every day

## ABSCESSSES

### What is an abscess?

- An abscess is an accumulation of pus inside a thick-walled capsule

### What causes an abscess?

- An abscess is caused by germs, called bacteria, which are found in dust, in dung and on the ground
- An abscess often develops after an injury caused by ticks, grass seeds or thorns
- The bacteria enter through a small wound but then move around the body in the blood
- The abscess can develop away from the original wound

### What signs do you see?

- There is a round swelling which may be red and painful to the touch
- An abscess often develops in front of the shoulder, on the head or neck, on the flank or on the hind leg
- As the abscess develops to bursting point, the hair falls out and there is a soft spot in the middle

### Treatment

- The abscess should be treated when the hair has fallen out and there is a soft spot in the middle
- Add about a teaspoon of salt to a litre of water, then boil it for 20 minutes and allow it to cool
- Sterilise a sharp knife by boiling the knife in water for 20 minutes
- Collect the bowl of water, the sterilised knife or a new blade, paper towel, wound spray with an insecticide and a spare plastic bag
- Restrain the goat
- Wear gloves
- With the knife or blade cut a cross over the soft spot
- Use your finger to squeeze out the pus and collect it on clean paper



- Clean the wound with the boiled salty water
- Use a suitable wound spray to keep away flies
- Collect the paper, pus and gloves together and bury or burn them
- If possible, give an antibiotic injection to the animal when the abscess has been treated

### Prevention

- If an animal has several very bad abscesses or gets abscesses often, it should be culled
- Control ticks

## FOOT ABSCESSSES

### What is a foot abscess?

- This is a painful condition in which an abscess develops in tissues of the foot

### What causes a foot abscess?

- Germs enter the body through a small wound or injury on the foot
- The wound or injury may be caused by a tick bite between the claws
- The wound or injury may be caused by thorns when the goat stands up against trees to browse
- The germs then cause an abscess to form
- The abscess may affect the joints of the foot

### What signs do you see?

- The goat is lame, usually on one foot
- The foot is hot to the touch and painful to the animal when pressed
- In time, the foot swells just above the hoof and the abscess may burst through the skin here

### Treatment

- A foot abscess is difficult to treat because it is between the claws and you cannot cut the abscess there
- A foot abscess is also difficult to treat because the antibiotic does not easily penetrate the capsule of the abscess
- Keep the affected foot clean and the animal on a dry, clean surface at night
- Antibiotic treatment with a long-acting oxytetracycline given every third day for 4 weeks may be successful
- If the abscess is very bad, it may be best to cull the animal

### Prevention

- Where ticks are a problem, dip the goats' feet in a solution of tick dip
- You may use a footbath to dip the goats' feet
- Or, you may simply dip the goats' feet one by one in a small container of tick dip solution
- Use the container only for this purpose
- Use a tick dip registered for goats
- Dip the feet once a week in summer and every second week in winter



*Dipping the goat's foot*

## ORF

### What is orf?

- Orf is an infection of the skin and mucous membranes of sheep and goats
- Animals with orf have sores on or around the mouth and nose
- Because of these sores, another name for orf is "sore mouth"
- Orf can affect humans if they handle infected animals

### What causes orf?

- The virus that causes orf is tough and can survive for many years in the environment
- It enters the body through a break in the skin such as a scratch or a cut
- The stress of kidding can cause infections to flare up in does
- The infection can spread to kids
- An infected kid can spread the virus to the doe when it suckles

### What signs do you see?

- Small round raised scabs are seen usually at the corner of the mouth
- Scabs spread to and around the muzzle and nostrils, and around the eyes
- Encrusted sores may develop on the teats of does that are suckling infected kids
- When the kid suckles a doe with sores on her udder, it hurts very much

### Treatment

- The disease should clear up on its own
- Separate animals with orf, because the germs are carried on the scabs of the sores and when these fall off they infect the soil for many months
- Wear gloves to apply petroleum jelly to keep the scabs soft
- In severely affected animals, an aerosol spray containing an antibiotic should be applied to the scabs
- Kids that cannot suckle should be bottle-fed

### Prevention

- Where a few animals are affected and you are concerned that the infection will spread to the other animals, vaccinate the herd
- Do not vaccinate the herd where many animals are already affected
- Do not vaccinate healthy animals in a clean herd

## MASTITIS

### What is mastitis?

- Mastitis is an inflammation of the udder
- Does producing a lot of milk are more likely to get the disease
- Mastitis can be the main cause of loss of milk production
- Severe mastitis may cause a general poisoning of the animal's system, causing fever, depression and loss of appetite
- In the following picture, half of the udder has fallen off as a result of mastitis

### What causes mastitis?

- Mastitis is caused by an infection of the udder

- Mastitis develops in wet and warm conditions
- The disease can develop when kids introduce the bacteria into the teat canal during suckling
- Does with kids that have orf sores ("sore mouth") are more likely to develop mastitis

#### What signs do you see?

- Changes in the udder and clots in the milk are most evident
- Mastitis can cause the udder to become swollen, hot to the touch, red and painful, and then, purple in colour
- There will not be any milk or the milk will be abnormal (thin and watery, thick with clots, or containing pus or blood)
- Abscesses may occur in the udder
- Does may drag the back leg closest to the affected part of the udder, and limp when they walk
- Because of pain, does may not allow kids to suckle
- Kids could starve and die

#### Treatment

- Where possible, the udder should be milked out
- Do not mix milk from a goat which has mastitis with healthy goat milk
- The milk from does with mastitis must be discarded
- Apply a hot pack (such as a hot-water bottle filled with warm water) to the affected udder for about 5-10 minutes
- Then apply a cold pack (such as ice wrapped in a towel, or a towel soaked in very cold water) for about 5-10 minutes
- Give an antibiotic injection into the muscle
- Consult a veterinarian on the use of treatment via the teat canal
- Bottle-feed kids of does with mastitis with milk from does that are not affected so the kids do not starve

#### Prevention

- Good hygiene and management are very important
- Prompt attention to teat injuries is critical
- Flies can spread infection, so fly control is also important
- Check the udders before breeding
- Do not breed does which have hard, lumpy udders or closed teats because they will not be able to feed and raise their kids
- Cull animals with serious mastitis
- If mastitis is a problem on the farm, include a mastitis vaccine in your **vaccination programme**

## PNEUMONIA

#### What is pneumonia?

- Pneumonia is a disease of the airways and lungs, affecting sheep, goats, cattle and other animals.

#### What causes pneumonia?

- Pneumonia is caused by bacteria called *Pasteurella* and *Mannheimia*
- The disease usually occurs when the animals are under stress

- Animals may be stressed when they are exposed to bad weather such as strong winds, heavy rain, sudden changes in temperature or extreme cold
- Animals may also develop the disease after being transported long distances

#### What signs do you see?

- Animals may seem tired and walk behind the rest of the flock when they are herded
- They may stop eating properly
- Goats with pneumonia often have a fever
- Animals with pneumonia show fast breathing and breathe with difficulty
- They may gasp for air and cough
- There may be mucous discharge from the nose

#### In animals that died from pneumonia:

- The lungs will look patchy with red patches amongst the normal pink areas
- A large part of the lungs may also be firm and red in colour
- The lungs may be covered with a yellowish white layer which sticks to the inside of the ribs
- There may be froth in the windpipe
- The affected parts of the lungs from an animal that died from pneumonia will sink in water

#### Treatment

- Treat with a long-acting oxytetracycline product
- Repeat after 3 days if necessary

#### Prevention

- Correct weak management problems that cause stress to the animals
- Provide shelter during bad weather
- During a long journey, allow the goats stops to rest, drink water and eat hay
- Vaccinating the herd may help control the disease

## PULPY KIDNEY

#### What is pulpy kidney?

- Pulpy kidney is a disease which affects and can kill goats, sheep and cattle

#### What causes pulpy kidney?

- Pulpy kidney is caused by a bacterium
- Pulpy kidney often follows a sudden improvement in diet, for example, when goats are moved from an overgrazed pasture to a conserved one
- Mostly young animals are affected, but older animals may also die from the disease

#### What signs do you see?

- The disease appears very quickly
- The goats may show an unsteady gait and convulsions
- Animals with this disease are usually found dead without showing any signs
- To make sure why a goat died, it is necessary to do a *post mortem* examination

#### In animals that died from pulpy kidney:

- You may see soft pale kidneys; hence the name "pulpy kidney"

- The kidneys may also look bloody
- Sometimes you may see gas-filled red intestines. (But you will also see this in animals that have been dead for a while)
- An important sign in the dead animal is an increased amount of fluid in the sac around the heart, which gets thicker and like a jelly when the sac is opened

#### **Treatment**

- Because signs are sudden, treatment is usually too late
- If there had been a sudden improvement of the diet, go back to the earlier diet and introduce the improved diet gradually

#### **Prevention**

- Do not change feed suddenly
- Regular vaccination is the best way to prevent the disease
- There are several vaccines available - follow the manufacturer's instructions very carefully

## **TETANUS**

#### **What is tetanus?**

- Tetanus is caused by the toxin of a bacterium that can be found in faeces and soil
- It results in severe muscle spasms and death
- It affects horses, pigs, sheep, cattle, goats and dogs
- Humans can also get tetanus

#### **What causes tetanus?**

- Tetanus may result when a wound, cut or dead tissue becomes infected with the bacterium
- A large amount of dead tissue may be caused by a surgical procedure (for example, castration) that is not performed properly
- The bacterium multiplies in the wound or dead tissue and produces a toxin which affects the nervous system

#### **What signs do you see?**

- This disease develops within 1-3 weeks of the animal being wounded
- The goat has spasms, falls down and lies on its side with its legs stretched out stiffly. The head is bent backwards
- The animal shows an exaggerated reflex action to sound or touch
- The third eyelid often moves across the eye
- The animal dies as a result of suffocation since the muscles used for breathing are affected

#### **In animals that died from tetanus:**

- Infected or poorly managed wounds are evident

#### **Treatment**

- Wear gloves when dealing with an animal that you think might have tetanus
- Clean and disinfect wounds of affected animals, removing all dead tissue
- Inject the animals with a long-acting antibiotic
- Put the affected animals in a dark, quiet area
- Ensure that the animals have fresh food and water
- Severely affected animals should be humanely killed

### **Prevention**

- Practice good wound management by cleaning and disinfecting wounds
- After male kids have been castrated, put them in a clean pen or in a goat house where the faeces can fall through a slatted floor
- Vaccinate pregnant does against tetanus 6-8 weeks and again 2-4 weeks before kidding. Follow the vaccine manufacturer's instructions very carefully

## **BLUETONGUE**

### **What is bluetongue?**

- This disease of sheep and goats is usually seen after heavy rains in late summer and autumn

### **What causes bluetongue?**

- This disease is caused by a virus that is carried by small flying insects called midges
- These insects are found mostly in places where conditions are warm and wet

### **What signs do you see?**

- A goat that is sick with bluetongue will have a fever and its temperature will be higher than 39°C
- The lips may be swollen
- There may be ulcers on the tongue and gums
- The colour of the tongue may be blue, hence the name "bluetongue"
- The bands above the hooves may be red
- If the doe is producing milk, there may be a drop in the amount of milk produced

### **Treatment**

- Goats with bluetongue should be kept in the shade and given fresh water and green feed
- Inject the animals with a long-acting antibiotic to prevent pneumonia

### **Prevention**

- Protect the goats from the biting insects by avoiding low lying wet pastures
- Apply insect repellents on the goats
- Vaccinate against bluetongue in the spring, after the does have kidded
- Do not vaccinate pregnant does during the first 3 months of pregnancy

## **HEARTWATER**

### **What is heartwater?**

- Heartwater is a disease of sheep, goats and cattle and the animals have a fever and show nervous signs

### **What causes heartwater?**

- This disease is caused by a blood parasite
- This parasite is a bacterium
- The parasite is transmitted by the bont tick
- This tick is found mainly in frost-free drier parts of the country, so heartwater is only found in these areas

### What signs do you see?

- A very important sign is that sick animals may have a fever of 40°C or higher
- You may see strange behaviour, for example, the goat may turn its head towards its body in a strange manner
- You may also see nervous signs such as a high-stepping walk, convulsions or kicking very hard



*Goat kicking very hard*

- Goats that are very sick with heartwater may die and in these animals you may see froth and fluid from the nose
- If you open the carcass, you may find fluid in the belly, chest and sac surrounding the heart, swelling of the lungs with froth, and fluid in the windpipe

### Treatment

- When you notice signs of the disease, treat **immediately** with a long-acting oxytetracycline product
- Read the product label to check the dosage and exact instructions for use

### Prevention

- Consult your local veterinarian on the best way to control the disease in your area
- In heartwater areas, the disease can be controlled by
  - initial vaccination of all animals, and,
  - thereafter, only treating for ticks when they become a nuisance

## COCCIDIOSIS

### What is coccidiosis?

- Coccidiosis is a disease of kids and lambs

### What causes coccidiosis?

- It is caused by a type of protozoon which is a single-celled organism
- This disease happens when there are dirty conditions in the animal pens, sleeping areas and kraals
- Young animals get this disease very easily and get infected from the manure
- Older animals that are immune to the disease (and show no signs) act as carriers that shed the parasites in the dung

### What signs do you see?

- Watery diarrhoea
- Dehydration

- Loss of appetite
- Loss of condition

#### Coccidiosis in the dead animal:

- There may be spots on the surface of the intestines
- When the intestines are cut open, they have a bumpy appearance

#### Treatment

- Separate all sick animals
- Treat all sick animals with a remedy for coccidiosis
- Mix ½ teaspoon of salt and 6 teaspoons of sugar in 1 litre of clean warm water
- Give the dehydrated kid ¼ to ½ litre of the solution 4 times a day for 3 days

#### Prevention

- Make sure that you keep the animal pens, sleeping areas and kraals dry and clean
- Do not crowd animals into an area that is too small
- If possible, build a goat house on legs with a floor made of planks with small spaces between the planks to allow the dung to fall through

## ROUNDWORMS

#### What are roundworms?

- Roundworms are parasites of grazing animals such as goats, sheep and cattle

#### How do animals get roundworms?

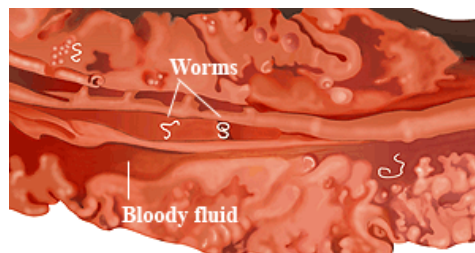
- Goats, sheep and cattle get roundworms when they take in the immature worms while eating grass
- These immature worms grow into adult worms in the animal
- Young animals are most badly affected

#### What signs do you see?

- You may see bottle jaw
- The inside of the eyelids could be pale
- Diarrhoea may occur. But remember, diarrhoea may also have other causes (such as coccidiosis or toxic plants)
- During winter or the dry season, animals may be in poor condition

#### In animals that died from roundworms:

- There may be bleeding or worms on the stomach or intestinal lining



*Intestine which has been cut open*

#### Treatment

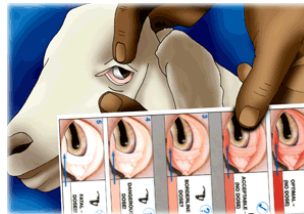
- If you see these signs treat with a worm remedy





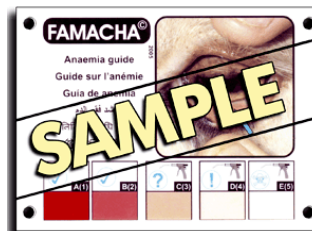
*Worm remedies*

- The FAMACHA® system can be used to determine which animals require treatment - instead of treating the whole flock



*Using the FAMACHA® card*

- If you want to use the FAMACHA® card ask a trained agricultural extension officer, an animal health technician or a state or private veterinarian to show you how to use it



*The FAMACHA® card is available in two different sizes*

**For further information or to purchase FAMACHA® cards, contact:**

Professor Gareth Bath

Private Bag X04, Onderstepoort, 0110 Republic of South Africa

Telephone: national: (012) 529 8038, international: + 27 (0)12 529-8038

Fax: national: (012) 529 8396, international: 27 (0)12 529-8396

E-mail: [gareth.bath@up.ac.za](mailto:gareth.bath@up.ac.za)

**Prevention**

- Keep your animals in good condition
- Give them good quality hay and a lick - they will be less likely to become ill from worms



Goats being fed a lick

## TAPEWORMS

- Other types of worms, tapeworms, commonly occur in sheep and goats
- The tapeworms appear as white segments in the droppings of the animal
- Animals with tapeworms should be treated, but remember that the roundworms are considerably more important than the tapeworms
- Use a worm remedy that treats for both tapeworms and roundworms. This will save money

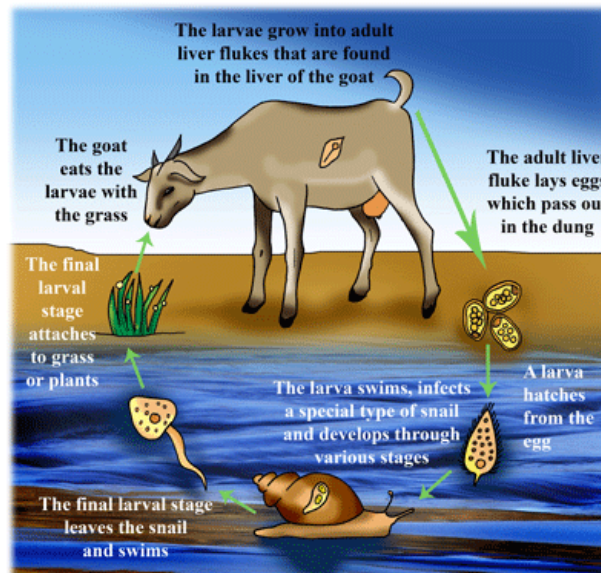
## LIVER FLUKE

### What is a liver fluke?

- Liver flukes are flat, leaf-shaped worms that are found in the bile ducts of the livers of animals

### How do animals get liver fluke?

- The adult fluke lays eggs which hatch in water or wet pasture, giving rise to immature flukes
- The fluke needs to spend part of its life in a snail so the immature fluke enters the snail and lives there for some of its life
- It then leaves the snail and clings to the plants growing around marshes and vleis and is swallowed when the goat grazes there



Life cycle of the liver fluke

### What signs do you see?

- Pale mucous membranes
- Weight loss. In the photograph below, the goats in the middle and on the right were infected with liver fluke. They are in poorer condition than the goat on the left which was not infected
- Bottle jaw, which is a soft swelling under the chin of the animal. (You may also see this with a **roundworm infection**)

### In dead and slaughtered animals:

- Bleeding in the liver
- Thickened bile ducts in the liver
- Firm, lighter areas in the liver (fibrosis)
- Liver flukes in the bile ducts
- In the photograph below, the livers on the left and in the middle were infected with and damaged by liver fluke. The liver on the right is normal

### Treatment

- Use a registered worm remedy in your animals in early spring, in midsummer, and in late autumn or early winter
- If fluke infection is serious, animals may need additional treatments during the summer
- If you have been treating for liver fluke and there is no improvement, then you need to ask your veterinarian or animal health technician for help

### Prevention

- Where possible, fence off vleis, streams and dams to stop the goats going there
- Fence off the pastures that are free of fluke from those that are not
- The pastures that are known to give liver fluke problems should be grazed only in the winter months, when the fluke numbers are much lower

## VACCINATION

- The following schedule should be seen as a guide only. Consult a veterinarian for a specific immunization programme for your goats
- Follow the specific recommendations of the manufacturer when using any vaccine
- Pay special attention to recommendations regarding the use of the vaccines in pregnant goats

### Kids - within 1st week of life

- Heartwater (consult your local veterinarian)

### Kids - from 2 weeks of age

- *Pasteurella* (2 times, 4 weeks apart)

### Kids - before weaning (at 2 to 5 months of age)

- Pulpy kidney
- *Pasteurella*
- Blackquarter

### Kids - at 6 months of age

- Bluetongue (3 vaccines, 3 weeks apart)
- Pulpy kidney
- Blackquarter

- Anthrax

**Does and rams - spring (August-September in South Africa)**

- Bluetongue (9 weeks before breeding in does but only after breeding in rams; 3 vaccines, 3 weeks apart)
- Pulpy kidney
- Blackquarter (4 weeks before shearing in Angora goats)
- Anthrax (4 weeks before shearing in Angora goats)

**Does and rams - autumn (April-May in South Africa)**

- *Pasteurella*

**Does - before the breeding season**

- Enzootic abortion (4-6 weeks before breeding)

**Does - before the kidding season**

- Blue udder (6-8 weeks and 2-4 weeks before kidding)
- Tetanus (6-8 weeks and 2-4 weeks before kidding)
- Orf (4 weeks before kidding, if indicated)

<http://www.arc.agric.za/home.asp?pid=3946>